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Editorial

Dear IEEJE Readers,

We are entering a second Covid-19 year.

Humanity is facing unique challenges. The covid-19 pandemic continues to have a negative impact on many sectors in all countries. Our health is under constant threat. Educational activities are carried out under uncertainty, and our socialization are restricted.

Working from home, Remote, Virtuel, Distance, Zoom, Teams etc. became an important part of our daily educational vocabulary. We had to learn, and we did as much as we could under different circumstances.

It seems to me that in several areas, we were encouraged to tackle different challanges. One of them is educational research and dissemination. This volume of International Electronic Journal of Elementary Education (IEJEE) shows that many researchers did not give up. They conducted research in different parts of the world. Our job was to arrange peer-reviews, manage technical issues and publish their papers in accordance with rules of indexing agencies.

I would like to express my gratitudes to all authors, peer reviewers, and IEJEE staff Vedat Şeker, Dr Gökhan Özsoy and Dr. Turan Temur for their contribution.

Sincerely,

Dr. Hayriye Gül Kuruyer

Acting Editor-In-Chief, IEJEE

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How primary teachers use games to support their teaching of mathematics

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Abstract

Mathematical games are widely employed by Australian primary school teachers to support mathematics instruction. Despite broad usage, prior research has not focused on the how and why games are employed from a teacher perspective. Australian primary school teachers (*n* = 248) completed a questionnaire designed to probe their experience with mathematical games in the classroom, specifically; motivation for and frequency of game usage, game execution within lesson routines and structures, and, perceptions of the efficacy of games to achieve pedagogical objectives. Almost all the primary teachers self-reported playing mathematical games in their classrooms a minimum of once a week. Games were utilised in differing pedagogical capacities, for example, as a 'warm-up' exercise, to introduce new mathematical concepts, to consolidate skills and knowledge, and for fluency practice. Consistent with prior research, teachers viewed games as highly effective for engaging students in mathematics. Teachers also viewed games as being effective for developing all four proficiencies highlighted in the Australian Curriculum: Mathematics (ACARA, 2019); fluency, understanding, problem-solving, and reasoning. Interestingly, despite the burgeoning use of digital games, only two out of the 248 teachers surveyed mentioned a computer game or digital application as their favourite game to use in a mathematics lesson. A substantial majority of teachers nominated favourite games that involved minimal or no materials, in particular, playing cards and/or dice, pen and paper, and oral games. Implications of these findings are discussed and future research directions are recommended. This study has taken steps towards deepening our mathematics educational community's understanding of primary teachers' use and experience of games.

Keywords:

Games, Teacher Perspectives, Pedagogical Approaches, Student Engagement, Mathematics Education

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Introduction

The word "game" brings to mind various interpretations. Mousoulides and Sriraman (2014) synthesised earlier work by Harvey and Bright (1985) and Oldfield (1991) to offer a comprehensive definition of a mathematical game. A mathematical game was defined as a pedagogical activity that:

- has specific mathematical cognitive objectives,
- [requires] students to use mathematical knowledge to achieve content-specific goals and outcomes in order to win the game,
- is enjoyable and with potential to engage students,
- is governed by a definite set of rules and has a clear underlying structure,
- involves a challenge against either a task or an opponent(s) and interactivity between opponents,
- includes elements of knowledge, skills, strategy, and luck, and,
- has a specific objective and a distinct finishing point. (p. 383, 384).

Findings from Bragg's (2012a, 2012b) research with upper primary students (9 - 12 year olds) supports the employment of games with these characteristics to promote mathematical cognitive growth and engage students. Other studies with similar definitions of games have found positive impacts of playing games on primary students' mathematical learning (Bright, et al., 1985; Cohrssen & Niklas, 2019) and/or engagement in mathematics (Lindenskov & Lindhardt, 2020; White & McCoy, 2019). Indeed, a recent meta-analysis of mathematical games used in a Turkish educational context across all levels of education (pre-primary, primary, secondary and tertiary) incorporating 30 studies (4 journal articles, 26 dissertations) found that games had a medium positive impact on academic achievement compared with a variety of what were termed "traditional methods" of teaching mathematics (Turgut & Temur, 2017, p. 196)

Given the considerable benefits of playing games, it is perhaps not surprising that instructional time devoted to game-related activities in the primary education context is both substantial and increasing (Heshmati et al., 2018). Yet, a search of the literature revealed there is a paucity of research into the frequency with which teachers employ games in the mathematics classroom. One exception is Russo and Russo's (2020) study involving 135 Australian early years primary teachers (Foundation, Year 1 and Year 2) participating in professional learning on teaching with challenging tasks. A single item in a pre-program questionnaire asked the frequency with which participants played games. Almost all early years teachers (98%) who completed the questionnaire reported playing mathematical games at least once per week in their classrooms, whilst 85% of teachers reported playing games multiple times per week and over half (53%) of teachers reported playing games 4-5 times per week. Surprisingly, given the evidence that most primary teachers use games multiple times per week to support mathematics instruction in class, it is curious how little prior research explores teachers' perceptions and usage of mathematical games in general (Heshmati et al., 2018).

The aim of this article is to broaden our current knowledge of how and why primary teachers use mathematical games in their classrooms. Specifically, we report on results from an online questionnaire of 248 primary teachers to address the research question:

- How are games used by primary teachers to support mathematics instruction?

We present the background literature organised into sections as follows: Mathematical games and the student learning experience, Games pedagogy, and Digital games.

Background Literature

Mathematical games and the student learning experience

For decades there has been a general acceptance by educators that mathematical games are beneficial for student learning. As early as the 1960s Dienes (1963) was advocating commencing mathematics lessons with games to tune students into the lesson. In the 1980s, Ernest (1986) wrote a rationale for the use of games citing the effectiveness of games to teach mathematics, particularly for: the acquisition and development of concepts; reinforcement and practice; developing problem-solving skills; and, motivation. Playing mathematical games offers an engaging way of developing problem-solving skills (Pintér, 2010), opportunities to improve students' social skills (Koay, 1996), foster mathematical reasoning (Olson, 2007), support differentiation (Buchheister et al., 2017), provide targeted instruction (Clarke & Roche, 2010), and build connections between the home and school environment (Russo, et al., 2018).

Indeed, there is long-standing empirical evidence that playing games can lead to improved mathematical learning outcomes (Bragg, 2012b; Bright, et al., 1985; Swan & Marshall, 2009), even for very young students (Elofsson et al., 2016; Ramani & Siegler, 2008). For example, providing pre-school teachers with a suite of mathematical games, and a one-day workshop supporting them to use such games, improved the mathematical knowledge and skills demonstrated by their young students (Cohrssen & Niklas, 2019).

Using games has been noted to be effective for improving mathematical thinking across all levels of primary and secondary schooling, even if they do not explicitly target mathematical concepts. Cramer (2019) demonstrated that a board game can be used as a catalyst for exploring formal mathematical argumentation in upper secondary classrooms, positively impacting both the perceived competency and intrinsic motivation of students. Similarly, McFeetors and Palfy (2018) showed that engaging in commercial board games with logical structures provided opportunities for children to improve their capacity to reason mathematically.

Moreover, there is evidence that experiences designing mathematical games can support mathematical learning. Cody et al. (2015) instituted a yearlong study with 24 high performing upper primary students in the US that involved introducing six novel mathematics topics, adopting a repeated-measures design. For half of these topics, instruction involved explicit lessons, followed by collaborative problem-solving. For the other three topics, students were given an opportunity to create, and then play, mathematical games. Students created games that addressed the relevant mathematical learning focus. These games took the form of board, dice, or card games, and varied greatly in their content and complexity. The authors assessed performance on an achievement test linked to their state's curriculum standards, as well as students' perceptions of the lessons. Students' post-program performance on topics in the games condition was equivalent to their performance on the control condition topics, despite pre-program assessments indicating that the game topics were notably more difficult. Interestingly, student enjoyment, perceptions of their conceptual understanding, and overall motivation to engage in mathematics learning were similarly high in both conditions.

In a comprehensive series of studies examining the impact of mathematical games on student learning, Ramani and Siegler (2008; 2011) established that engaging in linearly numbered board games can improve students' whole number knowledge, and that such experiences can help reduce the mathematical performance gap between students in low-income and middle-income families prior to the start of school. The particular mechanics of the game were important for realising these gains. In particular, it was important that the board was numbered, presented in a linear representation (as opposed to circular), and that students were required to 'count-on' as they played (Ramani & Siegler, 2008; Siegler & Ramani, 2009). Follow-up studies confirmed that the linear representation was particularly important for improving the capacity of students to accurately represent magnitudes on number lines, as well as developing their early arithmetic capability (although not necessarily for the development of counting or number naming; see Elofsson et al., 2016). Similarly, playing linear board games that included negative integers, and incorporating similar game mechanics to those advocated for by Ramani and Siegler (e.g., counting on; counting back), improved young school children's understanding of negative numbers (Bofferding & Hoffman, 2019).

Additional evidence in support of the claim that mathematical games are effective for learning can be gleaned from the beliefs and attitudes of students themselves. White and McCoy (2019) undertook an action research project involving 24 fifth-grade students who played a series of mathematical games focused on interpreting co-ordinates and ordered pairs (e.g., battleships) across three consecutive mathematics lessons. These games were non-digital. The authors concluded that playing games improved students' knowledge of ordered pairs, and as well as their attitudes towards mathematics. White and McCoy's (2019) analysis of qualitative follow-up interviews with a subset of students revealed that these improvements in attitude were influenced by students cultivating a growth mindset (Dweck, 2015), the opportunity to strengthen problem-solving skills through working with another student, and the fact that the games themselves were highly engaging.

In further support of acknowledging students possessing positive attitudes towards playing games as an avenue for learning, Bragg (2007) found that prior to the game-play intervention three-quarters of the 121 upper primary students involved in her study agreed or strongly agreed with the statement "Maths games help me to learn maths", with only a small minority (9%) disagreeing with the statement. Moreover, after spending eight sessions playing a challenging calculator based game focused on exploring multiplication and division of decimals, post-intervention interviews revealed that the competitive game context motivated students to contend with demanding mathematical concepts beyond the local curriculum standards for their grade level, as they attempted to devise effective strategies for beating their opponent. However, using games alone is unlikely to be a panacea for learning mathematics. In the same study, Bragg (2012a) found that, although participating in an intervention involving games significantly improved student performance on an achievement test, a comparison group who undertook rich, problem-based activities focused on the same concept generated larger and more sustained improvements. This occurred despite students who played games being more likely to engage in relevant mathematical discussion than students who undertook rich, problem-solving activities (Bragg, 2012b).

Games pedagogy

One of the proposed reasons why games might not be as effective for supporting learning as other pedagogical approaches is that excessive engagement in a game can be problematic, reducing the tendency to promote reflection and thus undermining potential learning (Harviainen & Merilainen, 2019). It is in part for this reason that it is preferable when selecting games that the key mathematical ideas be central to gameplay, and for the game to be tested against the emergence of players applying heuristics disconnected from the core mathematics; that is, to prevent players 'gaming the system' (Heshmati et al., 2018, p. 779). The implication is that as students experience 'flow' (Csikszentmihalyi, 2014, p. 209) in the game, they are additionally contending with important mathematical concepts. To support this approach, Heshmati et al. emphasised the importance of utilising games which necessitate the player possessing a well-developed mathematical understanding of the relevant learning focus to be successful in the game. Heshmati and colleagues' (2018) naturalistic study monitored the introduction of two manipulative-based fraction games, Cover-up and Un-cover, in 14 fifth-grade classrooms. Although the fraction games analysed were used widely in mathematics classrooms, the authors concluded that the players were able to navigate play by referencing the different colour of the pieces rather than their fractional amount. Thus, little abstraction to the mathematical quantities was evident.

Another potential reason that games may result in less gains in learning compared with equivalent non-game activities, despite generating more mathematical discussion and on-task behaviour (Bragg, 2012a; 2012b), could be due to games leading to poorer quality mathematical interactions between the teacher and students. In the aforementioned study, Heshmati and colleagues (2018) analysed 70 video-taped mathematics lessons, some lessons involved the Cover-up and Un-cover games (14 lessons), whilst the remaining lessons included other learning experiences (e.g., worksheets, problem-solving activities) on the same topic, multiplication of fractions. The authors examined how the games were utilised, and compared the quality of teacher-student interactions across the games and non-games lessons. Games were almost exclusively used to review a concept and/or reinforce prior learning (13 lessons), rather than introduce or explore a new topic (1 lesson). The game segments in a lesson typically lasted for 15 to 20 minutes. The game-based lessons were associated with lower quality teacher-student interactions, with most interactions focused on game management, for example, turn-taking, game rules, or game progress, rather than the underlying mathematical concepts. Rather than question the pedagogical value of games per se, Heshmati et al. (2018) concluded that teachers require explicit professional learning around how to employ games effectively. They suggest that part of this professional learning could involve more detailed instructional notes around implementing games, particularly in relation to teacher actions to elicit student mathematical thinking during play. "As the authors note: Ultimately, teachers are the ones who have to decide when and which games students play in their classrooms and how to make game playing a valuable classroom activity and learning experience" (Heshmati et al., 2018, p. 780).

Building on the notion that game mechanics are important in shaping the student learning experience (Ramani & Siegler, 2008; 2011), it has been demonstrated that the design characteristics of a game can be systematically varied to achieve a particular pedagogical outcome. Nilsson (2007) investigated a small group (n = 8) of Swedish seventh-grade students' reasoning through the experience of playing a purposefully structured probability game. The game involved students first distributing 24 or 36 counters across a game board labelled 1 to 12 and rolling two dice. Students removed a counter if its position on the game board was equal to the sum of the dice roll. The team to remove all their counters first was declared the winner. Drawing on principles of variation to encourage students to attend to the underlying mathematical structure, four different versions of dice were introduced to students across the data collection session. Although Nilsson (2007) was mainly concerned with how the game and its variations revealed and supported student thinking around probability, there were several instructional design characteristics worthy of note. First, Nilsson's (2007) study is a relatively rare example of exceptional care being taken to manipulate game mechanics to shape the student learning experience; a practice that is highly prevalent in the digital game educational literature (e.g., Lindström et al., 2011; Pareto et al., 2012), but relatively absent from the mathematical educational games literature. Specifically, Nilsson constructed the quantities on the dice and manipulated the order in which students engaged with different dice to encourage students to notice particular probabilistic phenomena. Second, the study utilised the power of competition and collaboration in deliberate ways. Allowing students to work in pairs enabled students' probability thinking to be illuminated, whilst encouraging students to refine their strategies through discourse with their teammate. Moreover, as Nilsson notes, competing against other teams was highly motivating, and incentivised students to engage more deeply with the mathematical ideas.

Given the evidence that students' learning experience is impacted by the design characteristics of a game (Nilsson, 2007), it is noteworthy that inexperienced teachers find designing high quality games difficult. Pilten et al. (2017) undertook a study that involved 386 undergraduate pre-service teachers designing games for (hypothetical) Year 4 elementary students. The authors found that although participants tended to design games with compelling narratives that allowed for sufficient competition and challenge, they had more difficulty generating interactivity amongst players, articulating clear game rules, accurately representing mathematical concepts, and ensuring that gameplay promoted engagement with key educational objectives. Pilten et al. argued that supporting teachers to design educationally-rich games should be included as a focus of teacher education and professional learning. Perhaps the aspect of mathematics education in which the most attention has been paid to game design is in the area of digital games.

Digital games

Over the past two decades, there has been an increasing focus on digital games in the educational research literature. Beyond the field of mathematics education, recent reviews that have considered the educational value of game-based learning have focused overwhelmingly on digital games. Abdul Jabbar and Felicia (2015) identified 91 studies for inclusion in their systematic review of the educational outcomes associated with game-based learning, 18 papers specifically related to learning mathematical content. Although the scope of the review included both digital and non-digital games, only a single study identified in the review relied on a non-digital delivery platform (classified as a "board and card-based game", p. 753). It is unclear whether this present focus of educational research on digital game-based learning aligns with the everyday usage of games by primary teachers in mathematics classrooms. Exploring this issue of teachers' usage of games, including digital and non-digital mediums, is one of the aims of the current study.

Some research into digital games has taken place specifically within a school-based context, and consequently informs our understanding of how digital games might support student learning. Pareto et al. (2012) evaluated how playing a computer game that required primary students to collaboratively engage with non-proportional virtual manipulatives and spatial representations of two- and three-digit numbers, impacted on students' conceptual understanding of Base-10 concepts. Forty-seven third grade Swedish students participated in the study. Students in the intervention group undertook seven 35-minute sessions involving the computer game over a nine week period as part of their mathematics instruction, whereas the control group received their regular classroom instruction (with the equivalent amount of instructional time) on the same topic. The game-playing group showed greater improvements in their conceptual understanding of Base-10 concepts over the control group, demonstrating that the game was efficacious. Further analysis revealed that students in the intervention group were more confident explaining mathematics to a peer, although there was no advantage of the intervention in terms of student attitudes towards mathematics. The authors attributed this later null finding to the global measure of attitudes towards mathematics employed in the study (e.g., questions such as "Do you think maths is boring or fun?"), noting that students may not have associated the game with "regular mathematics practice" (p. 742). The authors described the students in the game-playing group as being highly engaged in the game, enthusiastic to begin and reluctant to finish.

In summary, prior studies on games have indicated the effectiveness of games on students' mathematical understanding of concepts (Turgut & Temur, 2017), but in some cases, these games were not as effective as well-crafted activities (Bragg, 2012b). Games have been employed in differing pedagogical approaches, yet researchers warn of the pitfalls of playing games without reflection or sufficient emphasis on key concepts (Heshmati et al., 2018; Pilten et al., 2017). Whilst there is research generally on digital games (Abdul Jabbar & Felicia, 2015), focused research within the mathematics classroom is sparse. Notably, most of the research explores the impact of game interventions on students, and there is little known research enquiring about games from the teachers' perspective (Heshmati et al., 2018). The Methods section outlines how the current study attempts to address this gap in teachers' perspectives in the research.

Method

Participants

Two hundred and forty-eight teachers completed the questionnaire focused on how they use mathematical games in their classrooms. Participants were spread across all years of primary education in Australian classrooms: Foundation - Year 2, n = 78; Year 3 - Year 4, n = 63; Year 5 - Year 6, n = 71; taught across multiple year level groups, n = 36. As a group, they were relatively experienced primary school teachers, with a median time spent teaching of 10 years (mean = 13.2; SD = 9.3; Min = 1 year; Max = 51 years).

Procedure

The questionnaire was designed to be completed through an online survey platform Qualtrics. Online surveying was selected as a useful tool to reach a large cohort of teachers. Snowball sampling was used as a way of disseminating the questionnaire as widely as possible. Specifically, the first author circulated the survey link via email to 15 key informants based in three Australian states, as well as utilising social media (Twitter, Facebook) to directly recruit teacher participants. The only inclusion criterion was that a teacher was currently teaching in a primary context in an Australian school. Questionnaires were completed anonymously, and only completed questionnaires were considered for analysis. This research adhered to national ethics guidelines.

Questionnaire

In total, the questionnaire contained a mixture of four forced-choice and three open-ended items, as well as collecting demographic information (location, year level taught, number of years of teaching experience). In the current paper, we focused on three of the forced choice items and one of the open-ended items, specifically:

1. How frequently do you play maths games in your classroom? (forced-choice)
    a. All the time (e.g., about 4-5 times per week)
    b. Often (e.g., 2-3 times per week)
    c. Sometimes (e.g., once per week)
    d. Rarely (e.g., once per month)
    e. Never
2. In which of the following ways do you use maths games? (forced-choice; frequency scale same as Item 1).
    a. Outside of my maths lessons
    b. As a warm-up activity in a maths lesson
    c. As the main learning activity in a maths lesson
    d. As the closure activity in a maths lesson
    e. To support fluency practice
3. Maths games are effective for... (forced-choice; 5-point Likert scale, ranging from strongly disagree to strongly agree)
    a. engaging students in maths lessons
    b. maximising on-task behaviour
    c. generating rich mathematical discussions
    d. differentiating for different performance levels
    e. focusing students on important mathematical ideas
    f. supporting connections between home and school
    g. building procedural fluency
    h. building conceptual understanding
    i. building mathematical reasoning
    j. building problem-solving skills
4. Take a moment to reflect on your favourite maths game. Name and describe the game. How do you use the game in a lesson? Please provide as much detail as you can. (open-ended).

Data analysis

The frequency of responses to the survey data were analysed and are presented in tables in the following section. Teachers' open-ended responses were examined for references to the materials used to support their nominated favourite game.

We acknowledge that the data collection has limitations. The first is self-selection bias within online survey research (Thompson, et al. 2003); some participants are more likely to respond to survey requests than others. Therefore, the voices of those that do not respond to online survey requests are unheard. Second, apart from the demographic variables, little is known about the respondents beyond their self-reporting (Wright, 2006). There was no opportunity to check the veracity of their claims. These limitations underline the difficulty of collecting online survey data. Notwithstanding, a benefit of the online survey data was that it offered a snapshot of primary teachers' perspectives across the country. These perspectives are presented below.

Results and Discussion

In this section, the findings from the analysis on how 248 Australian primary teachers used games to support mathematics instruction are reported. The following four sub-sections are unpacked to understand more deeply the actions of teachers as facilitators of game-play: Frequency with which games are used in primary classrooms; How games are incorporated into classroom routines and lesson structures; Pedagogical aims teachers perceive mathematical games as being effective for achieving; and, Characteristics of highly valued mathematical games.

Frequency with which games are used in primary classrooms

Teachers were asked to report how frequently they played mathematical games in their classrooms. Five levels of frequency were provided, ranging from 'all the time' to 'never'. An indicative frequency corresponding to each descriptor was provided in parentheses (e.g., 'all the time'; 4-5 times per week) to elucidate the intention of these descriptors.

Table 1 summarises the frequency with which the entire sample of participating teachers played mathematical games in their classrooms, while Table

2 provides the results by year level taught. Almost all teachers responding to our survey reported playing mathematical games at least once per week in their classrooms (98%), whilst approximately one-third of teachers reported playing games all the time – effectively every lesson. There was no correlation between teaching experience and the frequency teachers played games in their classrooms (rho = 0.02, $p > .05$). Moreover, there were no notable differences in the frequency with which teachers played games across different year levels [$X^2_{(6, 244)} = 1.457$, $p > .05$].[1]

It was concluded that, regardless of the year level they teach or their level of teaching experience, most primary school teachers reported playing mathematical games 'often' or 'all the time' in their classrooms. For parsimony, it is useful to combine these two categories 'often' and 'all the time' into a new descriptor, 'regularly'. Thus the term 'regularly' can be used to describe primary school teachers who reported playing mathematical games in their classrooms multiple times per week (i.e., at least twice per week). We will use this new descriptor 'regularly' for much of the remainder of our analysis, to distinguish between teachers who reported playing mathematical games multiple times per week and those teachers who reported using games less frequently.

Our results are consistent with the only other study of which we are aware that asked Australian primary school teachers about how frequently they employed games in their classrooms. Specifically, Russo and Russo (2020) reported that 85% of early years teachers (Foundation – Year 2) reported playing mathematical games regularly, compared with 79% of teachers in our study. This suggests that the snowball sampling methodology utilised in the current study did not result in teachers participating who were disproportionately inclined to play mathematical games in their classrooms, increasing the potential generalisability of the results reported here. In comparison, early years' teachers in our study were actually less likely to report playing mathematical games 'all the time' (35%) compared with their counterparts in the Russo and Russo (2020) study (53%).

Table 1

Frequency Teachers Reported Playing Mathematical Games

	Frequency	Percent
All the time (e.g., about 4-5 times per week)	80	32%
Often (e.g., 2-3 times per week)	116	47%
Sometimes (e.g., once per week)	48	19%
Rarely (e.g., once per month)	4	2%
Never	0	0%
Total	248	100%

Table 2

Percentage Frequency Teachers Reported Playing Mathematical Games by Year Level Taught

	F-Y2 Only (n = 78)	Y3-Y4 Only (n = 63)	Y5-Y6 Only (n = 71)	Combination of levels (n = 36)	Total (n = 248)
All the time (about 4-5 times per week)	35%	35%	28%	31%	32%
Often (2-3 times per week)	45%	46%	48%	50%	47%
Sometimes (once per week)	19%	17%	23%	17%	19%
Rarely (once per month)	1%	2%	1%	3%	2%
Never	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%

Note: Percentages in tables may not total 100 due to rounding.

How games are incorporated into classroom routines and lesson structures

Teachers were asked how they incorporated mathematical games into classroom routines and lesson structures. Results are reported in Table 3. Combining the categories 'all the time' and 'often', three-quarters of teachers reported using mathematical games regularly (i.e., multiple times per week) as a warm-up activity in a mathematics class. Using games as a 'warm-up' perhaps equated to a somewhat traditional conception of how primary teachers use games to support mathematics instruction (Bragg, 2006).

By contrast, slightly less than half the teachers in our sample reported regularly using mathematical games to support rich mathematical investigations (45%), and one-third of teachers (33%) regularly used games as the main learning activity in a mathematics lesson; although a large majority of teachers reported using games in these more substantive ways at least some of the time. Using a mathematics game outside of a mathematics lesson, or as a mathematics lesson closure, was less frequently reported by teachers.

It is noteworthy that almost all teachers (96%) responding to our questionnaire reported using games in multiple ways to support mathematics instruction at least some of the time. This indicates that teachers understand the flexibility games offer as a pedagogical tool. Teachers incorporated mathematical games into their classrooms in a variety of ways, adopting at least two of these approaches at least once per week: using games as a 'warm-up', using games as the main learning activity, using games as a lesson closure, using games to launch a rich investigation or using games outside of the mathematics lesson. This variety of usage suggests that although teachers frequently used games as warm-ups, games were weaved into their instructional repertoire in a multi-faceted manner. It has been highlighted in the literature that using games in exclusively superficial ways (e.g., as rewards for early finishers, or as 'add-ons' to the lesson) is unlikely to support student learning, and that students benefit when teachers use games both for purposeful practice and introducing new mathematical concepts (Swan & Marshall, 2009).

Teachers' pedagogical aims when using mathematical games

In general, teachers indicated that mathematical games were highly effective for achieving the pedagogical aims outlined in the survey (see Table 4). There is evidence that teachers thought games were most effective for engaging students in mathematics lessons, with all except one teacher agreeing with this statement, and 82% of teachers indicating that they strongly agreed with this statement. This finding is consistent with the research literature indicating that student engagement is an advantage offered by games over other potential activities (Attard & Curry, 2012; Bragg, 2012a; Kim et al., 2017). Moreover, building on other strengths of games noted in previous research, approximately 9 in 10 teachers in our study agreed or strongly agreed that games were effective for supporting differentiated instruction (Buchheister et al., 2017), maximising on-task behaviour (Bragg, 2012a), and focussing on important mathematical ideas (Pintér, 2010). Interestingly, a similar proportion of teachers endorsed the capacity of games to generate rich mathematical discussion, despite mixed evidence for this in the literature (Bragg, 2012b; Heshmati et al. 2018). In particular, Heshmati and colleagues' suggested that games often lead to superficial interactions between teachers and students, due to the teacher focusing more on managing the game than probing students' mathematical thinking.

Table 3

Percentage Frequency of Ways Teachers Use Mathematical games to Support Mathematics Instruction

	All the time (4-5 times per week)	Often (2-3 times per week)	Sometimes (once per week)	Rarely (once per month)	Never
Outside of my maths lessons (e.g., end of the day before packup)	3%	16%	48%	25%	9%
As a warm_up activity in a maths class	30%	45%	19%	4%	1%
As the main learning activity in a maths class	4%	29%	53%	13%	1%
As the closure activity in a maths lesson	2%	14%	40%	34%	9%
To support rich mathematical investigations	11%	34%	38%	14%	3%

Table 4

Percentage of Teachers Agreeing/Strongly Agreeing with the Effectiveness of Games for Achieving Various Pedagogical Aims

	Combined Agree or Strongly Agree	Only Strongly Agree
Engaging students in maths lessons	100%	82%
Maximising on-task behaviour	88%	49%
Generating rich mathematical discussions	92%	50%
Differentiating for different performance levels	89%	56%
Focusing students on important mathematical ideas	90%	45%
Supporting connections between home and school	71%	32%
Building procedural fluency	86%	45%
Building conceptual understanding	90%	43%
Building mathematical reasoning	91%	50%
Building problem-solving skills	91%	50%

By contrast, the least endorsed aim was 'supporting connections between home and school'. However, it is notable that even for this least endorsed item, 7 in 10 teachers agreed that games were an effective means of supporting connections between home and school, with one-third of teachers strongly agreeing with this statement.

Another interesting aspect of the data presented in Table 4 is that it offers support for the assumption that teachers do not exclusively view games as being effective for building procedural fluency. In fact, teachers tended to view games as supporting the development of all four proficiencies highlighted in the Australian Curriculum: Mathematics equally (ACARA, 2019), including reasoning and problem-solving. Other authors have provided examples illustrating how games can be effective for developing the mathematical proficiencies beyond procedural fluency, including mathematical reasoning (Olson, 2007), conceptual understanding (Clarke & Roche, 2010) and problem-solving (Pintér, 2010). Taken collectively, the views of teachers in our study are highly consistent with the argument that playing a game should be equivalent to engaging in meaningful mathematics (Swan & Mitchell, 2009) that builds mathematical proficiencies.

Characteristics of highly valued mathematical games

Most teachers (85%; 211 out of 248) described a favourite mathematical game for which the game materials could be discerned from their description. In instances where more than one game was described, the first game they outlined was the one analysed. Results are displayed in Table 5.

Table 5

Materials Involved in Teachers' Favourite Games

Materials	Frequency	Percent	Example
Dice and/ or playing cards	126	60%	Greedy Pig; Dice Cricket
Pen and Paper Only	36	17%	Mastermind; Bingo
Oral Games	24	11%	Buzz; 21.
Custom Cards (Sourced/ Created by teacher)	9	4%	I am, who is?
Commercial Games	5	2%	Prime Climb
'Real World'	5	2%	Chocolate, Music
Digital Games	3	1%	Wishball
Counters	3	1%	Bullseye

Note: *n* = 211; 37 teachers did not respond to this item or provided a general response that could not be further classified (e.g., "multiplication games").

Approximately 60% of teachers who responded to this item described a game involving playing cards or dice (126 out of 211). The next most frequently described games were those requiring no additional equipment beyond pen and paper, and in some instances a template constructed by the teacher (17%). Games involving verbal interactions only (described as 'oral games') were a favourite of approximately 1 in 10 teachers. Interestingly, only a tiny fraction of teachers nominated a computer game or app (1%).

Additional analysis of the data revealed that whilst one-quarter of the games described involved some sort of physical activity, or bodily engagement on behalf of the players (e.g., students standing up and sitting down in Greedy Pig), only 4% of games involved students or the teacher interacting with a digital technology in any capacity (e.g., digital game, calculator, random number generator, interactive number chart, supportive software). To summarise, overwhelmingly primary teachers' favourite games appear to be a low technical experience, requiring minimal equipment beyond cards, dice and, on occasion, a printable template.

These results contrast with the literature, where the research into digital games to support mathematics learning is substantial and in fact notably more prevalent than non-digital games (Abdul Jabbar & Felicia, 2015). There are many reasons why digital games might lend themselves to being the focus of educational research vis-à-vis non-digital games, such as: the provision of a highly controlled-environment, the precision with which game mechanics can be modified systematically, opportunities to provide learners with immediate feedback regarding student accuracy, the efficiency at which data can be collected and analysed, and students familiarity with, and interest in, digital games (Divjak & Tomić, 2011). However, to the extent that research in education should both reflect and inform current teaching practices, and in light of the views expressed by teachers in our study, the privilege given to investigating digital games in the research literature can be viewed as problematic.

Conclusions and Implications

In this paper an account was presented of primary teachers use of games to support mathematics instruction. The findings from this study provide quantitative evidence that Australian primary teachers are frequent users of mathematical games in their classrooms, and employ games in a variety of pedagogical practices, beyond a reward or time-filler. As long-time advocates of the benefits of games for students' mathematical learning, we are heartened by these findings.

Many of the favourite games mentioned by teachers require few or no materials (e.g., cards and dice), and have relatively simple rules (e.g., greedy pig, mastermind, buzz). Due to the frequency with which mathematical games are used among teachers and the preference for simple games, there may be an opportunity to create a central depository and/or to provide additional professional learning to bolster the pedagogical repertoire of teachers. Ideally, these professional resources would focus on games that require few inputs, provide ideas on how these games might be adapted to suit the differing needs of students, and possibly include suggestions about how to transform games into rich investigations to deepen mathematical reasoning (Russo & Russo, 2020). In addition, there are perhaps opportunities for universities to include a greater focus on mathematical games in pre-service preparation courses and, in turn, to help maximise the educational value of games in Australian classrooms. Pre-service teachers would benefit from exploring the role of games to support differentiation and to deepen mathematical thinking, and to build their confidence in game selection and modification.

Beyond the previously noted limitations of relying on online questionnaire data, it is important to note the data from the current study was collected in late 2019 which was prior to the COVID-19 pandemic impacting Australia. This additional contextual characteristic is important, as it is likely that if the questionnaire had of been administered in 2020 after online and remote teaching was being implemented across the country, some of our findings would have been different. For instance, we note the lack of focus on digital games in the questionnaire responses may at first glance seem somewhat surprising, given the proliferation of digital games usage in Australia and globally (Abdul Jabbar & Felicia, 2015). The growth in online teaching and remote learning in response to the COVID-19 pandemic leads us to question what opportunities for online game play might have been taken up by teachers over the past year that will be further incorporated into mathematics instruction in the future. Potentially, teachers who are catering for students learning online and remotely will utilise digital games more readily than their non-digital counterparts. Another potential impact of the COVD-19 pandemic may have been the further utilisation of mathematical games by educators as a means to strengthen home-school connections. Although a majority of teachers recognised building home-school connections as one of the aims of playing mathematical games, it was the least endorsed aim. However, due to their inherent interactivity (be it cooperative or competitive), it is more likely many Australian adults engaged in mathematical games with their child/ren during remote learning periods in 2020 and beyond.

Our research shines a light on the frequency with

which games are employed in the mathematics classroom, and provides further support for the notion that games can engage students (Kim et al., 2017), support differentiated instruction (Buchheister et al., 2018), maximise on-task behaviour (Bragg, 2012a), allow students to explore important mathematical ideas (Pintér, 2010) and generate rich mathematical discussion (Bragg, 2012b). However, there remains a need for more focused research aimed at exploring the mechanisms through which games may lead to these outcomes, as well as providing opportunities to better understand some of the subtler research findings. For instance, an overwhelming majority of respondents in our study highlighted the effectiveness of games in promoting rich mathematical discussions, but the type of interactions and their role in supporting mathematical learning are unclear. Previous research indicates that whilst games may promote rich peer-to-peer mathematical discussions (Bragg, 2012b), they may lead to more superficial mathematical interactions between the teacher and students (Heshmati et al., 2018). Consequently, endeavouring to better understand both the role games play in promoting mathematical dialogue between students, between teacher and students, as well as students and their family, and the net effect of games on the quality of mathematical interactions in and beyond the classroom seems important. Future mathematical games research must incorporate study designs that shed light on these and other complexities.

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The Effect of Interactive Reading Aloud on Student Reading Comprehension, Reading Motivation and Reading Fluency*

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Abstract

This study aimed to examine the effect of interactive reading aloud (IRA) lessons on students' reading comprehension levels, reading motivation, and reading fluency skills. A mixed experimental design was used to model the study. This study was conducted in a Turkish public school in the academic year 2017–2018, with 62 second-grade students, 22 in the first experimental group, 20 in the second experimental group, and 20 in the control group, and it lasted for 11 weeks. The IRA lessons within the research scope were performed by the researcher in one experimental group and by a second-grade teacher who was responsible for the class itself in the other experimental group. Reading Comprehension Rubric, Motivation to Read Profile scale, and Rubric for Reading Prosody were used as the data collection tool. The findings of the study revealed that reading comprehension, reading motivation, and reading fluency levels of the students in the experimental groups were higher than those of the students in the class, where lessons were taught on the basis of the current Turkish lesson curriculum. Furthermore, it was determined that IRA practices improved students' levels of reading comprehension, reading motivation and reading fluency skills, independently of the practitioner.

Keywords:

Interactive Reading Aloud, Reading Comprehension, Reading Fluency, Reading Motivation

Introduction

Reading is a meaning-making process that is conducted in a regular environment by using prior knowledge in line with an appropriate method and purpose based on the presence of effective communication between an author and reader (Akyol, 2011). Comprehension is to make sense of the information received through reading after it is processed in mind. While reading, mind, on the one hand, creates meaning from what the eyes collect from writing, and on the other hand, it combines these with the meanings in the previous lines. In other words, mind carries thoughts from one line to the next and links to the previous and next thoughts. This process is called

meaning formation or sense-making (Güneş, 2009). Motivation is of great importance for reading, as reading is a demanding choice (Guthrie et al., 2004). Reading motivation is defined as "personal goals, values, and beliefs that affect reading processes, outcomes, and topics" (Wigfield & Guthrie, 1997). Individuals who are motivated enough to read are considered fluent readers (Hasbrouck & Tindal, 2006). Reading fluency means reading the sentence with appropriate intonation, prosody, and expressiveness (Allington, 2006). Required strategies that are taught to children can improve the students' motivation to read, reading fluency skills, and reading comprehension levels. Thus, it aims to make them better readers. In literature, one of the reading activities, which affect reading comprehension, reading motivation, and reading fluency skills is said to be Interactive Reading Aloud (IRA) lessons taught to students by one or more teachers within regular planning (Lane & Wright, 2007; Morrison & Wlodarczyk, 2009; Tompkins, 2006; Trelease, 2013).

Interactive reading aloud is defined as planned reading of children's books aloud by a practitioner (Meller et al., 2009). During IRA, the teacher, by modeling thinking aloud teaches students the reading strategies for comprehension before, during, and after reading. Students listen to their teachers, and with the guidance of their teachers, they guess about the book they are listening, re-create the images in mind, make connections, question, identify the main theme, summarize, check the predictions, evaluate, and learn new vocabularies. During the IRA practices, teachers also use graphic organizers to improve reading comprehension and teach reading comprehension strategies, scaffolding, and think-aloud strategies. When interactive reading aloud is performed, students are provided with conversations, information, and explanations about the book read. Students have fun listening to the book and their curiosity about the book is aroused, and most importantly, fostering vocabulary, forming conditions for child's brain to enjoy reading, promoting prior knowledge, providing a role model for reading, and stimulating an interest in reading are all ensured by interactive reading aloud (Trelease, 2013). According to Routman (1991). IRA not only increases the levels of student reading comprehension but also improves their listening skills, vocabulary, and enables them to have a positive attitude toward reading. During the IRA process, teachers and students interact each other and this process can be explained by Vygotsky's (1978) sociocultural theory based on sociocultural constructivism. According to sociocultural theory, learning takes place through dialogues. These dialogues occur between teacher-to-student, student-to-student, and text-to-student, and thus, learning occurs thanks to the inner dialogues made by the student (Vygotsky, 1978). Social constructivists claim that students learn self-learning with the help of the ideas, classroom dialogues, interactions, and discussions organized by the teacher (Yang & Wilson, 2006).

According to Vygotsky (1978), "good learning" occurs in the zone of proximal development, which indicates the difference between the existing and potential developmental levels of children (Adam, 2017). The zone of proximal development refers to the distance between what a child can do independently and what a child can do with the help of any more knowledgeable person (Scharlach, 2008). In interactive reading aloud lessons, students are taught reading comprehension strategies with appropriate books and book plans selected by the teacher. While performing this teaching, an appropriate scaffolding strategy is used according to the level of the student. Throughout the whole process, the teacher is a model for students by thinking aloud. At the end of this process, it trains students who can read fluently, are motivated to read and can comprehend when they read their own. Think-aloud is a teaching strategy used by teachers to model thinking and thought process to students (Dunston & Headley, 2002). The literature review revealed that special methods have been developed to read books aloud to children. These research-based methods are Dialogic Reading Strategy, Text Talk Strategy, and Print Referencing Strategy (Lane & Wright, 2007). Interactive reading aloud as a process contains all three of these strategies because each is considered a read-aloud strategy. Dialogic reading is the method of reading illustrated books to children by an adult. However, this reading greatly differs from ordinary readings. In traditional reading, an adult reads and a child listens, but in dialogic reading, the child learns to be a storyteller (Whitehurst et al., 1994). The text talk strategy is a read-aloud strategy aiming to foster vocabulary growth (Beck & McKeown, 2001). Print referencing is a strategy that uses verbal and non-verbal cues, especially to encourage children's attention and interactions with print and writing in a book. Talking about the writing of the story enables the child to know about the language and linguistic features used (Justice & Ezell, 2004). In her study, Hazzard (2016) first taught students to make connections, make predictions, and think on the text while reading a book through the IRA lessons. The findings of her study revealed that average and below level students in the experimental group comprehended what they read better and higher-level students were more motivated to read. Mitchell (2015) investigated the effect of a well-planned IRA lesson on second-grade students, performed the IRA lessons for her students every day and taught them reading comprehension skills during the lessons. She postulated that students' reading comprehension levels, at the end of the study, improved. Spencer (2011) claimed that the IRA lessons improved students' reading comprehension, reading fluency, and motivation to read and vocabulary. The

findings of the study by Delacruz (2009) conducted with second-grade students, revealed that the reading comprehension levels of the students attending the IRA lessons were higher than those who did not.

In this study, the effects of interactive reading aloud practices performed by a teacher or other practitioners within a specific plan on students' reading comprehension levels, reading motivation, and reading fluency skills were examined. In line with this purpose, this study examined the following research questions:

1. Do reading comprehension levels of elementary school second-grade students differ significantly according to their attendance to the IRA lessons?

2. Do reading motivation levels of elementary school second-grade students differ significantly according to their attendance to the IRA lessons?

3. Do reading fluency levels of elementary school second-grade students differ significantly according to their attendance to the IRA lessons?

Method

Research Model

The study used a 3 x 2 mixed experimental design for the effectiveness of the IRA practices on the features dealt within the research scope regarding the second-grade students. The first factor in the experimental design represents the group variable (experimental 1(R), experimental 2(T), and control), and the second factor indicates repeated measures (pretest and posttest). Dependent variables of the study are comprehension, reading fluency, and reading motivation levels of the students. The independent variable of the study was IRA practice. The experimental process is shown in Table 1.

Study Group

A convenience sampling method, one of the purposeful sampling methods, was used to determine the study group. The convenient sample method was preferred due to time, resource, and labor limitations (Büyüköztürk et al., 2016). The study group consisted of 62 second-grade students, 22 in the experimental group 1(R), 20 in experimental group 2(T), and 20 in the control group, at a Turkish public school in Çankaya district of Ankara province in the academic year 2017–2018.

Data Collection Tools

While determining reading comprehension and reading fluency levels of students included in the study group, a text selected in line with expert opinions was used. In addition, "Reading Comprehension Rubric" for determining students' reading comprehension levels, "Motivation to Read Profile" scale for determining students' levels of reading motivation, and word recognition percent, reading rate, and "Rubric for Reading Prosody" for determining students' reading fluency levels were used.

Text Used in Determining Reading Comprehension and Reading Fluency Levels

To select the text to be used in determining the reading comprehension and reading fluency levels of the students in the study group, A text appropriateness form developed by the researcher was used. While developing this text appropriateness form, in order to identify the criteria included in the form, developmental characteristics of the second-grade students and the elements that a text appropriate to this grade level should include were taken into consideration. Accordingly, the literature was reviewed and three field experts' opinions were obtained. Then, the text appropriateness form developed by the researcher and three texts, namely Yarişmaci Marti (The Competitor Seagull), Gamze ve Arkadaşi (Gamze and Her Friend), Yavru Kedi (The Kitten), included in the Turkish course books were taught in the second grade with the recommendation by the Turkish Ministry of National Education. They were then presented to the same three experts contributing to the form development process in order to obtain their opinions. Based on the experts' opinions, the text named "Yarişmaci Marti" was decided to be used in the evaluation.

Reading Comprehension Rubric

Reading Comprehension Rubric, developed by the researcher, consists of 10 criteria. The highest possible

Table 1

IRA Experimental Process

Groups	Pretest		Posttest
Experimental 1(R)	R1	IRA practice (11 weeks)	R4
Experimental 2(T)	R2		R5
Control	R3	----------	R6

score obtained from the rubric was 20, while the lowest score was 0. For the preparation of the rubric, first, rubrics in literature and suitable for the second-grade level were examined. Then, a rubric was prepared to be used in the study and expert opinion was asked. The rubric was corrected and finalized in line with the expert opinions obtained. Regarding the reading comprehension rubric, expert opinion was asked for content validity, while an exploratory factor analysis was conducted for construct validity. As a result of validity analyses, the one-factor 10-items structure of the rubric used in this study was confirmed.

The findings revealed that the total variance ratio explained by this one-factor structure was 53.28%. For the measurement regarding the structure consisting of the determined items, a reliability analysis was conducted and Cronbach α value was found to be .84. The findings revealed that measures obtained from the rubric were reliable. To determine inter-rater reliability of the measures obtained from the reading comprehension rubric, Cohen's kappa coefficient was calculated. Chi-square value for the significance of inter-rater reliability on each item was examined. The findings, therefore, revealed that all items were statistically significant. In other words, inter-rater reliability scores for each item showed a very good level.

Motivation to Read Profile Scale

The study used the "Motivation to Read Profile" scale adapted into Turkish by Yıldız (2013) to determine the students' reading motivation levels in the study group. It is a 4-point Likert type scale comprising two sub-dimensions called "Reader Self-Perception" and "Value toward Reading." The scale has 18 items with nine items on each sub-dimension. The highest score possible to be taken from the scale was 72, while the lowest score was 18. The increase in the score shows that students' reading motivation also increases, and the decrease in the score indicates the decrease in students' reading motivation. The adaptation study of the scale by Yıldız (2013) was conducted for third-, fourth- and fifth- grade students. As the study group in this research was second-grade students, a confirmatory factor analysis (CFA) was performed to retest whether the scale structure e provides a fit model. The findings of the analyses revealed that the goodness-of-fit values were adequate, and consequently, the two-dimensional structure of the motivation to read profile scale for the second-grade students was confirmed (Chi-square (X^2) = 206,66; degree of freedom (*df*) = 134; $\frac{\chi^2}{df}$ 1,54;*p*.00; root mean square error of approximation (RMSEA) = .03, standardized root mean square residual (SRMR) = .04;incremental fit index (IFI) = .99; comparative fit index (CFI) = .99; normed fit index (NFI) = .90;Tucker-Lewis index (TLI) = .99). The Cronbach α reliability coefficient was calculated to prove the level of reliability of measures obtained. The findings of the analyses revealed that the Cronbach alpha reliability coefficient .90 for the scale, .91 for value toward reading sub-dimension, and .95 for reading motivation sub-dimension. As a result, it is safe to say that the measurements were reliable.

Data Collection Tools Used in Determining Reading Fluency Level

The word recognition percent is obtained by dividing the number of words read correctly in 60 seconds by the total number of words and then multiplying by 100 (Akyol et al. 2014). To determine the reading rate that affects determining the reading fluency level, the number of words that the student correctly reads per minute is calculated. Words that were read correctly also included the words that were read incorrectly at first, but then corrected and reread by the student. Reading fluency includes the student's skill of reading a text with a good expression, namely, reading prosody, reading rate, and word recognition (Akyol et al. 2014). In this study, "Rubric for Reading Prosody" developed by Zutell and Rasinski (1991) and adapted into Turkish by Yıldırım et al. (2009) was used to determine the levels of reading the prosody of the students. This rubric comprises four dimensions: "expression and volume," "phrasing and intonation," "smoothness," and "pace." The lowest score to be taken from the rubric was 4, while the highest score was 16. The results of the Cohen's kappa test were evaluated in the inter-rater reliability for the Reading Prosody rubric. Accordingly, the inter-rater reliability obtained from each criterion in the Reading Prosody rubric was found to be at a very good level.

Data Analysis

To examine the effects of interactive reading aloud practice on the relevant-dependent variables, the analysis of covariance (ANCOVA) was used to test the differences between the changes in the experimental and control groups before and after the implementation. By using ANCOVA, it was aimed to statistically control for a variable or variables associated with the dependent variable, other than a factor or factors whose effect was tested in the research (Büyüköztürk et al., 2016). The variable aimed to be controlled in this study was the pretest scores obtained from the experimental and control groups. The effect of the experimental process that might arise due to the differences in pretest scores of the groups was avoided by controlling the pretest scores of control and experimental groups.

Experimental Process

The experimental process of the study lasted for 11 weeks. Thirty-three class hours were practiced three

days a week and one class hour per day. During this practice, 11 illustrated children's books were used, i.e., one book for each week. The books were read three times within different plans to complement each other every day. Over the course of 33 - hour practice, to observe the lesson and interact with each other at times, the grade teacher was present in the class where the practice was performed by the researcher, and the researcher attended the class where the practice was performed by the grade teacher. While selecting the books to be used in the process, based on the opinions taken from seven field experts, 80 illustrated children's books were determined by the researcher first. In line with those examinations, it was agreed that 20 of 80 books selected together with the field experts at the beginning were deemed appropriate to be used for IRA studies. A detailed book list for these 20 books and the book evaluation form prepared to evaluate the books were presented to the field experts. With the opinions obtained from the field experts, 12 books, 11 principals, and one substitute, were selected to be used in the experimental process. Book plans were prepared by the researcher for the selected books. While preparing the book plans, the books that would be read for the practice every week were initially read in detail by the researcher. During these readings, what would be done before, during and after reading was decided for the first, second, and third readings of the book. Accordingly, during the lesson, the things to be done related to question-answer, visualizing, identifying the main theme, making a prediction, making an inference, summarizing, identifying the characters in the story, identifying the setting of the story, identifying the words and idioms whose meaning students would not be able to know, identifying the aspects of writing, including spelling and punctuation in the story, and associating with real life and providing preliminary information for students to comprehend the book better were all agreed.

Materials to be used in the lessons were prepared by the researcher before the lessons. These materials include detailed lesson plans prepared so that no details are missed during the teaching process. Word cards, including the meanings of words and idioms are covered in the book plan and the details about the meaning and use of which are not known by students. Pictures are used to better understand the story in the book and objects are provided when needed to facilitate students' reading comprehension.

FINDINGS

Table 2 shows the findings of ANCOVA analysis conducted to make a group comparison for the pretest and posttest reading comprehension scores of the students included in experimental 1(R), experimental 2(T), and control groups.

Table 2 shows that the difference in corrected posttest mean scores of the groups for reading comprehension was statistically significant ($F_{(2;58)}$=16,08; p <.01; p <.05). The findings of the post hoc test performed to find sources of difference revealed that the statistical difference was in favor of the students in experimental groups between the experimental 1(R) and control, and experimental 2(T) and control. Based on this finding, it would be safe to conclude that IRA practices positively affect the second-grade students' reading comprehension scores. The findings of another paired comparison revealed that there was no statistically significant difference in pretest and posttest comparison of experimental 1(R) and experimental 2(T) groups in terms of reading comprehension scores. In other words, no positive or negative change occurred in the reading comprehension scores of experimental 1(R) and experimental 2(T) groups for which IRA practices were performed by the researcher and teacher. Considering that the plan for the process of practicing IRA applied in both experimental groups is the same. It would be possible to say that the practitioner effect does not make a significant difference in IRA practices.

Table 3 presents the results of ANCOVA analysis conducted to make a group comparison for the pretest and posttest reading motivation scale and sub-factor scores of the students included in experimental 1(R), experimental 2(T), and control groups.

As Table 3 presents, based on the reading motivation, values toward reading and reader self-perception pretest scores of experimental and control groups, the difference in corrected posttest mean scores was statistically significant ($F_{(2;58)}$ = 28,98; $F_{(2;58)}$ = 17,21; $F_{(2;58)}$ = 16,52; p < .01; p < .05). The findings of the post hoc test performed to find sources of difference revealed that

Table 2

ANCOVA Results of Pretest and Posttest Reading Comprehension Scores

Source of variance	SS	*df*	MS	*F*	*p*	η^2	Difference
Model	310,94	3	10365	19,51	.00	.50	
Pretest	149,69	1	149,69	28,18	.00	.33	
Group	170,88	2	85,44	16,08	.00*	.36	Experimental1(R) > control Experimental2(T) > control
Error	308,11	58	5,31				
Total	5445,00	62					

Table 3

ANCOVA Results of Pretest and Posttest Reading Motivation Scores

	Source of variance	SS	*df*	MS	*F*	*p*	η^2	Difference
Reading motivation	Model	1813,09	3	604,36	53,30	.00	.73	Experimental1(R) > control Experimental2(T) > control
	Pretest	956,79	1	956,79	84,39	.00	.59	
	Group	657,27	2	328,64	28,98	.00*	.50	
	Error	657,62	58	11,34				
	Total	237832,00	62					
Value toward Reading	Model	323,60	3	107,87	25,01	.00	.56	Experimental1(R) > control Experimental2(T) > control
	Pretest	146,74	1	146,74	34,03	.00	.37	
	Group	148,45	2	74,23	17,21	.00*	.37	
	Error	250,10	58	4,31				
	Total	59599,00	62					
Reader self-perception	Model	543,59	3	181,20	30,39	.00	.61	Experimental1(R) > control Experimental2(T) > control
	Pretest	285,21	1	285,21	47,84	.00	.45	
	Group	197,02	2	98,51	16,52	.00*	.36	
	Error	345,78	58	5,96				
	Total	59545,00	62					

the statistical difference was in favor of the students in experimental groups between the experimental 1(R) and control, and experimental 2(T) and control. According to this finding, it has been observed that IRA practices positively affect the second-grade students' reading motivation, value toward reading, and reader self-perception scores. According to findings of another paired comparison, no statistically significant difference has been observed in the pretest and posttest comparison of experimental 1(R) and experimental 2(T) groups in terms of reading motivation, value toward reading, and reader self-perception scores. In other words, no positive or negative change occurred in the reading motivation, value toward reading, and reader self-perception scores of experimental 1(R) and experimental 2(T) groups for which IRA practices were performed by the researcher and teacher. Based on this finding, considering that the plan for the process of practicing, IRA applied in both experimental groups is the same, we can conclude that the practitioner effect does not make a significant difference in IRA practices.

Table 4 presents the results of ANCOVA analysis conducted to make a group comparison for the pretest and posttest reading rate scores of the students included in the experimental 1(R), Experimental 2(T), and control groups.

Table 4 shows the ANCOVA results for the pretest and posttest reading rate scores. As the table presents, the difference in corrected posttest mean scores for the total number of words read correctly per minute was statistically significant ($F_{(2;58)}$ = 4,07; p = .02; p < .05). The findings of the post hoc test performed to find sources of difference revealed that the statistical difference was in favor of the students in experimental groups between the experimental 1(R) and control, and experimental 2(T) and control. Based on this finding, it can be said that IRA practices have a positive effect on the reading rates of the second-grade students. As a result of another paired comparison, no statistically significant difference has been observed in pretest and posttest comparison of experimental 1(R) and experimental 2(T) groups in terms of reading rate. That is to say, no positive or negative change occurred in the reading rate scores of experimental 1(R) and experimental 2(T) groups for which IRA practices were performed by the researcher and teacher.

Accordingly, considering that the plan for the process of practicing, IRA applied in both experimental groups is the same, it would be safe to say that the practitioner effect does not make a significant difference in IRA practices.

Table 5 shows the results of ANCOVA analysis conducted to make a group comparison for the pretest and posttest word recognition scores of the students included in the experimental 1(R), experimental 2(T), and control groups.

Table 5 shows the ANCOVA results of retest and posttest word recognition scores. As the table presents, the difference in corrected posttest mean scores for word recognition was statistically significant ($F_{(2;58)}$ = 5,61; p = .01; p < .05). The findings of the post hoc test performed to find sources of difference revealed that the statistical difference was in favor of the students in experimental groups between the experimental 1(R) and control, and experimental 2(T) and control. According to this finding, IRA practices positively

Table 4

ANCOVA Results of the Pretest and Posttest Reading Rate Scores

Source of variance	SS	*df*	MS	*F*	*p*	η^2	Difference
Model	16949,38	3	5649,79	51,11	.00	.73	
Pretest	15429,46	1	15429,46	139,59	.00	.71	
Group	899,62	2	449,81	4,07	.02*	.12	Experimental1(R) > control Experimental2(T) > control
Error	6410,89	58	110,53				
Total	308283,00	62					

Table 5

ANCOVA Results of Pretest and Posttest Word Recognition Scores

Source of variance	SS	*df*	MS	*F*	*p*	η^2	Difference
Model	379,12	3	126,38	6,40	.00*	.25	
Pretest	114,31	1	114,31	5,79	.01*	.10	
Group	221,69	2	110,85	5,61	.01*	.16	Experimental1(R) > control Experimental2(T) > control
Error	1146,00	58	19,76				
Total	559539,12	62					

affect the second-grade students word recognition scores. According to another paired comparison finding, no statistically significant difference in the pretest and posttest comparison of experimental 1(R) and experimental 2(T) groups in terms of word recognition scores of the groups has been observed. Hence, no positive or negative change occurred in the word recognition scores of experimental 1(R) and experimental 2(T) groups for which IRA practices were performed by the researcher and teacher. Based on this, considering that the plan for the process of practicing IRA applied in both experimental groups is the same, it would be safe to say that the practitioner effect does not make a significant difference in IRA practices.

Table 6 presents the results of ANCOVA analysis conducted to make a group comparison for the pretest and posttest reading prosody scores of the students included in the experimental 1(R), experimental 2(T) and control groups.

As Table 6 shows, based on the prosody pretest scores of experimental and control groups, the difference in corrected posttest mean scores for reading prosody was statistically significant ($F_{(2;58)}$ = 46,49; p = .01; p < .05). The findings of the post hoc test performed to find sources of difference revealed that the statistical difference in favor of the students in experimental groups between the experimental 1(R) and control and experimental 2(T) and control. According to this finding, it can be said that IRA practices positively affect the second-grade students' prosody scores. As a result of another paired comparison, no statistically significant difference in pretest and posttest comparison of experimental 1(R) and experimental 2(T) groups in terms of reading prosody scores of the groups has been observed. In other words, no positive or negative change occurred in the prosody scores of experimental 1(R) and experimental 2(T) groups for which IRA practices were performed by the researcher and teacher. Based on this finding, considering that the plan for the process of practicing IRA applied in both experimental groups is the same, we can state that the practitioner effect does not make a significant difference in IRA practices.

Discussion

The findings obtained from the analyses revealed that the practices based on the IRA strategy increased the reading comprehension levels of the second-grade students. Hazzard (2016) argued that students were involved in the reading process and interacted with their teachers, learned how to use reading comprehension strategies such as summarizing, making connections, clarifying the meaning of the word, directing questions, thinking about answering the questions during IRA lessons, and, therefore, the reading comprehension levels of students improved.

Santoro et al. (2008) highlighted that the IRA practices improved reading comprehension level as students could talk to their teachers about the text and learned how to think to comprehend during those talks, how to identify the sequence of events as they occurred in the text, and new vocabularies in the IRA lessons. Türkben and Temizyürek (2018) claimed that the teacher modeled thinking aloud strategy and taught comprehension skills to students in that way during practicing IRA, and after a while, students would comprehend the text by putting what they learned from their teachers into practice when they encounter with a text, and, therefore, the levels of

Table 6

ANCOVA Results of Pretest and Posttest Reading Prosody Scores

Source of variance	SS	*df*	MS	*F*	*p*	η^2	Difference
Model	416,16	3	138,72	48,86	.00	.72	
Pretest	177,91	1	177,91	62,66	.00	.52	
Group	264,01	2	132,00	46,49	.00*	.62	Experimental1(R) > control Experimental2(T) > control
Error	164,68	58	2,84				
Total	9176,00	62					

student reading comprehension would be increased. Giorgis and Johnson (2003) claimed that teacher was a model for students and taught them how to visualize an event while reading a text and understand the emotions aimed to be given in the story in the IRA lessons, and, thus, students could perform the reading comprehension strategies they learned from their teachers while reading on their own and their levels of reading comprehension improved accordingly.

Alshehri (2014) emphasized that he taught basic strategies for reading comprehension to students during IRA lessons and then, students could comprehend better while reading alone by using those strategies. Delacruz (2009), after examining what the teachers did to increase reading comprehension level in the IRA lessons in her study, determined that during IRA lessons, teachers benefited from reading comprehension strategies such as asking questions, making a prediction, summarizing and taught students how to make connections between the story being read and the other lessons. Mitchell (2015), in the IRA lessons, the lesson plans for which she prepared meticulously, taught students to use reading comprehension strategies by modeling think-aloud and graphic organizers to see what was read more perceptibly. As a result of these studies, an increase was observed in students' reading comprehension scores.

While conducting IRA practices, the teacher displays how to connect reading with the things in his/her life and what he/she has learned about the world through other texts he/she has read at the points where he/she stopped reading. The teacher models how to pose a question to the author while reading the text and how to pay attention to important information between the lines while making an inference (Albright & Ariail, 2005). Modeling the eight basic comprehension strategies, the components of the IRA lessons, enables students to make relevant connections with the text and make sense of the text (Lane & Wright, 2007; Scharlach, 2008).

Teachers, who prepare plans for the IRA lessons to ensure that their students understand better based on the book they will read and the things they want to teach, first prepare questions for which preliminary information they will give to their students, how to make possible for their students to make connections and predictions, how to teach summarizing strategies, and how to make their students identify the essential elements of a story such as the main theme, setting, conflict and resolution, central message, protagonist, and other characters in the story. During the lesson, the teacher also encourages students to think through the questions he/she asks while thinking aloud for the answers to these questions. In this way, students learn what they need to pay attention to comprehend while reading a text on their own.

According to Tompkins (2006), comprehension can be taught with clear instructions. Teachers teach students how to activate prior knowledge, identify the objectives, use comprehension strategies, and make inferences. Students put this learning into practice when they read and write. When teachers actively engage their students in the text, students are not only more motivated to read independently but also learn how to learn (Boyd & Devennie, 2009). In the IRA lessons, teachers should explain what the things they want to teach mean and why they are important, and they should model how a text can be understood, while reading aloud and how thinking aloud can be performed (Tompkins, 2006). Competent readers, who are aware of whether they understand what they read, often use comprehension strategies such as reading comprehension, rereading, slow reading, and looking up definitions for words (McTavish, 2008). Students, as active listeners in the IRA lessons, learn comprehension strategies that their teacher is trying to teach by modeling think-aloud and use these strategies while reading on their own in time, to better understand what they read. The findings of the study revealed that the practices based on the IRA strategy increased the reading motivation levels for the second grade students. Spencer (2011) emphasized that the IRA practices improved students' curiosity and interest in reading and, therefore, their reading motivation. Kindle (2009) claimed that the books chosen by teachers for the IRA lessons attracted students' attention and, thus, they were curious about the events narrated in the book and their reading motivation increased. Morgan (2009) emphasized that it is possible to gather students with different cultures at a common point and create shared reading

pleasure thanks to IRA lessons to increase students' reading motivation. The study of Young and Rasinski (2009) revealed that reading aloud lessons increased students' interest in reading and, therefore, their motivation to read. The fact that teachers present the IRA lessons to their students in their classes, regardless of the age of students, allows them to become more interested in reading and participate in the lesson to motivate them to read (Duncan, 2010).

As the attitude toward reading and interest and curiosity in reading directly affect reading motivation, it appears that the reading motivation levels of students who are interested in reading and have a positive attitude toward reading will increase. Arial and Albright (2006) used the IRA strategies in the lessons in which they benefited from informative texts, and consequently determined that students could learn better in that way by feeling more motivated to understand while reading as they learned the reading comprehension strategies during the lessons. Fox (2008) stated that when an adult reads a book aloud to a child, both the adult and child could have a lot of fun and the child would be awaiting the following page curiously. Ivey (2003) found that the student could learn how to understand the text in the IRA lessons exactly, and, therefore, his/her interest in reading might increase.

Braun (2010) expressed that practices based on the IRA strategy increased the reading motivation levels of students. Muller (2005) stated that reading aloud was the most effective way to improve reading motivation. Trelease (2013) claimed that, thanks to the interaction between teacher and student in the IRA lessons, the positive attitude that the teacher displays toward a book would also encourage students to have a positive attitude toward it. Considering this interaction, he also emphasized that students will be more interested in reading if the topics of the books selected appeal to students. Children interested in reading are also motivated to read and spend more time on reading: thus they are more successful at reading (Gambrell, 2011). The main purpose of reading is to understand, and teachers can educate students who are more motivated to read, are enthusiastic about reading and have attained reading competency (Scharlach, 2008). In the IRA lessons, a teacher reads the book and student is in the listener's position; however, this does not necessarily mean he/she is a passive listener. Students interact with both their teachers by answering their questions and friends by sharing their own ideas.

Tompkins (2006) expressed that motivation has a dimension related to social environment and students want to share their ideas in social circles, i.e., with their group of friends. When teachers provide students and their classmates with the opportunity of reading aloud, they gain self-confidence and get motivated (Hurst et al., 2011). Also, Morgan (2009) stated that teachers can motivate students to read, especially when they read aloud to their students, by reading a book that is pleasant for them. Giorgis and Johnson (2003) underlined that when a book is read aloud to students, teachers and students take pleasure in reading. According to Tompkins (2006), the student-related factors affecting students' engagement in literacy are expectations, collaboration, reading and writing competency, and choices. Students are more interested in reading when they think that they will be successful, cooperate with their classmates, become competent readers and have the opportunity to make choices to improve their reading skills. Thus, IRA, an effective process in which students interact with their teacher and classmates, share their own ideas and pay attention to the ideas of others, motivates the students to share with their teachers and friends to read. When the findings were evaluated, it was concluded that the practices based on the IRA strategy improved the reading fluency levels of the second-grade students. Myers (2015), Muller (2005), Lane and Wright (2007), Hurst et al. (2011), and Spencer (2011) similarly claimed that the practices based on the IRA strategy refer to an interactive process between teacher and students. They also emphasized that the teacher was a model to the students while reading the book aloud by paying attention to reading rate, accentuation, intonation, and accurate pronunciation of the words. In the IRA lessons, teachers read the book to students by pronouncing the words correctly and reading fluently with an appropriate intonation and reading rate. During the readings, teachers model themselves to the students to show how to read fluently so that students can improve their skills of reading fluency by watching and listening the teachers (Hurst et al., 2011).

During the IRA strategy practices, the practitioners tried modeling themselves to the students by reading at the proper rate, pronouncing accurately, and observing intonation and punctuation marks. With appropriate pausing, they let the students repeat the words they had difficulty pronouncing them. During the practices, the reading fluency of the students was aimed to be improved by modeling the teachers. In this respect, Akyol (2012) emphasized that teachers should read aloud to their students by using different text types every day to improve their reading fluency. Reading fluency improves as students listen to teachers' readings repeatedly in the IRA lessons, carried out by the repetitive readings of the same book (Trealese, 2013). The IRA lessons enabled the students to read the same book three times in accordance with the plans prepared for each reading throughout the whole process of practicing appropriately. Thus, all the necessary activities could be practiced in an understandable way and students were allowed to model by performing the same reading more than

one.

Researchers may perform IRA practices at different grade levels. Narrative texts were used in this research. Researchers may use different types of texts in new studies. Practitioners may be taught how they should prepare a plan for IRA lessons and teach the lesson.

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A Systematic Review of Studies on Classroom Management from 1980 to 2019

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Abstract

This review study aims to reveal trends in classroom management research by employing a two-stage analysis of articles indexed by the Web of Science. The bibliometric analysis results indicated the descriptive statistics of the articles, the most productive countries and authors, the most popular articles, journals, and keywords, annual scientific production, growth of the top three journals by year, and the pioneer and influencer researchers in classroom management. The content analysis results showed the changes in the selection of methods, purposes, and participants for nearly three decades of classroom management research. This review concluded that interest in classroom management has been constantly growing, but research on classroom management is not prevalent worldwide.

Keywords:

Bibliometric Analysis, Classroom Management, Content Analysis, Systematic Review

Introduction

Teachers' classroom management skills are considered one of the most important elements that teachers should have to create effective education and training environment. Classroom management is the placement of course materials, determining the courses' duration, determining the class rules, ensuring student participation, obeying the rules, and preparing academic activities (Brophy, 1996). Classroom management involves important decisions such as how and with whom students sit, how to set the hours of the lessons, how to organize the materials, and how to ensure the participation of each student. Classroom management requires attention to ongoing events and behavioral problems in the classroom and how teachers behave and organize these teaching practices. Effective classroom management enables all students in the classroom to benefit from the teaching environment at the highest level, increase their class participation and prevent potential problem behaviors. Studies revealed that student achievement increases in an effectively managed classroom (Wilks, 1996).

The classroom environment is considered one of the main

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places where education and training take place. There is a need for a system that will be effective in learning and teaching activities. Maintaining the order, using classroom-teaching materials effectively and efficiently, and supporting the active participation of all students in the classroom require important classroom management knowledge and skills. The main purpose of effective classroom management is to achieve the basic objectives of education by creating a positive classroom and an efficient learning environment. In this respect, classroom management aims to ensure the regular practice of class-life and self-control of all students. The key to becoming an effective teacher is to have effective classroom management. Marzano et al. (2003) highlighted that it is very difficult or even impossible for a classroom teacher who is not effective in managing the classroom, actively participating in classroom activities and using his/her time efficiently and achieving the necessary tasks. Therefore, it can be said that in the absence of effective classroom management, students will have no active participation, and in the absence of active participation no effective learning can be achieved. Some research showed that active participation in the lesson has a very strong effect on learning (Baker et al., 2008; Greenwood et al., 2002). The research results showed that with effective classroom management, undesirable behaviors of the majority of students can be prevented, and students' participation in classes will increase (Arın et al., 2016; Soodak, 2003).A systematic review is a scientific study that examines original research on a subject through certain methods. The systematic review is the most powerful and useful source of evidence to guide implementation (Stevens, 2001). In a standard literature review, there is a possibility of researcher's bias. In systematic review, researcher's bias is prevented and minimized.

Research is evaluated according to methodological strengths and weaknesses. In a systematic review, all relevant research is sampled and evaluated. The characteristics and results of each study are summarized, digitized, coded and a database is created. The benefit of the systematic review is that it incorporates all available studies into a single report, summarizing a large amount of information and making it usable. The most important advantage of the systematic review is that it increases the power and validity of the cause-effect relationship (Stevens, 2001). Studies with the systematic review of classroom management might provide evidence-based insight into how teachers can effectively manage classrooms. However, systematic reviews of this topic are limited (Oliver et al., 2011). Although there have been attempts to review classroom management research systematically (Håkansson, 2015; Korpershoek et al., 2016; Maggin et al., 2011; Simonsen et al., 2008), these studies do not cover all types of classroom management studies. Therefore, these review studies were unable to capture all trends related to classroom management research.

Classroom management is broadly defined as everything a teacher does to create an environment for both academic and behavioral education (Evertson & Weinstein, 2006). Research on classroom management aims to identify individual practices to support education within classrooms. These effective practices are then combined into a package for more effective education. Systematic reviews should examine classroom management as an efficient package of these practices to contribute to the existing literature. For this purpose, a more comprehensive review of existing research on classroom management should be conducted by identifying studies directly related to classroom management and published in high quality journals. Therefore, this study aims to systematically review all classroom management studies to reveal research trends over time, the most productive scholars and journals interested in classroom management, and the countries in which articles are based through a bibliometric analysis of articles indexed by the Web of Science (WoS). It is also aimed to conduct a content analysis of the articles to reveal detailed information about the methods, purposes, and participants of these studies. This systematic analysis may provide researchers with a big picture of the developments in research on classroom management.

Method

The research on classroom management was examined through bibliometric and content analysis methods. First, a bibliometric analysis draws the quantitative aspects of classroom management research by presenting the statistics related to the journals, countries, and authors. A content analysis of available full-text articles showed detailed information about the methods, purposes, and participants of these studies.

The bibliometric analysis is the application of statistical methods to published papers (Pritchard, 1969). This analysis reveals the statistics of keywords, citations, authors, sources, and countries, thus enabling researchers to explore and compare these statistics. The use of bibliometrics in educational research is new.

The rationale for selecting studies and a database is affected by the practicality of this research. As the WoS database indexes only rigorous studies from top-ranked journals of the world and stores many details of the papers can be analyzed through the bibliometrix (Aria & Cuccurullo, 2017) R (Ihaka & Gentleman, 1996) package used in this study, articles directly related to classroom management were gathered from this

database. To determine which articles clearly focus on classroom management, the first 100 articles out of 1132 that include the term "classroom management" in the title, abstract, and keywords are carefully examined. Then the results revealed that the articles including the term in their titles are directly related to classroom management. Therefore, the database search is conducted using the title field only. The timeframe of these studies is between 1980 and 2019. Because the first study directly related to classroom management on the WoS database appears in 1980, and since it takes up to six months for the database to index all the articles in a year, studies from 2020 were excluded, and 273 studies from 1980 to until the end of 2019 were selected (Table 1). The Arts & Humanities Citation Index, (AHCI), Science Citation Index Expanded (SCI-Expanded), and Social Sciences Citation Index (SSCI)) indexes on the WoS database were selected. The Emerging Sources Citation Index (ESCI) was not selected due to its lack of rigor (Bozkus, 2019).

Table 1

Number of Articles on Classroom Management Included in the Bibliometric Analysis

Years	*f*	%
1980-1984	24	8.8
1985-1989	24	8.8
1990-1994	13	4.8
1995-1999	18	6.6
2000-2004	17	6.2
2005-2009	34	12.5
2010-2014	50	18.3
2015-2019	93	34.1
Total	273	100

For the content analysis, the full texts of the 273 articles were tried to be retrieved, but 210 full texts were available (Table 2). Most of the articles that did not have full texts were published before 1991. The analysis aimed to reveal the methods, purposes, and participants in these studies.

Table 2

Number of Articles on Classroom Management Included in the Content Analysis

Years	*f*	%
1991-1995	12	5.7
1996-2000	12	5.7
2001-2005	15	7.1
2006-2010	35	16.7
2011-2015	61	29.0
2016-2019	75	35.7
Total	210	100

Results

The results of this study are presented in two sections. First, the bibliometric analysis results are elaborated using tables and figures. Then, the content analysis results are represented in a single table.

Results of the Bibliometric Analysis

The bibliometric analysis begins with descriptive statistics of the articles included in the analysis (Table 3). A total of 273 articles were published by 123 different journals from 1980 to 2019. Articles were written by 610 different authors who appeared 742 times and used 530 different keywords. Of these 610 authors, 77 of them authored their articles alone, while the remaining 533 authors had coauthors. The average number of articles per author was 0.45, and the average number of authors per article was 2.23. Articles were cited an average of 20.15 times.

Table 3

Descriptive Statistics of the Articles Included in the Bibliometric Analysis

Description	Results
Articles	273
Journals	123
Period	1980 – 2019
Authors	610
Author appearances	742
Author's keywords	530
Authors of single-authored articles	77
Authors of multi-authored articles	533
Articles per author	0.45
Authors per article	2.23
Average citations per articles	20.15

The source countries of the articles are presented in Table 4. Most articles were written by authors from the United States of America (USA) (*n* = 151). The other countries in the top five were Germany (*n* = 23), Turkey (*n* = 22), Netherlands (*n* = 9), and Australia (*n* = 9).

The 20 authors who published most of the articles are presented in Table 5. Carolyn M. Evertson was the author who published most articles (*n* = 8).

In terms of author scientific productivity, most of the authors (*n* = 494) published one article only (Table 6).

Table 4

The Number of Articles Per Country (Limited to the First 20)

Country	Articles	Country	Articles
USA	151	Israel	3
Germany	23	Switzerland	3
Turkey	22	Estonia	2
Netherlands	9	Spain	2
Australia	9	Denmark	1
United Kingdom	9	Finland	1
Canada	6	Ireland	1
China	5	Italy	1
Norway	5	Japan	1
Cyprus	4	Korea	1

Table 5

The Most Productive Authors (Limited to the First 20)

Authors	Articles	Authors	Articles
Evertson CM	8	Bradshaw CP	3
Emmer ET	7	Drugli MB	3
Herman KC	7	Freiberg HJ	3
Reinke WM	7	Handegard BH	3
Gold B	6	Jarodzka H	3
Lewis R	5	Leutner D	3
Holodynski M	4	Newcomer L	3
Kunter M	4	Piwowar V	3
Stormont M	4	Sanford JP	3
Boshuizen HPA	3	Thiel F	3

Table 6

Author Scientific Productivity

Number of Articles	Number of Authors
1	494
2	45
3	12
4	3
5	1
6	1
7	3
8	1

The most cited articles are presented in Table 7. The article authored by Brouwers and Tomic, titled "A longitudinal study of teacher burnout and perceived self-efficacy in classroom management," published in Teaching and Teacher Education in 2000, was cited 378 times and 19.89 times on average per year.

The historical direct citation network is presented in Figure 1. Emmer and Evertson were the pioneering authors as their articles have influenced several research through decades. Then, Brouwers et al. influenced the waves of research after the 2000s.

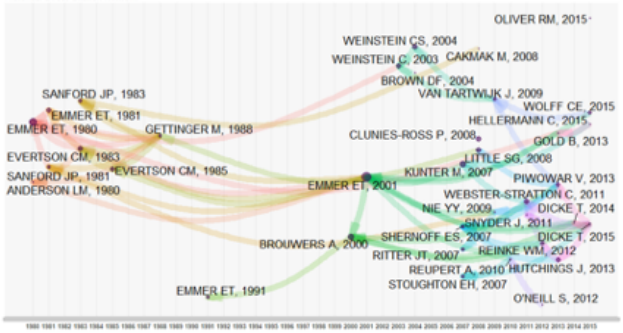

Figure 1

Historical Direct Citation Network

The annual scientific production is illustrated in Figure 2. It can also be seen in Table 1. The number of articles directly related to classroom management has increased year by year. There has been a dramatic increase after 2005. However, the number of journals in the field of education indexed by the WoS database has also increased dramatically from around 100 to over 200 after 2005. Therefore, the increase in the number of articles directly related to classroom management might be due to this change in the database.

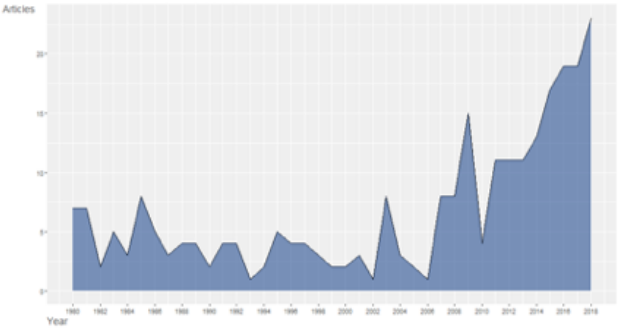

Figure 2

Annual Scientific Production

The keywords used by the authors are presented in Table 8. The most frequently used keyword was classroom management (n = 82). Based on these results, a word cloud is generated (Figure 3).

Figure 3
Word Cloud of Author Keywords (Excluding Classroom Management)

Table 9 presents the journals that published the most articles. The top three journals were Teaching and Teacher Education (*n* = 25), Theory into Practice (*n* = 14), and Psychology in the Schools (*n* = 8). A graph representing the growth of these top three journals is presented in Figure 4. Teaching and Teacher Education had steady growth, while the growth of the other two journals were bumpy. Teaching and Teacher Education has published more articles by far after 2010.

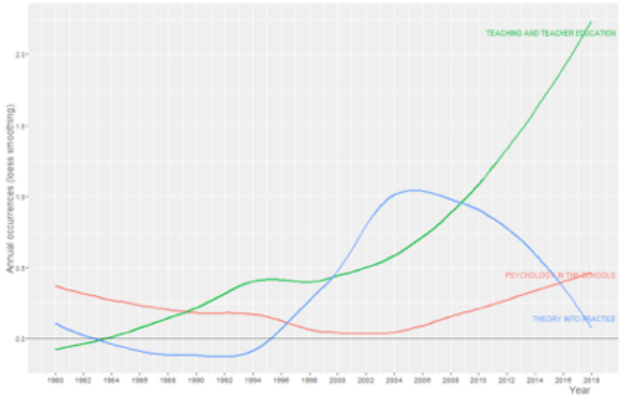

Figure 4
Growth of Top Three Journals by Year

Content Analysis Results

The content analysis of 210 articles resulted in the following three categories: method, purpose, and participants (Table 10). In the methods category, more than half of the articles (*n* = 119) employed quantitative methods, while the other most-used methods were qualitative (*n* = 42), theoretical review (*n* = 37), mixed methods (*n* = 8), and systematic review (*n* = 4). As the number of articles has increased after 2005, it makes sense that the use of these methods has also increased after 2005. However, after 2005, the use of quantitative methods has increased considerably. In the purpose category, more than half of the articles (*n* = 120) aimed to reveal either perception of research participants on different aspects of classroom management or various practices employed by the participants. Almost a quarter of the articles (*n* = 49) determined the effect of a model, intervention, or a program. The remaining 41 articles aimed to conceptualize a theory or research trend of classroom management. In the participants category, almost half of the articles (*n* = 103) included teachers in their samples. Students were participants in 58 research articles. Theoretical and systematic review articles (*n* = 43) had no participants. Parents, teacher candidates, supervisors, and other school stakeholders were participants in 35 studies. Finally, two articles included school administrators as research participants only. As some articles had multiple groups of participants, the total number of participant groups exceeded the number of articles.

Discussion

This study aimed to reveal trends in classroom management research through a two-stage analysis. The bibliometric analysis results identified the descriptive statistics of the articles, the most productive countries and authors, the most popular articles, journals, and keywords, annual scientific production, the growth of the top three journals by year, and the pioneer and influencer researchers in classroom management. The content analysis results showed the changes in the selection of methods, purposes, and participants for nearly three decades of classroom management research. To the best of our knowledge, so far, this is the first systematic review of all research directly related to classroom management.

The bibliometric analysis results revealed that the USA is the leading country in classroom management research. This may be because the higher education institutions in the USA than in other countries. This may also be partly because many journals indexed in the WoS database are US-based. Similar results were found in previous research (Bryman, 2007; Esen et al., 2018; Gumus et al., 2018).The content analysis results revealed that the number of quantitative studies in classroom management is greater than the number of qualitative, mixed methods, theoretical and systematic review studies. Qualitative research aims to explore the in-depth meaning of a phenomenon that is not well known. However, quantitative research aims to understand how a relatively well-known phenomenon affects a large population. As classroom management research is not in the early development stage, most researchers preferred using quantitative methods to reveal and generalize the effects of phenomena. Only a few studies employed mixed methods to research classroom management. This may be because mixed methods research is difficult to conduct, needs experience in both quantitative and qualitative methods, and requires more resources and time. The findings also revealed that articles aimed to reveal either perception of research participants on different aspects of classroom management or various practices employed by the participants

Table 7

The 20 Articles, Which Had the Most Citations (Journal Names Are Abbreviated)

Paper	Citations	Citations Per Year
Brouwers A, 2000, Teaching & Teacher Educ	378	19.89
Emmer ET, 2001, Educ Psychol	284	15.78
Clunies-Ross P, 2008, Educ Psychol-Uk	143	13.00
Weinstein CS, 2004, J Teach Educ	130	8.67
Kochenderfer-Ladd B, 2008, J School Psychol	129	11.73
Emmer ET, 1980, Elem School J	116	2.97
Emmer ET, 1991, Educ Psychol Meas	107	3.82
Kunter M, 2007, Learn Instr	101	8.42
Allen JD, 1986, Am Educ Res J	75	2.27
Sutton RE, 2009, Theor Pract	74	7.40
Maggin DM, 2011, J School Psychol	70	8.75
Weinstein C, 2003, Theor Pract	68	4.25
Bondy E, 2007, Urban Educ	66	5.50
Marzano RJ, 2003, Educ Leadership	62	3.88
Gencer AS, 2007, Teaching & Teacher Educ	60	5.00
Oliver RM, 2010, Behav Disorders	58	6.44
Dicke T, 2014, J Educ Psychol	57	11.40
Brown DF, 2004, Urban Educ	57	3.80
Choi I, 2009, Etr&D-Educ Tech Res	56	5.60
Stoughton EH, 2007, Teaching & Teacher Educ	55	4.58

outnumber the articles that determined the effect of a model, intervention, or program, and the articles tried to conceptualize a theory or research trend of classroom management. This situation has especially become prevalent after 2006. As it is easier to employ questionnaires to survey people's perceptions and practices, researchers may be more likely to opt for perceptions and practices for research purposes.

Table 8

Author Keywords (Limited to First 20)

Terms	*f*	Terms	*f*
classroom management	82	teacher-student relationships	4
teacher education	9	teacher knowledge	4
professional vision	7	teacher self-efficacy	4
teacher training	7	video analysis	4
behavior management	6	adhd	3
teachers	5	beginning teachers	3
classroom intervention	4	coaching	3
discipline	4	instructional quality	3
professional development	4	pre-service teachers	3
self-efficacy	4	qualitative research	3

This review makes an important contribution to the research on classroom management by systematically analyzing many studies indexed in the WoS database. The study results draw a big picture based on numerical evidence on the development of classroom management research. However, the study has some limitations. Although the author spent a lot of time and effort in minimizing errors during the research process, considering the nature of bibliometrics and the high number of articles, there could still be minor errors. Also, articles published in some well-known educational journals (such as the Journal of Educational Administration, International Journal of Educational Management, School Leadership and Management, and International Journal of Leadership in Education) that were not indexed in the WoS database were excluded from the research. They were excluded because of the capabilities of the software used, and it is considered a common deficiency for systematic review studies. Future review studies may include journals excluded from this study. Finally, there may be over-generalization during the content analysis of articles. Future research should narrow the scope by focusing on a single category, such as the effect of interventions on classroom management practices and conduct a more detailed analysis of a small number of articles.

Table 9

The Journals, Which Published the Most Articles (Limited to the First 20)

Journals	Articles
Teaching and Teacher Education	25
Theory into Practice	14
Psychology in the Schools	8
Journal of School Psychology	7
Hacettepe University Journal of Education	6
Journal of Positive Behavior Interventions	6
Education	5
Elementary School Journal	5
Journal of Education for Teaching	5
Journal of Teacher Education	5
Zeitschrift Fur Erziehungswissenschaft	5
Education and Science	4
Journal of Educational Psychology	4
Phi Delta Kappan	4
Urban Education	4
Academic Therapy	3
Behavioral Disorders	3
Contemporary Educational Psychology	3
Educational Leadership	3
Educational Psychology	3

Table 10

The Results of the Content Analysis

	Total	91-95	96-00	01-05	06-10	11-15	16-19
Method							
Quantitative	119	5	3	2	17	32	60
Qualitative	42	4	2	4	9	15	8
Theoretical review	37	2	6	9	8	9	3
Mixed methods	8	1	0	0	1	3	3
Systematic review	4	0	1	0	0	2	1
Purpose							
Perceptions and practices	120	5	4	3	20	35	53
Effect of a model/intervention	49	4	2	2	6	16	19
Conceptualization	41	3	6	10	9	10	3
Participants							
Teachers	103	8	3	6	16	29	41
Students	58	4	1	0	8	14	31
None	43	2	7	9	8	11	4
Other	35	0	2	1	9	13	12
Administrators	2	0	0	1	1	0	0

Conclusion

This review has proved that interest in classroom management is constantly growing. Year by year, more researchers examine perceptions on different aspects of classroom management, various practices educators employ, and the effects of new models, interventions, or programs. This implies that increasing pressures of accountability systems and high-stake testing may direct researchers to focus on improving the classroom management of teachers. As teachers' classroom management skills are crucial to making education process effective, research in this area should use quantitative methods more frequently to find ways to improve classroom management practice. However, research on classroom management is not prevalent worldwide. The issue of improving the classroom management of teachers should be independent of the pressures of accountability systems and high-stake testing, and should attract the attention of all researchers around the world.

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Investigation of Effects of Cognitive Strategies and Metacognitive Functions on Mathematical Problem-Solving Performance of Students with or Without Learning Disabilities*

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Abstract

The purpose of this study was to examine the effects of cognitive strategies and metacognitive functions of students with learning disabilities (LD), students with low-achieving (LA), and students with average-achieving (AA) over their math problem-solving performance. The study sample consisted of 150 students with 50 students from each group. Study data were collected through Think-Aloud Protocols, Metacognitive Experiences Questionnaire, Math Problem Solving Assessment-Short Form, and 10 math problems. Study findings revealed that the significant predictors of math problem-solving performance were metacognitive strategies and experiences regarding students with LD, metacognitive strategies and knowledge considering students with LA, and metacognitive strategies in students with AA. A statistically significant relationship was found between problem-solving performance of students with LD and their metacognitive strategies and metacognitive experiences. Problem-solving performance and metacognitive strategies of students with LA were found to be close to a high level, and their metacognitive knowledge had a moderate relationship. It was also observed to be moderately related to problem-solving performance and metacognitive strategies in students with AA. The findings were discussed within the relevant literature scope, and suggestions were made for teachers in terms of implementation and researchers for further studies.

Keywords:

Cognitive Strategies and Metacognitive Functions, Learning Disability, Math Problem Solving

Introduction

Problem solving is considered one of the basic skills in mathematics. Math problem solving includes combining and analyzing skills (Cawley & Miller, 1986) and consists of one and/or more steps (Fuchs et al., 2004). It requires necessary calculation operations to be used in the solution process (Carpenter et al., 1993) and rarely contains irrelevant or distracting information (Passolunghi et al., 2005). The components of metacognition play a crucial role in math

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problem-solving skills (Montague, 1992; Rosenzweig et al., 2011; Sweeney, 2010). Metacognitive knowledge describes what people know about what they know; metacognitive experience depicts who/what they are related to regarding the task or situation assigned to them, why they engage or withdraw from a task or event; while metacognitive strategy explains how they attempt to achieve an assigned task or situation (Sweeney, 2010). These three components refer to metacognitive functioning (Schudmak, 2014; Sweeney, 2010).

Students with LD experience limitations in combining the strategies they use in terms of metacognitive functions and use different strategies depending on their development (Geary, 2010; Hanich et al., 2001). Accordingly, studies revealed that students with LD either lack the required strategies to succeed or do not use the strategies they have (Montague & Applegate, 1993; Ostad & Sorenson, 2007; Özkubat & Özmen, 2018). Regarding the assigned tasks in problem solving, students with LD have problems visualizing the problem, understanding what is asked in the problem, deciding which method to use in problem-solving operations, and fulfilling the procedures to be followed in the process appropriately. Students with higher metacognitive functions exhibit more cognitive and metacognitive strategies than their peers. However, students with LD have limitations in terms of strategy use compared to their peers (Rosenzweig et al., 2011; Swanson, 1990; Sweeney, 2010).

Montague's mathematics problem solving model includes cognitive and metacognitive strategies and operations that master problem solvers know and use them effectively (Montague et al., 1993). Montague (1992) identifies seven cognitive operations required to solve the problem successfully and metacognitive operations that allow the use of these cognitive operations (Montague et al., 2000). The seven cognitive strategies in problem solving are reading, paraphrasing, visualizing, hypothesizing, estimating, computing, and checking strategies. Also, the cognitive operations used in the process are understanding, translating, transforming, planning, estimating, processing, and evaluating. The use of cognitive operations and strategies in problem solving plays a role in all stages, such as reading, reaching the solution, and checking solution and the process (Rosenzweig et al., 2011). The correct realization of cognitive operations playing a role in this process occurs through the correct use of cognitive strategies (Montague, 1992). Metacognitive strategies used in problem solving are self-instruction, self-questioning, self-monitoring, and metacognitive operations using strategy knowledge, use, and control (Montague, 1992). Students apply metacognitive strategies to regulate cognitive operations used in math problem solving, manage these operations and organize their problem-solving performance (Montague, 1992). Besides, students use metacognitive strategies to comprehend how strategies are implemented, develop effective strategies, and manage these process operations (Lucangeli & Cabrele, 2006). Therefore, Flavell's metacognition theory and Montague's mathematical problem-solving model provide a theoretical framework for examining cognitive strategies and metacognitive functions in math problem solving process (Sweeney, 2010).

Montague's model was applied in the studies in which the cognitive and metacognitive strategies used by students with LD while solving a math problem (Montague & Applegate, 1993; Ostad & Sorenson, 2007; Rosenzweig et al., 2011; Swanson, 1990), and the cognitive and metacognitive strategies students used while solving problems were assessed through the elements of this model. These studies evaluated the metacognitive strategy dimension only. However, in order for metacognitive processes to be understood in all dimensions as strategy, knowledge, and experience and to explain the results, the interaction of the related dimensions with each other is needed (Efklides, 2006; Veenman et al., 2006).

However, only one study examined all dimensions of metacognitive functions (Sweeney, 2010). Comparing the metacognitive experience and knowledge of students with LD, LA, and AA and the metacognitive strategies they used in solving math problems, Sweeney (2010) examined the effects of these variables in students' performance while solving math problems. According to findings, students' math problem-solving performance was affected by the metacognitive strategies, experiences, and knowledge.

The purpose of this study was twofold: (a) examining the relationship between cognitive strategies and metacognitive functions that sixth-grade students with LD, LA, and AA use in solving mathematical problems, (b) determining the effects of their cognitive strategies and metacognitive functions over a math problem solving. Unlike Sweeney (2010), this study examined the cognitive strategy and was conducted with more participants. Thus, it is considered to contribute to both national and international literature in terms of analyzing the relationship between strategies and functions used in problem solving.

Method

Research Design

This paper adopted a descriptive relational survey model to determine the cognitive strategies and metacognitive functions used by sixth-grade students with LD, LA, and AA while solving math problems and identifying the relationship between the specified

strategies and the use of functions (Karasar, 2014).

Participants and Recruitment Process

The sample consisted of sixth-grade students with LD and LA, and AA who were studying in five different districts of Ankara, the capital city of Turkey. The criteria for selecting students with LD were: a) having a diagnosis of learning disability in the disability health board report, b) not having any additional deficiencies. The criteria for selecting students with LA were a) being in the lowest 25% of the class in terms of math skills due to the teacher interview, b) not having a diagnosis of any deficiencies. Also, considering both groups, having certain learning outcomes in the basic arithmetic operations dimension (being able to perform addition and subtraction with three- and four-digit numbers that require regrouping, with an accuracy rate of 80%) was another criterion. The criterion for selecting students with AA was to be in the average 50% of the class in terms of math skills as a result of the teacher interview. The common criterion for all three groups was that they could analyze without spelling at the instructional level, with an accuracy rate of 90%-95%.The schools and classes of the sixth-grade students with LD were determined to select the students meeting the above-mentioned criteria. The researchers visited advisory teachers at the affiliated schools to determine whether their students met the aforementioned two criteria. Then, the math and Turkish-language teachers of those who fulfilled these two criteria were interviewed to identify students' knowledge of mathematics and reading. One-to-one assessments were conducted to obtain data on the students' math and reading prerequisite skills. Legal permission was obtained from the students' families. Students with LA and A were selected from the determined classes. The math and Turkish-language teachers were reinterviewed, and students meeting these criteria were assessed in terms of math and reading skills. The recruitment process was carried out by the first researcher. A total of 150 students participated in the research, including students with LD (n = 50), students with LA (n = 50), and students with AA (n = 50). The group of students with LD included 16 females (32%) and 34 males (68%). The students with LA were 22 females (44%) and 28 males (56%). There were 24 females (48%) and 26 males (52%) in the group of students with AA.

Data Collection Tools

Preparing Math Problems

Math problems requiring addition and subtraction with different difficulty levels (easy, medium, and difficult) were used to apply the think-aloud protocols and the metacognitive experiences questionnaire and assess math problem-solving performance. Preparing math problems included the following four stages: a) creating a problem pool by using math problems taken from sixth-grade math books, b) classifying them in the problem pool according to difficulty levels, c) obtaining expert opinions about the difficulty levels of problems, and d) performing validity and reliability analyses of math problems. The item difficulty indexes of easy, medium and difficult questions were .66., .54 and .36, respectively; item discrimination indices were .76, .70 and .34, respectively; point double series correlations were .66, .58 and .33, respectively.

Three problems with different difficulty levels were used to determine the cognitive, metacognitive strategies and experiences that participants use to solve the math problems. To identify students' math problem-solving performance, 10 math problems with medium difficulty level were used (Özkubat, 2019). These problems are included in the appendix.

Think-Aloud Protocols

Participants used think-aloud protocols to determine the cognitive and metacognitive strategies in solving math problems. A think-aloud protocol is a verbal performance-based assessment system where participants speak out everything they think and do during tasks like reading a text or solving a math problem (Rosenzweig et al., 2011). The think-aloud protocol-coding form was developed based on the math problem-solving model developed by Montague (2003) and was adopted by this research. The first part included students' demographic characteristics (code name, school, and class), date, and duration of the application (start and end time of the application). The second part included cognitive strategies, and the third part involved the student's metacognitive strategies during the problem solving. The think-aloud protocol-coding form and problems used during the implementation of the think-aloud protocols are listed in Appendix 1 and 2.

Metacognitive Experiences Questionnaire

Metacognitive Experiences Questionnaire (MEQ) developed by Efklides (1999) was used to determine the metacognitive experiences of the participants. Each item involves a statement followed by the following 4-point Likert scale rating system: not at all (1), a little (2), enough (3), and very (4). The metacognitive experience scale aims to unveil students' thoughts about mathematics and consists of the following two sub-sections: prospective reporting and retrospective reporting. The prospective reporting (e.g., How familiar are you with this problem?; How frequently did you encounter such a problem in the past?; How much do you think you need to 'think' in order to solve the problem?; How muck do you think you need to use some rules in order to solve the problem?) and

retrospective reporting (e.g., How much did you like this problem?; How difficult do you think the problem was?; How much did you have to 'think' in order to solve this problem?; How much did you you need to use some rules in order to solve this problem?) subsections consist of 12 and 11 items, respectively. The problems used during the implementation of the MEQ are listed in Appendix 3.

The validity and reliability of Metacognitive Experiences Questionnaire were conducted in three stages: ensuring the linguistic validity of the scale and collecting and analyzing data. The 23-item scale was administered to 475 students. Three weeks later, test-retest was performed with 60 students. To examine the reliability of the scale, a Cronbach alpha reliability analysis was conducted. The six-factor structure of the Turkish Form of the Metacognitive Experiences Questionnaire was analyzed in terms of DFA models, fit index values, Cronbach alpha, and test-retest reliability coefficients. The findings revealed that fit index values were acceptable for all problems with different difficulty levels, the models were verified, and the fit index values for easy problems, medium problems, and difficult problems were 4.53, 4.55, 4.56, respectively. Cronbach alpha and test-retest reliability coefficients varied between .70 and .89 for easy problems; .70 and .89 for medium problems; and .70 and .89 for difficult problems. These results were acceptable and indicated high-reliability coefficients (Özkubat & Özmen, 2020).

Math Problem Solving Assessment-Short Form

Math Problem Solving Assessment-Short Form developed by Montague (1992) is a "Solve It!" based model. It is an informal tool used to identify students' weaknesses and strengths in solving math problems (Montague, 1992). Before using the form, the linguistic validity was ensured, expert opinion was obtained, and the scoring rubric was adapted. Metacognitive knowledge levels of the participants were measured through 16 open-ended questions of the Math Problem Solving Assessment-Short Form. Three questions were about reading for understanding; two questions were for re-expressing them using their sentences, two questions were for visualization, two questions were for hypothesizing, three questions were for estimating the answers, two questions were for computing, and two questions were for determining the math problem solving knowledge about the checking process. (e.g., As you read, how do you help yourself understand math story problems? What else do you do when you read math story problems?; How do you help yourself remember what the problem says?; What do you do to make a picture in your mind? Is there anything else you do when you visualize?; How do you use your plan to help you solve math word problems?; Estimation is making a prediction about the answer using the information in the problem. How does estimation help in solving math word problems?; What do you do when you compute answers to word problems?; How do you check that you have correctly completed a math word problem?).

Problems for Determining Mathematics Performance

Problems for determining mathematics performance were used to determine the effects of participants' metacognitive knowledge and experience and their cognitive and metacognitive strategies over math problem-solving performance. These are 10 math problems with medium difficulty levels requiring the use of addition and subtraction. The specified problems are included in the Appendix 4.

Data Collection and Scoring Procedures

Data Collection

The data collection process for each variable is presented in Table 1.

The study data were collected by the first researcher. The researcher applied the measurement tools in Table 1 to ensure standard application conditions during the data collection process.

The data collection process was performed in five steps. In the first step, the Metacognitive Experiences Questionnaire was applied. The researcher asked the student to read the easy problem and complete the prospective reporting part of the questionnaire. He then instructed the student to read and solve the easy problem and fill in the retrospective reporting part. The same procedure was applied to medium and difficult problems. In the second step, a training session of the think-aloud protocol was held.

The think-aloud protocol was applied in two stages. In the first stage, the think-aloud protocol was introduced. The researcher explained the purpose of the research and informed the students about the importance of the think-aloud in understanding how students solve math problems. At this point, the researcher read the instruction about how to do the think-aloud protocol (Johnstone et al., 2006): "I am interested in how students solve problems, so I want to ask you to solve three problems for me and let me listen to how you solve them. I am not interested in the answer you come up with as much as how you are thinking about the problem. What you say is really important, so I am going to use a tape recorder to make sure I don't forget anything." Then, the researcher became a model for thinking aloud while solving a math problem. The researcher demonstrated behaviors such as self-questioning, self-controlling, and self-monitoring through problems. Finally, the researcher asked the

Table 1
Data Collection Process

Order	Application sessions	Duration	Data collection process
1	Session of Metacognitive Experiences Questionnaire	30 minutes	The researcher asked the participants to fill in the Metacognitive Experiences Questionnaire before and after solving math problems at three different difficulty levels (easy, medium, and difficult).
2	Training session of Think-Aloud Protocols	30 minutes	The researcher modeled the participant over a problem with a medium difficulty level in the process of think-aloud protocol and asked the participant to solve two different problems with the same difficulty levels by thinking aloud.
3	Application session of Think-Aloud Protocols	30 minutes	The researcher applied the think-aloud protocol to the participant while solving math problems at three difficulty levels.
4	Session of Math Problem Solving Performance	45 minutes	The researcher assessed the math problem-solving performance of the participant.
5	Session of Math Problem Solving Assessment-Short Form	20 minutes	The researcher assessed the metacognitive knowledge level of the participant.

students to solve two math problems with a medium difficulty level using the think-aloud protocols. The students were allowed to practice thinking out loud while solving a math problem.

The researcher encouraged students to speak with appropriate volume and clarity while solving math problems. In the third step, the researcher applied the think-aloud protocol after he repeated the instruction given in the think-aloud protocol training. The researcher presented the problem and asked, ''Are you ready to solve the problem?'' After receiving the answer ''I am ready'' from the student, he started the application by saying, ''Now I want you to solve the problem by thinking aloud.'' The researcher did not interfere with any operations that the students made wrong while solving the problem or the operations they had difficulty with. However, he warned students and said, ''Please do not forget to think aloud,'' when the student did not perform the think-aloud for five seconds. Also, when the students paused, he used expressions that help the student keep thinking aloud, such as ''What do you think right now? Well done, you think very well, keep thinking aloud.'' The same application was applied to other math problems with different difficulty levels. Fourth, the researcher carried out the problems for determining math performance. The researcher said, ''I want you to solve the problems in the booklet for me, you can start when you are ready.'' After receiving the answer ''I am ready'' from the student, he asked the students to solve 10 problems with medium difficulty levels. Fifth, the researcher verbally asked 16 open-ended questions from the Math Problem Solving Assessment-Short Form. The questions were provided in written form so that the students could understand the questions more clearly. If the student's answers were not clear and understandable, the researcher asked other questions such as ''Can you explain a little more? Can you give an example? Is there anything else you would like to add?'' When the student hesitated during the answering process, the researcher used expressions that help the student continue the answering process, such as ''Well done, you are providing very good information, please continue.''

Scoring Procedures. This part presents the scoring of the data collection tools used for each variable.

Scoring of the Metacognitive Experiences Questionnaire

Metacognitive experiences questionnaire has the following items based on a 4-point Likert scale rating system: not at all (1), a little (2), enough (3), and very (4). The total score for each problem with different difficulty levels ranges from 23 to 92 points.

Scoring the Think-Aloud Protocols

The verbal data recorded during the think-aloud protocol were transcribed verbatim immediately after the interviews. The think-aloud protocols were qualitatively analyzed, and then converted into quantitative data. The verbalization used by the participants in solving the math problems was coded as cognitive and metacognitive. The frequencies of the strategies were calculated separately for the problems with different difficulty levels. Cognitive verbalization had the following seven codes: reading, paraphrasing, visualizing, creating hypotheses, estimating, computing, and checking. Metacognitive verbalization was separated into two groups: productive and nonproductive metacognitive verbalization. Productive verbalization included self-monitoring, self-instruction, self-questioning, and self-correction statements/questions directly related to solving the problem (Rosenzweig et al., 2011). For

example, these statements are "I need to re-read the question," "That's not possible. It cannot be division," and "What am I doing?" Nonproductive verbalizations have reflective features of the student in line with the following categories: calculator, comment, and affect (Sweeney, 2010). This verbalization includes statements such as "I don't know what to do," "I'm confused," and "I need a calculator." The coding system included seven cognitive and seven meta-cognitive codes.

Scoring of the Problems for Determining Mathematics Performance

Each correct answer was scored as 1, while the incorrect answer was scored as 0. The total score obtained from problems for determining math performance ranged from 0 to 10.

Scoring the Math Problem Solving Assessment-Short Form

The audio-recordings were transcribed verbatim. The whole data were analyzed qualitatively and then converted into quantitative data. The total score to be obtained from the form varies between 0 and 45 points. The reading comprehension part was assessed over 9 points, the restating the problem in own words was assessed over 5 points, the visualization part was assessed over 6 points, the hypothesizing part was assessed over 5 points, the estimating part was assessed over 8 points, the computing part was assessed over 6 points, and the checking part was assessed over 6 points.

Reliability

Procedural reliability, transcript reliability, and inter-rater reliability were calculated. First, the application reliability was calculated for the training and application stages of think-aloud protocols and the metacognitive experience scale. Procedural reliability form was listed to include the application of the metacognitive experience scale and the training and application steps of think-aloud protocols, and a checklist was prepared. The observer is a research assistant in special education, who is at the dissertation phase. The following formula is followed to calculate procedural reliability: the number of observed behaviors is divided by the number of planned behaviors multiplied by 100. Procedural reliability was found 100% for the training and application stages of the think-aloud protocols and the application stage of the metacognitive experiences questionnaire.

Second, 30% of the data were calculated for transcript reliability, and it was made by a research assistant in special education, who is at all but dissertation phase of his doctoral study. The formula of "consensus/ (consensus + disagreement) x 100" was used to calculate the transcript reliability. The transcriptions of the think-aloud protocols consisted of a total of 13,689 words. After examining original recordings and transcripts, the rater added 53 words. The transcript reliability was found 99.6% (13.689/[13.689+53] x 100). For the reliability of the Math Problem-Solving Assessment-Short Form, a total of 15,404 words were delivered to the rater who added 70 words after examining original recordings and transcripts. The transcript reliability was observed to be 99.5% (15.404/[15.404+70] x 100).

Third, the reliability of coding forms was calculated for the think-aloud protocols, the Math Problem Solving Assessment-Short Form, and math problem-solving performance. The raters were provided with data including at least one-third of the whole data (45 pieces). The rater who calculated the reliability of the Think-Aloud Protocols and the Math Problem Solving Assessment-Short Form was an instructor holding a Ph.D. degree in special education, and he was an expert in cognitive and metacognitive strategies. The researcher provided training to the rater. The researcher and the observer scored the data at the end of the training. The data were delivered to the rater if there was a 90% or above agreement. The inter-rater reliability was calculated using the formula of "consensus / (consensus + disagreement) X100". The inter-rater reliability value was found to be 98.4% for the think-aloud protocol (range between %97-%100) and 99.2% for the Math Problem-Solving Assessment-Short Form (range between 98% and 100%). The rater calculating the reliability of the Math Problem-Solving Assessment Short Form was a Ph.D. candidate research assistant in special education. When calculating the reliability of students' math problem-solving performance, the correct answers were marked as 1 and the wrong ones as 0. Forty-five booklets containing signed forms and solutions to problems were given to the raters. The inter-rater reliability of math problem-solving performance was found to be 100%.

Data Analysis

The effects of metacognitive functions of participants' math problem-solving performance was identified using multiple regression analysis and Fisher Zr analysis.

Findings

Table 2 presents the multiple regression analysis results regarding the effects of students' cognitive and metacognitive strategies when solving mathematical problems of different difficulty levels (easy, medium, and difficult) and their metacognitive experience and knowledge levels over students' math problem-solving performance.

Table 2

The Effects of Students' Cognitive Strategy and Metacognitive Functions Over Their Math Problem-Solving Performance According to the Group Variable

	Variable	B	Constant error $_B$	β	T	*p*	Bilateral r
	Constant	-2.93	1.380		-2.12	.040	
	Cognitive strategy	.120	.125	.083	.954	.345	.309
	Metacognitive strategy	2.51	.618	.543	4.055	.000*	.803
LD	Metacognitive experience	.071	.032	.304	2.247	.030*	.749
	Metacognitive knowledge	.001	.078	.002	.018	.986	.157
				R = 0.83	R^2 = 0.69	*F* = 25.05	*p* = .000*
	Equation: Problem solving =-2.93+2.51* Metacognitive strategy +.071* Metacognitive experience						
	Constant	-2.11	1.652		-1.28	.208	
	Cognitive strategy	-.037	.214	-.02	-.172	.864	.381
	Metacognitive strategy	2.361	.435	.576	5.431	.000*	.684
LA	Metacognitive experience	.054	.029	.203	1.832	.074	.503
	Metacognitive knowledge	.195	.087	.259	2.229	.031*	.387
				R = 0.77	R^2 = 0.59	*F* = 16.09	*p* =.000*
	Equation: Problem solving =-2.11+0.20* Metacognitive strategy +2.36* Metacognitive knowledge						
	Constant	-1.62	6.363		-.254	.801	
	Cognitive strategy	-.103	.166	-.08	-.620	.538	.072
	Metacognitive strategy	1.238	.285	.563	4.350	.000*	.536
AA	Metacognitive experience	.110	.087	.157	1.266	.212	.155
	Metacognitive knowledge	.002	.048	.005	.038	.970	.058
				R = 0.57	R^2 = 0.32	F = 5.31	*p* = .001*
	Equation: Problem solving =-2.11+1.24* Metacognitive strategy						

The metacognitive strategies that students with LD used when solving a math problem and their metacognitive experience levels were a significant predictor of math problem-solving performance (F = 25.05, p = .000 < .05) and explained 69% of the variance. A high bilateral correlation value between math problem-solving performance and the use of metacognitive strategies (r = 0.80) and metacognitive experience (r = 0.75) was observed. The effect of using cognitive strategies and the level of metacognitive knowledge on math problem-solving performance was not statistically significant in students with LD. The LA students' metacognitive strategies used in solving math problems and their metacognitive knowledge levels were significant predictors of math problem-solving performance (F = 16.09, p = .000 < .05) and explained 59% of the variance. The bilateral correlation value between math problem-solving performance and the use of metacognitive strategies was close to a high level (r = 0.68), and the bilateral correlation value between math problem-solving performance and metacognitive knowledge was moderate (r = 0.50). The effect of using cognitive strategies and the level of metacognitive experience on math problem-solving performance was not significant in students with LA. The AA students' metacognitive strategies used in solving math problems were a significant predictor of math problem-solving performance (F = 5.31, p = .000 < .05) and explained 32% of the variance. The bilateral correlation value between math problem-solving performance and the use of metacognitive strategies was moderate (r = .54). The effect of using cognitive strategies and the level of metacognitive experience and knowledge on math problem-solving performance was not statistically significant in students with AA.

The multiple regression analysis results about cognitive strategies and metacognitive functions over students' math problem-solving performance showed differences according to the group variable. The Fisher Zr analysis for the stated differences is presented in Table 3.

Table 3

Fisher Zr Analysis of Cognitive Strategies and Metacognitive Functions Over Students' Math Problem Solving According to the Group Variable

Fisher Zr	LA (R^2 = 0.59)	AA (R^2 = 0.32)
LD (R^2 = 0.69)	0.48	2.32* (p = .03)
LA (R^2 = 0.59)	----	1.84

*p < .05; z table value of .05 with SD = 50-3=47 is 1.96, and if the z values are greater than the table value, it is significant.

No statistically significant difference was observed between students with LD and LA (Z = 0.48, p > .05), and between low and average achievers (Z = 1.84, p > .05) in terms of the effect of cognitive strategy and metacognitive function levels on math problem-solving performance. Regression effects were found to be identical. However, a statistically significant difference between students with LD and AA was observed (Z = 2.32, p < .05). Also, cognitive strategy and metacognitive function levels were found to have a higher effect on math problem-solving performance in students with LD.

Discussion

The effects of cognitive strategies and metacognitive functions over students' math problem-solving performance and their relationship levels were examined, and the findings were discussed. Several studies have examined the relationship between students' problem-solving performance and their metacognitive functions separately. These studies investigated the relationship between problem-solving and metacognitive strategies (Desoete, 2009; Desoete et al., 2006; Küçük-Özcan, 2000; Özsoy, 2005; Pape & Smith, 2002), metacognitive knowledge and strategies (Carr et al., 1994; Davidson & Sternberg, 1998; Schoenfeld, 1992; Wilson & Clarke, 2002) as well as metacognitive experiences (Efklides, 2001; 2006; Efklides & Petkaki, 2005). Also, Sweeney (2010) studied took metacognitive functions together and examined their effects and relationships on students' math problem-solving performance. Sweney found that metacognitive functions in all groups predicted participants' problem-solving performance. In this study, the predictors of math problem solving were *metacognitive strategies and experiences* in students with LD, *metacognitive strategies and knowledge* in students with LA, and *metacognitive strategies* in students with AA. Therefore, there is a correlation between the findings of the international literature and this research.

The fact that *metacognitive strategies* predicted math problem-solving performance in all groups could be explained by the nature of the problem-solving process, which is a metacognitive process based on the ability of students to examine and control their thoughts. The problem solver should be aware of the overall purpose of the process, the strategies that should be used to achieve this goal, and the effectiveness of these strategies. Therefore, during the problem-solving process, the student must control and monitor his/her cognitive process. These metacognitive strategies play a central role in the problem-solving process by controlling the other components of the problem-solving activities and regulating the relationship between them (Mayer, 1998; Özkubat & Özmen, 2021; Özsoy, 2005). This result leads us to the teaching of metacognitive strategies. Thus, students should be informed about the metacognitive strategies used in solving math problems providing regulation and awareness of cognitive strategies (Montague, 2008). The problem solving applied in schools should be scrutinized as the metacognitive strategy was the variable predicting problem solving in all groups. The metacognitive dimension of both teaching and assessment processes is ignored in the problem-solving practices applied in schools (Çelik, 2017). Considering these practices, students use some cognitive strategies (i.e., reading, computing, and controlling) to solve problems, and these strategies are included problem-solving stages; however, how to implement the strategies is not modeled (Karabulut & Özkubat, 2019; Özkubat & Karabulut, 2021). Although these stages help students know how to solve problems, they do not focus on the metacognitive strategies used for self-monitoring and self-controlling (Özkubat et al., 2020). In particular, intervention to be implemented for students with LD with limitations in managing their cognitive processes is not possible with an instruction that lacks metacognitive strategies. The findings of this study support the instructional including metacognitive strategy elements to middle school students.

Like metacognitive strategies, *metacognitive experience* also predicted math problem-solving performance in students with LD. Metacognitive experience may be affected by factors such as willingness to solve problems, self-confidence, stress and anxiety, uncertainty, patience and perseverance, interest in problem solving or problem situations, motivation, and desire to show success (Akama, 2006). Many students with learning disabilities face failure in mathematics to develop negative attitudes toward learning mathematics and use their existing potential (Jonassen, 2003; Montague, 1997). This situation causes less frequent uses of strategies. Thus, when problem-solving interventions involving cognitive and metacognitive strategies are applied to students, their perceptions and attitudes toward the problem-solving process develop. Studies on cognitive and metacognitive strategies (Daniel, 2003; Montague, 1992; Whitby, 2009) draw attention to the relationship between attitude and the increase in the number of problem solving as well as strategy performance, advocating that different teaching strategies develop positive attitude and experience toward mathematics and math problems. Therefore, instead of directly teaching mathematical concepts and strategies to students, teachers should experience a strategy-teaching environment where students take an active role, self-monitor, and self-evaluate. Thus, students can develop their strategy repertoire by experiencing whether they can choose suitable strategies in the problem-solving process and whether the strategies they use work.

In addition to metacognitive strategies, *metacognitive knowledge* predicted math problem-solving

performance in the students with LA. This may be explained by metacognitive strategies associated with metacognitive knowledge. The more information students have about the task assigned to them, the more they feel competent in completing the task. Thus, they are more persistent and use more strategies in completing the problem-solving process. On the contrary, if students have little knowledge, they will not insist on completing the assigned task and cannot use appropriate strategies. These reasons cause students to skip the necessary steps for the problem solution and negatively affect their understanding processes (Sweeney, 2010).

Comparing the effect of cognitive strategy and metacognitive function levels on students' math problem-solving performance, the findings of this study revealed that the effect of cognitive strategy and metacognitive function levels of students with learning disabilities on problem solving is higher than other students. The consensus is that the performance of students with LD can be developed significantly (Rosenzweig et al., 2011; Swanson, 1990; Sweeney, 2010). Therefore, the findings of this research underline the necessity of providing strategy teaching to students with learning disabilities to improve their cognitive and metacognitive function levels in solving math problems. Thus, students with LD will increase their strategy use, knowledge, and experience levels in problem-solving processes, just like their peers without LD. Therefore, there is a need for a process-based instruction for these students having problems in both cognitive and metacognitive functions, especially in increasing their math problem-solving performance (Karabulut & Özmen, 2018). Interactive dialogues can be included in this teaching, and math problem-solving performance can be increased by providing effective and efficient use of strategies through graphic organizers and mnemonics (Güzel-Özmen, 2006).

Considering the research findings, there is a call for problem-solving interventions based on metacognitive functions for developing problem-solving performance of students with and without LD at middle school. Unlike previous studies, metacognitive functions were discussed together, not separately, in this paper. In addition to its contribution to the literature, this study still has some limitations. First, determining the cognitive and metacognitive strategies used by the participants in problem solving with think-aloud protocols is based on the assumption that the participants think aloud while performing a task. Therefore, there may be strategies that students cannot verbalize or use a verbalization technique that was inaccessible to the researcher. However, this research has more participants than previous studies using think-aloud protocols (Bannert & Mengelkamp, 2008; Rosenzweig et al., 2011; Swanson, 1990; Sweeney, 2010). This is important in describing a more comprehensive profile of students in different skill groups. Second, standard instruments were utilized to recruit the participants due to the lack of achievement tests in Turkey. However, using standard measurement tools can reduce heterogeneity within groups and offer better opportunities to detect differences. Finally, this research was conducted only with the sixth-grade students to examine problems requiring addition and subtraction skills at different difficulty levels. Therefore, further studies can examine different grade levels and different problem types. Despite these limitations, this research provides a ground for researchers and practitioners interested in identifying variables that play a role in problem solving. The findings of this study can be used to prepare math problem-solving intervention programs that include cognitive and metacognitive functions.

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Appendix 1. *Think Aloud Coding Sheet*

Cognitive Strategies							
Category	Operational Definition	Problem 1		Problem 2		Problem 3	
		F	%	*F*	%	*F*	%
Reading	Reads the problem in its entirety						
Paraphrasing	Restates the problem in own words						
Visualize	Use of images (diagrams, pictures, mental imagery) to understanding task						
Hypothesizing	Sets up a plan, decides on a solution path, sets up a goal identifying operations to use						
Estimating	Predicts an answer						
Computing	Verbalizes computation						
Checking	Checks steps are completed, information is used, computations are accurate						
	Total						
Metacognitive Strategies							
Category	Operational Definition	Problem 1		Problem 2		Problem 3	
		F	%	*F*	%	*F*	%
Non Productive Strategies							
Calculator	Requests the use of a calculator						
Comment	Statements of personal functioning during task execution						
Affect	Statements concerning emotional disposition						
	Total						
Productive Strategies							
Self-Correct	Corrects products of process errors						
Self-Instruct	Statements regarding procedural control						
Self-Monitor	Observes performance and progress						
Self-Question	Considers problem and solution path						
	Total						
	Grand Total						

Appendix 2. *The Problems and Their Difficulty Levels Used in The Think Aloud Protocol Implementations*

Difficulty Levels of Problems	Problems
Easy	Raşit has 45, Çetin has 35, and Yunus has 55 walnuts. After Raşit eats 7, Çetin eats 8, and Yunus eats 12 walnuts, all three of them give their remaining walnuts to their friend Ahmet. According to this, how many walnuts would Ahmet have?
Moderate	The bill comes after three friends have eaten at the restaurant. When everyone pays 20 TL, the account will be paid, but because one of them has less money, the other two people have to pay 2 TL more each. Accordingly, how many TL does a person who has less money has?
Difficult	There are 18 small fish and 4 large fish in an aquarium. Since 1 big fish eats 1 small fish every day, what will be the number of fish in the aquarium after 3 days?

Appendix 3. *The Problems and Their Difficulty Levels Used in MEQ Implementations*

Difficulty Levels of Problems	Problems
Easy	Ms. Naide receives a salary of 987 TL. She reserved 457 TL for house rent, 100 TL for butcher, 80 TL for greengrocer, 75 TL for bills. How many lira is left for Ms. Naide?
Moderate	Emel wants to read a 145-page book. On the first day, she reads 27 pages of the book. Since she read 25 more pages on the second day than the first day, how many more pages does she have to read to finish the book?
Difficult	Mr. Ferhat, who liked a shirt worth 142 TL in February, pays 12 TL in advance. Since he will pay the rest in 10 TL monthly installments, in which month will the installment end?

Appendix 4. *The Problems Used to Determine Mathematical Problem Solving Performance*

Problems
1. In one hour, 40 bicycles, 30 cars, and 20 trucks passed through a street. Accordingly, how many are the total number of four-wheeled vehicles more than the total number of two-wheeled vehicles?
2. Asuman is 13 years old and his mother is 38 years old. How old was her mother when Asuman was 6 years old?
3. Hasan read 125 pages of the novel on Monday. He finished reading 17 more pages on Tuesday than Monday and 8 more pages on Wednesday. Accordingly, how many pages is the novel Hasan read?
4. The truck carrying parcels from Edirne to Iğdır unloaded 128 of 987 packages to Istanbul, 420 to Ankara and 235 to Erzurum. Accordingly, how many parcels were left in the truck when it came to Iğdır?
5. The entrance fee to an amusement park is 7 TL, the ferris wheel is 4 TL, the gondola and the fear train are 6 TL, and the bumper car is 4 TL. How many TL did Duygu, who went to the amusement park with such a price practice, spent a total of TL in the amusement park since she got on the ferris wheel and the fear train once?
6. Hacıbayram Secondary School asked students to bring the books they read to be donated to the libraries of schools in our eastern provinces. On the 1st day 250 books, on the 2nd day 124 less than the number of incoming books of the 1st day, on the 3rd day 179 more than the number of incoming books of the 2nd day, and on the 4th day the total number of books received on the 2nd and 3rd day were brought. Accordingly, how many books were collected in this school in 4 days?
7. Harun collected 478 kg of tea in the first day and 365 kg of tea in the second day in the tea garden. Since Harun collects as much tea as he did in the first two days on the 3rd day, how many kg of tea did he collect in these three days?
8. When a number is added 26 and subtracted 72, it makes 136. Find the number.
9. Osman's height is 17 cm shorter than his mother's. Osman's father is 25 cm taller than Osman. Since Osman's height is 145 cm, what is the total height of his mother and father?
10. Semih has 35 marbels. Gökhan's number of marbles is 8 less than Semih's number of marbles, while Hakan's number of marbles is 15 more than Gökhan's number. How many marbles does three of them have in total?

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Theater Arts as a Beneficial and Educational Venue in Identifying and Providing Therapeutic Coping Skills for Early Childhood Adversities: A Systematic Review of the Literature

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Abstract

This literature review highlights the utility of identifying early childhood adversities through dramatic play and theater arts. Understanding the impact of early childhood education, our focus included beneficial, qualitative observations of the positive therapeutic outcomes when participating in theater arts activities. We chose to search these individually (a) to understand how to identify adversities in early childhood and (b) to learn about the therapeutic effects that theater arts and dramatic play have on children. The findings amongst our articles show similar beliefs that theater arts can have a positive effect on a child's social and emotional development. Theater arts can be utilized as a venue for children to express themselves. We strongly believe that future studies should be conducted to further explore how theater arts and dramatic play can provide a means for identifying and treating children who have experienced early childhood adversities. Ending our literature review, we feel compelled to further investigate similar studies and/or design a study focused on identifying early childhood adversities using dramatic play and incorporating expressive arts as a therapeutic intervention. Particularly now, as the world determines how to navigate the multiple adversities of the COVID-19 pandemic, research informing educators, community leaders, and families of ways to protect children against the toxicity of pervasive stressors is vital.

Keywords:

Adverse Childhood Experiences, Drama, Dramatic Play, Early Childhood Education, Early Interventions, Expressive Arts, Social and Emotional Development, Theater Arts Education

Introduction

As teachers in a border city, we are constantly faced with the reality of the large number of students that come through our classroom doors that have suffered adversities in their early childhood years. We believe that

early childhood adversities can have a huge impact on their development. Perry and Conners-Burrow (2016) provide a range of outcomes that children with adverse experiences could display as poor social and emotional developmental skills, such as attachment difficulties, poor skills in peer play, inaccurate interpretations of social cues, and higher risk of mental health problems (p. 25). Adversities (a) can affect children's ability to cope with their personal thoughts and emotions and, importantly, (b) have shown children not to be *school ready* at the beginning of their educational career (p. 26).

Empathetic educators, as most are, want to find ways to provide students with a medium to help identify and overcome adversities. Teachers can help in providing a beneficial foundation to students' social and emotional development by having wholesome, responsive interactions with them (Magnuson & Schindler, 2019, p. 60). This is where teachers are able to "recognize and attend to children's many cues, including verbal ones such as crying and nonverbal ones such as a face expressing fear" (p. 59). Building rapport with students and displaying a genuine concern with personalized support can alleviate some of the stress that builds up within them (p. 60). Perry and Conners-Burrow (2016) identify long-term negative experiences as *toxic stress,* which "describes exposure to stressors—in the absence of a nurturing caregiver—that can lead to a prolonged activation of the body's stress-response system. Toxic stress in very young children can result in long-term changes to their brain's architecture (National Scientific Council on the Developing Child, 2005/2014)" (pp. 24-25). The Center on the Developing Child at Harvard University (2020) released resources, guides, and an infographic addressing what COVID-19 means for child development and the stress levels children face now and, potentially, in the future.

Dramatic play and *pretend and learn* centers in early childhood educational settings could possibly be the key in identifying adversities in young children. Expressive arts (e.g., visual arts, music, drama) for self-discovery and change can be used in the context of intervention, where art is often healing and life-enhancing, benefiting individuals with emotional problems as well as those coping with grief and trauma (Forrest-Bank et al., 2016, p. 431). Essentially, theater arts allow children "the opportunity to articulate their views and share their experiences through a [beneficial] medium" (Salmon & Rickaby, 2014, p. 39).

In this review of the professional literature, we want to identify the correlations that have been reported between children with early childhood adversities and the possible benefits that theatre arts and drama can provide in identifying and alleviating the stress that comes from dealing with or being exposed to such adversities. Throughout the years, in our own personal instructional experiences, we have seen an increase of intervention programs primarily focused on children who have learned the art of expressing their thoughts and emotions arising from adverse situations. Our focus is on children who have yet to develop those oral expressive skills, though still yearn for a safe, stable environment, filled with love, structure, and care that every child deserves to have.

Throughout our review, we discovered that there are several definitions that warrant clarity and meaning. Galvan and Galvan (2017) state that if we have many identifiably related variables, providing a table of definitions will facilitate the reader's ability to scan and identify similarities and differences (p. 88). Because of the considerable number of articles used in our literature review, we felt compelled to ensure that any necessary definitions facilitating the understanding of our review should and have been defined. Table 1 consists of terms and definitions pertaining to early childhood adversities, development, and theater arts.

Methodology

The measures in acquiring a meaningful analysis of literature came through the process of explicitly narrowing our topic of interest. This process was implemented by precisely selecting keywords in our article search. We refined our search to consist of a substantial number of manageable articles pertaining to our focus and manifesting significant academic standards (Galvan & Galvan, 2017, p. 29). Subsequent to several attempts in finding the exact keywords (which could potentially give us our desired results), we considered the possibility of identifying two different aspects within our research that could potentially be studied independently from each other. Our study discovered that in effectively narrowing our search criteria, we also needed to provide specific and suitable keywords. The initial process of simply typing up a phrase revealed a broad collection of articles. In looking for a more specific result, we used the key terms documented in Table 2. Terms utilized in our search consisted of *drama, child development, adverse childhood development, adversities,* and *art*. Subsequently, we found a mixture of studies that did not entirely include all aspects of our intended search within one article. In conducting our database search, we specified that all articles needed to be peer-reviewed in order to be considered part of this analysis.

After choosing WorldCat as the virtual database to search (Galvan & Galvan, 2017, p. 20), the initial focus was on the title and keywords that described the studies. While reviewing the articles, we read through the abstracts and focused on the ones that pertained to the benefits of theater arts and

Table 1

Terms and Definitions

Key Terms	Definitions
attachment	According to Duch et al. (2019), "John Bowlby first conceptualized attachment as the bond between caregiver and infant, formed from infants' need for security and closeness as a sensitive and consistent caregiver responds to the child (Bowlsby, 1969)" (p. 174).
constructivism	According to Budd (2016), "constructivism can broadly be understood as a theory of cognition that attributes learning to the active construction of knowledge through a learner's encounters with their environment" (p. 310).
creative and performing arts participation	Refers to attendance and/or participation in dance, drama, music, visual arts, and mediums such as film (Mansour et al., 2016, p. 240).
early childhood educator	According to Magnuson and Schindler (2019), an early childhood educator "ha[s] a complex understanding of child development and [is there] to provide rich and meaningful classroom experiences for all children, including those who are vulnerable or disadvantaged (Sheridan, Pope, Edwards, Marvin, & Knoche, 2009)" (p. 64).
early childhood trauma	"The range of events that young children may experience as traumatic [that could] potentially [be] broadened by the natural limitations in a young child's capacity for self-protection" (Holmes et al., 2015, p. 1650).
expressive art	According to Forrest-Bank et al. (2016), "the use of the art disciplines, including visual art, music, dance, writing, and drama, for self-discovery and change (Malchiodi, 2013). Expressive art is often used in the context of intervention; referred to as art therapy (Malchiodi, 2013)" (p. 431).
intermediality	According to Budd (2016), "intermediality is described by Donsbach (2008) as 'the interconnectedness of modern media of communication'" (p. 311).
longitudinal study	According to the Institute for Work & Health (2015), longitudinal study is observational; researchers do not interfere with the subjects, but they conduct observations of the same subjects over a period of time (some lasting for years).
nonarts	In Goldstein et al. (2017), nonarts refers to those developmental domains that are not art related (pp. 1507-1508).
play	According to Mages (2018), "play is the source of development and creates the zone of proximal development" (p. 225).
preschool theatre arts (PTAR) rubric	According to Susman-Stillman et al. (2018), a PTAR rubric is "an observational tool developed to assess children's preschool theatre arts skills in the context of storytelling/story acting" (p. 250).
self-concept	According to Mansour et al. (2016), self-concept "connotes how an individual perceives his/her capacity and self in a particular context (Shavelson, Hubner, & Stanton 1976)" (p. 241).
social emotional learning	According to Zinsser et al. (2016), "[Social Emotional Learning] SEL describes the process by which children acquire social-emotional skills including recognising their own and others' emotions, managing their emotions, showing social awareness and empathy, forming and maintaining positive relationships, and making responsible decisions (Collaborative for Academic, Social, and Emotional Learning 2012)" (p. 269).
theatre art skills	According to Susman-Stillman et al. (2018), "a set of skills that children use to participate in what is commonly referred to as creative drama or improvised guided enactment" (p. 250).
toxic stress	A "term coined to describe exposure to stressors—in the absence of a nurturing caregiver—that can lead to a prolonged activation of the body's stress-response system" (Perry & Conners, 2016, p. 25).
trust	According to Griffith and Larson (2015), trust "is defined as confidence in another person—a judgement that the person is dependable and has one's best interest in mind (Rotenberg, 2010)" (p. 791).

identifying childhood adversities, to attain our final relevant sources. In Table 2, we provide an audit trail of our search, displaying the terms used in our search and the Boolean operators, the number of possible sources located, and the number of relevant sources that were acquired.

Our team reviewed a total of fifteen articles, of which five articles focused on the studies and findings of identifying and addressing early childhood adversities. The remaining 10 articles provided studies and findings of various children-based theatre arts programs, benefiting their social and emotional development where some (not all) participants have been exposed to, or are currently dealing with, a type of adversity during their early childhood.

Analysis

Galvan and Galvan (2017) recommend tables to summarize literature effectively (p. 88). We provide two research methods tables. Tables 3.1 and 3.2 include information on the participants, methodology, and findings. This is to provide a helpful summarization of the methods employed in each of the articles (p. 89). In order to give the reader an understanding of the methodologies used, we have provided demographic information of the participants, indicated the experimental design used (if any), and included a summary of the authors' findings. We organized our review of the reported methodology and findings into two sections. Table 3.1 is a summary of the research that covers early childhood adversities in an educational setting, while Table 3.2 is a summary of research

Table 2

Audit Trail

Database	Dates Reviewed	Search Terms	Sources Found	Relevant Sources
WorldCat	2014 to 2019 July	"benefits of drama" AND "children with adversities"	10	0
WorldCat	2014 to 2019 July	"child development" AND "theatre art education" AND "elementary school"	25	5
WorldCat	2014 to 2019 July	"drama" AND "arts" AND "early childhood"	55	3
WorldCat	2014 to 2019 July	"drama" AND "theatre" AND "child"	48	1
WorldCat	2014 to 2019 July	"theatre" AND "arts" AND "children"	133	1
WorldCat	2014 to 2019 July	"identifying" AND "child behavior" AND "early childhood" AND "adverse childhood experiences" AND "play"	104	3
WorldCat	2014 to 2019 July	"trauma" AND "interventions" AND "early childhood" AND "behavior" AND "attachment" AND "preschool setting"	46	2

focusing on theatre arts studies and programs.

In Table 4, we summarize the strengths, weaknesses, and gaps that were found in the studies. Table 4 also includes some pertinent quotes that are important to this review.

Discussion and Findings

We noticed a pattern when searching for early childhood adversities and arts in education where most literature reviews were predominately qualitative in nature. This could be due to the "argument made by many arts researchers that they should only focus on qualitative work that is richly descriptive of the arts themselves, believing quantitative work threatens research and work in the arts" (Goldstein et al., 2017, p. 1510). After selecting our five articles based on early childhood adversities, we identified that the pattern of qualitative work continued. Qualitative research was predominantly the structure of the studies acquired on identifying early childhood adversities; addressing and treating them through their early childhood education. As we became more familiar with our articles, we discovered that, in some cases, some researchers quoted one another amongst their studies. For instance, Susman-Stillman et al. (2018, p. 258) quoted studies by Mages in both 2008 and 2015. We felt that this gave further credibility to the articles we were reviewing. Our discovery of one author citing another displays an evident common interest amongst scholars, through a *snowball* effect (Sage, 2020), towards the cultivation of studies addressing early childhood adversities and the benefits of theater arts in identifying and providing early interventions.

We found two nonexperimental studies. The observational style of data collection that Mansour et al. (2016) conducted looks at the relationship between the students' creative and performing arts participation along with their self-concept of the arts (p. 240). Mages' (2018) method of study followed a non-experimental style of research; conducting a "quasi-experimental multi-site study us[ing] a pretest-posttest design with a treatment group and comparison group" (p. 229). Evidential findings in the Mansour et al. (2016) study show that the researchers used casual-comparison studies (p. 246). Data were collected in prior achievement measures where previous research has found that there is a relationship between arts participation and student achievement (p. 246). Both Mages (2018) and the Mansour et al. (2016) looked into cause-and-effect and focused on the effect on the participants during the study. As Mages highlighted:

> [I]t is worth noting that the inclusion of a TIE [theatre-in-education] program did not detract from the children's acquisition of skills that contribute to school readiness; the scores on assessments of language, perspective-taking, and imagination were similar for children in the intervention and comparison conditions. Thus, this study suggests that the inclusion of high-quality theatre arts curricula in early childhood education can provide young children with an entertaining and engaging preschool drama experience while providing academic supports commensurate with those of more traditional early childhood programs. (p. 224)

Table 3.1

Methodologies and Findings in the Literature of Early Childhood Adversities

Authors and Publication Year	Participants	Methodology	Findings
Duch et al. (2019)	40 families; 100% from Hispanic origins; participants were mainly mothers, with exception of one father. All children average age of 4 to 5 years (pp. 175-176).	"The purpose of the focus group was to gather qualitative information of the CARING (a preventative, play-based, parent-child intervention designed to promote preschoolers' social-emotional development by strengthening their bonds with their parents) program, as well as to obtain feedback to make programmatic improvements" (p. 176).	Hope of a preventive, low-cost intervention program for families facing adversities and for parent/child relationships (p. 186).
Holmes et al. (2015)	"Roughly 150 participants were referred for assessment for Head Start Trauma Smart (HSTS) intensive services during the 2011-2012 school year" (p. 1655).	Measurements used: Childhood Trust Events Survey (CTES): Caregiver Version, Achenbach System of Empirically Based Assessment (CBCL), Classroom Assessment Scoring System (CLASS) (p. 1655).	"Much remains to be known about effective interventions for this population, the Head Start Trauma Smart (HSTS) model offers an approach that deserves further study" (p. 1657).
Magnuson & Schindler (2019)	"Social and human service programs and policies that serve low-income families and early childhood caregivers (parents or teachers) currently facing adversities" (p. 60).	"The focus is on programs implemented with economically disadvantaged families and children." Programs such as Mobility Mentoring, Ready for Routines, Family Check-Up (FCU), mindfulness training, Chicago School Readiness Project, ideas42, Mental Health Outreach for Mothers (MOM) Partnership, and READY4K" (p. 67).	"Their findings show that there is potential to boost caregiver (and child) self-regulation and executive function. Though rigorous evaluations are needed to better understand whether the programs are effective, including more attention to a broad range of parenting behaviors and children's outcomes, as well as consideration of how long program impacts persist" (p. 71).
Perry & Conners (2016)	Research focused on children in foster care who were served in child care settings as an example of how Early Childhood Mental Health Consultation (ECMHC) builds the capacity of other adults in the child's life to serve as buffers of toxic stress (p. 25).	The use of Early Childhood Mental Health Consultation (ECMHC) as a support to home visitors and child care workers who are serving young children exposed to or at high risk for early adversity (p. 25).	Findings acknowledge the vital role that those who spend many of their waking hours with other people's children play in mitigating the risk factors to which young children may be exposed in their homes and communities. "The hopeful part is the evidence that biological stress response systems are malleable and that we can make positive changes in children's physiology when we improve their relationships with the important adults in their lives" (pp. 32-33).
Zinsser et al. (2016)	Total of 12 participants: 1 private preschool executive, 1 professional program evaluator, 1 mid-level manager at the office of Head Start, 1 retired superintendent, 3 former administrators (served in advisory capacities), and 5 current center directors (p. 272).	"Interviews were conducted and recorded (with permission) by phone (n=5) or in person (n=7). They were then transcribed and analyzed via NVivo qualitative coding software. The software helped them code and categorize keywords or phrases used in their study" (p. 272).	Their findings have connected developmental theory and educational practices and how the leader's emotional environmental climate strongly affects the teachers' emotional experiences at work and children's social and emotional learning (p. 286).

Table 3.2
Methodologies and Findings in Literature on the Performing Arts

Authors and Publication Year	Participants	Methodology	Findings
Budd (2016)	15 child performers with a "diversity of cultural heritages and socioeconomic status" (p. 310).	Practice-led research project that "ran from 2011 to 2013, and creative developments took place in almost every school holiday break" (p. 310).	"This report offers insight into intermediality's potential as a performative strategy capable of generating new modes of communication and perception" (p. 317).
Forrest- Bank et al. (2016)	40 youth participants, 6th to 8th grade): Group A: 23 students, 12 yrs. average age: 52% male, 47.8% African immigrants, 34.8% African American, 8.7% Asian, 8.7% unknown race Group B: 17 students, 13 yrs. average age): 35.3% male, 52.9% Latino, 35.3% African immigrants, 11.8% African American (p. 434).	Surveys were done prior to the beginning of the program and immediately after the last workshop (pp. 434-435).	Social work focuses on identifying effective interventions. This study found that when arts professionals collaborated with social workers, they should develop guidelines for managing youth behavior. Studies support that future study needs to explore the efficiency of the arts and child development (p. 439).
Goldstein et al. (2017)	"21 exemplary case studies, covering an age range from 18 months to 17 years old" (p. 1505).	Rigorous studies of the arts in child development, (a) intrinsic, (b) instrumental, (c) liminal studies (p. 1507).	Children are naturally drawn to the arts and engage happily throughout childhood. Current work is beginning to bridge the understudied activity with developmental science (pp. 1510-1511).
Griffith & Larson (2015)	108 youth ages 12-19, with an average age of 15.7 in 13 arts, leadership and technology programs: 53 males 55 females 46 Latino 36 African American 21 European American 05 other ethnicities (p. 792).	Data collected from a longitudinal mixed-methods study. Data obtained at four points in time over full course cycle. Trust questions were asked at times 2 and 4 (p. 792).	From the point of view of program staff, youth's trust magnifies the impact of staff and program activities (p. 801). Future research needs longitudinal quantitative studies, which should include programs with leaders that have different assets and youth who do not trust leaders (p. 802).
Hui et al. (2015)	790 young children 217 parents 65 teachers in 7 kindergartens and nurseries (p. 315).	"The quantitative part of the study involved objective tests administered to young children, including the Story-Telling Test (STT) and the Test for Creative Thinking–Drawing Production (TCT-DP), and two other subjective tests, including parents' ratings of the students' behavioural characteristics and teacher questionnaires" (p. 317).	"The current findings suggest that young children exposed to a single art form (drama and visual arts) tend to gain more in verbal creativity than those to integrated art forms" (p. 323).
Kahn & Zeilder (2016)	Students K-12 (p. 262). (No other specifications given on participants).	Using perspective-taking interventions for students' perspectives to be voiced and inclusive scientific literacy is in reach (p. 278).	There is a need to challenge teachers to integrate the arts with other disciplines to value students' perspective taking as cultural skill (p. 278). This will help students understand from different points of view.
Mages (2018)	155 children 77 females 78 males	"This study assessed children's language abilities in three domains. The children's ToM [Theory of Mind] abilities were measured using two items that are part of the DELV story production measure and the "Rabbit-Fox Test," a measure of a child's comprehension of others' emotions. Children's imaginative propensities were assessed using the Telephone Task and the Assessment of Pretend Actions" (p. 229).	"This study suggests that the inclusion of high-quality educational drama and theatre curricula in early childhood education can provide young children with an entertaining and engaging preschool experience while providing academic support commensurate with those of more traditional early childhood programs" (p. 235).
Mansour et al. (2016)	643 students 55% female 45% male from 15 primary & secondary schools: 9 government schools, 4 independent, 2 Catholic; 2 single-sex schools 13 co-ed; 11-19 yrs. of age; 79% of students from English-speaking families, 21% from non-English speaking families; 3% percent Aboriginal and Torres Strait Islander (p. 244).	Measures adapted from the Organization for Economic Cooperation and Development (OECD) (2000) student survey, responding in regard to dance, drama, film/video making, music and visual arts (p. 244).	There is an instrumental role in home, school and community play in nurturing people's arts self-concept and participation (p. 251).
Salmon & Rickaby (2014).	35 young people total, 14 had been part of care system, only 10 agreed to be interviewed post production, 7 females, 3 males (p. 32).	"While the researchers were independent from the creative endeavour, both researchers worked hard to forge relationships with young people prior to commencing the fieldwork; this included meeting them in advance, explaining their role, encouraging questions and attending rehearsals" (p. 32).	"The qualitative evidence presented here supports previous claims that young people's involvement in the arts can develop emotional literacy and improve confidence and social skills" (p. 39).
Susman-Stillman et al. (2018).	158 participants 74 males 84 females all ethnically and linguistically diverse low-income preschoolers (p. 249).	"The present study is an initial assessment of the psychometric properties of the Preschool Theatre Arts Rubric (PTAR), a new observational measure of preschool children's theatre arts skills developed for use in the context of an early childhood theatre arts outreach program that emphasizes storytelling (ST) and story acting (SA)" (p. 252).	"While more research is needed, the PTAR is a promising tool to observe preschool children's theatre arts skills in research, classroom, and programmatic contexts" (p. 260).

Table 4
Strengths, Weaknesses and Gaps, and Meaningful Quotes in the Literature

Authors and Publication	Strengths/Weaknesses/Gaps	Quotes
Budd (2016)	Strengths: Drama was used to provide a place where children can express their emotions with their audience and lead to discussions about real issues. "children were able to speak directly to an audience about their fears through animated text....it challenged audiences to consider their own conceptions of childhood.... prompted by workshop discussions about risk. Risk emerged in early developments as a recurrent characteristic of 'childhoods'" (pp. 315-316). Weaknesses: None noted Gaps: None noted	"This dual concept of expression and exchange is at the heart of intermediality's capacity to provide new opportunities for child performers" (p. 311). "Joy Fear and Poetry consciously articulated the social interplay between adults and children, highlighting adult influence as a significant and consistent characteristic of children's lives" (p. 317).
Duch et al. (2019)	Strengths: The authors gave a thorough breakdown of the CARING program studied (pp. 173-175). "Caring is a preventive, play-based, parent-child intervention designed to promote preschoolers' social-emotional development by strengthening their bonds with their parents" (p. 171). Weaknesses: Low participation attendance hindered focus groups (p. 185). "Reasons for low program participation were also responsible for the inability to attend focus groups (e.g., lack of child care, having moved, having changed schools)" (p. 185). Gaps: A focus mainly on Mexicans resulted in less generalizable findings (p. 185). "Our sample was entirely first-generation Latino parents and predominantly Mexican, our findings concerning the impact of CARING cannot be generalized to other populations" (p. 185).	"We present parents' own voices to describe the impact the intervention had on themselves, their children, and their relationship with each other" (p. 185).
Forrest-Bank et al. (2016)	Strengths: Focused on proving that youth overcome adversities, even when exposed to risks and disadvantages, when they are supported with positive development using expressive arts interventions (p. 429). Weakness: Results between both groups varied greatly because of the many differences (ethnic background, gender, ...) in the sample groups (pp. 437-438). "Demographic differences between the two groups and a limitation of our study was our inability to adequately assess them" (p. 437). Gaps: Behavior expectations between the professional artists and social workers need to be aligned (p. 439).	"Preventing problematic behavior in youth might be optimally accomplished by focusing on fostering protective factors in at-risk youth rather than targeting specific risks or negative behavioral outcomes" (p. 430). "Further research is needed regarding the efficacy of specific expressive arts interventions as well as examining their potential for Positive Youth Development (PYD) in nonclinical populations served in the context of after-school programs" (p. 432).
Goldstein et al. (2017)	Strengths: Authors discussed "how the arts are no more difficult to study than other real-world developmental phenomena and deserve a thorough examination" (p. 1505). The focus was on methodological studies of child development through the use of fine and performing arts (p. 1507). Weakness: None noted Gaps: None noted	"Parents and teachers have long claimed they see development and change as a result of involvement in the arts but have done so without recourse to systematic definition and measurement" (p. 1506). "Arts classes become more complex and developmentally appropriate to the growing child's ability over time-a progression developmental scientists can well take advantage of" (p. 1510). "Current work is beginning to bridge this critically understudied activity with developmental science" (p. 1511).
Griffith & Larson (2015)	Strengths: Showed the effectiveness of youth programs for building trust overtime through different activities and interactions. Review effectively broke down the processes. Clearly stated the study methods, participants, data analysis that show the effectiveness of youth programs for building trust overtime through different activities and interactions (p. 801). Weakness: Only focused on effective programs, so there doesn't seem to have been a comparison with programs that had negative outcomes (p. 792). Gaps: None noted	"Theory and research across fields of social science demonstrate multiple ways in which trust can enhance the functioning of individual behavior and human interactions" (p. 790).
Holmes et al. (2015)	Strengths: Focused on detecting childhood trauma early enough to be able to provide interventions as soon as possible. "HSTS[1] represents an innovative integration of evidence-informed modalities for the purposes of creating a developmentally appropriate intervention to address complex trauma among young children ..." [and] "integrates three evidence-informed modalities to create a model that includes training, classroom consultation, intensive therapy, and peer mentoring" (p. 1657). Weaknesses: Throughout the article, there was a large number of acronyms used. This made the article difficult to understand. Results were based on the data collected. Some measurement forms were incomplete by participants (pp. 1656-1658). Gaps: Incomplete data collection did not help provide an accurate representation of results (pp. 1656-1658) leading to discrepancies in the study. Note 1. "Head Start Trauma Smart (HSTS), an early education/mental health cross-systems partnership designed to work within the child's natural setting—in this case, Head Start classrooms" (p. 1650).	"There is a clear need for applied evidence-informed interventions and trainings . . . few developmentally appropriate options exist, particularly when the goal is not only to address the specific child in need but also to create an overall trauma-informed model that can help build the resiliency of the larger community" (p. 1658).
Hui et al. (2015)	Strengths: The creative partnership project on creativity and arts education in early childhood was designed with both qualitative and quantitative methods, which is seldom found for studies in the arts. "The current paper focused on quantitative analysis" (p. 317). Weaknesses: The shortness of the time frame given to the study put a limitation on acquiring results that would prove if the creative thinking would continue over time (p. 324). "The partnership project was implemented for one academic year only. Longitudinal studies covering a longer period are required to investigate whether this increase in creative thinking can be sustained for further development" (p. 324). Gaps: Age gaps can create discrepancies in findings as children have different abilities and interests (p. 325).	"The present study examined whether young children's creativity improved after their participation in a creative partnership project" (p. 317). "Pre-test and post-test design with both quantitative and qualitative methods... quantitative part of the study involved objective test administered to young children, including the Story-Telling Test (STT) and the Test for Creative Thinking-Drawing Production (TCT-DP), two other subjective tests, including parents' ratings of the students' behavioral characteristics and teacher questionnaires" (p. 317).
Kahn & Zeilder (2016)	Strengths: Showed strong support of perspective- taking in science classrooms through the support of the humanities, arts, and social sciences. One method is the use of method acting (pp. 269-272). Weakness: The main focus was on how to implement the use of the arts in a science classroom, rather than using the arts in helping students overcome adversities (p. 278). Gaps: The focus of the study was mainly on science classroom and not on other disciplines, which limits the findings on child development overall (p. 278).	"This approach might require some coaching as students are more accustomed to being asked for an opinion and then backing it up; they are not accustomed to looking inside themselves for places of congruence with opponents or opposing points of view, yet this is precisely the skill that we are trying to build in order to prepare students to approach multifaceted problems" (p. 271).

Table 4 (cont)

Mages (2018)	Strengths: Focused on how theater in education can promote child development and proved that children participating in drama were not negatively affected in their academic achievement (p. 235). Weaknesses: There was an anomalous pattern with the results of the comparison group, failing the "false-belief" question but passing the "belief-based" question which hypothesized that those pattern results could not happen (p. 233). Gaps: The researchers could not pinpoint the exact reason for the anomalous pattern, they presented multiple possible reasons for this pattern (p. 233).	"Drama and theatre activities provide tangible, language-rich, social contexts for decontextualized language, in which children are introduced to new language structures and vocabulary, and are offered opportunities to use their verbal and physical communication skills to actively engage with both adults and peers" (p. 226). "This study suggests that the inclusion of high-quality educational drama and theatre curricula in early childhood education can provide young children with an entertaining and engaging preschool experience while providing academic support commensurate with those of more traditional early childhood programs" (p. 235).
Magnuson & Schindler (2019)	Strengths: We are provided an explanation on how caregivers dealing with their own adversities can additionally affect children with adversities (p. 63). "With low compensation and few opportunities for professional of economic advancement, but increasingly high expectations to ensure that young children are developing to be ready for school, early care providers are vulnerable to work stress and may experience negative emotional reactions to work-related challenges (Whitaker, Dearth-Wesley, & Gooze, 2015)" (p. 63). Weaknesses: All the programs mentioned are in the developing stages, not much longitudinal research has been done to truly tell of its effectiveness (p. 71). Gaps: None noted	"A social structural lens can help explain why some parents and caregivers do not provide high-quality care to their children. In particular, low-income and economically disadvantaged families face many obstacles and challenges in raising their children. Likewise, the under-resourced contexts in which they provide care to children present a challenge to low-wage early care and education workers" (pp. 60-61).
Mansour et al. (2016)	Strengths: We can see the relationship between young people's creative and performing arts participation and how it affects their arts self-concept (p. 240). Authors explained the process step by step. Weakness: The limitation seen is the lack of more "objective" measures as part of their data, and they recommend it should be included in future studies (p. 251). Gaps: None noted	"When students are actively engaged in an activity such as the arts, they are more likely to experience and develop well-established indicators of positive development such as self-worth (Blomfield & Barber, 2011), healthy social relationships (Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006), and pro-social behavior (Catterall, 2009)" (p. 249). "Both receptive and active arts participation are related to mental health and life satisfaction; however, active arts participation is the stronger predictor of these outcomes" (p. 243).
Perry & Conners- Burrow (2016)	Strengths: Gave a tremendous amount of information on Early Childhood Mental Health Consultation's (ECMHC) optimal implementations on children in foster care (p. 24). "This article shares best practices from the field of early childhood mental health consultation (ECMHC) as a strategy to help reduce the impact of stressors on young children" (p. 24). Weaknesses: There was not a clearly stated methodological procedure within this article. Gaps: There is not a sufficient amount of research to prove the program's effectiveness (p. 31). "At present, there are limited published studies of the effectiveness of ECMHC in-home visiting" (p. 31).	"Parent-child interaction therapy (PCIT) was originally developed to reduce child behavior problems and reduce parenting stress (Eyberg et al., 2001; Hood & Eyberg, 2003; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998). However, well-designed studies have also shown that PCIT is effective in improving outcomes of child physical abuse and neglect, in particular the reduction of re-reporting (Chaffin & Friedrich, 2004)" (p. 31).
Salmon & Rickaby (2014).	Strengths: The method used for data collection was based on constant comparative analysis, which allowed the researchers to easily jump back and forth between speculation previously found, data and analysis and personal reflection (p. 34). "The sample size enabled interview transcripts to be analysed using a traditional 'cut and paste' approach whereby the researcher reads and re-reads the transcripts drawing out themes and sub-themes (Gibbs, 2007) ... describe as an iterative process of revisiting themes" (p. 34). Weaknesses: Lack of funding did not allow for a continuation of the research, therefore limiting the study (p. 38). "Financial constraints... remains a limitation of the study, as it is not possible to assess the degree to which the outcomes explored here were sustained or built on over time" (p. 38). Gaps: None noted	"Moreover, it not only engaged young people for the duration of the project, it inspired and enthused young people to maintain and extend their involvement in terms of their continued involvement in arts-based projects and courses" (p. 39). "Friendships and social connectedness were key impacts of the project" (p. 39).
Susman- Stillman et al. (2018)	Strengths: Researchers awareness of the newness of the study. They are conscious that there are gaps in the measurement of theatre arts effect on child development. Their goal is to create measurements to close those gaps for further research (p. 252). "Our goal was to fill an important measurement gap by creating an observational measure of preschool children's theatre arts skills that would demonstrate necessary psychometric properties of reliability and validity" (p. 252). "This measurement gap limits the ability of researchers to document the extent to which theatre arts affect children's development and examine potential mechanisms by which they may support children's outcomes" (p. 258). Weaknesses: None noted Gaps: None noted	"With the resurgence of attention to arts integration in early childhood education, and its potential to improve the quality of early care and education, engage early learners, and improve children's developmental outcomes, a new generation of research on the impact of the arts is dawning" (p. 258). "However, research examining the developmental processes and potential benefits of theatre arts/creative drama on young children's development suffers from a lack of psychometrically rigorous measures of arts skills (Mages, 2008, 2015)" (p. 258).
Zinsser et al. (2016)	Strengths: It helps realize and emphasize the relationship between educational and administrative theory and what is actually practiced (p. 286). "The findings of this study highlight interesting connections between developmental theory and educational practice. Specifically, all three components of the Positive Early Emotional Leadership model identified by our administrators, in addition to aligning with emotion socialization theory, are process-based mechanisms that don't resemble traditional measures of director qualification or management proficiency in education realms" (p. 286). Weaknesses: None noted Gaps: This study was only focused on administrators who had an association with the Head Start program. Further studies should be performed with a greater diversity of early childhood educational administrators (p. 287).	"One of the most fundamental ways in which early-childhood directors can influence the emotions of staff and students in their buildings is through direct interactions through sharing of their own emotions or by being empathic to the emotions of others" (p. 277).

The research by Holmes et al. (2015) was an experimental study in which "treatments were administered to participants for the purposes of the study and their effects [were] assessed" (Galvan & Galvan, 2017, p. 66). The "Head Start Trauma Smart (HSTS) staff did identify and utilize standardized instruments from the beginning in order to measure systematic improvements in the classroom (as measured by CLASS scores) and whether the children who were receiving individual treatment were making clinical progress" (Holmes et al., 2015, p. 1655). Throughout the experimental study "children were identified for referral to the program by either the child's teacher or parent, and typically, although not always, were referred due to the child's externalizing behaviors" (p. 1654).

Limitations were distinctly stated by the authors of the majority of the articles reviewed, yet some were not clearly established nor made reference to. Though not all of the authors clearly stated their limitations, we were able to locate a few that were clearly identifiable as the limitations which the researchers faced within their studies. Mages (2018) discusses the results and mentions that the study demonstrates the importance of implementing high-quality theater arts and drama in early childhood education. Mages (2018) does not mention any limitations within her article; however, she goes into discussion of the results and mentions that the study demonstrates the importance of implementing high-quality theater arts and drama in early childhood education (p. 235). In the Mansour et al. (2016) closure, the researchers give a clear statement in regards of the limitations and provide future directions for prospective research. In expressing their suggestions to further their study, they suggest the need to possibly include objective performing and achievement arts measures and incorporating the use of instruments as a method of self-expression (p. 251).

Holmes et al. (2015) provided a clear critique of their study, stating that their particular research was administered to children living in urban areas (where adverse conditions thrive), yet noting that young children experience adversities in rural environments as well (p. 1658). As intricate as their research may have been, clear limitations were mentioned such as "the data collected are on children referred and served. No control group has been used to date... [The] data only reflects use with children in an urban inner core setting. It is not yet clear how HSTS will work in a rural setting" (p. 1658). Acknowledging that their study focused on a specific demographic, Holmes et al. conclude their article by putting forth suggestions to incorporate for future studies (p. 1658).

Within the articles reviewed, both qualitative and quantitative types of methodologies were identified. Although Goldstein et al. (2017) do not specify, they do appear to draw on the same conclusions under their *Research Programs in the Arts* section, seen throughout the subheadings (pp. 1507-1510). Within this section, they also explain that the studies of arts in child development can be classified into three broad spectrums (p. 1507). They explain the different methods used under intrinsic observational methods, where they took notes on (a) seven 1-hour elementary school classes and (b) six 2-hour high school classes and (c) analyzed the statements the teachers made over 19 hours of classes (p. 1507). Following the section under the subheading *Instrumental: Effects of Engagement in the Arts,* Goldstein et al. included a longitudinal quasi-experimental method that researched the effects that the arts have had on "nonarts developmental domains" (p. 1508). Studies in the arts can also be conducted rigorously and should not only involve formalized arts programs and arts interventions and treatment programs, but also artistic activities (p. 1509).

Duch et al. (2019) "used a two-phase qualitative approach [in] analyz[ing their] data" (p. 177). They further explain the two phases of methodology mentioning that in the first phase, they incorporated an "inductive approach, based on grounded theory (Creswell et al., 2007) to generate a general explanation/description... broad categories were established that [in turn] guided subsequent coding... [in] the second phase, two independent coders used establish coding strateg[ies] to review transcripts and code categories" (Duch et al., 2019, p. 177). Throughout their methods of coding the data collected, Duch et al. (2019) pointed out that they "only describe[d] codes that were reported by at least 20% of participants across groups and focus[ed] on [just] the first two main categories" (p. 181). After analyzing their collected data, Salmon and Rickaby (2014), "informed by grounded theory and using the method of constant comparative analysis ... part of what Crabtree and Miller (1992) describe[d] as an iterative process of revisiting themes" (p. 34). We found specific and concise information from the qualitative methodologies, their authors presenting clear and sufficient information to build trustworthiness into their findings and focus towards the findings of our study.

Goldstein et al. (2017) provided the qualitative data they gathered from the chosen exemplary case studies; however, there is no specific results section and most of the information provided on findings is under different subheadings (pp. 1507-1510). Duch et al. (2019) presents their results through the demonstration of a table that consists of "codes within each category, including the percentage of participants who reported [on] each code, [including] inter-rater reliability for the code, and [adding] participant quotes" (pp. 178-181). We feel that the study by Salmon

and Rickaby (2014) displayed a great amount of information such as the social and emotional benefits received by participating in this program. They added validity to this by displaying direct quotes throughout their findings (pp. 34-38). In reviewing our studies, we see that there appears to be a correlation between the positive impact that theater arts have on children with early childhood adversities.

Implications and Conclusions

We believe that early childhood educators along with teachers of all grade levels have an extra-large heart. As teachers of children with a demographic range consisting of large volumes of low socioeconomic families and English language learners, we have witnessed our fair share of children who are currently in, or have been through, one or more adverse situations. A noted limitation in attaining in-depth information is that the majority of early childhood children are not fluent in their oral skills to effectively express what situations they are going through or how they are feeling. "The wide range of behaviors exhibited by young children impacted by trauma can present challenges in an early childhood education setting as effects may be seen in multiple domains: affective, behavioral, physiological, and relational (Lieberman et al. 2011; Cook et al. 2005)" (Holmes et al., 2015, p. 1651). Every new school year, we receive a new group of children, unaware of what they are going through or have been through. By observing a child's manner of play and social interactions, we might gain insight of possible adversities, address them, and help them acquire skills, social and emotional skills, that all children can benefit from, especially children who have dealt or are dealing with adversities (Magnuson & Schindler, 2019, p. 60).

When we look at the studies focused on the dramatic arts, plays, and expressive arts, we find that they were applied as a venue for children to be able to express their emotions and thoughts. "Various forms of expressive arts are known to have associations with positive academic, social, and behavioural outcomes in addition to offering important therapeutic benefits for children and adolescents" (Forrest-Bank, 2016, p. 429). Many children who suffer from adversities in early childhood might not have a way to express or cope with the emotions that they may be experiencing. However, through the use of theater arts and dramatic play, we might be able to create a venue for children to gain therapeutic coping skills towards their adversities to help them cope. We were surprised to find that there are a limited number of peer reviewed articles that involve studies relevant to our focus. As per Goldstein et al. (2017), educational journals such as *Child Development* are prone to focus their "articles on factors such as temperament, vocabulary, executive function, decision making, social groups, and ethnic identity but almost never [focus] on involvement [of] the arts, despite *prima facie* observations that these above-mentioned factors are deeply entwined in the context of arts engagement and learning" (p. 1505). We also believe it important to note the importance of identifying demographic data and considering generalizability or transferability and trustworthiness in research, such as in the case of Duch et al. (2019) who focused on first-generation Latino parents, predominantly Mexican, in their study (p. 185).

Although we see that these studies come to similar findings, it is evident that future studies are still needed. Due to COVID-19, we agree that, "these factors are continuing to contribute to children experiencing high levels of stress as the sense of normalcy is lost from their lives and they are bombarded with new expectations and responsibilities. Children need social and emotional support now more than ever" (Kamei & Harriott, 2021, p. 365). According to Goldstein et al. (2017), any activity in the arts is likely to have important cognitive, social, and emotional functions (p. 1511). They conclude their article by stating that specialists in their field, such as "developmental psychologists and artists can create rich and diverse partnerships with which to investigate these issues in the real world" (p. 1511). Implementing theater and dramatic arts in early childhood education "improv[es] our understanding of the impact and mechanisms by which theatre arts can affect children's developmental outcomes" (Susman-Stillman et al., 2018, p. 260). As mentioned in the Forrest-Bank et al. (2016) study, their findings support further studies of the efficacy of theater and expressive arts on a child's social and emotional development (p. 439). In accordance, we believe that additional research should be done in exploring the benefits that theater arts and dramatic play can have on children who have suffered early childhood adversities. Future studies should utilize theater arts and dramatic play to identify early childhood adversities and should incorporate expressive arts as a therapeutic response.

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Agile Approach in Training Future Primary School Teachers for Resolving Complex Pedagogical Situation

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Abstract

The article presents the results of an experimental study of the impact of scrum methodology as a kind of Agile approach on building competence in resolving complex pedagogical situations in future primary school teachers. It is noted that the experiment was conducted in the first semester of the 2018-2019 academic year and covered fourth-year students majoring in 013 "Primary Education" at Pavlo Tychyna Uman State Pedagogical University and Berdiansk State Pedagogical University. The author reveals the peculiarities of adaptation of the scrum methodology to the traditional educational process, distribution of academic time into periods in accordance with iterative processes of educational assignments. The specifics of the scrum methodology, the role and relationship of teacher and students, the process and procedures of creating the final product — a portfolio of analysed and resolved complex pedagogical situations, as well as a compendium of relevant case studies and teaching materials. Procedures for the formation of experimental and control groups and ensuring the statistical reliability of the results are covered. Diagnostic methods for determining the resulting variables are described, namely: the ability of students to resolve complex pedagogical situations, the quality of learning and motivation of students to learn. It is experimentally proven that the scrum methodology promotes the development of students' ability to resolve complex pedagogical situations, increase the quality of education and motivation to learn in training future primary school teachers.

Keywords:

Primary School Teacher, Agile Approach, Scrum Methodology, Complex Pedagogical Situations, Quality of Education, Motivation to Learn

Introduction

In order to perform its essential functions, higher education must constantly change and adapt to modern conditions. This is the concept of VUCA world (U.S. Army Heritage and Education Center, 2019). Agile approach was proposed in response to the challenges of VUCA world first in military practice and later in other areas, such as programming, logistics, manufacturing, etc. Subsequently, the process

of implementing the Agile concept in higher educational institutions regarding the training of specialists in information systems and technologies, programming, computer science, engineering, etc. began (Krehbiel et al., 2017). It is mostly a scrum methodology (Schwaber & Sutherland, 2020), which is one of the main components of the Agile concept. Scrum methodology involves the use of self-organizing teams to create a specific intellectual product, dividing the process into separate sequential iterations and applying the Agile Principles.

The study of relevant research and world experience shows that there is still a lack of research in the field of high school pedagogy that would reveal the specifics of the application of the Agile concept in training of primary school teachers. At the same time, our analysis shows that the scrum methodology, with its essential features, can be used in training of future primary school teachers to resolve complex pedagogical situations.

This confirms the topicality of our research and gives grounds to determine the aim of the study, which is to experimentally test and justify the use of the scrum methodology in training future primary school teachers for resolving complex pedagogical situations.

Literature review

Reviewing the relevant scientific literature, we must first pay attention to the origins of the Agile approach and its gradual adaptation to the resolution of pedagogical problems, in particular, the application in the training of primary school teachers.

The Agile approach is the result of finding ways and means to solve complex problems in connection with the VUCA world's challenges, which, in particular, is characterized by the concept of ambiguity, that is instability, uncertainty, complexity. The VUCA concept assumes that the modern world offers ambiguity situations in which events and information can be given different interpretations, as ambiguity does not allow to find only one "correct" interpretation and confidently offer a single solution (Stewart et al., 2015). A key feature in dealing with ambiguity situations is Agility, which involves the ability of a person or group to be flexible, innovative and learn quickly from mistakes (Scott, 2020).

Despite the fact that the VUCA concept was intended for military action in cases where the combat situation is constantly changing, this idea has become widespread in other areas of professional activity, including pedagogical practice. Here we should refer to the publication of a group of teachers who presented the results of a two-year experiment of implementing the Agile Way of Work method. These materials show that Agile's adaptation to higher education has yielded positive results: attracting students to cooperate, encouraging them to take responsibility for their learning, improving the level and quality of cooperation and obtaining better learning outcomes. In addition, the authors argue that it is effective to use the Scrum methodology, which involves the creation of self-organizing teams with different skills to develop work products in small sequential iterations (Krehbiel et al., 2017).

Riedler and Eryaman (2016) cover methodological aspects of teacher training for professional activity under the conditions of complexity, diversity and ambiguity. The authors explore the possibility of applying a phronetic approach to teacher training, that is teaching them to quickly make the right decisions, perform correct actions, the ability to distinguish good from bad in particular pedagogical situations.

Sipman et al. (2019) developed this topic. Through focus group discussions with teachers and school principals, scholars view intuition as a crucial competence for teachers' pedagogical tact. We consider their conclusion about the need to develop intuition important in resolving complex pedagogical situations. This gives grounds to use this idea in experimental research.

Another work related to the research problem is the article by Sharp and Lang (2018), which summarizes six cases of application of the Agile concept in building student competencies in the field of information systems. The authors classify the Agile-related literature in teaching by two axes of pedagogy: 1) teaching students Agile technology for its further application in professional activities; 2) the use of Agile as a pedagogical method.

In their article, Hulshult and Krehbiel (2019) describe the experience of implementing Agile practices integrated into the online learning of graduate students majoring in Computer Information Technology at the University of Miami. Their experience of using Agile practices such as team charters, daily stand-ups, Kanban boards, story cards, MoSCoW, timeboxing, showcases and retrospectives, etc. is valuable. Similar problems are described in the article by Lang (2017).

The publication by Magnuson and Cosgrove (2019) summarizes the experience of using Agile practices in teaching students of Leysin American School. In particular, the researcher describes ten practices that are successfully used in schools.

López-Alcarria et al. (2019) provide a systemic overview of the use of the Agile approach in building

competencies of sustainable development in lifelong learning. The authors argue that Agile learning creates favourable learning conditions, while improving outcomes and increasing the level of motivation of both teachers and students.

Udas et al. (2018) consider the problems of applying the Agile approach in the evaluation and use of demonstration technologies for innovation in the higher education system. Yakovyshyna (2018) provides theoretical substantiation of the Agile approach in the modernization of higher education. In their article, Ivetić and Ilić (2020) discuss possibilities and conditions of Agile implementation in higher educational institutions, values, principles and different practices of Agile, which is important for the development of experimental research methodology.

Among the few publications on the problem of the Scrum approach in training of primary school teachers, we should mention the article by Stakhova (2020), who explores the possibilities of the Scrum approach in making future teachers ready for environmental activities in primary school.

In her work, Minhalova (2018) covers the principles of agile management of Scrum projects in the research of students. Anufrieva (2020) considers the possibility of using Agile and Scrum in teaching macroeconomic subjects for masters in Entrepreneurship, Trade and Exchange Activities.

Pannier's (2020) publication addresses the effectiveness of Agile in collaboration with primary school teachers when developing a game platform. The analysed publications reveal the theoretical and practical aspects of the Agile approach in the pedagogical practice of higher educational institutions, mostly in training specialists in computer science, information systems, engineering, etc. At the same time, there is a lack of research that reveals the specifics of the application of the Agile concept in training primary school teachers. The authors emphasize that one of the main Agile-related techniques is the use of the Scrum methodology, which involves the use of self-organizing teams with different skills to create work products in small sequential iterations. This confirms the topicality of our research and gives grounds to focus it on the use of the Scrum methodology in training of future primary school teachers to resolve complex pedagogical situations.

Methods

The study used the scrum methodology — dividing the experimental group of students into teams, each receiving assignments and instructions for analysis and resolution of complex pedagogical situations, as well as receiving explanations about the Scrum methodology and printed instructions for participation in the experiment.

To prove or disprove the effectiveness of the Scrum methodology, we used an experimental method having formed two groups of students — experimental and control. This procedure was performed in two stages using a sampling method. At the first stage, a sample of 68 people was formed by random sampling at the level of confidence probability p = 95%, (confidence interval $\Delta = \pm .05$) of the general population (a total of 82 fourth-year students majoring in 013 "Primary Education" at Pavlo Tychyna Uman State Pedagogical University and Berdiansk State Pedagogical University). In the second stage, 35 students were selected from the sample in the experimental group and 33 students in the control group. The groups were equalized through the random division of students into experimental and control groups according to the following criteria: age, gender, level of ability to resolve complex pedagogical situations, quality of learning and motivation to learn.

The study used a model of the experiment "Before-after with the control group". The experimental group studied according to the Scrum methodology, the control group — according to the traditional one. Three methods were used to diagnose the resulting variables (the ability to resolve complex pedagogical situations, the quality of learning and motivation to learn). The first (expert assessment method) was aimed at determining the level of students' ability to resolve complex pedagogical situations. The diagnostic procedure provided that each student was given texts describing pedagogical situations (a total of four situations). According to the instructions, each participant had to suggest 3-5 options for resolving the situation and provide a justification for the most acceptable choice. The completed assignments were subject to analysis and evaluation by an expert (teacher) according to the criteria at four levels: creative, partially search, reproductive and unconscious (spontaneous).

The level of students' ability to resolve complex pedagogical situations was determined through the following criteria. The creative level was determined by the ability to: independently model an original, non-typical way of resolving a situation; carry out the deep pedagogical analysis of a situation; justify the compliance of the chosen option with the conditions of the situation; predict the pedagogical consequences of the proposed solution. The partially search level included the following features: adapt the known methods of addressing the changed conditions of the proposed situation; analyse the content and conditions of the situation; substantiate own choice of the resolution of a pedagogical situation; predict the possible consequences of the

proposed solution. The reproductive level met the following criteria: copying known, traditional ways of resolving the situation; artificial transfer of previously known ways of resolving the situation without taking into account its conditions; too general substantiation of one's own resolution to the situation, as it had little to do with the situation; insufficiently clear definition of the possible consequences of the proposed solution. The unconscious (spontaneous) level was determined by the following features: the erroneous resolutions of pedagogical situations; inability to justify one's choice; the conditions of origin and development of the situation are not taken into account; the consequences of one's proposal to resolve the situation are not foreseen (Kaplinskyi, 2015).

The quality of education was determined by the ECTS system (European Credit Transfer and Accumulation System): a high level was correlated with A grade (90-100 points), a sufficient level was determined by B and C grades (75-89 points), the average level corresponded to D and E grades (60-74 points), low — FX and F grades (1-35 points).

Levels of student motivation to learn were studied using a survey method, where the answers to relevant questions were arranged according to the Likert scale, which gave grounds to divide students by levels: high, medium, below average, low.

The information obtained during the experiment was analysed using the methods of mathematical statistics: Pearson's chi-square test, Chuprov's correlation coefficient, calculation of confidence probability and the level of statistical significance. Expert assessment and survey data were presented in tabular and graphical form.

Results

At the pre-experiment stage, a zero data slice was made in the experimental and control groups, which consisted in establishing their homogeneity in terms of ability to resolve complex pedagogical situations, quality of education and motivation to study in higher educational institution. Table 1 presents the results of diagnosing the levels of students' ability to resolve complex pedagogical situations.

Comparison of experimental and control groups by factor characteristics (Table 1) gives grounds to speak about their practical similarity (critical value χ^2 at significance level $p < .05$ is 7.815, significance level $p > .05$). It is worth noting that in both groups there was a lack of students with a creative level of ability to resolve complex pedagogical situations, while the largest share was represented by students of reproductive level, namely: 17 people (48%) in the experimental group and 15 people (45%) in the control group.

The zero data slice was made for the quality of education of students in both groups (Table 2).

Table 1.
Levels of ability to resolve complex pedagogical situations (before the experiment)

Levels	Experimental group		Control group	
	People	%	People	%
Creative	0	0	0	0
Partially search	8	23.0	10	30.5
Reproductive	17	48.0	15	45.5
Unconscious (spontaneous)	10	29.0	8	24.0
Total:	35	100	33	100

Table 2.
Indicators of the quality of student learning (before the experiment)

Learning quality levels	Experimental group		Control group	
	People	%	People	%
High	2	6.0	3	9.5
Sufficient	12	34.0	14	42.0
Medium	15	43.0	13	39.0
Low	6	17.0	3	9.5
Total:	35	100	33	100

Calculations of the relevant statistical indicators give grounds to state the absence of differences between the experimental and control groups on the indicators of learning quality ($\chi^2 = 7.815$ at the level of confidence value $p = 0.996$: χ^2 emp = 0.63 < χ^2cr0.05 = 7.815). Another important result and indicator, which probably could affect the outcome of the experiment, was the students's motivation to learn. Table 3 contains the relevant data obtained by interviewing students before the experiment.

Table 3.
Students' motivation to learn (before the experiment)

Level of motivation to learn	Experimental group		Control group	
	People	%	People	%
High	2	6.0	3	9.5
Sufficient	9	26.0	11	33.0
Below medium	14	40.0	12	36.5
Low	10	28.0	7	21.0
Total:	35	100	33	100

Calculation of the statistical criterion according to Table 3 indicates no differences between groups ($\chi2_{emp} = 0.462 < \chi2_{cr0.05} = 7.815$ at the confidence level $p = 0.928$).
Thus, the obtained data and relevant statistical

calculations show that the selected groups of students are almost identical in terms of levels of the ability to resolve complex pedagogical situations, quality of learning and motivation to learn, which is important for testing the effectiveness of the Scrum methodology.

The effectiveness of the experimental methodology was tested during the first semester of the 2018-2019 academic year and concerned the study by students of a special practical course Methods of Resolving Complex Pedagogical Situations in the fourth year for students majoring in 013: Primary Education. The students of the experimental group were informed about the survey, and received explanations about the Scrum methodology, as well as printed instructions for participation in the experiment. The experimental group was divided into five self-managed teams of seven people. The academic semester was divided into eight two-week periods (sprints) to perform iterative processes, resulting in a final product — a portfolio of analysed and resolved complex pedagogical situations, as well as a compendium of relevant cases and teaching materials.

The teacher-student relationships were defined by such roles as product owner, scrum team, scrum master. The teacher performed the role of the product owner, who offered the assignment to the groups according to the backlog (order). The assignment consisted of a description of complex pedagogical situations, as well as the structure of their analysis and resolution. The product owner acted as coach, monitored the process, set priorities, and received interim reports after each sprint.

The students selected in each group performed the role of Scrum masters. According to their functions, scrum masters supported team spirit, facilitated the planning and execution, were the link between the group and the teacher, kept a portfolio of meetings, stand-ups and other materials of the group.

The role of Scrum teams was determined by the assignment according to which they analysed in detail the pedagogical situations offered to them, developed scenarios for their resolution, substantiated and provided recommendations to the participants of the situation. In addition, all team members participated in stand-up meetings (stand-ups) lasting up to 10 minutes twice a week, where they discussed current issues of the group according to the scheme: "What did you manage to do?", "What difficulties arose?", "What is it planned to do?"

The activities and relationships of the participants in the Scrum process were governed by the Agile Principles, which provided a high level of group and individual activity of students, their commitment, independence and responsibility for the quality of educational activities.

The training course was divided into eight sprints lasting two weeks each. The first four sprints dealt with the development of four projects for resolving difficult pedagogical situations. The fifth to eighth sprints consisted in developing case studies that contained complex pedagogical situations.

In the first lesson, the teacher delivered an introductory speech, talking about the relevance, aim and content of the course, the features of the Scrum methodology. Organizational issues were resolved: division into teams, election of Scrum masters, etc. In addition, each team was provided with a case that contained a brief description of a complex pedagogical situation, as well as assignments and instructions for their completion.

At the beginning of the next sprint, each group had a general discussion of the purpose and stages of work. Students independently selected short assignments, distributed them among themselves, set completion dates, as well as determined the dates of weekly stand-ups.

The sprint was followed by a retrospective team meeting, where students assessed the contribution of each to the overall result, reflected on how individual contributions contributed to the overall goal, how the team worked as a whole, how team members interacted, what methods and tools were involved.

A general group review meeting was also held at the end of the sprint to summarize and discuss each team's reports and evaluate each team's contribution to the overall product, to identify best practices, and to share them with other teams. Working in Scrum teams, the students of the experimental group analysed and provided justifications for resolving 20 complex situations and prepared a compendium of cases with complex pedagogical situations, as well as a description of their processing method.

The impact of the experimental factor on the development of the ability to resolve complex pedagogical situations was measured at the end of the experiment. Table 4 presents measurement results.

Comparison of experimental and control groups by factor characteristics did not reveal statistical differences ($\chi 2$ is 3.109, the critical value of $\chi 2$ at a significance level of $p < .05$ is 7.815). However, a more detailed analysis showed that significant changes occurred in a subgroup of students with a creative level of ability to resolve complex pedagogical situations: their share in the experimental group was almost twice as high as in the control group (17%

vs. 9%). There was also a significant increase in the number of students with a partially search level: 26% in the experimental group as opposed to 16% in the control group.

Table 4.
Levels of ability to resolve complex pedagogical situations (after the experiment)

Levels	Experimental group		Control group	
	People	%	People	%
Creative	6	17.0	3	9.0
Partially search	17	49.0	15	46.0
Reproductive	12	34.0	13	39.0
Unconscious (spontaneous)	0	0	2	6.0
Total:	35	100	33	100

Another distinctive trend of the obtained data was that all students of the experimental group with an unconscious (spontaneous) level of the relevant ability (10 people or 29%) raised it to reproductive (4 people) and partially search (6 people) levels. At the same time, the number of students of the same level decreased by 6 people (18%) in the control group. Figure 1 visually reflects the revealed tendencies.

The identified differences show certain advantages of the Scrum methodology in terms of developing students' ability to resolve complex pedagogical situations. One of the objectives of the study was to test the hypothesis about the impact of the Scrum methodology on the quality of student learning. Table 5 presents empirical data of the final slice of the quality of education of students of the experimental and control groups.

According to Table 5, no statistical differences were found between the experimental and control groups ($\chi 2$ is 3.550, the critical value of $\chi 2$ at the significance level $p < .05$ is 7.815), however, there was an increase in the quality of student learning in the experimental group. Compared to the indicators of zero data slice, the number of students with a high and sufficient level increased by 11 people and amounted to 25 (71.0%), while similar changes in the control group were not so noticeable. Figure 2 presents the given dynamics. On the basis of the recorded changes, it is possible to draw a reasonable conclusion about the positive impact of experimental methods on the quality of student learning in the experimental group.

According to a survey conducted after the experiment, there was a significant increase in student motivation to learn under the influence of experimental technique. The number of students with a high level of motivation increased by 8 people, and with a medium— by 6 people compared to the situation before the experiment. At the same time, the corresponding indicators were not significant in the control group (Table 6).

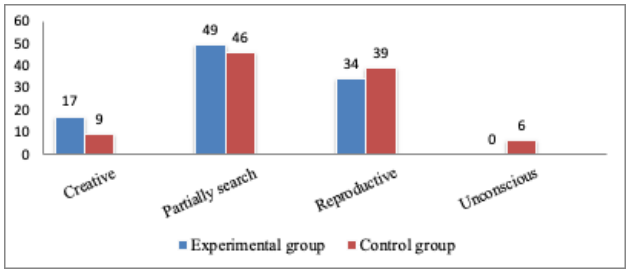

Figure 1.
Comparison of the ability to resolve complex pedagogical situations of students of the experimental and control groups (after the experiment, in %)

Table 5.
Indicators of student learning quality (after the experiment)

Learning quality levels	Experimental group		Control group	
	People	%	People	%
High	5	14.0	3	9.0
Sufficient	20	57.0	15	46.0
Medium	10	29.0	13	39.0
Low	0	0	2	6.0
Total:	35	100	33	100

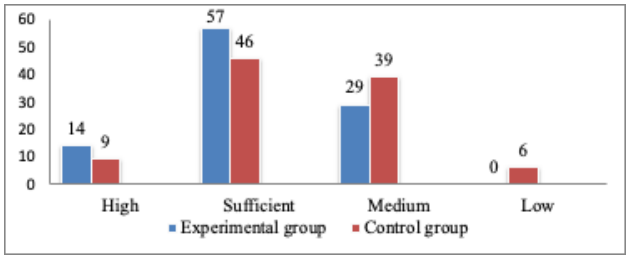

Figure 2.
Comparison of the quality of education of students of the experimental and control groups (after the experiment, in %)

Table 6.
Students' motivation to learn (after the experiment)

Levels of motivation according to the survey	Experimental group		Control group	
	People	%	People	%
High	10	29.0	4	12.0
Medium	15	43.0	12	36.0
Lower than medium	5	14.0	10	30.0
Low	5	14.0	7	22.0
Total:	35	100	33	100

The criterion $\chi 2$, calculated according to Table 6, is

8.499. The critical value of $\chi 2$ at the significance level $p = .05$ is 7.815. The relationship between factor and resultant characteristics is statistically significant at a significance level of $p < .05$. These data and the corresponding statistical calculations give reason to believe that learning with the use of the Scrum methodology has a positive effect on student motivation. Figure 3 graphically presents changes in student motivation.

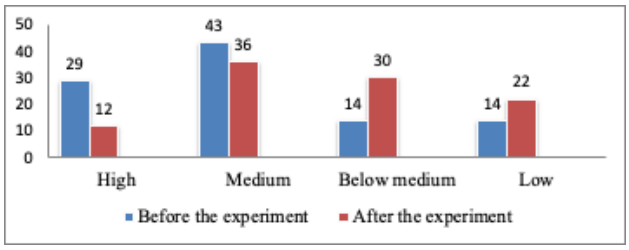

Figure 3.
Changes in motivation to learn in students of the experimental and control groups (after the experiment, in %)

Further analysis of the obtained results was aimed at finding the mechanisms of influence of factors on the resulting variables, in particular, using the correlation method. Table 7 was prepared based on the results of expert assessment of the levels of ability to solve complex pedagogical problems and the results of the survey on the students' motivation to learn after the experiment.

Table 7.
Relationship between students' motivation and ability to resolve difficult pedagogical situations (after the experiment)

Levels of motivation based on survey results	Ability to resolve complex pedagogical situations				Total
	Creative	Partially search	Reproductive	Unconscious	
High	5	5	0	0	10
Medium	1	9	5	0	15
Below medium	0	3	1	1	5
Low	0	0	4	1	5
Total:	6	17	10	2	35

Source: developed by the author

Calculated according to Table 7, Chuprov's correlation coefficient showed a fairly close correlation between factor (motivation) and the resultant (ability to resolve complex pedagogical situations) variables ($C = 0.485$ at a significance level of $p < .01$). This gives grounds to claim that motivation to study significantly affects the development of students' ability to resolve complex pedagogical situations. On the other hand, we should note that in this case the main factor of influence is the Scrum methodology, which creates a situation of success, when achieving positive results in solving complex problems increases the level of motivation.

Thus, the results of experimental study proved the effectiveness of the Scrum methodology in building students' ability to resolve complex pedagogical situations and achieve better learning outcomes.

Discussion

The analysis of the obtained data showed that the students of the experimental group achieved significant learning outcomes in the ability to resolve complex pedagogical situations, distinguish different types of pedagogical situations according to their complexity, perform their step-by-step analysis, find causes, generate ideas for solving and eliminating causes. There was also a significant increase in the quality of learning and motivation of students in the experimental group. The correlation analysis helped to find that motivation to learn significantly affects the development of students' ability to resolve complex pedagogical situations.

The achieved results were obtained due to the ability to work in a Scrum team, combining with individual work, to use such tools of the scrum methodology as product backlog, distribution of roles and tasks, sprint planning, daily stand ups, iterative review, retrospective meetings, generation of ideas. The level of independence and responsibility of the students of the experimental group significantly increased, which ultimately affected the motivation of students and the results of the quality of learning.

At the same time, we should note that the students were confused in the first two weeks of the semester, because they got used to traditional learning, when teacher controls all issues of the educational process. The same situation was recorded in the study of Jurado-Navas and Munoz-Luna (2017) at the University of Malaga (Spain), although in general they confirmed the high efficiency of the Scrum methodology in training English teachers. Other studies raised similar problems, for example Vogelzang et al. (2020b) also note that the students who participated in the experiment were not familiar with the Scrum methodology, so they needed time to adapt to the procedures, roles, and conditions.

It is worth noting that there is a certain concern and frustration of teachers that not all students show activity, responsibility and desire to work together (Vogelzang et al., 2020a, p. 237). We concluded in the course of the research that teachers need to be trained on their role as coaches in the scrum learning process (Müller-Amthor et al., 2020).

The solution to this problem in our study was realized by individually assessing the contribution of each student to each increment and the overall product. We found in the course of our study that the degree of team cohesion depended on the frequency of their weekly meetings: those teams that met 2-3 times a week worked more successfully than those that met once a week (Rush & Connolly, 2020, p. 206).

In the next two weeks of our experiment, there was a gradual adaptation of students to independent learning, they addressed the teacher only in case of solving particularly difficult educational problems or team relations. Some students expressed dissatisfaction and desire to return to traditional education. In her study, Linden (2018) observed similar problems, who recorded a lack of motivation of disinterested students and a positive impact on their learning outcomes. Such considerations encourage more attention to study of the impact on the effectiveness of the scrum feedback methodology and teacher-student relationships in further research (Švejdarova, 2019). We should also pay attention to the students' proposals of involving them both in planning course design and product backlog for teams (Norberg et al., 2017).

Our research also encourages the solution of problems related to the Scrum methodology implementation in the educational process with strict planning of hours by type of classes and a significant reduction in classroom-based learning, etc. (Masood et al., 2018).

Conclusion

The experimental study gave us the results, which testify to the effectiveness of the Scrum methodology in training future primary school teachers to resolve complex pedagogical situations. During the experiment, students developed competencies to distinguish different types of pedagogical situations by their level of complexity, to carry out their step-by-step analysis, to find the causes of pedagogical situations, to generate ideas for their solution and elimination of causes. Besides, students gained skills and abilities to work in a Scrum team in combination with individual work, use tools such as role distribution, sprint, stand-up, brainstorming, increased the level of independence and responsibility. The results of the study convincingly prove that the quality of students' learning in the experimental group is significantly higher than in the control group. As a result of the diagnosis, we also found a significantly higher level of motivation to learn in the students of the experimental group in comparison with the control group. The answers to the open-ended questions of the final questionnaire testified to the mostly positive and enthusiastic responses to the scrum method.

The obtained results can be used in training future primary school teachers in higher education institutions, in the system of postgraduate pedagogical education, in the creation of textbooks for students majoring in 013: Primary Education. Further research on this problem is expected to explore the possibilities of applying the Agile approach in the development of such educational products as game techniques, scenarios for creative lessons, the development of individual educational learning trajectory of a child.

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Developmental Trajectory of Korean Adolescents' Multicultural Receptivity Applying a Latent Growth Model

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Abstract

The purpose of this study was to analyze the developmental trajectory of Korean adolescents' multicultural receptivity with a latent growth model. The study was performed using the data of 5,943 students (2,918 boys and 3,025 girls) who sincerely responded to all the questions used as variables in the data in the 2nd, 4th, and 6th years of the Korean Education Longitudinal Study: KELS 2013 by the Korean Educational Development Institute. The research results are as follows: First, adolescents' multicultural receptivity insignificantly decreased, as they grew up. Second, peer relations, teacher relations, and community spirit in the early youth influenced the formation of early multicultural receptivity. Third, teacher relations had a positive relationship with multicultural receptivity and affected the change in multicultural receptivity later. Finally, community spirit had a positive relationship with multicultural receptivity, and as time passes, it affects the decrease of adolescents' multicultural receptivity. In conclusion, this study has the significance that it investigated longitudinal changes in multicultural receptivity. The study reviewed and discussed the implications and limitations of the study based on the research results.

Keywords:

Multicultural Receptivity, Community Spirit, Peer Relations, Teacher Relations, KELS, Latent Growth Model

Introduction

According to the immigration statistics by the Korea Immigration Service, a Ministry of Justice-affiliated organization (2019), the number of foreigners was 2,367,607 persons in December 2018, 4.57% of the entire population, which is shown to experience increases each year. The number of multicultural families nationwide in 2018 was 319,000 households, and the number of members of the households was determined to be 964,000 persons. It is expected that the number of multicultural families in this region will reach one million soon (Ministry of Gender Equality & Family, 2019a). As immigrants entering and staying in the country for various purposes such as jobs, education, marriage and family formation, etc. grow in Korean society,

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their numbers of children increase rapidly (Ministry of Gender Equality & Family, 2019b). For these reasons, the multicultural students in elementary, middle, and high schools were 122,212 persons in 2018, 2.2% of the entire students, and for the last five years, the number of the entire students has decreased, while that of multicultural students has been shown to have increased (Ministry of Education, 2019). It is noted that the ratio of multicultural students is highest in elementary school, followed by middle and high schools, which is outlined visually in a pyramid shape. This scale is contrasted with the entire school-age population of Korea decreasing. The number of multicultural students will likely increase further to greater numbers in the future (Lee et al., 2017). To coexist and harmonize with members with multicultural backgrounds, it is necessary to change the perspective, perception, attitude, and value of the existing members (Choi, 2014).

In the "2018 Field Survey of Nationwide Multicultural Family" by the Ministry of Gender Equality & Family (2019a), 8.2% of children in multicultural families experienced the victimization of school violence, which was similar to the result of the 2012 survey. Thus, it is noted that there has been little change in adolescents' perceptions of multicultural students who are their peers in the school environment. New perceptions of diversity are required as an important quality from adolescents who will lead our society, that will directly experience multicultural society with children in multicultural families (Park, 2014). It is noted that "The 2019 Plan for Education Support for Multicultural Students" announced by the Ministry of Education presents goals, "to construct a mature education environment in which various cultures coexist" and "to secure multicultural students' education opportunities and resolve the education gaps," which emphasizes the harmonious coexistence between multicultural students and general students. With this in mind, it is important for domestic students to improve multicultural receptivity to accept multicultural students with an open mind. Furthermore, it should increase awareness, and recognize them as beings that they should get along with so that students in multicultural families can be well adjusted (Lee, 2015). During adolescence, people form values, and for this reason, it is necessary to form the right values on multicultural society through the right education related to multiculturalism in this period (Cha & Byeon, 2018).

Looking at the factors affecting adolescents' multicultural receptivity, the factors include personal factors such as the student's sex (Lee, 2015; Oh, Han, & Yang, 2017; Park, 2014; Roh & Ha, 2016), and community spirit (Baek & Chung, 2017; Lee, 2015; Park, 2017; Un, 2016;) and school factors such as peer relations (Baek & Chung, 2017; Lee, 2015; Un, 2016) and teacher relations (Baek & Chung, 2017; Park, 2017; Un, 2016). Since Korean adolescents spend much of their time at school, their lives and relationships in school are important to their development. Peers and teachers whom adolescents see and interact with most of the day, often play important roles in the development of their socialization and interpersonal relationship skills (Lee, Lee, & Han, 2016). Another key point is that of the factors affecting multicultural receptivity, peer relations and teacher relations are important factors for student socialization. These relations are affected by the consciousness of care for others in the student's community spirit as developed by the students in the school environment.

Korean domestic studies of multicultural receptivity were conducted with elementary school students (Choi & Kim, 2015; Kim & Hwang, 2012; Lee & Bang, 2017; Oh, Han, & Yang, 2017) and analyzed by a review of the variables affecting multicultural receptivity. Since many studies were based on the cross-sectional research design, there is a limitation in inferring the longitudinal causality among the variables. Thus, the purpose of this study was to estimate the developmental trajectory of adolescents' multicultural receptivity, applying a latent growth model. Specifically, this study used the longitudinal data of the 6th graders of elementary schools, 2nd-year middle school students, and 1st-year high school students of the Korean Education Longitudinal Study 2013 (KELS 2013). In addition, this study would analyze the impacts of adolescents' peer relations, teacher relations, and community spirit on multicultural receptivity. Research questions for this study are as follows.

Research Question 1. Is there a difference in the developmental trajectory of adolescents' multicultural receptivity among individuals?

Research Question 2. What are the impacts of adolescents' peer relations, teacher relations, and community spirit on the developmental trajectory of multicultural receptivity?

Literature review

Multicultural Receptivity

In Korean society, studies and academic interests in multicultural receptivity increase awareness of these issues; however, it is defined in various ways by researchers, without consensus, since it is a complex and multidimensional concept (Lee & Bang, 2017; Lee et al., 2017; Lee, Lee, & Han, 2016; Park, 2014). Multicultural receptivity is defined as an unbiased, open attitude to foreigners (Kim & Hwang, 2012). It is also to include awareness, the level of consciousness of accepting the policies related to the realization of multiculturalism aimed by the multicultural society

(Lee & Kim, 2012), or an attitude to look at others equal to oneself by recognizing and respecting the fact that others have different skin colors, values, and beliefs as a member of multicultural society (Yang & Kim, 2015). The Ministry of Gender Equality & Family (2012) defines multicultural receptivity as an attitude in a comprehensive meaning that one does not have prejudice to members or cultures different from one's group (race and nationality) as a citizen living in a multicultural society. This definition also recognizes the level of receptivity as equally as one's own culture (mutual recognition), whereby a person cooperates and makes an effort to set harmonious relations with them (direction of coexistence), does not grade foreigners or immigrants by their native place or economic level and would practice that based on the universal value as one of the global citizens (Ministry of Gender Equality & Family, 2012). For this reason, multicultural receptivity is also defined as the ability to understand and accept other's cultures in a multicultural condition (Lee & Bang, 2017). It can also be seen or conceptualized as the level of support for the coexistence and acceptance of various races, cultures, and languages or positiveness to change into a multicultural society (Hwang & Jung, 2019). In this way, Park (2019) defines it as the emotional acceptance of foreigners and the acceptance of their universal rights to coexist with dominant demographically identified cultures.

In foreign studies, the term multicultural sensitivity is used in the same context as that of multicultural receptivity. Here it is identified, and it is defined as a personal ability to develop positive emotions about understanding and recognizing cultural differences (Chen & Starosta, 2000; Tamam & Krauss, 2017). The definition goes on to also include awareness or the increase of the recognition of cultures different from one's own (Karpinski & Heinerichs, 2015). In fact, this study would define multicultural receptivity as the recognition of foreigners equally without prejudice, and the pursuit of harmonious relations with multicultural friends.

Peer Relations

Obiunu (2015) said that adolescents' friendship is an interpersonal relationship of sharing common interests and emotions at a certain level, and it is important for students, which is a supportive relationship that becomes the resource for the period and the later period of the development stage. Uslu and Gizir (2017) called peer receptivity as peer relations, which is defined as an important aspect of a sense of belonging to the school as is the student's academic and social capabilities. In Korea, peer relations are defined as one's attitude toward their peers. These relations typically include facets related to the communal life, intimate communication, goodwill, and support, and are trusted as well as a reliable friend's duty (Yang, 2019). Song and Lee (2011) define it as a human relationship that children and adolescents have with their peers during development. In this study, peer relationships are defined as respected, understood, and trusted relationships with peers.

Teacher Relations

The relationship between the teacher and students provides the resources so they can become independent members of society. These students benefit from this relationship through the adjustment to school life and smooth interpersonal relations, as well as their academic aspect in the continuous process of exchange (Kim et al., 2019). Agrawal et al. (2019) noted that a good relationship between the teacher and the students is a safe, satisfying, and supportive relationship. Primarily it is a positive relationship development for students, which improves academic achievement and reduces the incidence of the student's problem behaviors. Teacher relations are psychological space provided by teachers for students. These teacher relations are also positive, and are defined as an area in which their behaviors or thoughts can be supported by sharing such psychological space with students (Kim & Kim, 2014). This process is also described as a type of interaction between the teacher and the students with the social environment of the school as the background (Lee & Han, 2017). This study would define teacher relations as the positive support for students from teachers based on the questions of KELS.

Community Spirit

Jones and Davenport (2018) defined community spirit as various structures with social and psychological elements. Moreover, it is noted that in the school environment, community spirit is an element contributing to the positive school atmosphere. It is important to realize that the idea of community spirit is a state in which one maintains meaningful relationships with members in the community one belongs to and has the senses of closeness, belonging, and kinship (Han & Oh, 2013). Additionally, community spirit may serve as a facilitator for accepting various cultures and races by allowing students to make meaningful relationships with school or peer groups. The enhancement students receive from developing relations with peer groups is positive, and encourages feelings of a sense of belonging, a sense of kinship, and a sense of closeness (Yang & Gwon, 2018). In this way, community spirit is a concept that recognizes the diversity of individuals and emphasizes life as a community based on communitarianism (Baek & Chung, 2017). This study would define community spirit as attention and a sense of belonging to the community one belongs to and an intention to

participate in the parts one can do, in order that the individual's participation can enhance the chance at the development of a better community.

Correlations of Multicultural Receptivity with Peer Relations, Teacher Relations, and Community Spirit

To examine the preceding studies related to multicultural receptivity, studies were reporting that the better peer relations, the higher multicultural receptivity became (Baek & Chung, 2017; Un, 2016; Lee, 2015). Additionally, there was also data and studies reporting that the better teacher relations, the higher multicultural receptivity became (Park, 2017; Baek & Chung, 2017; Un, 2016). In Kim (2019), which was a longitudinal study of adolescents' social relations and multicultural receptivity, peer relations and teacher relations had significant impacts on multicultural receptivity. This result was also shown in Roh and Ha (2016), which investigated a longitudinal change in adolescents' multicultural receptivity, peer relations, teacher relations, and community spirit were shown to have affected multicultural receptivity. There is a study reporting that in the relationship of the impact between multicultural receptivity and community spirit, positive multicultural receptivity formed in a previous time had a significant impact only on the promotion of community spirit (Lee, 2015), a study reporting that the group in which multicultural receptivity increases longitudinally also shows a longitudinal increase in community spirit (Baek & Chung, 2017) and studies reporting that multicultural receptivity affects community spirit (Park, 2014; Un, 2016).

Methods

Subjects

This study was conducted, using the partial data necessary for the study in the 2nd year (2014), 4th year (2016), and 6th year (2018) of data in the Korean Education Longitudinal Study (KELS 2013). The KELS 2013 data was collected from 5th graders of elementary school nationwide each year from 2013 through 2018 by the Korean Educational Development Institute. The KELS 2013 data is a longitudinal study at a national level. It was constructed of 7,324 5th grade elementary school students as a sample panel in 2013 and investigated them every year for the 6 years until 2018 (Korean Educational Development Institute, 2018). The research subjects of this study were 5,943 persons who faithfully responded to all the questions used as variables, 2,918 boys (49.1%) and 3,025 girls (50.9%).

Measurement Tools

This study would deal with four variables, one dependent variable (multicultural receptivity) and three independent variables (peer relations, teacher relations, and community spirit). For the questions of multicultural receptivity, this study used those in "the Global Leading School Student Life Opinion Survey" conducted in December 2012 by the Center for Multicultural Education Research of Seoul National University of Education used in KELS 2013. On the whole, the multicultural receptivity consists of five questions about the perceptions of foreigners and six questions about the relationships with multicultural neighbors/friends. Additionally, the measurements were made on a 5-point Likert scale, and two of five questions about the perceptions of foreigners are reverse-scored ones.

For teacher relations, this study used the six questions modified from the teachers in charge in the questions of KELS 2005 to school teachers in KELS 2013. When reviewing peer relations, the questions utilizing the related six questions in the "Korean Children and Adolescents Panel Survey" used in KELS 2013 were used. For community spirit, the questions were the ones the same as those in KELS 2005 used in KELS 2013. As an illustration, the survey in 2014 consisted of the two factors of consciousness of participation and care for others. This is contrasted with the survey in 2016 and 2018 which also consisted of three factors, which were the consciousness of participation, civic consciousness, and cooperative behavior. This study used a total of six questions, the consciousness of participation (two questions) and care for others (four questions), which were surveyed in all 2nd, 4th, and 6th years. The composition and scale of the variables used in this study and the internal consistency among the questions (Cronbach α) are like Table 1 below.

Table 1.

The Cronbach α of the Variable

Variables	Cronbach α
Peer relations	.910
Teacher relations	.930
Community spirit	.855
6th grade of elementary school multicultural receptivity	.856
2nd year of middle school multicultural receptivity	.873
1st year of high school multicultural receptivity	.872

Analysis Method

This study would calculate the descriptive statistics of the measurement variables, using SPSS 25 with the relevant materials of the data in KELS 2013. Particularly, the study works to estimate the change in adolescents' multicultural receptivity, and conduct an analysis, using the 'latent growth model (LGM)' method used to account for the difference in the change among

individuals. The LGM method is a method to analyze the size of the change, using longitudinal data or panel data measured at least three times (Heo, 2013). By applying a linear model, the factor loading of intercept of multicultural receptivity is fixed to 1 and the factor loading of slope is set to 0, 1, and 2 from the first year through the third year. Figure 1 and Figure 2 show a structural model indicating the relevance of changes in each variable. Using AMOS 22, the first step is to verify the growth model without inputting predictive variables into the model, and the second step is to set and analyze the conditional model by inputting peer relations, teacher relations, and community spirit as predictive variables.

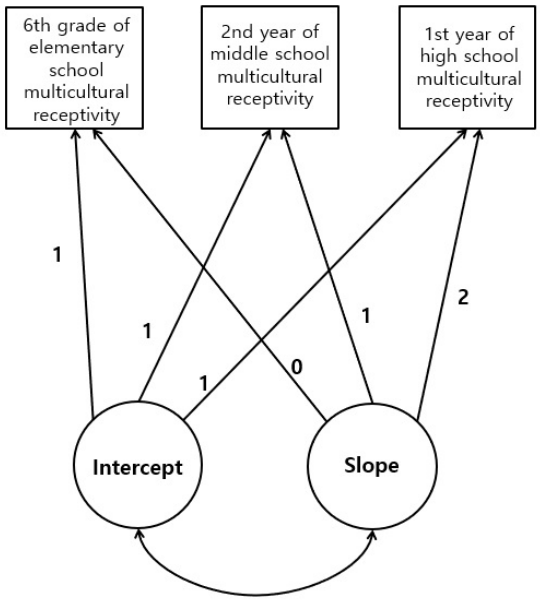

Figure 1.
Analysis multicultural receptivity: Unconditional model

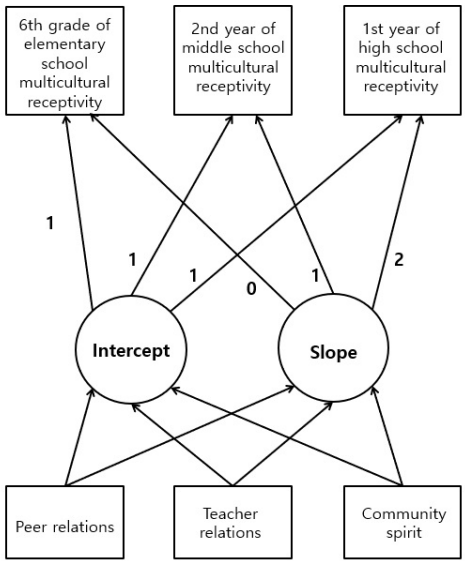

Figure 2.
Analysis multicultural receptivity: Conditional model

Results

Descriptive Statistics and Correlations of the Measurement Variables

This study found the descriptive statistics of the measurement variables of adolescents' peer relations, teacher relations, community spirit, and multicultural receptivity (See Table 2). As a result of the measurement, that identified the noted skewness was between -.488 and -.055, and kurtosis was between -.422 and .194, which met the criteria for normal distribution. With this in mind, the mean score of adolescents' multicultural receptivity decreased from 4.193 in the 6th grade of elementary school to 4.154 in the 2nd year of middle school and 4.130 in the 1st year of high school. As time passed, there was a decreasing tendency of adolescents' multicultural receptivity. As a result of an analysis of the correlations among the variables through correlation analysis, all the measurement variables had significant correlations at p = .01 (See Table 3).

Unconditional Model of Adolescents' Multicultural Receptivity

This study estimated change in multicultural receptivity with an unconditional model, without putting in predictors to estimate the adolescents' developmental trajectory of multicultural receptivity. As noted in Figure 3, Intercept and slope were set at potential variables, and the path coefficient from intercept to the measurement variable was set to 1, and slope was set to 0, 1, and 2 to set a linear change model.

The goodness-of-fit values of the linear change model were TLI = .980, CFI = .980, and RMSEA = .064. It was a good model for the goodness-of-fit criterion (See Table 4). Table 5 shows the estimates of the mean and variance of intercept and slope. In this case, the mean of intercept was 4.191 (p < .001), and the variance was .166 (p <. 001). There was a significant difference in the intercept of multicultural receptivity among adolescents. For slope, the mean was -.031 (p < .001). There was a statistically significant gradual decreasing tendency of multicultural receptivity during adolescence, and the variance of slope was .024 (p < .001). Related to this data there is a significant difference in the trajectory of change in adolescents' multicultural receptivity among individuals. The covariance between intercept and slope was -.018 (p < .001), which was a significant negative covariance. This shows that adolescents with high multicultural receptivity in the 6th grade of elementary school, have a slow decrease in the level of multicultural receptivity as they get older.

Table 2.

Descriptive Statistics (N = 5943)

Variables	*M*	*SD*	Skewness	Kurtosis
6th grade of elementary school multicultural receptivity	4.193	.559	-.413	-.422
2nd year of middle school multicultural receptivity	4.154	.571	-.372	-.203
1st year of high school multicultural receptivity	4.130	.565	-.401	.003
6th grade of elementary school peer relations	3.956	.765	-.488	.012
6th grade of elementary school teacher relations	3.879	.806	-.459	.194
6th grade of elementary school community spirit	3.877	.638	-.055	-.323

Table 3.

Correlations among the Measurement Variables

	1	2	3	4	5	6
1. 6th grade of elementary school multicultural receptivity	1					
2. 2nd year of middle school multicultural receptivity	.457**	1				
3. 1st year of high school multicultural receptivity	.375**	.536**	1			
4. 6th grade of elementary school peer relations	.349**	.235**	.224**	1		
5. 6th grade of elementary school teacher relations	.367**	.213**	.207**	.461**	1	
6. 6th grade of elementary school community spirit	.557**	.305**	.273**	.485**	.456**	1

** p<.01

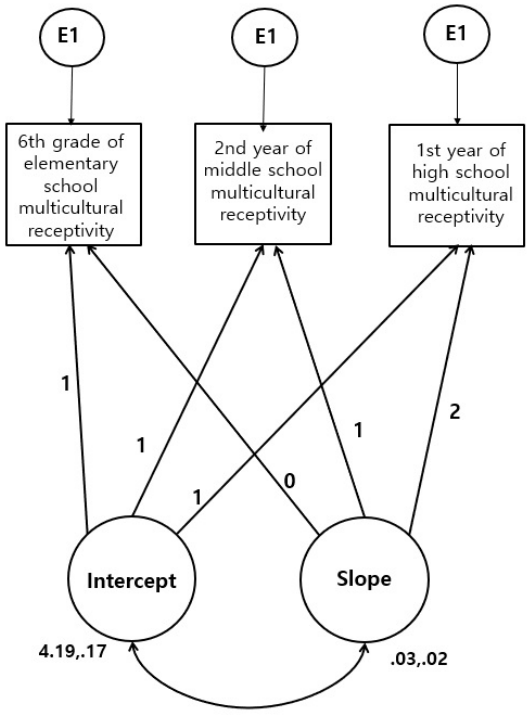

Figure 3.
Mean and variance estimates of the intercept and slopes

Table 4.
Goodness-of-fit Index of the Unconditional Model

	χ^2	*df*	*p*	TLI	CFI	RMSEA
Unconditional model	75.802	3	.000	.980	.980	.064

Table 5.

Intercept and Slope of the Unconditional Model

	Mean	Variance
Intercept	4.191***	.166***
Slope	-.031***	.024***
Covariance	-.018***	

*** p < .001

Impacts of Adolescents' Peer Relations, Teacher Relations, and Community Spirit on the Developmental Trajectory of Multicultural Receptivity

This study set peer relations, teacher relations, and community spirit as the factors affecting the developmental trajectory of adolescents' multicultural re-

ceptivity. The paths of intercept and slope were set by putting the predictors into an unconditional model.

The goodness-of-fit values of the conditional model were TLI = .942, CFI = .973, and RMSEA = .079. It was also a good model for the goodness-of-fit criterion (See Table 6). In Table 7, adolescents' peer relations had a significant impact on the intercept of multicultural receptivity (β = .093, p < .001). In other words, the higher their peer relations, the higher the intercept of multicultural receptivity in that case. Naturally, it was shown that the teacher relations had a positive impact on the intercept of multicultural receptivity (β = .150, p < .001), while it had a significant negative impact on slope in multicultural receptivity (β = -.078, p < .01). In other words, the students who have high teacher relations in the *6th* grade of elementary school have a high intercept of multicultural receptivity and have a slow decrease in multicultural receptivity. In this case, the adolescents' community spirit had a positive impact on the intercept of multicultural receptivity (β = .588, p < .001). Even though it had a significant negative impact on slope in multicultural receptivity (β = -.467, p < .001). In other words, the students who have high community spirit in the 6th grade of elementary school have a high intercept of multicultural receptivity and have a slow decrease in multicultural receptivity.

Table 6.

Goodness-of-fit Index of the Conditional Model

	χ^2	*df*	*p*	TLI	CFI	RMSEA
Conditional model	269.461	7	.000	.942	.973	.079

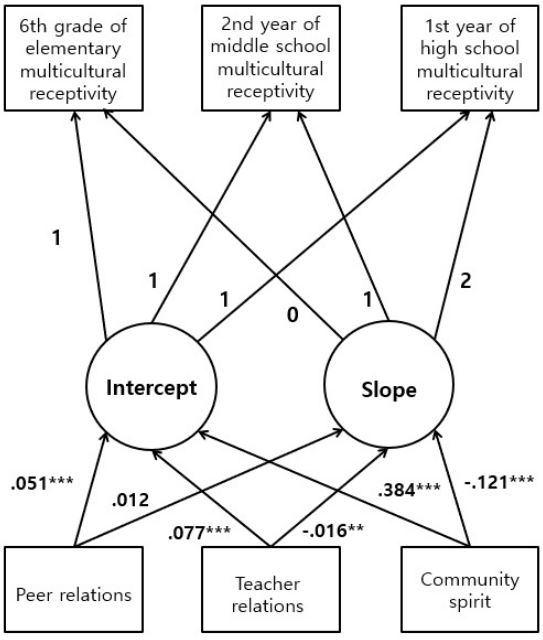

Figure 4.
Conditional model of multicultural receptivity (Non-standardized coefficient)

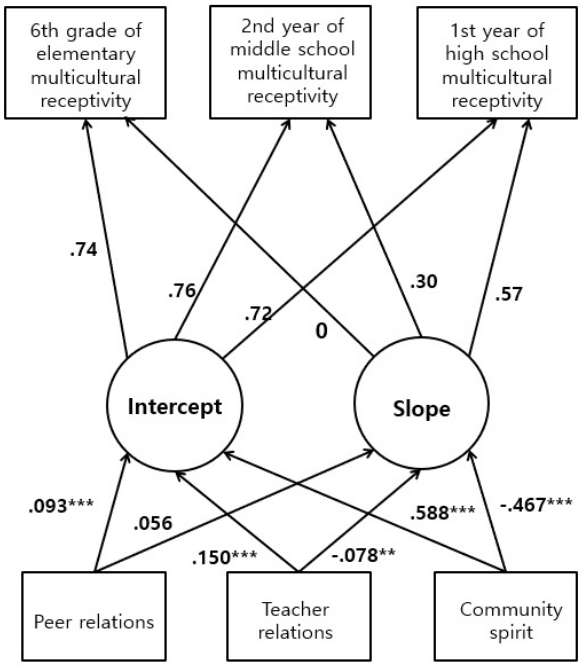

Figure 5.
Conditional model of multicultural receptivity (Standardized coefficient)

Discussions and Conclusions

The purpose of this study was to analyze the impacts of adolescents' peer relations, teacher relations, and community spirit on the longitudinal change in their multicultural receptivity. For this purpose, this study investigated the latent growth model, utilizing the data of the 2nd year (2014), the 4th year (2016), and the 6th year (2018) in the KELS 2013 Panel. The discussions according to the main results of this study are as follows:

First, the developmental trajectory of adolescents' multicultural receptivity gradually decreased as time passed from 6th grade in elementary school through 2nd grade in middle school to 1st grade in high school. This result is different from Yang and Gwon's (2018) research, which was a longitudinal study with middle school students, in which the mean of multicultural receptivity increased as they advanced into a higher grade. And yet, it is shown that this is the same result as that of Oh, Han, and Yang (2017), a study with elementary and middle school students, where multicultural receptivity was higher in elementary school students than in middle school students. Jeon and Chung (2017) analyzed potential groups from the 5th grade of elementary school through the 3rd year of middle school. In that study, it is noted that there is a group in which multicultural receptivity increases while there is a group in which it decreases as time passes.

Table 7.

Path Coefficient of the Conditional Model

Path	B	β	S.E.	C.R.	p
Peer relations → multicultural receptivity intercept	.051	.093	.009	5.488	.000
Peer relations → multicultural receptivity slope	.012	.056	.006	1.931	.053
Teacher relations → multicultural receptivity intercept	.077	.150	.009	8.978	.000
Teacher relations → multicultural receptivity slope	-.016	-.078	.006	-2.756	.002
Community spirit → multicultural receptivity intercept	.384	.588	.011	34.785	.000
Community spirit → multicultural receptivity slope	-.121	-.467	.007	-16.179	.000

Second, as a result of an analysis of the unconditional model of adolescents' multicultural receptivity, there were significant differences in the variance of intercept and slope. It shows that there is a difference in the development trajectory of multicultural receptivity among individuals. The element of slope is one that shows that there is a difference in developmental trajectory among individuals. For one thing, the development pattern of multicultural receptivity from the 6th grade of elementary school through the 3rd year of high school is not the same. In this case, the developmental trajectory may differ depending on the predictors. This result is the same as that of Kim (2019), where intercept of multicultural receptivity and slope were statistically significant from the 2nd year of middle school through the 3rd year of high school.

Third, as a result of an analysis of a conditional model in which peer relations, teacher relations, and community spirit were put in as predictors, peer relations, teacher relations, and community spirit were all the factors predicting intercept of multicultural receptivity. In the 6th grade of elementary school, early adolescence, peer relations, teacher relations, and community spirit affected the formation of multicultural receptivity. It must be remembered that this is the same as the results of Roh and Ha (2016) and Park (2014), where peer relations, teacher relations, and community spirit affect intercept of multicultural receptivity.

Finally, it is noted that the incidence of teacher relations and community spirit have significant impacts on slope in multicultural receptivity. This is different from Kim's (2019), where peer relations have a significant impact on slope in multicultural receptivity, while it is the same as the result that teacher relations affect slope. In addition, this result is the same as that of Cha and Byeon (2018). Cha and Byeon were a study that identified teacher relations and community spirit as the factors having the greatest impact on multicultural receptivity in Korean adolescents in middle and high school, which is seen through an analysis of the preceding studies.

The suggestions and conclusions presented based on the main results as above are as follows.

First, this study longitudinally analyzed how the longitudinal change of adolescents' multicultural receptivity and how peer relations, teacher relations, and community spirit in the early adolescence had an effect on multicultural receptivity. In its most positive context, peer relations during early adolescence had a positive relationship with multicultural receptivity. In this case, making good relationships with peers during early adolescence has a positive impact on adolescents' multicultural receptivity. To increase multicultural receptivity, peer relations in school, where adolescents make social relationships during early adolescence are important. It is noted that for this purpose, schools should be able to develop programs and provide activities in order that they can make positive peer relations during early adolescence.

Second, teacher relations had a positive effect on the early stage of multicultural receptivity and have a lasting effect on the change of adolescents' multicultural receptivity later. It is shown that having good teacher relations during early adolescence has a positive impact on adolescents' multicultural receptivity. To increase adolescents' multicultural receptivity, teachers should treat all students with attention and affection without exhibiting any prejudice to any one group of students. Since the teacher's values can be delivered to students when the students have a good relationship with the teacher, the teachers, too, should first have the right understanding, knowledge, and attitude toward "multicultural" students. In this way, it is necessary to increase their multicultural receptivity as well. To do so, it is necessary to develop and provide programs for the promotion of their multicultural receptivity that would be available and apply to all students equally.

Finally, community spirit had a positive relationship with multicultural receptivity, and as time passes, it affects the decrease of adolescents' multicultural receptivity. In addition, in the standardized path coefficient in this study, the figure of community spirit is the

largest as noted in the data. For this reason, therefore, its influence on multicultural receptivity may as well be exhibited greatly. During adolescence, it is necessary to systematically conduct education that allows students to serve as members of society. It is also important for the students to have a community spirit with which they can coexist in a multicultural society, instead of the education of knowledge focused on the college entrance exam (Park, 2017). To this end, it is necessary to establish personality education and multicultural education that can develop a capacity for other cultures and races, not education that focuses only on changes to a multicultural society.

This study has the significance that it examined the developmental trajectory of the multicultural receptivity of adolescents in elementary, middle and, high school, utilizing the data of KELS 2013. In this case, it analyzed that the data regarding the development of adolescents was significant, by putting in the predictors affecting that the factors related to information, including peer relations, teacher relations, and community spirit. The Ministry of Education (2019) presents "students are growing up, learning together and diverse and harmonious school" as the vision of multicultural education. For this reason, it is important to seek a way to fulfill the vision of multicultural education, and in this way, the results of this study can be utilized as an example of these principles. And yet, since this study was conducted only with the data of the Korean Educational Development Institute, it has a limitation. This limitation is that it did not include all of the factors related to various adolescents' actual developmental conditions. In addition, since this study was conducted with the general students, it would be necessary to conduct a study in the future with multicultural students who urgently need practical help.

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Development of a Primary School Teacher on The Philosophy with Children: An Action Research*

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Abstract

This study aims at providing a detailed description of the ways to understand the development process of a primary school teacher on philosophy with children (PwC) approach. Action research was used as the research method since the problems determined in the current study can be iteratively solved with the development of the teacher. The study group consists of a teacher in a primary school located at the center of Bayburt, Turkey in the 2018-2019 academic year and 20 third-grade students. Qualitative data collection methods; observation, interview, field notes and diaries were used. A systematic analytical method was applied and the data were analyzed using a content analysis approach. The primary school teacher was provided with training on the PwC approach and eight action cycles were conducted regarding the implementation of this approach. Observations and interviews conducted in this process indicated that there are developments in the teacher in implementing the PwC approach and these developments positively affect some skills of the students. Based on the findings obtained in the current study, the authors made some recommendations for practice and future studies.

Keywords:

Philosophy With Children, Primary School Teacher, Teacher Training, Action Research

Introduction

The argument of Matthew Lipman, who is recognized as the founder of Philosophy for Children, "critical thinking can be taught" might be explained to children through the metaphor 'teaching a man to fish'. Considering thinking is the most unique trait of human beings and this trait includes many human characteristics such as speaking, feeling, socializing, and creating a culture (Taşdelen, 2013); training of the thinking ability will be the development of the core of the human identity. Humans have the innate ability to think, however, thinking skills must be taught to develop this ability and prevent it from being lay fallow. Training of thinking ability is the basis of human education in every century and period (Taşdelen, 2013). Training of thinking skills does not

only improves the thinking skills of the students but also enables them to be aware of meaning and cause of existence and provides the opportunity to determine their own future. Training of thinking skills leads children to question the world they live in, provides them a mental habit that allows making consistent evaluations, therefore, has significant importance on providing students with the ability to evaluate and solve certain problems on their own (Direk, 2013).

Turkey and many countries have made significant curriculum updates to provide individuals with thinking skills through education. The latest curriculum update in Turkey placed the thinking at the core of the curriculums. Thinking skills such as "analytical thinking, critical thinking, creative thinking, decision making, and problem-solving" are included in the skills that should be developed. For example, these skills are described under the 'life skills' topic in the Science Course Curriculum. In recent years, the curriculums were updated frequently in Turkey, and highlighting the thinking skills in the curriculums should be mentioned as an important step. However, teachers should gain the required skills as they are implementers of these curriculums. Because the key responsibility belongs to the teachers in providing students with thinking skills. A teacher aiming to improve students' thinking skills should effectively use verbal expressions, questions, and examples to activate students' thinking. Teachers should establish an appropriate classroom environment to promote the use of thinking skills. In this classroom environment; different kinds of thoughts should be valued, students should be able to improve their communication skills by expressing their thoughts freely and without any fear (Fisher, 2013). During this process, the teacher should guide the students to think and to manage their thoughts. Such a classroom environment will contribute students' thinking skills included in the curriculums (Gregory, 2008). Naturally, teachers should be aware of training programs on thinking and their role in these programs. Accordingly, the most effective approach on the thinking education for a teacher aims at improving students' thinking skills included in the curriculums should use the education method with its best-known name, Philosophy for Children, or the preferred name in the current study, Philosophy with Children (PwC).

PwC is a pedagogy widely used in schools to support students' thinking skills (Lipman, 2003). This method focuses on thinking and aims at developing thinking skills. In this process, providing philosophical knowledge and culture is in the second plan. (Taşdelen, 2013). PwC educational movement was first initiated by Matthew Lipman in the 1970s. Lipman, who was teaching philosophy and logic at Columbia University in the USA, realized that college students' thinking skills were weak and one should look at the childhood period to discover the causes (Lipman, 1976; Smith, 2010). This view led Lipman to investigate whether children can be gained philosophical thinking that involves bringing conceptual and rational evidence. As a result of the positive findings obtained in his research, he founded "The Institute for Advancement of Philosophy for Children" in 1974 to further improve this approach (Karakaya, 2006a).

PwC education encourages children to ask philosophical questions and answer them under adult guidance. In this period, children discuss philosophical concepts such as happiness, right-wrong, rights, justice, equality, and freedom through daily life experiences or stories related to their lives. Using thought-provoking questions, children reason, define concepts, and establish a relationship between these concepts and daily life (Worley, 2020). During this process, teachers should never provide students any information or provoke them about what they have to say unless anticipating something before (Guitton, 2011). Teachers' role in the PwC method is a person who introduces children with alternative options through questions and supports them to justify their explanations by reasons. A teacher is not just a person who has knowledge of philosophy, but also a person who shows his knowledge by asking the right questions at the right time, and has a curiosity-arousing function on children. (Gönül, 2013; Lipman, Sharp, & Oscanyan, 1980). Accordingly, many recommendations have been made for teachers or facilitators in the literature (Fisher, 2013; Gregory, 2008; Haynes, 2002; Lipman, Sharp & Oscanyan, 1980). Beyond doubt, appropriate teacher training is required to fulfill these suggestions. IAPC, which was founded in 1974 as part of Montclair State College based on the Lipman's thoughts, organizes various teacher trainings to make the PwC method widely used in schools. The IAPC provides these training programs in accordance with certain principles. First of all, The IAPC argues that the PwC approach can be more effective when it becomes part of the school culture, and therefore aims at building new relationships with teacher groups of a school (IAPC, 2020). According to the IAPC, a small group of teachers within a primary school should be trained for at least one year, then these teachers should be observed by a certified instructor and the observation and evaluation process of teacher practices should be carried out every week by certified instructors. Thus, the IAPC guarantees constant evaluation of teachers by their supervisors, students and themselves (IAPC, 2020). The authors tried to establish a similar process for implementation of the PwC approach in the present study.

A literature survey revealed that there are some studies introducing and describing the PwC approach (Bingham, 2015; Doddington, 2014; Gregory, 2011; Kennedy & Kennedy, 2011; Ndofirepi & Cross, 2015; Valitalo, Juuso & Sutinen, 2016; Vansieleghem, 2014;

Vansieleghem & Kennedy, 2011; Worley, 2009) and addressing its relationship with the education of citizenship, democracy, ethics and values (Bleazby, 2006; Burgh & Yorshansky, 2011; Cam, 2014; Di Masi & Santi, 2016; Garret & Piper, 2011; Mizell, 2015; Splitter, 2011). Moreover, some papers examined its relationship with cognitive, affective, and social skills (Daniel & Aurıac, 2011; Fisher, 2001; Gruioniu, 2013). Furthermore, some theoretical studies addressed the role and training of the teacher in philosophy with children approach (Farahani, 2014; Haynes & Murris, 2011; Knight & Collins; 2014; Lone, 2013; Wartenberg, 2009).

Additionally, several studies have been conducted in Turkey on the PwC approach. These studies include definition and introduction of the PwC approach (Akkocaoğlu-Çayır, 2015a; Boyacı, Karadağ & Gülenç, 2018; Çiçek, 2017; Erdoğan, 2018; Gür, 2010; Kabadayı, 2012; Mutlu, 2017; Taşdelen, 2014), its relationship with children's literature and literary works and model implementations (Akdağ, 2011; Günay, 2011; İlhan Tunç, 2017; İyi, 2011; Karakaya, 2005; Karakaya, 2006a; Önal, 2011; Ülper-Oktar, 2019) and studies addressing the discussions on PwC and its relationship with other fields (Dirican, 2017; Dombaycı, 2014; Karakaya, 2006b; Oral, 2013). A literature survey on the applied studies revealed that a majority of the studies are carried out at pre-school level (Demirtaş, Karadağ & Gülenç, 2018; Dirican, 2018; Karadağ, Demirtaş & Yıldız, 2017; Karadağ & Demirtaş, 2018; Okur, 2008; Taş, 2017). Moreover, there are few applied studies that directly address PwC at primary school level (Akkocaoğlu-Çayır, 2015b; Bülbül Hüner, 2018; Karasu, 2019). To the best of our knowledge, the study conducted by Akkocaoğlu Çayır (2018) is the only study examining the impact of the PwC approach on teacher candidates and difficulties experienced. However, no study has addressed the teacher, his role and his development regarding the PwC approach. Therefore, authors believe that introducing the PwC method for state schools and the teachers working in these schools can be useful to spread this approach wider audiences.

Considering the individual and social contributions of the PwC method, it is clear that the implementation of this approach will be useful at all educational levels from pre-school education to college. Primary school education is the most effective education level to implement this approach. As an initial and important step in formal education, primary school education has an important function as it forms a basis for subsequent education levels and additionally, the knowledge and skills acquired in this stage have a great impact on children's further education (Gültekin, 2007). Apart from pre-schools, primary schools are the places where children acquire their first experiences of the formal education environment. Therefore, it is the education level where education's role regarding the development of the culture and promoting creativity and innovation intensively carried out. Primary schools have a significant role in providing children with the cognitive skills required for higher-order thinking skills such as understanding, analyzing, evaluating and creating, and improving their affective and social skills (Adıgüzel, Tatlı-Dalioğlu & Ergünay, 2017).

The above-mentioned explanations and discussions attracted the authors' interest in how a teacher in a state primary school can use the PwC approach in lessons, what problems might be experienced in implementation and how to overcome these problems. Moreover, while addressing the question of how the PwC approach can be used at the primary school level, the action research method was considered and it was decided to implement this process in a Life Science course. The fact that the children should acquire behaviors including intellectual and artistic fields such as knowing, understanding, interpreting and predicting the natural and social phenomena and events they experienced, as well as they should use these principles, generalization, and methods in other situations (Sönmez, 2010, p.7) was the determinant factor in this view. Finally, the present study focuses on the development process of a primary school teacher on providing students with the thinking skills and examines how to implement a PwC approach in a Life Science course. Accordingly, this research aims at providing a detailed description of the ways to understand the development process of a primary school teacher on philosophy with children (PwC) approach.

Method

Research Design

An action research strategy was used in this study. Johnson (2015, p.19) defined action research as "the process of studying a school situation to understand and improve the quality of the educative process". Therefore, the present study focuses on a real classroom environment and the development of a teacher to enhance the quality of teaching through thinking skills. During the research, the first author (hereafter referred to as 'researcher') took an active role in the process and introduced the PwC approach to the teacher and ensured the teacher adopt and implement this approach. During this process, a validity committee consists of scholars supported the researcher. Taking these factors into consideration, authors decided to use an action research method based on "practice/mutual cooperation/discussion" introduced by Berg (2009). Moreover, the steps of the dialectic action research spiral developed by Mills (2011, p.112) was followed. The steps included in the spiral are "identify an area of focus", "collect data", "analyze and interpret data", and finally, "develop an action plan". The area of focus in the current study is determined

as the implementation of a PwC approach in the Life Sciences course by a primary school teacher of a state school and solution of problems encountered.

Participants

The school and classroom where the research conducted: The universe and sampling unit of the study are the same since the action research is conducted with people directly linked to the research questions. Accordingly, a purposeful sampling strategy was used in determining the school and class where the research will be conducted since this method focuses on the purpose of the study and provides rich information that needed for an in-depth study (Patton, 2002). The criterion sampling method as a purposeful sampling strategy was used to select participants. The following criteria were considered in the study:

- Selecting a state school to conduct the research
- Selecting a third-grade class
- A primary school teacher who had never had any training in PwC or thinking education
- The permission regarding the use of audio and video recording devices
- Voluntarily participation of the teacher in the action research
- A class with a maximum of 20 pupils

According to the criteria described above, the participants of the study consist of a teacher of a rural primary school in the 2018-2019 academic year and 20 students.

The classroom teacher. The teacher was graduated from a Primary Teacher Education Program and has been teaching for 11 years. He is 34 years old and has been the teacher of the students since the first-grade. During the research, the participant teacher was coded as "Teacher".

The students. 20 third-grade students studying in the Class 3-A participated in the research. 12 students were girls and 8 were boys. Fifteen of the students were born in 2010 and five in 2011. Four of the students' mothers were graduates of primary school, three were middle school, nine were high school and three were university graduates. Of the 20 mothers, 16 were housewives, 1 was teacher, 1 was cook and 1 was secretary. Two of the students' fathers were graduates of primary school, 11 were high school, and six were university graduates. Five of the fathers were teachers, 1 was soldier, 1 was civil servant, 1 was truck driver, 9 were working in various sectors and 2 were farmers. The participating students were coded with the names or surnames of people who have contributed to the fields of philosophy and education in Turkey. These names in alphabetical order are *Afşar, Ahmet, Ali, Aliye, Arslan, Bedia, Betül, Bilge, Fatma, Hasan, Necla, Nermi, Nuran, Oruç, Sabiha, Sevgi, Seyla, Teoman, Uygur, and Yücel.*

The first author (Researcher). During the action research process, the researcher was a participant observer and contributed to the implementation process through his specialty by cooperating with the implementing teacher. The researcher has a bachelor's and master's degree in Primary Teacher Education. He worked as a primary teacher in a public elementary school for about 1.5 years and has been working as a research assistant in the Primary Teacher Education department for 7 years. He had worked as the coordinator of the program called "Little Philosophers, Big Thoughts" in the winter and summer semesters of 2017 with children ranging in age from 8 to 16 at the Children's University which was established as part of Anadolu University Research Centre for Children's Education. In 2018, he organized "PwC" workshops for two weeks with the support of the Child Rights Unit in the Eskişehir Metropolitan Municipality. Additionally, he organized a workshop titled "PwC" with a total of 30 children ranging in age from 10 to 12 at the Winter School of the Children's University, which was established in 2019 as part of Bayburt University. He has both a teaching experience in this field and also a practitioner experience in the PwC approach, thus the authors believe that the researcher's experiences is an important factor for determining the gap between theory and practice in education and contributing its solution. Accordingly, he informed the teacher when needed with the role of participant-observer by avoiding disrupt the flow of the lesson, identified the problems with the teacher, and had the direct responsibility for the preparation of action and activity plans regarding the solution of these problems.

The validity committee. Validity committee have undertaken the role of supervising, discussing and evaluating the researcher's work during the research process. The validity committee consists of three members including the first author. The other members of the committee were working at the Bayburt University, Faculty of Education, Primary Teacher Education Department. One of the members, M.A has a Bachelor's and Master's degree in Philosophy and also a trainer of Philosophy for Children. The other member of the validity committee, Y.E. has a bachelor's, master's, and doctoral degrees in Primary Teacher Education. He has multiple years of teaching experience in this field and wrote his doctoral thesis on classroom management. The validity committee convened 9 times as of October 3, 2018.

The research environment

The research was conducted in the Class 3-A of the school. The Class 3-A had 10 student desks, a table

and a chair for the teacher, 3 cabinets, 2 bulletin boards, a writing board, a whiteboard, and an interactive board. The classroom had a U-Shaped desk arrangement with 2 students per desk. Since it was the actual classroom set-up and students familiar with this desk arrangement, no changes were made during the implementation. The 3D image of the classroom is presented in Image 1.

Image 1.
The 3D image of the classroom where the research conducted

Data Collection Tools

Only qualitative data collection techniques were used in the present study. This is because the data was collected from only one teacher and also considering the age range of the students. Moreover, different qualitative data collection techniques were employed to provide a wide variety of data. Observation, interview, field notes, researcher's and teacher's diaries, meeting logs of the validity committee, and personal information sheet were used as data collection tools.

Observation. An unstructured observation strategy was followed. The researcher, as a participant-observer, tried to penetrate and be a part of the culture or subculture that he examines (Yıldırım & Şimşek, 2008, p. 171). Video recording was made during observations to make in-depth analysis, review observations and, allow the researcher to take notes. To prevent any data loss, two video cameras were used during unstructured observations. Information regarding the video recordings is shown in Table 1.

While observations were carried out in the important courses such as Life Sciences, Math, Turkish, and Science during the assessment of the current status, observations were made only in the Life Science course during carrying out action plans. During the observations, field notes were taken and these were analyzed together with the observations.

Interview. Interviews were conducted with the teacher and students during the research period. After the assessment of the current situation, during and after the implementation individual, face to face, and stimulated recall interviews were conducted with the teacher. The free association narrative interview methodology includes using audio or video recordings to help the participant remember a thought process behind a behavior (Calderhead, 1981). The semi-structured group interviews were conducted with the students only after the implementation. While the interviews conducted with the teacher were recorded using an audio recording device and smartphone of the researcher, the group interviews conducted with the students were recorded with video cameras used in the observations. We prepared an expert evaluation form and consulted 7 field experts (two faculty members of Primary Teacher Education department, two Ph.D. students studying on Primary Teacher Education, and three Ph.D. students studying on Social Studies Education) to evaluate the content and language validity of the questions developed for the teacher and student interviews. The questions were reviewed and finalized by the researcher according to the expert recommendations.

Diaries. Diaries were kept by the researcher and teacher to reflect the observations and thoughts at all stages of the research. While the researcher kept the diaries on the computer, the teacher kept hand-written notes using a notebook. These diaries used to support the other data obtained during the research. The teacher kept 13 separate diaries corresponding to 13 days. The researcher also kept 17 separate diaries for 17 days.

Roles in the research process

The role of the first researcher. The researcher guided the teacher during his development. He identified the problems experienced in the classroom during the teaching process with the teacher and supported

Table 1.
Information about the Video Recordings

	Research Process	
	Assessment of the Current Status	Carrying out Action Plans
Date Period	15.10.2018-28.11.2018	22.02.19-09.04.2019
Number of lessons	36 lessons	18 lessons
Recording length	1391 min.	685 min.

him to find solutions to these problems. Moreover, he collected data during the entire research process, controlled the preparations regarding the actions, prepared the action plans, and conducted observations and interviews. Thus, the researcher played an active role at all stages of the research except the implementation.

The role of the second researcher. The second author supported the researcher during the entire research process. He guided the researcher during the preparation of action plans and activities, determination of data collection methods, and analysis of data.

The role of the teacher. The focus of this study is the development of the teacher as the practitioner of the PwC approach. The teacher, as the practitioner, supported the researcher during obtaining the consent from parents and collecting students' personal information to carry out the research efficiently. The most important role of the teacher, as a practitioner is to reflect his own development and also the development of his teaching skills through interviews and diaries. In addition to his practitioner role, he collaborated and helped the researcher in everything regarding the research process.

The role of the students. The students are the group that directly affected by the teachers' teaching process. Accordingly, the differences between the teachers' traditional teaching process and the PwC method were measured through the changes in the students. During the evaluation of these changes, the students' status before, during, and after the implementation was considered as the main determinant.

The action research process

The research was started in May 2018 including the application period for required permits and ended on 30 April 2019. Accordingly, the study covered a one-year period including four main stages: preparation, assessment of the current status, implementation, and finally, evaluation after the implementation. These stages are explained in Table 2.

The preparation stage. This stage includes obtaining the required permits. Then the school and classroom were determined, the teacher was met and he was given brief information regarding the research process. Student and parent consent forms were given to the students and the returning forms were collected by the teacher. On October 15, 2018, observations were initiated for assessment of the current status.

Assessment of the current status. The researcher conducted observations during 36 lessons in the Life Sciences, Math, Turkish, and Science courses. The data were simultaneously collected from the field and analyzed. Following the identifying of the problems by the authors, an interview was conducted with the teacher. After the interview, it was decided to prepare a general plan and implement action plans accordingly to find solutions to the determined problems.

The implementation stage. Following the assessment of the current status, on January 7, 2019, the teacher and researcher conducted a meeting in the teachers' lounge of the school in which the research will be carried out. A general plan was prepared according to the decisions taken during the meeting as provided below and this general plan was implemented.

Table 2.
The action research process

Stage	Date period	Performed tasks	Data types
Preparation	21.05.18-12.10.18	Obtaining required permits, Determining the school and classroom, Interviewing with the teacher and obtaining his approval, Meeting of the validation committee Meeting with the children and starting to the pilot video recordings	Ethical committee, MONE permit, Teacher, student and parent consents, Personal Information Form
Assessment of the current status	15.10.18-20.12.18	Making observations at a total of 36 lessons, Conducting an interview with the teacher	Observations (Video Recording) Interview (Audio Recording)
Implementation	07.01.19 14.01.19-25.02.19 25.02.19-04.03.19 04.03.19-11.03.19 11.03.19-18.03.19 18.03.19-25.03.19 25.03.19-01.04.19 01.04.19-08.04.19 08.04.19-15.04.19	General Plan Action Plan 1 Action Plan 2 Action Plan 3 Action Plan 4 Action Plan 5 Action Plan 6 Action Plan 7 Action Plan 8	Field Notes Observations (Video Recording) Interview (Audio Recording, WhatsApp Records) Diaries
Evaluation after the implementation	25.04.19	The final interview with the teacher	Interview (Audio and Video Recording)

Following the general plan, the action plans were implemented.

Evaluation after the implementation. The research process was completed after the implementation of 8 action plans. An interview was conducted with the teacher on April 25, 2019, to evaluate the implementation of these action plans.

Preparation of action plans

A total of 8 action plans (each two plans cover a course) were prepared by the authors and reviewed by the validity committee and the teacher. While preparing the activity plans, at first, outcomes were determined. According to the discussions made in the validity committee, 12 of the 22 learning outcomes of the Life Science courses that are intended to be achieved in the spring semester of 2018-2019 academic year were considered as suitable for the PwC approach. Additionally, it was decided to have an introductory activity in the Free Activities course in the first week since it will be the first experience of the teacher regarding the implementation and also to explain the rules to the students and introduce them some concepts such as philosophy, philosopher, philosophizing, and thinking. The outcomes of the first activity implemented in the Free Activities course were prepared by the authors. The activities were prepared for 7 of the 12 outcomes of the Life Sciences course that determined in the validity committee. Activities for the remaining 5 outcomes were not prepared since it was decided to end the action research study. The selected outcomes, stimulus used in the activity plans, and philosophical concepts were given in Table 3.

Following this process, philosophical concept(s) that can be associated with the related outcomes were identified, stimuli that might attract students' attention were determined, and based on these stimuli, open-ended questions were prepared that would present dilemma scenarios for students, enrich the discussion environment in the classroom and deepen thoughts. During the preparation of these plans, the researcher's experience as a practitioner provided valuable help. The researcher considered the answers and questions that students may ask and prepared notes for the teacher while developing each plan. The activity plans were prepared accordingly, considering the stages suggested by Fisher (2007, p.623) as explained below.

Focusing exercise. In this stage, students are prepared for learning outcomes, they asked to relax and the rules agreed upon are reminded.

Sharing a stimulus. Elements such as story, picture, poetry, and video can be used as stimuli to promote thinking.

Thinking time. This is the stage that a student thinks about what is interesting, strange, and unusual about

Table 3.
Information regarding the activity plans

Outcomes	Philosophical concepts	Stimulus	Implementation day and course
Defines philosophy with his own words. Realizes the nature of philosophical questions. Adopts the rules that should be followed when making philosophy.	Thinking, philosophy, philosopher, philosophical and scientific questions, Daily questions	Narrative	22.02.19 (Friday) Lessons 5 and 6 Free Activities
Provides examples regarding the importance of obeying traffic rules.	Rules	Narrative, Picture, Video	26.02.19 (Tuesday) Lessons 2 and 3: Life Sciences
Defines traffic signs.	Rules, Responsibilities Penalty, Freedom	Picture, Video	05.03.19 (Tuesday) Lessons 2 and 3: Life Sciences
Explains what should be done and who he can ask for help when someone threatens his safety.	Good-bad	Video	12.03.19 (Tuesday) Lessons 2 and 3: Life Sciences
He gives examples of things he can do when he faces a situation that threatens his safety in daily life.	Good-bad	Video	19.03.19 (Tuesday) Lessons 2 and 3: Life Sciences
Describes the regime of the country.	Living together, Ruling, Laws	Video	26.03.19 (Tuesday) Lessons 2 and 3: Life Sciences
Recognizes the public authorities and administrators in the close vicinity.	Knowing and not knowing	Video	02.04.19 (Tuesday) Lessons 2 and 3: Life Sciences
Establishes a link between the development of his country and the fulfillment of his duties and responsibilities.	Responsibilities, Duties	Video, Picture	09.04.19 (Tuesday) Lessons 2 and 3: Life Sciences

the stimulus and shares his thought with his partner(s). This stage starts with the question of the teacher.

Questioning. This stage includes writing, discussing, clarifying, and classifying of the questions or answers of children. New opinions that will initiate a new questioning phase should be received. At this stage, the teacher should behave completely as a member of the group.

Discussion. At this stage, children use each other's ideas and the teacher deepens questioning by providing reasons, examples, and alternative perspectives, thus enables children to engage in dialogue. In cases when alternative ideas cannot be developed, the teacher should play the role of an 'imaginary opponent' at this stage and strengthen the discussion.

Plenary. At this stage, children are asked to summarize issues discussed and review the discussion. Thus, the issues learned by the students are determined.

Validity and reliability of the research

Instead of the validity and reliability, the concepts included in a qualitative study such as trustworthiness, transferability, invariability, and confirmability were emphasized in the current study. Accordingly, to ensure the trustworthiness of the study, authors spent more time in the research environment, collected data at different times using different data collection tools to ensure data diversity, and shared the collected data with many experts and the validation committee. To ensure transferability, the author tried to describe the entire research process objectively and in detail. The criterion sampling method was preferred for determining the participants and the criteria were clearly stated. Moreover, direct quotations were used for presenting research findings.

To examine the invariability of the research, a macro analysis was carried out on the data obtained from the video recordings by the researcher and presented to the validity committee. Additionally, authors have made efforts to present the data obtained from different data collection tools consistently, supporting each other. Finally, regarding the confirmability, the raw data collected during the research were examined by the validation committee and the results obtained by the researcher were compared with the raw data. At the end of the research, the obtained results, judgments, interpretations, and suggestions were reviewed and confirmed by an expert who was not involved in the research process and the confirmability was ensured.

Analysis of the data

Only qualitative data were collected in this study. Therefore, the steps of qualitative data analysis were followed. Miles and Huberman (2015, p.10) defined the steps of qualitative data analysis as reducing data, presenting data, and finally, obtaining and verifying the results. Accordingly, the data collected through observations and interviews were reduced by reading, and macro analyzes were carried out by the researcher. Following the macro analyzes, the data were interpreted, discussed, and agreed upon with the validity committee. The agreed macro analyzes were finally presented to the teacher's review. The subsequent action plan was shaped using these obtained results and the data collection stage was repeated while implementing the subsequent action plan.

Although the study has a theoretical framework, the possibility of the formation of different categories from the collected data was taken into consideration and a content analysis technique was used for data analysis. The main goal of using the content analysis technique is to obtain the concepts and relationships that can explain the collected data (Yıldırım & Şimşek, 2008, p. 227). Accordingly, analysis of the data was carried out at four stages: coding of data, determining themes, organization of the codes and themes, and finally, identifying and interpreting the findings.

Findings

Only qualitative data were obtained during this action research study. The findings obtained from qualitative data were developed into themes as shown in Figure 1

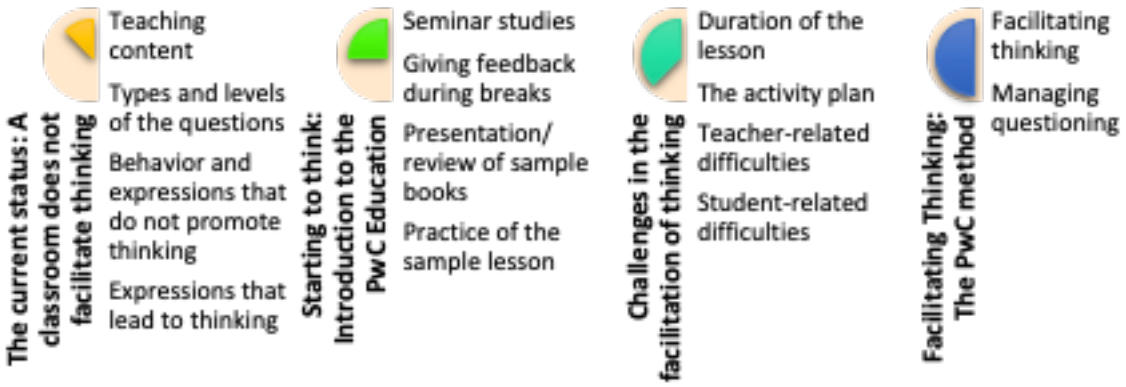

Figure 1. *The themes and sub-themes obtained from the data collected*

The current status: A classroom does not facilitate thinking

This theme includes the sub-themes of teaching content, types, and levels of the questions asked to the students, behavior, and expressions that do not promote thinking, and expressions that lead to thinking. The codes such as the use of textbooks and the e-learning platform, direct instruction, reminding, giving examples, and reinforcement were determined regarding teaching content. The teacher usually taught the course contents through direct instruction. The most frequently observed behaviors are the use of the e-learning platform in Life Sciences and Science classes, especially related to the teaching content and assessment. The e-learning is a platform that uses various animations for teaching content to the students through direct instruction and includes fun assessment activities for students. E-learning platform is generally used for assessment activities in Math and Turkish courses. It was observed that the teacher usually preferred direct instruction methods and provided reminders and examples in the Math course.

A quote from the teacher's speech regarding the direct instruction used by the teacher to remind in the Mats course is provided below.

> *T: What was the criterion about rounding? If the next digit to the tens is equal to one, two, three, or four, leave it the same. If the number is five, six, seven, eight, or nine, increase it by 1. It is the same for the hundreds digit also. If the number on the tens is equal to one, two, three, or four, leave the hundreds the same. If it is more, five, six, seven, eight, or nine, increase the hundreds by 1. We did it here. What was the five? It was in the middle. But which number the middle one turns into? It is turning to a bigger one.*

It was observed that the teacher uses the question-answer method in his lessons. However, considering the questions he used frequently, it was found that these questions were limited to the levels of knowledge and remembering. Especially closed-ended questions that can be answered by a simple word such as the questions end with the word "What" or "Which" and confirmation questions. Although relatively few in number, "Why" questions are also asked the students. An observation recording regarding the closed-ended questions asked by the teacher in the Math course is provided below.

> *T: Which digit are we looking at when rounding to tens? Who might answer? When rounding to tens? Nuran.*

The researcher observed that the teacher did not give students sufficient time to think of the answer of the questions. This may be because the teacher usually focuses on the correct answer in his mind and wants to obtain that correct answer as soon as possible. Moreover, it was also observed that the teacher used guiding, dictating, and judgmental statements in response to students' ideas regarding some controversial topics. A section of the teacher's speech is given below indicates that he did not give students sufficient time to think.

> *Nuran: We look at the tens...(the student does not sure about her answer, the teacher notices that and answers himself)*
> *T: Tens,... We look at the ones digit, right? And, when rounding to the hundreds, Necla...*
> *Necla: ...(she thinks, however, the teacher answers without giving her sufficient time)*
> *T: We look at the ones digit, right?*

It was observed that the teacher sometimes asked the students to present alternative ideas, think deeply, explain their reasoning, and deduce. However, very few examples were obtained about this. Especially, a dialogue example recorded in a Turkish course is given below.

> *T: Hasan, what will you do if you find an injured bird?*
> *Hasan: First, I would take it to a veterinarian. To heal it if it has a wound or something. Then I would tell someone who can take care of it. So, it will be recovered.*
> *T: Let's hear other opinions. Uygur, what will you do?*
> *Uygur: Do you know what I do? (He shows a throwing motion from the ground up) I would throw it like that. It will fly away.*
> *T: It has fallen, cannot fly. If it falls again after you throw? Do you take a risk?*
> *Uygur: Yeah.*
> *T: Ok, let's hear another opinion. Betül.*
> *Betül: I would bandage its injured parts. Then I would put it back in its nest.*
> *T: Very good.*

The teacher exhibited expressions and behaviors that encourage students to think, especially in the Turkish lessons. It can be said that the textbook of the Turkish course might be played a role here. Moreover, according to the researcher's notes, it was determined that the question patterns asked the students regarding the activities on a given text and also the presentation of the activity in the Turkish textbook prompt students to think. Besides, this was supported by a meeting held with the teacher. The teacher expressed his thoughts on the Turkish textbook saying:

> *T: As teachers, we usually implement the activities included in the textbooks provided by the directorate of national education. Accordingly, the thinking was not encouraged in the textbooks provided by the directorate of national education in previous years. Just question-answer was used for children. Very simple. However, the activities of this year seem quite different. They encourage children for speaking. For example, I'm looking at an activity given in the Turkish textbook and it says the children should say their opinions about that topic.*

Starting to think: Introduction to the PwC Education

As a result of the observations made in the classroom and the interviews conducted with the teacher,

the authors believe that the deficiencies related to the critical thinking skills can be fixed by increasing the awareness level of the teacher. Therefore, it was decided to provide the teacher training on the PwC approach by the researcher and support him through the process. The findings regarding this support provided by the researcher were addressed in the theme titled "Starting to think: Introduction to the PwC Education". This theme includes sub-themes of seminar studies, giving feedback during breaks, presentation/review of sample books, and practice of the sample lesson.

At first, comprehensive training was given to the teacher on the PwC approach by the researcher in the first action plan. Following this training, one day before the implementation of the activity plan of the week, a seminar was held regarding the problems experienced. Accordingly, on January 14, 2019, the first training was given to the teacher on the PwC approach by the researcher. The topics provided in this training are presented in Table 4.

Table 4.

Topics discussed in the interviews conducted with the teacher

Topics	Sub-topics
Philosophy	What is thinking? Philosophy Education, Teaching Philosophy
Children and Philosophy	Common points of children and philosophers, Can children do philosophy?
What is Philosophy with/for Children?	Historical development, Objectives, Content, Learning-teaching process, Assessment, Sample activities, Contributions
Teacher's role in the PwC	Question types, Classroom management, Asking for justification, Neutrality, Avoiding dictating, Respect, False opposition, Dependence to philosophical questioning, Interaction and communication

Following the first training, to address the inadequacy of the teacher regarding the implementation of the PwC approach, training was given to the teacher on the "Teacher's role in the PwC". While comprehensive training was given during the implementation of the first three activity plans, training intensity was decreased starting with the implementation of the fourth activity plan. This situation reflected in the interview conducted with the teacher as shown in the quote below.

> *The researcher: At which week did you feel sufficient regarding the implementation? Why?*
> *T: I felt very inadequate in the first week. I went home very upset. I was not satisfied with the lesson I gave. Besides, I couldn't receive feedback from students. It was like a disaster. The second week may be slightly better, the third a little more, however, after the 4th and 5th, I felt things got in the way. This is because I noticed my shortcomings. Especially, the meetings we conducted. Your warnings, such as "Here, you should do ...", "be careful with that..." provided great assistance to me. Gradual improvements and I think that the problems solved after weeks 4 and 5. I believe that I didn't face any difficulty in the following weeks.*

The researcher conducted observations in the classroom during the implementation process and accordingly, gave instant advice to the teacher during the recesses regarding which expressions he should use and how he should behave according to the PwC approach. This advice provided significant assistance for the development of the teacher since they allowed the teacher to fix his shortcomings faced during the implementation of the PwC approach. The teacher explained the assistance provided him by the researcher one day before the implementation and during the recesses in the following statement.

> *T: The advice was very useful. I wrote down them into my diary also. The meetings we conducted provided great support for fixing my shortcomings. Besides, the discussions we made during the recesses provided instant support. You frequently advised me at the beginning. This advice reduced each day. Considering these, I feel successful.*

Following the first training, the teacher was given 8 books about the PwC to read until the first application begins. These books; *Life of Timon of Athens, Learning Thinking with the Nasrettin Hodja, The Philosophical Child,* and *Picoolophilo C'Est quoi la mort?* Besides, *"Courage and Fear"* from the book series: *Philosophy Lollipops* and *"What is Goodness?"* from *The Philosophical Child* were also provided to the teacher. The effects of these books reflected in the teacher's diaries as follows:

> *"... the researcher conducted observations during the semester. I was given some books on Philosophy to read and analyze. I have basic knowledge of Philosophy since I took Philosophy lessons during my high-school and college education. However, as I read these books, I noticed that I know only 'P' of Philosophy. I realized that its essence is very different from what I know. I saw many different aspects of the funny stories and anecdotes of the Nasrettin Hodja that I didn't realize before. I learned the situation of Timon of Athens, his view of life, and how he changed. I can't wait to do PwC"*

Although the teacher's attention to the PwC approach and desire to implement it are important factors, a sample lesson was given by the researcher on 21 February 2019, to show teacher situations that may occur during the implementation. The teacher observed the implementation process during this lesson and wrote down some details in his diary.

> *"The text is read to the class at a slow speed so it can be understood. The story is left unfinished at a certain moment and open-ended questions are asked to the students. Following the answers, students are encouraged. The students are asked to clarify their answers and reasons. A discussion environment is created when opposing views were presented by the*

students. The teacher avoids actively involved in the discussion. In order to make the students' explanations more understandable, the teacher asks some questions such as "Can you explain a little more?" and "I don't fully understand, can you give some detail?" (continue explaining, can you give some examples?). If a student digresses from the original subject, the subject is remembered to him and the student is lead to think about the subject. After this lesson, I realized that students can do philosophy. A correct picture, a correct video, a correct question, and a warm environment make doing philosophy possible."

Many important aspects regarding the implementation of the PwC approach were reflected in the teacher's diaries as a result of the sample lesson given by the researcher. Many details were noticed by the teacher such as asking students open-ended questions and their reasons, creating a discussion environment when opposing views were presented, and avoiding too much involvement in the discussion. Therefore, the increased awareness of the teacher regarding the PwC approach was supported by a sample lesson.

Challenges in the facilitation of thinking

No obstacles were faced during the preparation and the assessment of the current status. However, some challenges affecting the quality of teaching were faced during the implementation stage, especially, in the implementation of the first three activity plans. It was determined that these challenges cover the sub-themes of the difficulties related to the duration of the lesson, the difficulties related to the activity plan, teacher-related difficulties, and student-related difficulties.

The activity included in the first activity plan was implemented during the lessons 5/6 on Friday, the last day of the week. Some problems associated with the selected day and time of the activity were observed in the students such as low motivation and lack of focus. These problems indicated in the teacher's diary as follows:

"Noise in the classroom, distraction, and boredom among students are the problems. It was very good at the beginning, in the first 15 minutes. Towards the end, distraction started. Naturally, this may be a result of implementing this activity in the lessons 5/6 on Friday. Because they used to play games at this time. However, it was quite acceptable to have such problems in the first practice."

Besides, the consensus view of the meeting held with the validity committee stated that the problems experienced were most likely due to time of the lessons and it was considered that implementing the next activity plan in lessons 1 and 2 would be more efficient. However, in the meeting regarding this issue, the teacher indicated that the most productive time is lesson 2. According to the teacher's suggestions, as a solution to problems arising from the time of the lesson, it was decided to conduct the following action plan in lessons 2 and 3. Following this decision, no problems faced regarding the time of the lesson during the activities.

The challenges arising from the activity plans are addressed under two separate topics; time management and the diversity of the subjects. Although the activity plan includes information and guidance on the subject for the teacher, the fact that the first activity plan covers some topics that the teacher is not fully competent such as thinking, philosophy, philosopher, philosophical question, and scientific question is considered as a problem arising from the activity plan. However, this can be accepted as a natural problem. Moreover, regarding time management, the teacher's hesitation about how long the discussion should continue was considered a problem. This is reflected in an interview with the teacher as follows:

T: In fact, I have studied too much on the plan, but I realized that I couldn't control it effectively. Moreover, I wasn't sure where to end the subject. I have faced such problems. I have also experienced a problem with time management. I have extended the duration of the subject a little bit because I didn't know when to end it.

Based on the meeting conducted with the validity committee and the teacher's views, it was decided to make a meeting with the teacher one day before the implementation to discuss the plan to solve challenges arising from the activity plan. No problems faced in the implementation of the activity plans regarding time management as a result of these meetings. However, during the implementation of the third activity plan, the teacher moved beyond the plan and took the initiative. This is important for the teacher to be an independent PwC practitioner. However, the teacher focused on a question that generate a dilemma for students during the implementation, although it was not included in the plan and was beyond the concept of "rule", the main theme of the activity. The teacher divided the class into two groups and asked them to discuss this question. However, this initiative taken by the teacher caused some difficulties regarding time management. The teacher was informed during the recess by providing observations on this issue.

The problem regarding the management faced in the first implementation was not encountered in the second implementation as a result of the meeting conducted with the teacher one day before the implementation. However, since the teacher stated that he had hesitation regarding the duration of the discussion during the third implementation, it was considered to add some guidance tips for the teacher in the activity plans. Considering the opinions of the validity committee, it was decided to add guidance tips regarding the time management in the activity

plans. These guidance tips include information for the teacher such as how much time should be spent on a question and the length of a discussion. An example of these tips is "Note for teacher: The story should be ended here and the questions given below should be discussed. First, the students are asked to ask questions regarding this text. These questions are written on the whiteboard. (This activity should take 10 minutes)".

The teacher implemented the PwC approach for the first time. Naturally, some teacher-related difficulties were experienced during the implementation such as lack of asking for justification, too much sticking to the plan, not listening to students, role confusion, fail to involve students in the discussion, and insufficient management of the dialogue. According to our observations, the teacher often looking at the activity plan in his hand during the lessons. This situation sometimes prevented the teacher from listening to students and therefore, he couldn't emphasize the answers of the students that can promote the discussion. A quote from the meeting held with the teacher indicating this issue is given below:

> *"Naturally, for the first time, I'm trying a new method. We want children to think freely without any disruption. I was confused about where to interrupt and end it. Should I end it, or not? The kid says his opinion. Should I interrupt him, or not? I had such hesitations in my mind. Or, I missed what the kid said when I was looking at the plan to think the next step".*

According to the PwC approach, the teacher should behave as a group member, heat up the discussion when thinking is poor, orient a view of a student to the class, and share his opinions with the students avoiding dictating. However, it was observed that the teacher experienced role conflicts here and unable to fully demonstrate the role of the teacher expected in the PwC approach. Moreover, the active participation of the students Hasan, Uygur, Sabiha, Nuran, Ali, and Sevgi, who were also effectively participated in the lessons before the implementation, were increased during the discussion process. The observations indicated that the teacher had difficulties regarding inviting other students to the discussion and encourage them. The PwC approach aims at full participation of the group in the discussion. Here, the main responsibility belongs to the teacher. Therefore, in order to fix such teacher-related problems, training was given explaining the teacher's role in the PwC approach. Moreover, the researcher provided feedback to the teacher regarding the previous lesson during recesses.

The observations made in the implementation of the first activity indicated that students do not listen to others, they make noise in the classroom, and therefore, they warned multiple times by the teacher. Since the rules regarding the PwC approach explained to the students at the end of this activity and this was the first experience of both the teacher and students, such issues can be accepted. In order to fix these problems, it was decided to remind students to follow the rules at the beginning of each lesson, and accordingly, o note for the teacher about this was added in the activity plans.

Some ideas such as awarding a prize or selection of "Little Philosopher of the Week" were generated on the meeting held with the validity committee to help students to follow the rules and increase student participation. It was considered that the use of a board regarding "Little Philosopher of the Week" might increase students' participation and attention in class by increasing their motivation. Since the teacher also made a similar suggestion, it was decided to choose "Little Philosopher of the Week" at the end of each activity and a board was prepared accordingly as shown in Image 2.

Image 2.
"Little Philosopher of the Week" board.

The contribution of the "Little Philosopher of the Week" board to the students' motivation is mentioned in the researcher's diary as follow:

> *"Today we implemented the second activity. At the beginning of the lesson, the teacher said to the students that the "Little Philosopher of the Week" will be chosen and the students very enjoyed this idea. They asked many questions to the teacher, how this will be done, how to choose, etc. Comparing to the first activity, the teacher was very confident. He read the story to the class with his own words. He didn't look at the plan too much."*

In the following weeks, the "Little Philosopher of the Week" board should have motivated Nuran and Nermi since the following thoughts were mentioned in the teacher's diary.

> *"The "Little Philosopher of the Week" board attracted great attention among students. Even the winner, the philosopher of the week, Nuran brought her mother to the school and showed the board. Nermi, who never speaks, hugged me warmly and said "Sir, from now on I will always participate" because we chose her.*

Consequently, the authors believe that a board such as

"Little Philosopher of the Week" may have a significant impact on students' motivation, participation, and attention in the class regarding the implementation of the PwC method.

Facilitating Thinking: The PwC method

The authors believe that the teacher displayed a significant development regarding the implementation of the PwC method during the action research study. This theme includes sub-themes: facilitating thinking and managing questioning. It was determined that the sub-theme of facilitating thinking include the following codes: requesting reasoned thinking, requesting explanations, requesting alternative opinions, giving time for thinking, asking notional thinking, reflection, encouraging thinking, and organization of thinking.

It was observed that the teacher acted decisively regarding requesting reasoned thinking from students as in the quote below:

T: Yes, Hasan.
Hasan: It will be very good.
T: Why did you say so?
Hasan: I don't know.
T: No, my dear. Ideas should be reasoned. Be serious, please.
Hasan: There might be accidents.

A quote given below from the fifth activity plan can be mentioned as an example of this. Besides, the teacher gave Afşar time for thinking.

T: Are earthquakes bad? Why? Demirhan. Louder, please.
Arslan: They are bad. Because they kill millions of people.
Afşar: They are bad.
T: Why?
Afşar: I didn't think about it.
T: You should think about its reason. Do you remember our rule? We should say its reason. Think for a while.

The teacher noticed that the students have similar opinions and asked them to develop alternative ideas. A section of the teacher's dialogue regarding this is given below:

Sevgi: Sir, I wouldn't drink since we couldn't live without rules.
T: Ok. Another opinion. Necla.
Bilge: Sir, I wouldn't drink either. Because it's impossible to live without rules.
T: Ok. Yücel.
Yücel: I wouldn't drink either. The teacher might be angry at us if there were no rules.
T: Ok, there are similar views. No need to hear similar views anymore. Let's hear different views now.

The teacher requested students many times to make explanations or give examples to express their views clearly. A dialogue is given below as an example:

T: Ok, let's change the question. Can a person help his country to develop?
Uygur: If he is the president, yes.
T: How?
Uygur: He can develop the country. That is, he would.
T: Can you give an example?
Uygur: He would develop, for example, he builds new factories. He constructs more new houses.

The teacher encouraged the students especially, those who are shy since their thoughts may be wrong. A section of the teacher's dialogue is provided below.

Uygur: I think, the existence of a leader is bad. Let's say, we want to play soccer. But the leader wants to play piggy in the middle. It will be what the leader wants. So, the existence of a leader is bad.
Sabiha: I don't agree with Uygur. Uygur, you say that no need for a leader. So, no need for a president also.
T: You say that no need for a president also. Yes, Uygur. You may respond.
Uygur: No need to respond. My view is wrong.
T: We respect your opinion. We don't say it is wrong or something like at. Your opinion may be true also. However, you should support it.

As shown in the quote below, the teacher provided feedback to students to allow them to rethink their answers considering assumptions. Besides, he wanted students to make explanations.

T: What is the most correct way to decide together? Let's solve this issue in this lesson. Sabiha.
Sabiha: Kicking the killjoy out of the group.
Uygur: I agree.
Hasan: I agree.
T: Let's say you don't have that option. What would you do?
Ali: If we couldn't decide, we will make a test immediately. We will play a game.
T: Can you give some detail?
Ali: For example, brain puzzles. We would prepare brain teasers and accept the successful ones to join the group.

Reflection in the PwC method can be described as the teacher understands a thought that a student has difficulty in explaining and says to the student "do you mean ....". Reflecting improves the expression of thoughts and reinforces thoughts by repeating. Therefore, it is an important technique that a teacher should use in the PwC method. The quote regarding the use of reflection by the teacher is provided below.

Arslan: Sir, I believe that it is not for a penalty. For example, you can run over a person if you pass through a red light.
T: So, you say it is not for a penalty but to prevent damage to a person?
Arslan: Yes.
T: Could you give some detail? So, explain more, give an example.
Arslan: Sir, if you don't obey the rules, if you pass through a red light, you can run over a person and cause death. You will go to both jail and hell.
T: Ok, Arslan has a view from a different perspective. Sabiha.
Sabiha: Sir, it's for both penalty and prevent damage to person. If you pass through a red light, you can run over people walking across.

The dialogue below indicates the teacher's attitude regarding acting as a group member. Besides, as it can be seen in these dialogues, the teacher tried to be a model regarding organizing the students' views as a group member.

> *Sabiha: So, remember the Gölcük 1999 and Japan 2016. So, in 2016, they made these (showing the trusses in the classroom) stronger. In the past, for example, they didn't include iron between concrete. They couldn't find such materials in 1999. One of these places has advanced technology. The other one is a less developed place.*
> *T: You say that the year is important. There were no such materials in the past. All right, there are very old mosques and building in Turkey and they didn't demolish during the earthquake. How about that?*

As seen in these dialogues, it can be argued that the teacher progressed regarding facilitating thinking. The teacher mentioned this development in the quote given below.

> *"T: At first, I didn't allow questioning. For example, why this was done that way? It was done that way. No need to think deeply. However, we questioning now, such as why this was done that way? Because of this? What would be if it wasn't done such? How else it could be? In short, we ask more 'why' questions. Previously, I would have asked 'what' questions. I have changed from 'What is this?' to 'Why is that so?'. In fact, we have learned in the college that information should not be transmitted directly through the didactic method, that is, 'teach a man to fish' instead of giving fish. Especially, I noticed this after the philosophy lessons. However, in time, I get used to giving fish directly".*

As can be understood from the teacher's words, he was preferring to transmit information directly before he was introduced with the PwC method and he has no concern regarding the questioning. This finding indicated in the assessment of the current status also. Another theme related to the development of the teacher in the implementing PwC method is managing questioning (enquiring, discussion, or negotiation session) in the classroom.

Findings related to the managing questioning: Managing questioning includes the codes such as following the dialogue, directing the dialogue, noticing going beyond the subject and directing the discussion to the subject again, and making a summary. Following the dialogue is very important to continue questioning, increase the group's participating, and allow to discuss the different subjects for the PwC method. The authors believe that the teacher displayed an important development in this regard as shown in the following dialogue.

> *Nuran: For example, I would collect fruits and similar stuff from the trees in the forest to prevent starvation. Then I would build a cabin using woods. Then I suicide. Nobody would see me.*
> *(Nuran speaks again about 8 minutes later)*
> *Nuran: I've changed my find.*
> *T: So, you gave up suicide yourself. Why?*
> *Nuran: Yes, I have. Because I can find many solutions if I think.*
> *T: What is the main reason to change your mind?*
> *Nuran: Sir, you know, trees have wood. I would write "HELP" on them using stones and hang it. So, I can survive.*

As seen in the dialogue above, the teacher followed the view that Nuran argued about 8 minutes ago and asked her the reason to change her mind. In another example, he followed the dialogue between Nuran and Uygur and explained to Uygur what Nuran actually mean after saying they are similar thoughts. The teacher asked different questions to change the subject using the students' thoughts, directed the view to the classroom, and allowed them to join, therefore, he was able to direct the discussion to a different subject. A dialogue as an example is provided below.

> *Uygur: All very well but there are no rules!*
> *Nuran: Sir, he always says there are no rules.*
> *T: According to him, here are not. Isn't he right? He drank water from the fountain.*
> *Nuran: There are no rules from his perspective but the other person has, sir.*
> *T: Then what will be the solution? Wouldn't that be a problem? Ali, do you want to answer to Uygur?*
> *Ali: Yes.*

One of the most frequent situations faced during the implementation of the PwC method is that children tend to move beyond the subject always. Teachers should notice that immediately and warn students to direct discussion to the subject. The development on the teacher in this regard can be seen in the dialogue given below.

> *Sabiha: Because the fruits may be poisonous as Uygur said. Even they might be poisonous, the coconut shell is very hard. Nobody can put poison in it. I would eat them.*
> *Uygur: Well, Sabiha. But there are poisonous plants. They may open inside and put into them. However, there are other plants that naturally poisonous.*
> *Sabiha: Ok but you are the only person on the island, who can put poison inside them?*
> *Uygur: I say not only humans. There are plants that naturally poisonous.*
> *Sabiha: But those trees are not poisonous. I know those trees. They are not poisonous.*
> *T: Ok, this poison issue is beyond our subject. Let's focus on the actual subject.*

Another important technique for implementation of the PwC method, acting as an 'imaginary opponent' is used by the teacher sometimes to heat up the discussion when thinking is poor. A dialogue relating to this is provided below.

> *T: Can you give an example to the situation that intention is good but the behavior is bad?*
> *Uygur: Let's say, I want to buy flowers for my mother, my intention is good, however, I steal a person's bag.*
> *T: Hımm. Hasan, please think more.*
> *Hasan: Let's say, I want to help someone. However, I beat him up.*

(When some other students also gave similar examples, the teacher gave examples from his activity plan)
T: Ok, I will give an example also. Let's say, a mother beats up her child because he smokes. Now, is this mother good or bad? I think she is bad. Because she can talk to him.
Nuran: Sir, I do not agree with you. If this mother never breaks his kid's hearth, if she allows smoking, and therefore, you will smoke. And you will be sick when you grow up. Or, God forbid, you will die. So, your mother has to beat you up for your own good.
T: Could be any other way? Could she teach me without beating me up?
Nuran: I don't think so. So, you can yell at your kid. You can say 'Don't'. But, the kid would not afraid of these and continues his attitude.
T: So, is this mother good or bad?
Nuran: She is good.
T: She's good, right? Even she beats up her kid?
Nuran: Of course, she is good. This mother makes this for her kid's own good.

Towards the end of the implementation of an activity related to the PwC, different topics might come to students' minds. At this stage, the teacher should summarize the topics discussed and help students focus only on the main subject. Accordingly, the development of the teacher in this regard can be seen in the following dialogue.

T: All right, we started with the Vikings and continued with the uncle. We talked about our duties and responsibilities. Now, let's talk about the main problem. What might be the duties and responsibilities of children in the development of their country? Yes, Afşar.

T: Ok. Good. Now, let's talk about knowing and not knowing. Today, our subject in the Life Sciences lesson is the local authorities and administrators (writes on the whiteboard). Ok? We discussed whether fractions are important or not. So, learning this subject, is learning about local authorities and administrators important? What do you think?

The following dialogue displays the teacher's development regarding noticing the philosophic thought among the students' views.

Uygur: Sir, my aunt does not obey the rules either. Because he is a traffic cop. For example, I saw that he passes through red light when we are going together.
Bilge: Noo. Why don't they? They should obey also.
Fatma: Yes, sir. Cops should obey the rules, too.
T: Yes, that's correct, cops sometimes pass through red light. Hasan, do you want to answer?
Hasan: Yes. Sir, cops, fire trucks, ambulances carry lives, save lives. Should they stop to obey the rules? Should people die? Life or rules, which one is more important?
T: That is a question. That is a real philosophical question. Does anyone want to answer Hasan's question? (writes the question on the whiteboard) Life or rules, which one is more important?

As seen in the dialogue above, the teacher asks Nuran a question to organize her thoughts. The authors believe that the teacher displayed a development regarding being a role model in order to organize students' thoughts by asking questions. This development can also be seen in the dialogue below.

Nuran: Sir, I'm not agree with Uygur and Arslan.
T: Why?
Nuran: Sir, ok, we blame constructors because of the houses demolished, however, everything comes from God. You say because of constructors.
T: Ok, why such houses are not demolished in Japan?
Nuran: .....(She couldn't answer)
T: Ok, think a little more.

As shown in the dialogues above, the teacher displayed a significant development regarding the implementation of the PwC approach. This development can be seen also in the dialogue below.

"T: I can ask children questions. Children can explain their thoughts. I can create dilemmas. I can force children when their thoughts create a dilemma. That is, we can do philosophy with children. I know where to direct the subject using their answer to my question. So, I believe, I got the idea. At first, I had difficulties regarding estimating children's thoughts. I was open to any kind of thought. However, starting the fourth week, I realized that the children should be guided for correct thinking. I realized that a child should be guided to a dilemma, to a different context, not using answers but questions, when he does not think logically consistent. Or, when children don't participate, I tried to engage children in the conversation by asking personal questions or questions related to their past experiences. In the beginning, I implemented the plan strictly. However, starting the fourth week, I behave more relaxed on the following plan. At that moment, I feel good enough."

As can be seen in the interview records, the teacher indicated his development as he can able to manage the discussion, create dilemmas, guide the dialogue using the students' answers, as request them to organize their thinking. No doubt, the guidance tips included in the activity plans, training given to the teacher one day before the implementation, and feedbacks provided during recesses played an important role in the teacher's development.

Results and Discussion

Considering the data obtained in the current study, rather than a student-centered education method, a more teacher-centered education method was used in the class previously. In this method, the teacher over-relies on textbooks and the e-learning platform. Therefore, the teaching process is directly affected by these materials used by the teacher. Moreover, since the activities in the Turkish textbook prepared to facilitate thinking, we observed some teacher expression and attitudes that support thinking in the Turkish lessons. The teacher usually tends to guide students to the correct one and push them to find the correct answer in his mind. This tendency includes factors that restrain students' thinking. Besides, the teacher does not give students sufficient time to think.

Although the level and types of the questions asked to students are important regarding promoting students' thinking skills, the questions asked by the teacher limited with the lowest level of questions such as knowledge and reminder related questions.

In order to fix these issues, the teacher was supported by the researcher regarding the implementation of the PwC method. This support includes giving training, providing feedback during the recesses, providing relevant books, and giving a sample lesson. The authors found that supporting the PwC training with relevant books and giving a sample lesson provided a great contribution to the teacher's development regarding the PwC approach. Moreover, instant feedback was given to the teacher in the recesses during the practices also played an important role in this development.

The findings of the present study demonstrated that a teacher without any prior knowledge on thinking education or the PwC approach can display a significant development regarding the implementation of the PwC method when provided with correct support accompanied by the monitoring of the development process. No doubt, the teacher's interest, engagement, and curiosity on this regard is an important factor in his development. Authors believe that the teacher displayed a development in many areas as a practitioner of the PwC method. The results obtained in this study indicated that the teacher improved especially, regarding the facilitation of student's thinking by requesting students to justify their thoughts, requesting explanations, encouraging thinking, asking students to think hypothetically, requesting alternative views, doing reflection and giving students sufficient time for thinking. Many recommendations have been made for teachers or facilitators in the literature (Fisher, 2013; Gregory, 2008; Haynes, 2002; Lipman, Sharp, & Oscanyan, 1980). Haynes (2002) made suggestions to teachers who want to apply the PwC method based on the views he obtained from children.

These suggestions are about questioning, listening, choice, participation and inclusion, starting points, trust and approachability, support, comfort, security and attention.

In this study, it can be said that the teacher improved in the related suggestions.

The teacher should manage the questioning as a moderator during the implementation of the PwC method. Accordingly, the authors argue that the teacher displayed a development in following dialogues, directing a dialogue, directing the discussion to the main subject when it went beyond the subject, and summarizing. Moreover, since the PwC method is a dialogue-oriented approach, the teacher also showed development regarding preventing discourteousness in the classroom, promoting student-student dialogues, asking students to show that they are listening, and support students' participation. Furthermore, the evidence found in the current study that the teacher internalized his role on the PwC method since he acted as a group member, joined in the discussion as an imaginary opponent when needed, asked students questions to organize their thinking, and noticed philosophical thoughts among others. Consequently, the authors believe that the teacher adopted his role of the facilitator as a practitioner of the PwC method.

The results obtained in this paper revealed that the teacher displayed a great development as a PwC practitioner. The authors claim that the support provided by the researcher is played an important role. This support was similar to those three-stage model theoretically suggested by Lipman (1988) for teacher training on PwC practices. This model requires PwC practitioner candidates to study on activities thoroughly, to observe a sample lesson given by an instructor, and finally, providing feedback to the candidates' practices through observation by an instructor. Similarly, in the present study, the teacher was given training, he studied on the activities thoroughly, observed a sample lesson, and he was provided constant feedback by the researcher during the implementation process. Green (1997) stated that teachers need a detailed education plan and constant supervision to obtain maximum output from the PwC method. Moreover, Akkocaoğlu-Çayır (2018) argued that successful implementation of the PwC method requires a teacher-centered environment that analyzes the discussion and questioning processes. The statements given above support the findings of this study.

A literature survey revealed that very few studies have been reported focusing on the development of the teacher on the PwC approach. Akkocaoğlu-Çayır (2015b) found that the PwC method enables teachers to realize that a question may have multiple correct answers, many perspectives exist and these perspectives can be used in a classroom environment, and philosophy can be used as a method for this purpose. Another study carried out by Akkocaoğlu-Çayır (2018) indicated that teacher candidates who took the elective course of Philosophy for Children course showed positive changes in their views regarding knowledge, philosophy, and childhood.

In a study performed by Akkocaoğlu-Çayır (2018), teacher candidates were expected to develop PwC activities, implement these activities, and make self-evaluation. As a result, it was found that the teacher candidates have difficulties regarding

asking questions and managing the discussion. In the current study, no difficulties were encountered regarding asking questions since the questions prepared by the researcher are included in the activity plans. Besides, in the later activities, the teacher gained freedom regarding managing the discussion, took initiative beyond the plan, and asked his own questions. Moreover, he was able to notice the students' philosophical questions and directed these questions to the class. It is suggested that the constant analysis of the discussion and questioning processes, and providing feedback to the teacher are effective factors here. Similarly, in a study carried out by Akkocaoğlu-Çayır (2018), the analysis of discussion and questioning processes, and giving feedback to the teacher candidates during the teacher training were recommended for a successful implementation of the PwC method. The findings obtained in the present study are consistent with the results of previous reports. Furthermore, another important result obtained is deepening the steps for implementing PwC in schools suggested by IAPC (2020). The authors believe that the present study will make a significant contribution to both in-service teacher training and teacher education processes as it identifies the challenges that may be encountered in a such process and provides possible solutions.

Recommendations

Based on the results of the current study, the authors state that long-term training should be provided to teachers who will be introduced with the philosophy for children approach and an advisory service should be available during this process. Teachers should be supported by constant feedback. Moreover, the PwC method might be taken into consideration during preparing the textbooks and activities for teachers. New textbooks and activities related to the PwC method and the use of these materials should be encouraged. Considering the contributions to students of PwC education, pre-service teacher should be trained through PwC lessons. Rules of PwC session must be emphasized in the PwC training to be applied to students. Awards like the "Little Philosopher of the Week" should be included to motivate students during the sessions.

There are insufficient studies on the PwC method in Turkey. Therefore, the researchers studying in this field should be supported and new researchers should be encouraged to study on this field. Future studies should therefore include the development of the teacher and implementing PwC in the classroom. Longitudinal studies may be carried out to determine the long-term effects of the PwC method in Turkey.

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A Comparative Analysis of Fraction Addition and Subtraction Contents in the Mathematics Textbooks in the U.S. and South Korea

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Abstract

Developing textbooks of optimal quality is crucial for enriching the students' learning and understanding. This study examined fraction addition and subtraction problems in the U.S. and South Korean mathematics textbooks according to the types of denominators. In particular, we investigated Everyday Mathematics (EM) and South Korean mathematics (KM) textbooks revised in 2015 and developed an analytic framework encompassing horizontal and vertical dimensions to examine the learning opportunities presented to students by the textbooks. We assessed their topic sequence and frequency of fraction addition and subtraction contents with regard to the former and examined their contextual features, cognitive demands, and mathematical activities with regard to the latter. We observed that EM provided inadequate learning opportunities for fraction subtraction problems, representation problems, and high-order cognitive abilities. However, KM provided more even learning opportunities for fraction addition and subtraction problems, various contextual features, and high and low thinking skills. Moreover, we found that EM emphasized understanding and resolving activities, whereas KM underscored exploring and explaining activities. The findings of this study suggested updating fraction addition and subtraction contents in the U.S., South Korea, and other countries by considering horizontal and vertical dimensions.

Keywords:

Textbook Analysis; Fraction Addition and Subtraction; Problem Analysis

Introduction

The curriculum is designed to achieve educational goals, and textbooks are the most prominent source of its dissemination (Alajmi, 2012; Charalambous et al., 2010; Tan et al., 2018; Yazıcıoğlu & Pektaş, 2019). As the curriculum is compiled in abstracted language, textbooks facilitate its translation into a readily comprehensible language and activities for the purpose of being utilized

in actual classroom environments (Stein et al., 2007). For example, a mathematics textbook elucidates mathematical content, problems, pedagogy, and teaching strategies. Therefore, teachers are likely to use textbooks than curriculum for their instruction. According to the Trends in International Mathematics and Science Study (TIMSS), for instance, about 75% of fourth-grade mathematics teachers use textbooks as their chief teaching resources (Mullis et al., 2012). In this context, researchers conceptualize curriculum, textbooks, teacher's instructions, and student outcome as the intended curriculum, potentially implemented curriculum, implemented curriculum, and attained curriculum, respectively (Valverde et al., 2002).

The quality of a mathematics textbook influences teacher's instructions and student's learning (Stein et al., 2007; Valverde et al., 2002; van den Ham & Heinze, 2018). Teachers acquire new teaching skills from mathematics textbooks and decide the way to teach mathematics and the concepts to be discussed. Therefore, students are not likely to amass mathematical knowledge, skills, and thinking not presented in the textbooks. For example, the students who learned mathematics with a high level of cognitive demands problems are likely to develop high-order thinking skills, such as analyzing, reasoning, justifying, and evaluating. Conversely, the students who learned mathematics with a low level of cognitive demands tasks tended to develop low-order thinking skills, such as recalling and computation (Mullis et al., 2012; Tan et al., 2018). As different learning opportunities lead to different mathematical outcomes (Bellens et al., 2020; Hadar, 2017; van den Ham & Heinze, 2018), developing a high-quality mathematics textbook is a critical issue for educators.

Researchers have analyzed mathematics textbooks across two dimensions, horizontal and vertical (Alajmi, 2012; Charalambous et al., 2010; Li et al., 2009; Özgeldi, & Aydın, 2021; Son & Diletti, 2017; Stein et al., 2007). The former focuses on characteristics of contents, including topic placement, allocation of time, development of contents, whereas the latter emphasizes the characteristics of problems, including contextual features, cognitive demands, and problem-solving activities. Li et al. (2009) referred to the horizontal and vertical dimensions as macroanalysis and microanalysis, respectively. Using those analytical frameworks, researchers have examined various mathematical topics, including fractions, integers, algebra, probability, and geometry, to investigate whether they provide students with sufficient opportunities to grasp the topics (Son & Diletti, 2017).

Among a multitude of mathematical topics, the current study examined fraction addition and subtraction problems in mathematics textbooks. Accurate understanding of fraction operations is of paramount importance for students' mathematical learning. It not only facilitates understanding other mathematics concepts (e.g., decimal numbers and ratio), but also predicts students' subsequent success in algebra (Martin et al., 2015; Torbeyns et al., 2015). Moreover, the comprehension of fraction operation influences peoples' performance in science, technology, engineering, and mathematics-related jobs, such as construction and computer programming (Handel, 2016). However, studies have reported that most students encounter difficulty in understanding fraction addition and subtraction (Aliustaoğlu et al., 2018; Kara & Incikabi, 2018; National Council of Teachers of Mathematics [NCTM], 2000). For instance, only the advanced U.S. elementary school students could solve fraction addition and subtraction problems correctly (Lee et al., 2007). Moreover, studies have reported that while some students can solve fraction addition and subtraction problems using appropriate algorithms, they do not completely understand their meaning (Aliustaoğlu et al., 2018; Martin et al., 2015). Given students' misconceptions and difficulties in fraction addition and subtraction problems, researchers have accentuated the importance of developing helpful mathematics textbooks to foster student learning (Charalambous et al., 2010; Son, 2012).

Several studies have been conducted to examine fraction addition and subtraction problems in mathematics textbooks. Charalambous et al. (2010) explored fraction addition and subtraction problems in the mathematics textbooks in Taiwan, Cyprus, and Ireland and Son (2012) investigated the same in the U.S. and South Korean mathematics textbooks. More recently, Yang (2018) examined four fraction operations in mathematics textbooks in Finland and Taiwan. These studies have reported that in comparison to mathematics textbooks in Asian countries, textbooks in Western countries included more problems with symbolic representation (Son, 2012; Yang, 2018). Furthermore, Asian mathematics textbooks chiefly included high cognitive demanding problems, whereas Western mathematics textbooks predominantly comprised low cognitive demanding problems (Charalambous et al., 2010). Although these studies provide new insights into how to design fraction addition and subtraction problems from the international perspective, they examined fraction operation problems without considering the types of denominator.

However, the student's problem-solving process in fraction addition and subtraction problems are different whether the denominator is like or unlike (Aliustaoğlu et al., 2018; Kara & Incikabi, 2018; NCTM, 2000; Torbeyns et al., 2015). In like denominator (LD) problems, students do not need to be concerned about the denominators and are expected to simply

add the numerators, whereas in unlike denominator (UD) problems, students are required to find a common denominator for equalization before adding numerators, such as 1/2 + 2/3 = 3/6 + 4/6. Therefore, mathematical knowledge and skills for solving LD and UD problems are different, even though they are both fraction addition and subtraction problems.

Textbook analysis should focus on what learning opportunities are presented to the students according to the types of problems because students become aware of essential aspects of mathematical learning by solving questions in the textbooks (Hadar, 2017; Li et al., 2009). However, there are unanswered questions about how mathematics textbooks present fraction addition and subtraction problems according to the types of denominator. Therefore, the primary objective of this study was to examine what learning opportunities are presented to students for solving LD and UD problems and to gain insights into how to revise the existing fraction addition and subtraction content in textbooks. To accomplish this goal, we selected different U.S. and South Korean mathematics textbooks. The U.S. textbooks and educational system, as a global benchmark, have been selected and analyzed by several researchers for global comparisons (Son & Diletti, 2017). Moreover, South Korean students have continuously manifested outstanding performances in international-level tests, such as TIMSS (Mullis et al., 2020). Analyzing mathematics textbooks in the U.S. and South Korea would prospectively contribute to the development of fraction addition and subtraction textbooks and students' understanding of them. The research questions are as following:

1. In the context of horizontal dimension, what are the differences in topic sequence and frequency of fraction addition and subtraction problems between the mathematics textbooks in the U.S. and South Korea?

2. In the context of vertical dimension, what are the differences in contextual features, cognitive demands, and problem-solving activities of fraction addition and subtraction problems between the mathematics textbooks in the U.S. and South Korea?

Methods

Textbook Selection

There is no particular national mathematics textbook in the U.S. and schools utilize various types of mathematics textbooks considering student's ability and school context. We used Everyday Mathematics 4th edition (EM; University of Chicago School Mathematics Project, 2015) for comparison with South Korean mathematics textbook (KM). The reason for such selection is that EM is supported by the National Science Foundation and is one of the three most frequently used elementary mathematics textbooks in the U.S. (Malzahn, 2013). Unlike the U.S., South Korean educational system is centralized. All elementary textbooks are developed and published by its Ministry of Education. Therefore, there is only one national elementary mathematics textbook series in South Korea. The latest version of KM was revised in 2015 (Ministry of Education, 2015), which was chosen for this study. Both EM and KM introduced fraction addition and subtraction in grades 4 and 5. Thus, we examined fraction addition and subtraction problems in students' textbooks and supplementary materials (e.g., student workbooks) at these two grade levels.

Analytical Framework

Researchers have reported that both horizontal and vertical features of a textbook affect students' mathematical learning (Hadar, 2017; Stein et al., 2007). Therefore, we developed an analytical framework across the two dimensions based on several previous studies (Alajmi, 2012; Charalambous et al., 2010; Li et al., 2009; Son, 2012; Stein et al., 2007; Tan et al., 2018). Regarding the horizontal analysis, we examined the topic sequence and frequency (i.e., allocation of the topic). Furthermore, regarding the vertical analysis, we examined the contextual features, cognitive demands, and problem-solving activities (see Table 1). In the following, we explain specifically the analytical framework.

Topic Sequence and Frequency. We first examined the sequence of fraction addition and subtraction lessons (Charalambous et al., 2010; Son, 2012). As each lesson contained a unique type of mathematical algorithm, it was classified based on two criteria: (a) types of denominator (i.e., LD and UD) and (b) types of operation (i.e., addition, subtraction, and both). While some lessons contained operation with natural numbers, we only focused on fraction operation. For example, a lesson introducing $c - \frac{b}{a} - d\,\frac{e}{a}$ algorithm was classified as LD and subtraction lesson. Six types of topics existed in textbooks, including three topics for LD ($\frac{b}{a}+\frac{c}{a}$, $\frac{b}{a}-\frac{c}{a}$, $\frac{b}{a}+\frac{c}{a}-\frac{d}{a}$) and three topics for UD ($\frac{b}{a}+\frac{d}{c}$, $\frac{b}{a}-\frac{d}{c}$, $\frac{b}{a}+\frac{d}{c}-\frac{f}{e}$). Subsequently, we counted the number of individual type of lessons to examine topic frequency. This process enabled us to understand which textbooks focus more on what types of fraction addition and subtraction problems.

Contextual Features. Contextual features refer to how the mathematical problems were illustrated in textbooks. Various contextual features help students think about diverse problem-solving contexts and strategies (Alajmi, 2012; Tan et al., 2018). In particular, representations help students develop accurate understanding of fraction concepts and operations

Table 1
Analytical Framework for Fraction Addition and Subtraction Problems

Dimension	Component of analysis	Category
Horizontal	Topic sequence and frequency	LD problems -Addition, Subtraction, Both UD problems -Addition, Subtraction, Both
Vertical	Contextual features	Symbolic Simple word Word with representation Word with story
	Cognitive demands	Memorization Procedures without connections Procedures with connections
	Problem-solving activities	Understanding Estimating Exploring Resolving Explaining

Note. LD and UD refer to like denominator and unlike denominator, respectively.

(NCTM, 2000). Yang (2018) suggested two criteria for contextual features, including contextualized and non-contextualized (e.g., purely mathematical problems). However, from the pilot analysis, we found that two criteria were not enough to classify all mathematical problems. Therefore, we developed our own framework built on previous studies (e.g., Alajmi, 2012). The developed framework consisted of four elements: symbolic, simple word, word with representation, and word with story problem. The symbolic problem refers to the problems with mathematical symbols and notations and the simple world problem refers to the problems with simple sentences. These two types of problems do not include any contextualization. The word with representation problem refers to the problems with representation, such as figures and number lines. The word with story problem refers to the problems with real-life context. Table 2 encapsulates instances of each type of contextual feature.

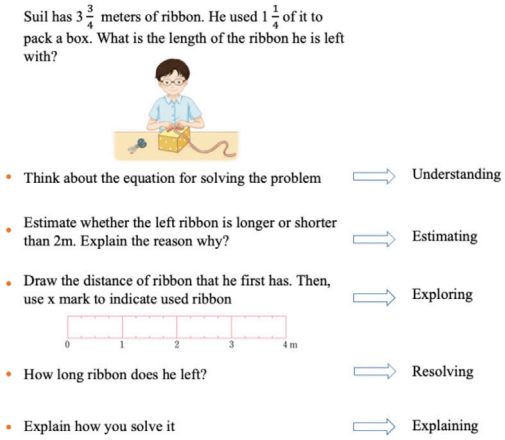
Cognitive Demands. Even though when the problems utilize the same contextual feature, the level of cognitive demand might be different. For example, simple word problems can be designed to recall a basic fact or property as low-level thinking (e.g., how many $\frac{1}{4}$s in $\frac{3}{4}$?) or to explain problem-solving strategies as high-level thinking (e.g., solve $\frac{3}{5}+\frac{4}{5}$ on the number line and explain the way to solve it). Therefore, it is crucial to analyze problems further in terms of the cognitive demand. Cognitive demands indicate the level of thinking required when students are solving problems (Son & Diletti, 2017; Stein et al., 2000). While some researchers have used two levels of cognitive demands, such as high or low cognitive demands, for analyzing mathematics textbooks (e.g., Son & Diletti, 2017), the four levels of cognitive demand proposed by Stein et al. (2000) are most extensively used by researchers (Charalambous et al., 2010; Tan et al., 2018). The four levels comprise memorization, procedures without connections, procedures with connections, and doing mathematics. The first two levels are related to low levels of cognitive demands. Memorization refers to the problems asking students to recall previously learned facts, formulas, or definitions. Procedures without connections refer to problems asking students to use algorithms (i.e., procedural knowledge) to solve problems. The last two levels are related to high levels of cognitive demands. Procedures with connections expect students to utilize their deeper understanding of mathematical concepts when solving problems, although they use a certain algorithm. Doing mathematics encompasses the problems that expect the students to use complex and non-algorithmic thinking. In addition, this level requires the students to understand the nature of mathematical concepts through self-monitoring. We decided to use the first three levels of cognitive demands for this study, because the last level, doing mathematics, is not exhaustively presented in elementary mathematics textbooks (Charalambous et al., 2010). Table 3 illustrates examples of the three types of cognitive demands.

Problem-Solving Activities. A mathematical problem entails several mathematical activities to guide students' mathematical investigation. Pólya (1945) proposed four mathematical activities for solving a problem, including understanding the problem, devising a plan, carrying out the plan, and looking back at the result. Similarly, current mathematics textbooks propose various problem-solving activities for solving a complex problem, such as estimating, exploring, resolving, and explaining (e.g., Gracin, 2018; NCTM, 2000). Therefore, we developed five categorizations for analyzing problem-solving activities in textbooks based on the previous studies: understanding, estimating, exploring, resolving, and explaining. It shall be remarked that not all problems in textbooks contain these five types of activities (Gracin, 2018; Son et al., 2020). Understanding refers to making sense of the information, such as number, equation, and figure, given in a problem. Estimating

refers to estimating answer or quantity of a problem or estimating problem-solving strategies. Exploring refers to exploring answer of a problem by employing the suggested information. Resolving refers to finding and deciding an answer of a problem. Explaining refers to describing the problem-solving strategies and rationale behind an answer to justify their reasoning. Figure 1 illustrates an example of each type of problem-solving activity.

Figure 1

Example of Each Type of Problem-Solving Activity (from KM 4th, p. 16, Translated by Authors)



Coding and Reliability

All the problems in EM and KM were coded by two authors, who independently coded 20% of the examples (130 cases) across the horizontal and vertical dimensions and subsequently compared their coding to the problems. The inter-coder reliability was calculated using Cohen's Kappa coefficient and its value was .74. The two coders met and resolved any discrepancies through discussion. After clarifying categorization of coding system, they again coded 40% of the examples (260 cases), including 20% of examples used for the first coding step. The value of Cohen's Kappa coefficient was found to be .93, revealing a substantial agreement between the two researchers (Agresti, 2018). Then, each author coded the remaining 30% of the examples, respectively.

Data Analysis

We first examined the topic sequence and frequency at the horizontal dimension. At this stage, we analyzed the lesson title and main mathematical algorithm discussed in each lesson. Second, at the vertical dimension, we assessed the context features, cognitive demands, problem-solving activities of individual fraction addition and subtraction problems. Note that we separately coded and counted LD and UD problems. A total of 663 problems from EM and KM were examined. Of the 663 problems, however, only 180 problems were investigated for problem-solving activities because other problems did not include specific problem-solving activities. Furthermore, we implemented chi-square tests or Fisher's exact tests to examine the statistical differences between EM and KM. We employed SPSS 21.0 for chi-square tests and astatsa.com, a web- based statistical calculator, for Fisher's exact tests (Vasavada, 2016). Fisher's exact tests were performed when 20% of the expected values were smaller than five (Agresti, 2018). We used an alpha level of .05 to examine the statistical significance of the results.

Results

Topics Sequence and Frequency

The number of lessons for LD and UD was similar for EM and KM. As depicted in Table 4, EM had nine lessons for LD and seven for UD, and KM had nine lessons each for both LD and UD. However, the topic sequence and frequency were observed to be different. EM

Table 2

Categorization of Contextual Features (from KM 4th, Translated by Author)

Type	Example
Symbolic	Find the sum (a) $\frac{1}{4}+\frac{2}{4}$ (b) $\frac{3}{6}+\frac{2}{6}$
Simple word	Find two proper fractions satisfying the following conditions. (a) The denominators of them are 6. (b) The sum and difference of them are $\frac{5}{6}$ and $\frac{3}{6}$, respectively.
Word with representation	Display $\frac{3}{4}$ - $\frac{1}{4}$ on the square below and find the difference.
Word with story	Suil has $3\frac{3}{4}$ meters of ribbons. He used $1\frac{1}{4}$ of it to pack a box. How many ribbons is he left with?

Table 3

Categorization of Cognitive Demands (from EM 4th)

Type	Example
Memorization	Write an equation to show the fraction as the sum of unit fractions (a) $\frac{4}{12}$ =
Procedures without connections	On Sunday, Tom ran $\frac{3}{9}$ of a mile more than Paul. Pan ran $\frac{7}{9}$ of a mile. How far did Tom run? Write number model with an unknown variable.
Procedures with connections	Decompose $\frac{5}{8}$ into a sum of fraction with the same denominator in three ways.

introduced both LD and UD problems simultaneously in a single unit, although grades 4 and 5 focused more on LD and UD problems, respectively (see Table 5). For instance, EM introduced seven lessons addressing fraction with LD problems and two lessons addressing fraction with UD problems at grade 4 (grade 4, lessons 5.4 and 5.5). Moreover, prior to introducing fraction addition at grade 4, EM addressed fraction decomposition and composition (e.g., $\frac{b}{a}=\frac{c}{a}+\frac{d}{a}$). The following lessons are extended to adding fractions with UD (e.g., $\frac{b}{10}+\frac{c}{100}$). Likewise, in grade 5, EM first introduced fraction addition and subtraction with LD that students already learned in the previous year. Then, the textbook introduced fraction addition and subtraction with UD. Because some lessons were designed to check students' understanding of previously learned algorithms, fraction addition and subtraction problems were not evenly distributed. Of the 16 lessons, lessons 11, 3, and 2 were related to addition, subtraction, and both, respectively (see Tables 4 and 5). Therefore, students were provided with minimal learning opportunities for practicing fraction subtraction problems. In particular, there was only one fraction subtraction with UD lesson (grade 5, lesson 5.4).

Table 4
Topic Frequency of Fraction Addition and Subtraction Problems in EM and KM

Denominator	Operation	Frequency			
		EM		KM	
		Grade 4	Grade 5	Grade 4	Grade 5
LD	Addition	5		2	
	Subtraction	2		5	
	Both		2	2	
UD	Addition	2	4		5
	Subtraction		1		3
	Both				1
Total		9	7	9	9

Note. Each number indicates the number of lessons addressing the operation.

In contrast to EM, KM had a rigid structure according to the types of denominators (see Table 6). In grades 4 and 5, students only learned about LD and UD problems, respectively. Moreover, although EM discussed previously learned mathematical algorithms before introducing new algorithms, KM directly introduced new algorithms without repeating the previous ones. Furthermore, unlike EM, the number of addition and subtraction lessons were similar (seven for addition and eight for subtraction). As a result, South Korean students were provided more equal learning opportunities for practicing fraction addition and subtraction, enabling them to learn various fraction problems.

Context Features

Table 7 displays the distribution of the contextual features on fraction addition and subtraction problems in EM and KM. The chi-square test was used to examine whether the contextual features between EM and KM were significantly different. Regarding the LD problems, the result of the chi-square test (x^2 [df = 3] = 6.427, p = .093) was not statistically significant, implying no significant relationship between the contextual features and textbooks in LD problems and that the distribution of the four types of contextual features were similar between the two textbooks.

However, the chi-square test for UD problems revealed significant differences between EM and KM (x^2 [df = 3] = 50.898, p < .001), which indicated that the proportion of the contextual features varied as a function of textbooks. The gap between EM and KM in word with story problem was negligible (4.2%). However, the gaps in the other contextual features were more than 10%. The largest proportion of contextual features in EM was of symbolic problems (49.1%), followed by simple word (32.9%) and word with story problems (18.0%); there were no word with representation problems (0%). However, the largest percentage of contextual features in KM was of simple word problems (54.1%), followed by symbolic (19.5%), word with story (13.8%), and word with representation problems (12.6%). The findings indicate that the students using EM and KM had similar learning experiences in terms of using contextual features in solving LD problems. However, the students using EM might not be provided with any learning opportunities using representations for solving UD problems. Instead, they were expected to focus more on symbolic and simple word UD problems than the students using KM.

Table 5

Topic Sequence of Fraction Addition and Subtraction Problems in EM

EM grade 4 second semester	EM grade 5 second semester
Unit 5. Fraction and mixed-number computation; measurement Unit 8. Fraction operations; applications	Unit 3. Fraction concepts, addition, and subtraction Unit 5. Operations with fractions
5.1 Fraction decomposition ($\frac{b}{a}=\frac{c}{a}+\frac{d}{a}$)	3.9 Introduction to addition and subtraction of fractions and mixed numbers ($d\frac{b}{a}+e\frac{c}{a}$, $d\frac{b}{a}-e\frac{c}{a}$)
5.2 The whole for fractions ($1=\frac{b}{a}+\frac{c}{a}$)	3.10 Exploring addition of fractions with UD ($\frac{b}{a}+\frac{d}{c}$)
5.3 Adding fractions ($\frac{b}{a}+\frac{c}{a}$)	3.12 Solving fraction number stories ($d\frac{b}{a}+e\frac{c}{a}$, $d\frac{b}{a}-e\frac{c}{a}$, $\frac{b}{a}+\frac{d}{c}$)
5.4 Adding mixed numbers ($d\frac{b}{a}+e\frac{c}{a}$)	5.1 Using equivalent fractions to find common denominators ($\frac{b}{a}+\frac{d}{c}$)
5.5 Adding tenths and hundredths ($\frac{b}{10}+\frac{c}{100}$)	5.2 More strategies for finding common denominators ($\frac{b}{a}+\frac{d}{c}$)
5.6 Queen Arlene's dilemma ($\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=1$)	5.3 Addition of fractions and mixed numbers ($e\frac{b}{a}+f\frac{d}{c}$)
5.7 Subtracting fractions ($\frac{b}{a}-\frac{c}{a}$, $c-\frac{c}{a}$)	5.4 Subtraction of fractions and mixed numbers ($\frac{b}{a}-\frac{d}{c}$, $e\frac{b}{a}-f\frac{d}{c}$)
5.8 Subtracting mixed numbers ($d\frac{b}{a}-e\frac{c}{a}$, $c-d\frac{b}{a}$)	
8.6 Fractions and perimeter ($\frac{b}{a}+\frac{c}{a}$, $d\frac{b}{a}+e\frac{c}{a}$)	

Table 6

Topic Sequence of Fraction Addition and Subtraction Problems in KM

KM grade 4 second semester	KM grade 5 first semester
Unit 1. Fraction addition and subtraction	Unit 5. Fraction addition and subtraction
1.1 Fraction addition 1 ($\frac{b}{a}+\frac{c}{a}$)	5.1 Fraction addition 1 ($\frac{b}{a}+\frac{d}{c}$)
1.2 Fraction subtraction 1 ($\frac{b}{a}-\frac{c}{a}$)	5.2 Fraction addition 2 ($\frac{b}{a}+\frac{d}{c}$)
1.3 Fraction addition 2 ($d\frac{b}{a}+e\frac{c}{a}$)	5.3 Fraction addition 3 ($e\frac{b}{a}+f\frac{d}{c}$)
1.4 Fraction subtraction 2 ($d\frac{b}{a}-e\frac{c}{a}$)	5.4 Fraction subtraction 1 ($\frac{b}{a}-\frac{d}{c}$)
1.5 Fraction subtraction 3 ($c-\frac{c}{a}$, $c-d\frac{b}{a}$)	5.5 Fraction subtraction 2 ($e\frac{b}{a}-f\frac{d}{c}$)
1.6 Fraction subtraction 4 ($d\frac{b}{a}-e\frac{c}{a}$)	5.6 Fraction subtraction 3 ($e\frac{b}{a}-f\frac{d}{c}$)
1.7 Challenging mathematics ($c-d\frac{b}{a}+\frac{e}{a}$)	5.7 Challenging mathematics ($e\frac{b}{a}+f\frac{d}{c}$)
1.8 Problem solving ($d\frac{b}{a}-e\frac{c}{a}$, $d\frac{b}{a}+e\frac{e}{a}$)	5.8 Problem solving ($e\frac{b}{a}+f\frac{d}{c}$, $e\frac{b}{a}-f\frac{d}{c}$)
1.9 Exploring mathematics ($c-\frac{b}{a}-d\frac{e}{a}$)	5.9 Exploring mathematics ($e\frac{b}{a}+f\frac{d}{c}$)

Table 7

Frequency of Each Contextual Feature

	LD			UD		
Context feature	EM	KM	$x^2(df)$	EM	KM	$x^2(df)$
Symbolic	37 (21.0%)	43 (26.7%)	6.427(3) (p = .093)	82 (49.1%)	31 (19.5%)	50.898(3)***
Simple word	75 (42.6%)	65 (40.3%)		55 (32.9%)	86 (54.1%)	
Word with representation	33 (18.8%)	38 (23.6%)		0 (0.0%)	20 (12.6%)	
Word with story	31 (17.6%)	15 (9.4%)		30 (18.0%)	22 (13.8%)	
Total	176	161		167	159	

Note. *** refers to <.001

Cognitive Demand

Table 8 shows the distribution of the cognitive demand between EM and KM. For LD, the results of the chi-square test showed a significant difference between EM and KM (x^2 [df = 2] = 24.016, p < .001), which implies that the frequency and percentage of cognitive demand in fraction addition and subtraction with LD problems varied as a function of textbooks. Procedures without connections problems were the most frequent type of problem in both the textbooks (65.9% from EM, 55.3% from KM). However, EM had more memorization problems (23.3%) than procedures with connections problems (10.8%), whereas KM had more procedures with connections problems (31.6%) than memorization problems (13.1%).

Similar to LD problems, UD problems in both the textbooks emphasized procedures without connections problems than the other types of

Table 8
Frequency of Each Cognitive Demand

	LD			UD		
Cognitive demand	EM	KM	$x^2(df)$	EM	KM	$x^2(df)$
Memorization	41 (23.3%)	21 (13.1%)		8 (4.8%)	10 (6.3%)	
Procedures without connections	116 (65.9%)	89 (55.3%)	24.016(2)***	150 (89.8%)	122 (76.7%)	11.915(2)**
Procedures with connections	19 (10.8%)	51 (31.6%)		9 (5.4%)	27 (17.0%)	
Total	176	161		167	158	

*Note. *** refers to <.001 and ** refers to <.01*

problems (89.8% from EM, 76.7% from KM). However, the chi-square test showed significant differences between them (x^2 [df = 2] = 11.915, p < .01), indicating that the distribution of cognitive demand was statistically different between EM and KM. Whereas 5.4% of problems in EM focused on procedures with connections problems, 17% of problems in KM were procedures with connections problems. These findings indicate that regardless of the type of denominators, the students using EM are more likely to use low-level thinking for solving fraction addition and subtraction problems than students using KM. In other words, students using EM are provided relatively limited learning opportunities to facilitate high-level thinking than the students using KM.

Problem-Solving Activities

Table 9 shows the distribution of the problem-solving activities presented in EM and KM. For LD, a Fisher's exact test of the association between problem-solving activities and textbook type was significant (p < .001), indicating a significant difference between EM and KM with varying problem-solving activities. The largest proportion of problem-solving activities in EM focused on understanding (50%), followed by exploring (25%) and resolving (25%). However, there were no activities for estimating (0%) and explaining (0%). By contrast, KM had a more even distribution across the five mathematical activities with each activity having a proportion more than 10%: exploring (37.9%), explaining (21.6%), resolving (18.9%), estimating (10.8%), and understanding (10.8%).

For UD, the test of association between textbooks and problem-solving activities was significant (Fisher's exact test, p < .001). In EM, resolving activities were the most frequent (35.8%), followed by estimating (28.3%), understanding (17.0%) exploring (13.2%), and explaining (5.7%). In contrast, KM did not have any resolving activities (0%) and exploring had the largest proportion (41.2%), followed by estimating (20.6%), explaining (20.6%), and understanding (17.6%). In summary, the students using KM are more likely to experience exploring and explaining activities for solving fraction addition and subtraction problems than the students using EM.

Discussion

This study examined EM and KM fraction addition and subtraction problems with regard to the types of denominators. By virtue of categorizing fraction problems according to the types of denominators, we discovered certain differences between EM and KM. For the horizontal dimension, the results demonstrated that there were differences in the topic sequence and frequency between EM and KM. Both textbooks generally introduced LD and UD at grade 4 and grade 5, respectively. Meanwhile, EM has more flexible structure than KM. Some LD and UD lessons in EM were included in subsequent year's textbooks. Moreover, because some lessons were designed to check previously learned algorithms, EM did not provide sufficient lessons for introducing fraction subtraction. Of the 16 lessons, there were only three lessons solely focusing on fraction subtraction. That is, the students using EM were provided minimal learning opportunities for practicing fraction subtraction problems.

In contrast, KM was observed to have a very rigid structure. It did not repeat previously leaned mathematical algorithms; instead, fourth and fifth graders only learned about LD and UD problems at their grade levels. Moreover, lessons on addition (seven) and subtraction (eight) were almost uniformly distributed. As KM did not provide the students with opportunities to learn again the previously learned algorithms, students without a clear understanding of them might encounter difficulties in learning new algorithms. At the expense of it, however, students were provided sufficient time for learning new algorithms, which helped them learn and practice various fraction addition and subtraction problems. Mathematical contents in the textbooks affect students' learning opportunities and mathematics achievement (Hadar, 2017; Stein et al., 2007; van den Ham & Heinze, 2018). Therefore, EM might provide the students with more opportunities for learning fraction subtractions. Additionally, KM might provide a lesson

Table 9
Frequency of Each Problem-Solving Activity

	LD			UD		
Problem solving activity	EM	KM	Fisher's exact Test	EM	KM	Fisher's exact test
Understanding	28(50%)	4(10.8%)		9(17.0%)	6(17.6%)	
Estimating	0(0.0%)	4(10.8%)		15(28.3%)	7(20.6%)	
Exploring	14(25.0%)	14(37.9%)	$p < .001$	7(13.2%)	14(41.2%)	$p < .001$
Resolving	14(25.0%)	7(18.9%)		19(35.8%)	0(0.0%)	
Explaining	0(0.0%)	8(21.6%)		3(5.7%)	7(20.6%)	
Total	56	37		53	34	

for checking previously learned algorithms to enable students practice them.

To examine the vertical dimension, this study examined the contextual features, cognitive demands, and problem-solving activities in textbooks. First, the findings of this study showed that the four types of contextual features used for LD problems were similar between EM and KM. However, their distribution for UD problems between EM and KM varied significantly. In particular, EM did not contain any word with representation problem for fraction with UD. This result contradicts previous studies that reported mathematics textbooks in Western countries including more problems with symbolic representation (Son, 2012). The differences between the previous studies and the current study might be caused by the fact that South Korean mathematic textbooks were revised in 2015 to include more problems with representations (Ministry of Education, 2015). NCTM (2000) remarked "Representation should be treated as essential elements in supporting students' understanding of mathematical concepts and relationships" (p. 67). In addition, NCTM (2000) found that using various representations improves students' understanding of and operation with fraction addition and subtraction. Therefore, it can be suggested that EM should devote considerable attention to incorporate more representation problems.

Second, the frequency and percentage of the cognitive demand in LD and UD problems varied as a function of textbooks. Procedures without connections problems were the most frequent type in both the textbooks. However, the second largest problems in EM and KM were memorization problems and procedures with connections problems, respectively. This supports a previous study that mathematics textbook in Asian countries included more cognitively challenging problems (Charalambous et al., 2010). As problems in EM required students to use low-order thinking skills for solving problems, they are unlikely to develop a deeper conceptual understanding of fraction addition and subtraction. Conversely, the students using KM were provided more cognitively challenging learning opportunities on fraction addition and subtraction than those using EM. These different learning opportunities may negatively affect students' mathematics outcomes (Hadar, 2017; van den Ham & Heinze, 2018). Therefore, the author of EM is recommended to update fraction addition and subtraction problems with respect to the cognitive demand.

Third, the results revealed that EM and KM were significantly different regarding the distribution of problem-solving activities. In both LD and UD problems, EM focused more on understanding and resolving, whereas KM focused more on exploring and explaining. These findings indicate that the students using EM are likely to attend to understanding information presented in a problem and find its solution. However, they were provided relatively less opportunities to not only explore and compare diverse problem-solving strategies, but also explain and justify their findings to peers and teachers than the students using KM. These findings are consonant with Gracin (2018), reporting that mathematics textbooks tend to provide limited range of mathematical activities. As teachers are likely to use problem-solving activities presented in textbooks, students seldom experience other activities not presented in the textbooks (Stein et al., 2007). Therefore, both EM and KM are suggested to be revised to include more evenly the five problem-solving activities.

Conclusion

Developing high-quality textbooks is cardinal for ensuring students' mathematical learning opportunities and improving their outcomes (Bellens et al., 2020; Hadar, 2017). Existing literature has offered guidance on how to design fraction addition and subtraction problems with regard to horizontal and vertical dimensions (e.g., Son, 2012). However, it did not consider the types of denominators. In this study, we investigated the topic sequence and frequency, contextual features, cognitive demands, and problem-solving activities in EM and KM considering LD and UD problems. Moreover, we implemented chi-square and Fisher's exact tests to examine statistical differences between the textbooks. Although we only examined mathematics textbooks in the U.S. and

South Korea, the findings of the study can provide the groundwork to the textbook developers in other countries for designing future fraction addition and subtraction contents. Moreover, teachers may use mathematics textbooks by considering the horizontal and vertical dimensions of the problems discussed in this study. They may modify their instructions or textbooks to provide the students with adequate learning opportunities.

This study has two limitations. First, we only examined one series of mathematics textbooks in the U.S., although it has different series of mathematics textbooks. Therefore, while EM was one of the three most frequently used elementary mathematics textbooks in the U.S. (Malzahn, 2013), the findings of this study could not be interpreted as characteristics of all the U.S. mathematics textbooks. Second, we did not analyze the use of textbooks by the teachers in classrooms. As teachers may use textbooks in different ways (Stein et al., 2007), we cannot readily assume that characteristics of fraction problems in textbooks directly influence students' learning opportunities. That is, some teachers might not use the content presented in textbooks, and others might introduce content not presented in the textbooks. Therefore, the findings of this study should be interpreted with caution. Given these limitations, we suggest future studies. First, more studies are essential to examine the horizontal and vertical dimensions of fraction addition and subtraction problems by using a series of textbooks. Second, further efforts are required to investigate how teachers and students use mathematics textbooks in classrooms. The findings of these future studies can plausibly ensure students' learning opportunities and improve their mathematics achievement with regard to fraction addition and subtraction.

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"In Fact, We Can All Decide": An Action Research on the Participation Right of Young Children

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Abstract

In this research, it is aimed to plan concrete and new arrangements that will encourage participation right and evaluate how these arrangements contribute to children's participation. The participants of the study are comprised of 41 5-year-old children attending the kindergarten in a province in Turkey's inner Aegean region. In the research, triangulation was used, and Participation Right Scale in Preschool Classes (Koran, 2017; Şallı İdare, 2018), interview form (Thayer and Schiff (1969), facial expressions form, observation form, and field notes were used as data collection tools. When the results from the scale, observations, and interviews were evaluated, it was determined that children began to express their views on the planning of programme activities and began taking an active role in decision making. Furthermore, it was concluded that children began to be active participants in the learning process and liked the arrangements and the materials they used in the classroom. This action research, focusing on the children's participation right, is thought to contribute to academic and social studies on how the participation right in school can be transferred from theory to practice. Comprehensive action plans can be developed by experts working on children and education policy makers in order to implement children's participation right in school.

Keywords:

Action Research, Participation, Participation Right, Young Children.

Introduction

It is highlighted that child participation is one of the critical issues in early childhood education (Clark & Moss, 2010; Venninen & Leinonen, 2013). According to the United Nations Committee on the Rights of the Child (2009) participation is sharing information and listening to children. After the first step of participation, including information sharing and listening, children's decision making abilities regarding their daily lives are considered as active participation (Alderson, 2008; Shier, 2001). Article 12 of the United Nations Convention on the Rights of the Child (1989) impresses children's opinions on situations where their concerns

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should be taken into account. The implementation of this item is remarked as a "practice of participation" (United Nations Committee on the Rights of the Children, 2009). Children need to practice decision-making to be active decision-makers (Hart, 1992). The right to participate includes the freedom of children to express themselves with or without language, the freedom of thought, the right to information, the right to take their views in their daily lives (Nyland, 2009). For this purpose, it entails understanding that all children have the capacity to express their opinions, providing environments where they can express their opinions easily, being aware of the situations that concern them, and respecting their opinions according to their age and maturity (Landsdown, 2005).

Although participation right is emphasized in early childhood policies and programs, it is still limited in practice (Bae, 2009; Theobald et al., 2011). Child participation requires children as active and democratic citizens to have a voice in areas that affect their lives, such as education (Horgan, 2017). Hammersley (2017) states that adults should not have an authoritarian view of children to be taken into account for the views of young children. Providing children with the opportunity to express their views on issues related to them depends on their perspective on their competencies. Perceiving children as active and capable members of society guides their participation (Hester & Moore, 2018). Participation is about children's self-regulation and individual freedom, and interaction between adults and children and adults' control over children's school life affect this process (Puroila et al., 2012).

The teacher has an essential role both as an observer and a supporter of their skills development to encourage children's participation (Berthelsen, 2009). The participation of young children in school differs depending on the teacher's communication, attitude, rules, and power (Emilson & Johansson, 2018; Johansson et al., 2016). Teachers can encourage participatory practices at different levels from three different perspectives; including being open to the idea of participation, creating opportunities for participatory experiences, and realizing these new participatory experiences in daily practice (Shier, 2001). In order to ensure participatory processes by considering the needs of children, it is necessary to take into account children's opinions (Muela et al., 2019). A little guidance for teachers to make them understand children's opinions and integrate them will be sufficient (Sargeant & Gillett-Swan, 2019). Failure to consider children's opinions stems from reasons such as teachers' perspectives on children, insufficient support for teachers to improve classroom participation, excessive classroom capacity, and the number of children quota per teacher (Smaree-Manassakis, 2019). Children are not provided with environments where they can start the process spontaneously or direct them in schools (Theobald & Kultti, 2012). The fact that teachers are regarded as the organizers of the classroom environment, who has the responsibility to provide space for children, causes children to be perceived as only users rather than participants. (Donaldson, 2015; Taylor et al., 2015). Based on all these factors, it is required to support child participation and design new educational approaches and practices that value children's opinions as a member of the group (Venninen, Leinonen, Lipponen, & Ojala, 2014). This study will discuss the new arrangements planned to support classroom participation.

It is essential to approach child participation in early childhood from a theoretical perspective, from a convenient viewpoint, for children to be involved in decision-making processes (Church & Bateman, 2019). Teachers have difficulties in taking children's opinions into account in the classroom. This is due to the challenges that children have encountered in using appropriate methods such as visual methods and supporting their participation in discussions that affect their experiences in school (Kanyal & Cooper, 2012). In the busy and structured daily schedule, there is not enough time for teachers to listen to children or the opportunity for children to express their opinions. Therefore, it is essential to change daily routines, schedules, and review general goals to encourage child participation (Ojala & Venninen, 2011). Providing enough time for children to listen individually or in a group, establishing routines for children's interests and needs, discussing classroom rules and making decisions together, and getting children's opinions about solving problems to include suggested ways to support participation (Clark, McQuail, & Moss, 2003). By creating learning environments with democratic and participatory features, the political and social importance of participation will be highlighted (Clement, 2019). It is emphasized that child participation should be supported by designing and creating learning environments (Clark, 2010; Correia & Aguiar, 2017). It is important to organize daily routines by taking children's opinions into account to create a participatory environment in the classroom and build participation culture (Joseph et al., 2010).

It is emphasized that novel participatory methods and practices can be developed to encourage child participation (Clark & Moss, 2010; Venninen et al., 2012). Previous studies examined participatory experiences in the classroom (Clement, 2019; Houen et al., 2016; Leinonen & Venninen, 2012; Smaree-Manassakis, 2019). A study by Johansson et al., (2016) found that children were given the opportunity to express themselves in the classroom, but teachers rarely took children's opinions into account. The results revealed that children's opinions are taken into account only when they are consistent with adults' previous plans and

expectations. In a study of Leinonen and Venninen (2012) examining the participation of young children in planning their learning processes at school, it was observed that children did not participate sufficiently in planning, and evaluation was insufficient. Instead of limiting children's participation in decision-making process in learning environments, it is necessary to ensure that they also become an active determinant of the learning process (Church & Bateman, 2019). While considering all these, this study aimed to plan concrete and new arrangements that will encourage child participation and evaluate how these arrangements contribute to children's decisions about the daily schedule, learning environment, and their emotional responses to materials and arrangements. This study will be critical to reveal how theoretical ideas on child participation will affect the implementation and an action plan that will encourage child participation in enriching the future studies on child participation in classroom.

Method

Research Design

The study conducted an action research, one of the qualitative research methods. Action research is an analysis process that is conducted to determine and improve the quality of teaching and methods applied in the school or classroom environment (Johnson, 2015). According to Yıldırım and Şimşek (2016), action research is a study that is conducted by a practitioner alone or with a researcher, and includes systematic data collection and analysis that aims to reveal and solve problems that may arise during the implementation process. In this study, participatory action research was conducted, in which the practitioner was also a researcher. Participatory action research is described as an approach that involves a social analysis with a dynamic process based on social and collaborative (Gillis & Jackson, 2002; Hendricks, 2006). Action research involves a cyclical process providing change with participatory methods (Smith, 2015). This research was conducted in four stages: choosing to change, planning for change, observing, reflecting, and acting and revising plan (MacNaughton & Hughes, 2009).

The researcher examined child participation, teacher's opinions on child participation, and research on developing children's participation in the classroom (Koran & Avcı, 2017; Salminen, 2013; Smaree-Manassakis, 2019). When she considered the studies in the literature, and during her field studies, the limited participation of children in decision-making regarding classroom activities and learning environments drew the researcher's attention. The researcher estimated that more concrete and applicable processes were required to encourage child participation. Based on all of these factors, it was focused on that the participation could develop positively with the new arrangements and materials to be prepared in the classroom.

In order to determine the participation and decision-making of children in the class, observations were made by the researcher, who will carry out the application third days a week in classrooms for two weeks and interviews were conducted with the classroom teachers. As a result, it has been observed that children are limited in their daily schedule in decision-making about classroom activities and learning environments. It was also observed that children's participation is insufficient. In order to resolve this problem and to put the change into practice, visual materials that can be used in the daily schedule of The Preschool Education Program of the Ministry of National Education (MoNE) (2013) were prepared. The arrangements for the use of these materials were planned and were carried out four days a week in classrooms for six weeks. In the third phase of the action research, all of these materials were used in the classroom for six weeks as part of the regulations in the classroom.

Participants and Settings

Criterion sampling, one of the purposeful sampling methods, was used in this study. The criteria for determining the classes in which the research can be conducted involve insufficient participation of children in classrooms none practice enhancing child participation, and preschool teachers being interested and volunteering to work. These activities planned by the researcher were performed in a kindergarten in a district center of Turkey's inner Aegean region, under the Directorate of National Education, where children with middle socioeconomic background attend. The arrangements were carried out in two classrooms for five-year-old children. There are music, science, art, and dramatic play centers in both classrooms, and there are materials suitable for children's developmental levels. Also, there is a playground for children outside the kindergarten.

One of the teachers in the applied classes has 12 years, and the other has four years of professional experience. Both teachers are female and graduate of the Preschool Education Undergraduate Program. None of the teachers took an undergraduate course on child participation and did not participate in any in-service training. In the study group, there are a total of 5-year-old 41 children, 21 boys, and 20 girls.

Procedure

Data collection was first conducted voluntarily by obtaining permission from the Directorate of National Education and consent forms from the families of the children in the study group. In this action research,

Table 1:
Action Research Process

Stage	Week	The content
Stage 1	1	Literature Review
	2	Literature Review
	3	Obtaining all required permits Determining the school and class
	4	Meeting with the teacher and getting approval
Stage 2	5	Observing children's participation and the classroom
	6	Observing children's participation and classroom
	7	Pre-test-Interviews
	8	Pre-test-Interviews
Stage 3	9	Classroom arrangements-observation-interview-field notes-photos
	10	Classroom arrangements
	11	Classroom arrangements
	12	Classroom arrangements
	13	Classroom arrangements
	14	Classroom arrangements
Stage 4	15	Post-test-Interviews
	16	Post-test-Interviews

Table 2
Materials Used in the Research

Material Name	How to use it
Rabbit Bondi	When starting the day, children place a card with the day written on it in the rabbit's pocket. Every day one of the children places a symbol/picture/text symbolizing a pre-determined conversation topic into the rabbit's pocket and starts the conversation. Children sit in a circle and share their experiences, feelings, and curiosities about that day's conversation.
Color Wheel	Children go to the learning center symbolized by the picture, which appears as they spin the wheel and play for a specific time. The playing time continues until the song of the day, determined by the children ends. When the time is up, children mark the learning centers they played on the board. Children can change the learning center by turning the wheel again, or those who want can continue playing in the center.
Caterpillar Time	Children place picture cards symbolizing activities and routines in the daily schedule on the caterpillar. They can follow the daily training flow from the caterpillar. The teacher can plan two of the activities of that day so that the children can choose, decide, and explain the optional activities to the children with the picture cards in the caterpillar. Children can participate in any of the optional activities. Besides, when the teacher is talking about the next day's activities at the time of evaluating the day, an activity type decided with the children can be put on the caterpillar.
Decision cards	The teacher may hold voting in the classroom using these colored decision cards for various situations, such as an activity selection/a field trip to be planned, etc./a material to be purchased for the classroom. For example, voting can be applied to decide on one of the two songs determined together with the children for the music during the game activity.
Story Chest	There are cubes with pictures of different actions, spoons, hand, and finger puppets belonging to different characters and dice in the chest. If they want, children can sit in a circle and tell stories/riveting events/ dreams they have, using cubes and puppets during the time to "start the day/time to evaluate the day" period. Children can change pictures and puppets on the cubes at certain times.

more than one data collection method triangulation was used, and the data collection was conducted systematically.

As discussed in the literature, different data collection methods can be applied to comprehensively conduct action research and support the findings (Johnson, 2015). Participation Right Scale in Preschool Classes, interview forms, facial expressions form, observation forms and field notes were used as data collection tools in this study.

Participation Right Scale in Preschool Classes: This scale was developed by Koran (2017) TRNC (Turkish Republic

of Northern Cyprus) to determine child participation in preschool education institutions. The reliability coefficient of the scale was found to be .85. (Koran, 2017). The validity and reliability study of the scale in Turkey was conducted by Şallı-İdare (2018). The results of the confirmatory factor analyses performed for the validity and reliability of the teacher and child form of the scale in Turkey, revealed that the factor loadings of the items were greater than .32 for all dimensions, and the four-factor structure was acceptable. The scale includes teacher and child forms, and both forms contain the same questions. The child form was used in the study. The scale consists of 23 items with two dimensions and seven sub-dimensions. The daily schedule dimension has the following three sub-dimensions: activities, playing and sharing activities in learning centers/outdoors. The determining classroom rules and procedures dimension have the following four sub-dimensions: going out of the classroom, expressing opinion in the classroom, consuming food and beverage in the classroom, and operations (Şallı-İdare, 2018).

The scale items are scored with 2 points as participation is fully took place in the decisions taken by children and adults, 1 point for the decisions made by the children only, and 0 points for an option that does not involve the children. In this study, all application steps determined by Koran (2017) were followed while implementing the scale. Before starting the application, a game was played together to make the child feel more comfortable, and permission was requested from the child for recording. During the application, the researcher and child sat face-to-face at the table, and the scale was introduced to the child at first. While reading the practitioner-scale questions, the child used a seal on the blank fields to mark the scale (Şallı-İdare, 2018). The scale was administered to the children twice, before and after the action plans were applied.

Observation form. In the second stage of this research, the researcher observed the classrooms for two weeks and recorded observations on the form to determine the children's participation, to know the classroom thoroughly, and increase the interaction with the children. During the third phase of the action plans, the researcher observed the children's participation and decision-making processes and the classroom environment for six weeks.

Interview form. In the first stage of this research, conversation-style interviews with predetermined questions were conducted with the teachers to get to know the classroom to be applied. In the second stage, focus group interviews were conducted with the children to determine child participation. Through the implementation, focus group interview, with children were held. Developed semi-structured interview forms were presented to three field experts' opinions to ensure internal validity. The required corrections were made under the views of the field experts, and the form was finalized. Interview form consists of five open-ended questions. The teachers were asked questions such as whether they decide together with the children in their daily schedule, and what they decide. In the interview form prepared for children, there are questions like, "What did you decide by using the materials in the classroom? Did you enjoy using the materials in the classroom?"

Field notes. The researcher took field notes for evaluations through the application. The field notes include children's reactions, perceptions, and differences in the arrangements performed in the classroom.

Facial Expressions Form. Facial expressions form, developed by Thayer and Schiff (1969), consists of visuals containing 11 facial expressions. Facial expressions show emotional states and include the presentation of confused, serious, happy, sad, angry emotional states in several ways. At the end of each application, the children were asked to find and mark the facial expression according to their feelings.

Data Analysis

The study uses two different research methods, qualitative and quantitative, to achieve its objective. Normality tests were implemented in order to analyze the quantitative data. As a result of the normality test (Shapiro-Wilk test) of the scores obtained from the scale applied in the study, the Wilcoxon signed-ranks test was performed for comparisons within groups as the values were not normally distributed. The significant level of .05 was set as the threshold, and it was stated that there was a statistically significant difference when $p < .05$ and that there was no statistically significant difference when $p > .05$. (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2012).

The descriptive analysis technique was used to analyze the qualitative data obtained from the observations, interviews, and field notes. In the descriptive analysis, the data are interpreted according to predetermined themes. In the first stage of the descriptive analysis, a framework is created. In the second stage, the data are processed under the framework. The findings are defined in the third stage, and while findings are interpreted in the last stage (Yıldırım & Şimşek, 2016). In this study, a diagram was constructed by determining the themes based on the research questions, and the observation results were evaluated before the application. In the second stage, an action plan was developed. The data obtained from the observations, interviews, and field notes formed during and after the implementations were analyzed according to

themes. In the last stage, the findings concerning the themes were revealed and interpreted by making direct quotations.

Validity and Reliability of the Research

It is required to ensure validity, reliability, and variation in action research (Johnson, 2015). The researcher made long-term participation and observations in the practice environment to increase the internal validity of the research (Lincoln & Guba, 1985.) The implementation steps, data collection, and participants are explained in detail to increase credibility. Besides, data triangulation was done using multiple data collection tools. The whole research process was described in detail (Lincoln & Guba, 1985) and direct quotations were made in presenting the findings to increase the external validity and transferability of the research (Yıldırım & Şimşek, 2016). Due to ethical concerns, the names of the participants were not used and thus the children were coded as C1, C2, C3, C4, etc. To ensure the reliability of the research, results, and interpretations, raw data were presented to an independent expert. For the reliability of the study, the examination and coding of the interview texts were followed by two independent researchers, and the analysis of the data was performed by the researchers separately. In order to calculate inter-coder reliability, the reliability formula Miles and Huberman (1994) was used, and the reliability between coders was calculated as .84.

Results

The findings of the research will be presented under the following three themes: the decisions made by the children about the daily schedule, and the learning environment, their emotional reactions to the materials, and arrangements.

Children's Decisions about Daily Schedule

Pre-test and Post-test Results of the Scale for Participation Right Scale in Preschool Classes

The findings of the pretest and posttest mean scores revealed that the posttest mean scores are significantly higher ($p < .05$) than the pretest scores (Table 3). Accordingly, it would be safe to say that the action plan is effective in increasing the right of children to participate in the classroom.

Results of Pre-interview and Post-interview

The results of the interviews with the children before the action plan was performed revealed that 31 of 41 children made the classroom decisions by the teachers, nine by the principal, and one by their parents. After the implementation, 34 children reported that teachers and children make decisions; three reported that only children make decisions, two children stated that the principal makes the decision, one child reported that his friend makes the decision, while one child reported that only the teacher makes decisions. While children' statement revealed that the classroom decisions were made by the *"teacher"* before the arrangements, C8 reported that *"We can make decisions too. In fact, we can all decide."* after the arrangements. While the children emphasized that the teacher makes the decisions by saying, *"Always the teacher, but sometimes we ask to go to the park."* in the C17 pre-interviews, he said, *"The teacher and we decide."* in the post-interviews. In the pre-interview, C1 said, *"I do not decide with the teacher, my teacher decides."* in the post-interview, C1 said, *"We decide some activities together."* C11 stated that they decided to *"drink water,"* with his teacher before the arrangements, *"play toys, read stories, tell fairy tales about butterflies"* after the arrangements.

Table 3.
Pretest and Posttest Results of the Scale

						Wilcoxen signed rank test	
Sub-dimensions	*N*	Mean	Median	Min.	Max.	*SD*	z	*p*
Activities sub-dimension pretest	41	1,12	1,00	0,00	3,00	,90	-5,60	.0001
Activities sub-dimension posttest	41	9,39	9,00	3,00	13,00	1,74		
Play sub-dimension pretest	41	,56	0,00	0,00	2,00	,63	-5,63	.0001
Play sub-dimension posttest	41	3,90	4,00	2,00	6,00	,83		
Sharing sub-dimension pretest	41	,27	0,00	0,00	2,00	,59	5,56	.0001
Sharing sub-dimension posttest	41	3,41	3,00	1,00	6,00	1,36		
Daily Schedule dimension pretest	41	1,95	2,00	0,00	5,00	1,36	-5,58	.0001
Daily Schedule dimension posttest	41	16,71	17,00	11,00	22,00	2,60		
Classroom Rules sub-dimension pretest	41	-	-	-	2	1	-5,60	.0001
Classroom Rules sub-dimension posttest	41	5,10	5,00	3,00	8,00	1,45		
Total pretest	41	2,44	2,00	0,00	6,00	1,61	-5,58	.0001
Total posttest	41	21,80	22,00	16,00	29,00	2,91		

The results obtained from the interviews revealed that the classroom decision making changed positively after the applications.

Results of Observation Forms

According to the findings gathered from the observation forms, it was found that the decision-making in classrooms improved over time and that children were involved in decision-making about activities.

The following was reported regarding the observation form's decision-making processes while the researcher performed the applications: *"One of the children said, 'Teacher, we can tell stories next week with music.' We got other children's opinions, and the next week it was decided that the children would tell stories accompanied by music"* (Third week).

"Decision cards were presented for the bouncing game and art activity; the children chose the game, and we played the game they decided on." (Fourth week).

"Children can say that they have decided on some questions asked during the day. They learned what it means to decide." (Eighth week).

The findings of the observation forms revealed that the decision-making in classrooms has improved over time, and children were involved in decision-making process about activities.

Children's Decisions about the Learning Environment

Results of Pre-interview and Post-interview

In the pre-interviews with the children, 12 of the 41 children stated that they did not make a decision about the learning environment, 14 of them stated that their teachers made their decision, 9 of them stated that they decided on play and toys, 5 of them decided to go outside, and 2 of them did not answer the question. In the post interviews, 30 children responded with stories and games, 8 with children's learning centers, and 2 with toys. C4 said that *"I have never tried, I don't know,"* about the decisions she made in the learning environment in the pre-interviews, and in the last interviews, she said that *"I decide the decision cards, tale, and wheel."* C5's statement about the decisions in the learning environment before the applications was as follows: *"The teacher makes the decision, not me,"* and after the applications, he said that *"We decided on the wheel and also a story box."* C15 said, *"I decide which toy to play with"* in the pre-interview, and in the post-interview, *"I can choose the center and tell stories."* The findings of the interviews with the children revealed that children started to make decisions with new materials and arrangements in the learning environment.

Results of Field Notes

The following was reported about the observation form's decision-making process while the researcher was performing the applications:

"When they took out the puppets and cubes in the fairy tale chest, they got very curious and asked what to do with them. After explaining the materials, I stated that they would make a decision." (First week).

"When I entered the classroom, the children quickly reminded the rabbit, the caterpillar, and the wheel, and together we used the materials accurately." (Second week).

"The children wanted to choose which book they would like to read using their decision cards." (Fourth week).

Based on the field notes, it can be assumed that the children started making decisions using the new materials in the classroom.

Children's Emotional Reactions to Materials and Arrangements

Results of Face Expressions Form

The distribution of answers given by the children to the facial expressions form on the application days is presented in Table 4.

Face expression	1. Week *f*	2. Week *f*	3. Week *f*	4. Week *f*	5. Week *f*	6. Week *f*
Happy	29	30	32	33	34	33
Pleased	-	3	1	-	2	1
Sad	1	-	1	-	-	1
Angry	1	-	-	1	-	-
Surprised	1	1	-	1	-	-
I don't know	1	-	1	1	-	-

The results revealed that children often stated that they were happy with the practices. Stating that they felt happy, C33 and C47 stated the followings:

"I'm happy because I loved the fairy tale chest and the puppets." (C33).

"I'm pleased because the caterpillar was so cute. I like it a lot!" (C47).

Results of Observation Forms

The examples in the observation form about the emotional reactions of children to materials and arrangements during the applications are presented below:

"The children said they loved puppets so much. They told stories by choosing the puppets they wished." (Second week).

"The children were delighted that we were going to tell a fairy tale. They are very curious and having fun while throwing the cubes." (Fifth week).

"The children liked the decision cards very much, while one of the children chose the cards for the hat, he said, 'Teacher, it is always what I want and they used the decision cards properly." (Sixth week).

When the examples in the observation forms were reviewed, it was found that the children enjoyed using the materials.

The examples in the observation forms proved that the children enjoyed using the materials.

Discussion

The data obtained from this research, which was conducted to determine the change in child participation as a result of concrete arrangements prepared in line with an action plan to support children's participation, were interpreted in the following three themes: children's decisions about the daily schedule, learning environment, and their emotional responses to materials and arrangements.

It was determined that children's participation was inadequate and they were at a limited level in decision-making about daily schedule, learning environment before to the arrangements to be made in the classroom. It is seen that this result is similar to the results of other studies carried out in this field (Koran, 2017; Salminen, 2013; Zorbay Varol, 2019). Findings of a study examining child participation in early childhood education institutions (Ree & Emilson, 2019) revealed that when teachers controlled communication, participation was restricted, and passive participation in a supportive communication and joint participation in a collaborative communication were observed. As preschool teachers take children's views into consideration and seek to consider their experiences, they will begin giving children meaningful opportunities for participation (Bae, 2009). Struthers (2015) stated that developing opportunities for children to practice their rights will enable them to learn about their rights.

The results of the scale, observations, and interviews in the theme of decisions about the daily schedule revealed that the decision-making process of children in the classroom improved positively. According to findings, it can be said that with the changes made in the classroom and the use of new materials, children began expressing their views on the planning of program activities. By using decision cards, for example, children began to decide which game to play in class and which book to read. This situation shows that the visual materials prepared in the study are used effectively in making decisions together with children in the daily schedule. The involvement of children in planning programs ensures the implementation of the right to participate (Theobald & Kultti, 2012). Houen et al. (2016) in the study in which they examined their interactions with children to improve their level of decision-making about their experiences in the classroom, it was concluded that "I wonder..." strategy was effective in children's ability to make choices. It was emphasized by Wall et al. (2019) that one of the processes that take children's views into account in line with the right to participate was to organize appropriate time and space. The teachers should guide children to take action in line with their desires and curiosity so they perform activities based on the right to participate (Church & Bateman, 2019). In this study, the arrangements that allow children to select the activity they want to participate in, review the daily schedule, and give feedback are considered to have been successful in this positive outcome.

The results of this study on decisions about the learning environment revealed that children started to make more decisions about the learning environment through new materials and arrangements. Children started to act as real participants in the learning environment rather than just being users (Nordtømme, 2012). Smaree Manassakis (2019) indicated that children have the right to organize the materials in the classroom according to the United Nations Convention on the Rights of the Child and reported that young children are aware of their role in organizing their learning environments. Children's ability to share their thoughts about learning experiences with their teachers helps them develop critical thinking skills (Touhill, 2013). Some studies have claimed that the decisions regarding learning environments are made by teachers (Hudson, 2012; Koran & Avcı, 2017; Şallı-İdare, 2018). Children's involvement in decision-making process and their active participation in the learning environment may differ depending on the experiences and opportunities provided by the teachers. Clement (2019) examined the impact of a democratic-pedagogical approach that deals with co-designing and organizing the classroom to support young children's participation. He noted that, children, by using this strategy, engaged in in-class activities like problem solvers and architects, and the relationship between teacher and child has changed

positively, enriching engagement, collaboration, and democracy in the classroom.

Furthermore, looking at the results of the children's emotional reactions to materials and arrangements, it was found that children were mostly satisfied and enjoyed using the materials during the applications. Given that physical arrangements may improve or limit children's participation (Bowden-Clissold, 2013; Leinonen & Venninen, 2012), it can be considered that active participation of children in the changes affecting the classroom is an important development.

The results of this research showed that concrete and new arrangements that support the participation right in the classroom positively changed child participation. One of the differences that this study contributes to the relevant literature is the results of the action plan, which promotes child participation and how the participation right can be fulfilled in the classroom. This action plan, which is based on the active participation of children in the Preschool Education Program Ministry of National Education in Turkey (MoNE) (2013) gives children the freedom to choose the material to play with, the opportunity to plan and apply, and the emphasis placed on the participation right directly, can contribute to the studies on how the right to participate can be put into practice from theory.

The limitations of this study are as follows: the small size of the study group, the implementation of the action plan in a certain amount of time, and not taking the opinions of teachers and families apart from children. More comprehensive results can be obtained by extending the aim of the action plan used in this study, which addresses significant improvements in children's participation, at the teacher and family level, and by applying it over longer periods. At the same time, it is thought that the positive effects of the action plan will contribute to the social studies to be conducted regarding the right to participate.

Conclusion and Recommendations

Within the scope and purpose of this research, it was aimed to show how the action plan, including concrete and new arrangements to improve the children's participation, affected the improvement of children participation. The findings of the study clearly revealed that children began expressing their opinions on the planning of program activities and began taking an active role in decision-making process. It was observed that students started to gain awareness of their choices as active participants in the learning process at the school. The children reported that they liked the new arrangements and the materials they used.

In line with the action plan used within the scope of this research, activities can be prepared to raise awareness of young children about their right to participate in educational programs. Observational evaluation tools can be created by taking the opinions of teachers, administrators, and specialists in this field to evaluate the level of participation of children at school. Comprehensive action plans can be developed by experts working on children and education policymakers to implement children's participation right in school. In addition to the children's right to participate in school, education programs can be developed to improve children's right to participate in families, society, and health institutions.

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Investigation of Special Education Teachers' Concern Levels Regarding Their Children

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Abstract

This study aims to determine mothers' concerns regarding their children, before and after giving birth. The study sample consists of 13 mothers working as special education teachers having graduated from the Special Teaching Department. The study utilized a semi-structured interview technique, which is one of the qualitative research methods, and a content analysis was used to analyze the study data at hand. Study findings revealed that the mothers had some anxieties regarding their children or children they may have in the future due to their occupation, and special education courses they attended during their preservice education. As expectant mothers, the main source of their concerns was that their baby might be born with some health issue or disability. The study findings also revealed that the mothers' concerns began when they found out about their pregnancy, concern continued throughout their pregnancy.

Keywords:

Concern, Special Education, Teachers' Opinions

Introduction

The family unit is considered the smallest constituent element of society. The importance of the existence of a child within the family is indisputable because such a unit called "a family" requires the existence of a child. Regardless of their characteristics, each child is deemed valuable, and each parent who wants to have a child attaches certain values to them. Even though the word "value" is widely used in many aspects of life, there is no singular and clear definition of the term. The notion of value is engaged in a close relationship with living standards and the emotions, thoughts, and actions of people (Yazıcı, 2014). Most researchers have pointed that values are of importance while attempting to explain human behavior (Kağıtçıbaşı, 2000). Values make sense when they are loaded with meanings and become actual value; or, what makes something valuable is actually the meaning attached to it (Tepe, 2008). The features that the parents attribute to their children constitute this value notion. This means that parents want to have children with these features, which constitute certain values in their mind. Kağıtçıbaşı (2000)

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stated that the value of a child should be examined in terms of economic, social, and psychological aspects. Accordingly, the economic value of a child for the family can be assessed in terms of their contribution to the housework, other chores, and to the family income when they reach the age at which they qualified as paid employees. While the child's contribution to the housework and the family's economy is perceived as being of prime importance in the lesser developed regions of the world, it is considered to be much less important to family units in more developed regions.

A social value of a child can be considered parents' thinking of their children as a source of financial and domestic security for their later years in life and as a continuation of the generations, enabling the continuation of the family name and the respect that the parents will receive thanks to the status that their child acquires in society. When it comes to the psychological value of a child, the thoughts that constitute psychological value are the child creating a sense of vitality and joy within the family, a source of entertainment, and being seen as the ultimate reason for the existence of the family (Kağıtçıbaşı, 2000). Every parent, in this context, dream that their children will grow up to be smart, hardworking, skillful, and successful individuals and that such expectations start even when the child is still in the womb. Expectant mothers may attempt to tone in physiological and permanent psychological changes during their pregnancy while dreaming about their children (Özkan, 1990). While some women adapt to psychological changes during pregnancy, while others may suffer from various psychological problems, and varying degrees of suffering (Karaçam et al.,2004). The aforementioned problems may only occur during a certain period of pregnancy and are usually accompanied by certain mental changes such as not knowing what will happen (uncertainty), isolation, depression, dependence, fear, or concern. In particular, concern may negatively affect women during their childbirth and during their postpartum period (Sertbaş, 1998).

Studies showed that the major factors that can cause concerns or fear are thoughts such as the potential loss of a baby during childbirth (e.g., miscarriage), giving birth to a child with some disability forms, experiencing extreme pain during childbirth, the necessity for cesarean delivery, lack of trust in healthcare personnel, bouts of screaming and/or loss of control during childbirth, being alone during childbirth, the place where they are to give birth, not knowing how long the labor will last, and even the possibility of their own and/or child's death (Melender, 2002).

No parents want their child to be born with some form of disability, but they also need to prepare for the potential of having a disabled child while getting themselves ready to be parents. These concerns can be disturbing for prospective parents and may lead to clinical depression (Metin, 2012). A family generally feels comfortable when a child is born healthy, as expected, and when everything is as planned. However, in situations where a child is not born as expected, new parents may experience disappointment (Yamaç, 2011). One of the most important factors that can lead to increased stress levels of new parents is an infant born with some unexpected disability forms. Hence, struggling to accept the child, explaining the situation with regard to the child to their wider circle in society, dealing with the health issues of the child, the type and severity of their disability, lack of knowledge about the disability, their thoughts about the child's future life, their emotional state as new parents, and their struggles to deal with the situation can all make new parents extremely anxious (Cavkaytar & Özen, 2010). The mothers, who mostly take on caring for a disabled child, can be affected the most. New mothers of a disabled child may be under much more stress and may experience more psychological problems than mothers whose children are not disabled (Bahar et al., 2009).

Parents' concerns and fears having a child with some kind of disability are usually experienced after the child takes his/her first breath and when and as parents first interact with special education teachers. At this point, they may start to receive detailed information from special education teachers about their children's potential behavioral problems, educational needs, and how they should behave in accordance with their children's disability (Heiskanen et al., 2018).In line with the necessities of their occupation, special education teachers receive four years of undergraduate education. The parents of children with special educational needs are considered important stakeholders during the special education process. Special education teachers conduct their professional work according to the training they receive, the detailed information they have learned regarding disabilities, and the causes, forms, and features of each type of disability. In light of this information, it would be safe to state that during their pregnancies, mothers who also work as special education teachers may have additional concerns about their children they already have and the unborn child they carry.

Studies obtained different results regarding the prevalence of fear and concern (Fenwick et al., 2009; Waldenström et al., 2006). In a study examining fear of birth that pregnant women went through, the prevalence rate was found to be 10% (Dönmez et al., 2014). Moreover, the study determined that the concern levels of expectant mothers in Turkey were 58.5% of being scared of the birth itself. The basis of such fears and concerns may differ by countries and

regions. While concerns sometimes start long before the birth due date, the fear of childbirth decreases during the postnatal period but can then lead to other concerns (Fenwick et al., 2009).

Areskog et al.(1981) found that out of 100 pregnant women who had birth-related concerns, 20% experienced a fear of the birth itself, 46% had negative experiences from their previous pregnancies, 76% had a lack of trust in healthcare personnel, 65% did not feel ready for birth, 55% feared the birth because it might end up with their own death, 44% thought that they might lose control during childbirth, and 43% expected to feel extreme pain during labor. The aforementioned concerns are considered normal to some extent, but negative effects on a person's quality of life may also occur after a certain period. Emotional stress and concern that an expectant mother experiences during pregnancy have been reported due to some of the following reasons: unwanted situations regarding the baby's health, risk of premature birth, miscarriage, or giving birth to a low-weight child, and delays to the development of baby in the womb (Berle et al., 2005). Due to these and some other reasons, the pregnancy period is of vital importance for the health of both the mother and the unborn child (Şahin & Kılıçarslan, 2010).In conclusion, when the studies are analyzed, it can be seen that the concerns and fears of mothers stand out. The majority of these concerns result from the mother's suffering during childbirth, the negative changes to her body, the fear of being alone while giving birth, a lack of trust in the healthcare personnel responsible for the birth process, as well as concerns related to the future of the newborn baby. This study aims to uncover special education teachers' concern, who obviously spend considerable time with children who have some form of disability, about their children or their as yet unborn children.

Method

In this section, the research design, demographic information of the participants, data collection method, and the data analysis are presented.

Research Design

This research was conducted to identify the concern levels of special education teachers who were mothers of at least one child aged four years old or below before and after giving birth. This study adopted a qualitative research method and the study data collected through observation, interview, and document analysis to examine perceptions and events in a realistic and holistic manner within the natural environment (Yıldırım & Şimşek, 2013).

A semi-structured interview was conducted to collect the study data. The interview questions were prepared in line with information obtained from a literature review based on the research focus. The first part of the interview form refers to the interviewees' demographic information, while the second part consists of subject-matter questions of the research. Following preliminary interviews, a draft interview form was created by the researcher and presented to field experts to assure the validity of the research. After making the necessary revisions in line with the experts' opinions, a pilot application was conducted. The pilot interviews were audio-recorded, and the researcher's written transcripts were subsequently prepared by the researcher from listening to the audio recordings. The pilot audio recordings and written pilot interview forms were examined by the researcher, and some of the questions then subsequently simplified to make them more comprehendible for the main application. The teachers who were interviewed during the pilot application were not included in the main study.

Study Participants

A purposeful sampling method was used to determine the study participants. The criteria used in this method were as follows: the participants should be either graduates of Special Education or Physiotherapy, they should work as a teacher in special education and should also be mothers of at least one child at or below the age of four years old. In total, 13 participants who met these criteria were determined as the study sample and included in the study. The participants were reached through a teacher working at a special education and rehabilitation center. The ethical considerations in determining the participant group and during the interviews have been taken into account. The participation in the research was voluntary, the use of pseudonyms for the reporting of the interview data and obtaining permission from the participants to use the collected data for scientific purposes was declared to the participants. The teachers were informed about the research study, and voluntary participation statements and permissions were obtained through a voluntary participant form. The participants' pseudonyms, ages, number of children they have, teaching branches, and teaching experiences are presented in Table 1.

The study participants are 13 mothers special education graduates working as teachers at special education schools. The participants were selected using the purposeful sampling technique.

According to Table 1, the age range of the participant special education teacher-mothers varied between 28 and 40. Seven of the teacher-mothers had one child only, while five of them had two children. The ages of the children ranged from one to six years. Eight of the teachers taught students with some form of intellectual disability, three of them taught students

Table 1

Demographic Characteristics of Teacher-Mothers

Name	Age	Children	Children's ages	Teaching branch	Teaching experience (years)
Özge	32	1	4	Special education	8
Gül	28	1	1	Special education	3
Songül	26	1	1	Special education	3
Rüya	33	2	2.5, 6	Special education	9
Ayşe	30	1	1	Special education	8
Burcu	28	1	3	Physiotherapy	4
Derya	34	1	3	Physiotherapy	10
Hilal	40	1	4	Special education	15
Serap	32	2	2, 4	Special education	6
Şule	34	2	2.5, 4	Special education	8
Aylin	35	1	4	Special education	7
Esra	34	2	3, 6	Special education	10
Ebru	32	2	2, 5	Special education	7

with hard-of-hearing, and two of the participants worked as physiotherapists with children with a disability. The participants have teaching experience ranging from 3 to 15 years.

Data Collection Process

Semi-structured interview questions were used to collect the research data at hand. Using the relevant literature, the interview questions were determined in accordance with the research purpose and included in a personal information form. Afterward, two experts' opinions were obtained. In line with the experts' opinions, the interview questions and personal information form were finalized.

The interview form consists of two parts. The first part has six questions about the participants' personal information, while the second part consists of the following 10 open-ended questions aiming to reveal the concerns of the participant teacher-mothers working in the special education field regarding their own young children or those they may have in the future.

1. What would you like to talk about your pregnancy?
2. What were the first questions that came to mind when you found out about your pregnancy?
3. What were the issues you thought about the most during your pregnancy?
4. Which method did you want to give birth and why?
5. What else did you do during your pregnancy to give birth to a healthy child and manage your concerns about childbirth?
6. What kinds of topics did you discuss during your pregnancy with the parents of your students with some forms of disabilities?
7. How did having detailed information about special education affect your pregnancy period or after your child was born?
8. What thoughts caused you to seek more detailed information about special education after you found out that you were pregnant?
9. What were your concerns about your children after giving birth?
10. How did your knowledge about the prenatal period and childbirth affect you in terms of having positive or negative thoughts during or before your pregnancy?

During the data collection process, an interview schedule was determined at participants' best convenience. The participant interviews were conducted in a room that is suitable for the interviews, located within the special education and rehabilitation center where the participants were employed. Following the interviews, the audio recordings were transcribed by the researcher, and then the data were analyzed.

Data Analysis

Content analysis, one of the qualitative data analysis methods, was used to analyze the data obtained from the semi-structured interviews. The purpose of content analysis is to reach the concepts and relationships that can be used to examine the collected data (Yıldırım & Şimşek, 2013). The aim of content analysis is to collect similar data within the framework of certain concepts and themes and organize them in a way that readers can understand (Yıldırım & Şimşek, 2013). The audio recordings of the participant interviews were transcribed by the researcher, after which the researcher reviewed the audio recordings alongside 85-page transcripts to remove any mismatches or incorrectly transcribed elements of the recorded interviews. A total of 30% of the data were then

submitted for expert review to assess check the accuracy of the transcription process. As a result of the experts' checking, the accuracy of the transcripts to the audio recordings was assured.

The participant teachers were each assigned a pseudonym to protect their privacy. The data obtained through the participant interviews were expressed as frequencies using digitizing. Similar elements in the expressions were grouped into main themes and then subthemes in accordance with the grouped data.

Validity and Reliability

The interview questions were prepared according to the opinions of field experts to ensure the research's content validity. The interview form was developed in line with two experts' suggestions and related literature. The themes were determined in accordance with the study objectives following the content analysis. The themes and their interpretation were performed independently by two researchers, and the internal validity was maintained during transference of the participant responses into codes. According to the consistency analysis of 30% of the collected data, a consistency rate of 96% was obtained.

Findings

This section discusses the perceived concern levels of the participant special education teacher-mothers regarding their current young children (or those as yet unborn). The findings of the study consist of the following 10 themes:

1. Information about their pregnancies.
2. The first questions that came to mind when they found out that they were pregnant.
3. Issues that they concerned about the most during pregnancy.
4. Preferred method of childbirth and reason.
5. What else they did during pregnancy to ensure they gave birth to a healthy child to alleviate their concerns:
    5.1. Sought information about additional non-routine tests during pregnancy and their reasoning.
    5.2. Types of questions they asked their doctors during routine pregnancy checks.
    5.3. Issues discussed with doctors outside routine pregnancy checks.
    5.4. Concerns held about screening tests during pregnancy.
6. Discussions held during pregnancy with parents of students with some forms of disabilities.
7. Whether having detailed information about special education caused them any concerns about their children during or later their pregnancy.
8. Detailed research undertaken, if any, on specific topics related to special education after finding out of their pregnancy.
9. Concerns about their children's health after giving birth.
10. Whether having prior knowledge about the prenatal period and childbirth positively or negatively affected thoughts during pregnancy

Information Supplied About Their Pregnancies

The teachers provided information about their pregnancies, and it was found that their opinions were very close to each other.

In the interviews held with teacher-mothers working at special education, 12 of them reported that they had felt ready to have children, nine of them indicated that their pregnancy was planned, while four reported that their pregnancy was not planned.

First Questions When They Found Out Their Pregnancy

All of the participants reported that the first question that came to their mind when they found out that they were pregnant was whether their children would be born healthy. On this, one of the participants, Burcu, said:

> *As we always deal with children with some form of disability, the question of whether my baby would be healthy went around and around in my brain, I cannot even state how often I thought of it. We see the parents of those children, talk to them, and cut a long story short; we are affected by them. And of course, you then ask yourself if you will face similar problems once you give birth to your own baby.*

Six of the teachers reported that one of the first questions that they had about after finding out their pregnancy was whether they would have problems during the prenatal, birth, or postnatal phases. On this, Esra stated, "As a special education teacher, we always hear the parents' stories about the major causes of disability during the prenatal, birth, and postnatal periods. Therefore, my thoughts were stuck there." On the other hand, five of the teacher-mothers stated having thought, *"What if my child is born with a disability?"* as one of the first questions that came to mind. On this issue, Serap said,

> *Actually, I do not want to remember that day as it was very hard to get through. I experienced very complex feelings, and I especially thought, due to my work, about the possibility of my child having a disability, knowing of the challenges I would have to face, and the entertaining aspect. For that, I always prayed that my child would be born healthy.*

Also, four teachers reported that one of their first questions they thought of was, *"Is it going to be an uneventful pregnancy?"*

Issues That Worried Them Most During Pregnancy

One question asked during the research interviews was, *"What were the issues you thought of the most during your pregnancy?"* seven of the teachers said, *"What will I do if my baby has a disability?"* On this, Songül said, *"I thought a lot about what I'd do if my child had a disability, and I was concerned about this all the time."* On the other hand, Aylin said,

> *I put a lot of thought into my baby's health, and undertook lots of research on what should be done, but I had one question on my mind all the time: 'Is my baby's physical and mental development at normal levels?'*

Four of the teachers reported that they had concerns about what type of birth would be in the best interests of their unborn child. Esra said,

> *Is my baby okay? Will there be any problem? I am concerned as my first birth was via vacuum-assisted delivery. That's why I constantly thought of what type of delivery I should opt for and sought many people's opinions.*

On this same issue, four of the teachers stated that they felt anxious about wondering if they would experience struggles during the birth and whether it would be difficult to deliver the baby.

Preferred Method of Childbirth? (Cesarean or Natural Delivery)

The teacher participants' answers to the question *"Through what method did you want to give birth, and why?"* varied. Seven of the teachers stated that they chose to give birth naturally, while six chose a cesarean delivery. Şule, who chose a natural birth said, *"It was the healthiest way to give birth via the traditional [natural] method, both for the baby and their future as a child. That's why I chose it."* Similarly, six other participants mentioned the same response. Hilal, who mentioned having preferred a cesarean delivery, said, *"I chose a cesarean birth because I knew that traditional delivery could be riskier for the baby's health, and the stages of a natural delivery scared me."* Three of the teachers who also chose a cesarean delivery stated that it was the less risky method for the baby's health, and two of the participants stated having chosen it because they had to.

What Else Did They Do During Their Pregnancy to Ensure They Gave Birth to a Healthy Child to Alleviate Their Concerns

In terms of the types of questions asked to their doctors during their routine pregnancy checks, 10 of the teacher-mothers stated that they consistently asked about their unborn baby's nuchal translucency and if it was normal.

One of the participants, Hilal, said,

> *I asked questions about the health of my baby. Were all the body organs there okay? Was the baby's nuchal translucency okay? As problems associated with a developing baby are observed via direct ultrasound testing under routine checks, the most important thing for me was the nuchal translucency of the baby and to ask about the bodily organs.*

Burcu, one of the nine teacher-mothers, asked the following question, "Does the baby have all of its bodily organs?" stated, "I asked questions like, 'Is the baby's development fully okay?' and 'Does the baby have a shortage of bodily organs or limbs?' Actually, I always had a bad feeling and concern about the baby's organs not being fully developed." Esra, who also asked questions about the development of her baby, said that,

> *As a result of my occupation, I might have asked my doctor a hundred times whether my baby was normal and whether its development is okay. A normal mother-to-be asks the sex of the baby, but I was so concerned that I never even asked about the sex.*

In terms of the issues discussed with their doctors rather than routine pregnancy checks, six teacher-mothers stated that they asked questions about the practicalities of giving birth.

Aylin stated her opinion on the subject by asking,

> *I asked about the options for giving birth, which method of delivery the doctor advised for the health of my baby, as everybody was saying different things to me. Some said that traditional birth includes risk, and some said cesarean birth causes lots of problems, so I took advice from the doctor on this subject.*

Gül, one of the four teachers who reported asking if the baby had any form of disability and what the indicators were, asked questions like *"What are the indicators of a disabled baby?"* and *"Can it be seen via an ultrasound test if the baby is disabled?"*

Also, three of the teachers reported that they asked no questions on this subject.

In terms of the teacher-mothers' concerns about the screening tests during their pregnancy, nine of the mothers reported that they were worried about the possibility that their baby could be born with some form of disability. On this, Özge said,

> *Most of my concerns during pregnancy were about Down's syndrome. I did not want to think of negative issues, but I always had it in my mind during the screening tests; having the concern that my baby could be disabled was always on my mind.*

Seven teachers reported that they felt as if something negative would show up in their scans, and Ebru said,

"I felt so scared, I had very complicated emotions if something bad would happen and if the tests would have negative results."

Discussions Held During Their Pregnancy with Parents of Students with Some Forms of Disabilities

The subjects that the teacher-mothers discussed with the parents of students having some forms of disabilities were mostly found to be very similar. On this subject, eight teacher-mothers reported that they asked questions about the problems the students' mothers experienced during their pregnancy. On this, Serap mentioned that she asked the following questions: *"What kinds of problems they had experienced during their pregnancy, what problems had they faced during that period, and had they associated those problems with the reasons for their child's disability?"* Burcu, one of the seven teachers, who asked the students' mothers the reason for their child's disability, said, *"I asked questions about the reason for their children's disabilities, what challenges they had gone through during their pregnancy, and when they found out that their child had a disability."* Five of the teacher-mothers reported that they asked about their method of childbirth, and, on this, Özge said, *"I probably talked about how they gave birth, because most of the parents said that they had experienced difficulties during childbirth and that was when their children had taken on some form of disability."*

Whether Having Detailed Information About Special Education Made Them Concerned About Their Children During or Later Their Pregnancy

With regards to whether having detailed information about special education made teacher-mothers concerned during or after their pregnancy, 11 of them reported that it made them concerned. On this, Şule said,

> *It constantly caused me concern, whether you want it to or not, as having all the information on this issue to hand, you become concerned about it. For example, your child performs some actions while playing a game, and you immediately associate it with some symptoms of a certain type of disability. Or you think, 'Can it be like this because of that?' You get all concerned about 'What if it happens?' because of seeing perhaps just the slightest of signs.*

One of the seven teachers, Aylin, who reported constantly checking their children, said, *"It made me worried. I started to see meaning in everything I see. I always take the temperature of my child and wake up at night four or five times at night to check my child."* On the same issue, Rüya said, *"I was concerned a lot. I started to compare my children and students in terms of their developmental phases. Especially, with my first child, I kept thinking if she was a child with autism."*

Four teachers reported that they had concerns about experiencing problems during their childbirth; one of them, Esra, said *"I had concerns about mistakes being made during childbirth, or leaving the baby with no air."*

Detailed Research Undertaken on Specific Topics About Special Education After Finding Out of Their Pregnancy

Nine teachers reported that they researched autism spectrum, and on this, Burcu said, *"I started to do more research on autism; its causes, causes known to trigger autism, its symptoms, and autism-related education."*

Four teachers reported that they researched Down's syndrome, and on this, Gul said, *"I especially tried to obtain more information about Down's syndrome; and even though I knew the general causes were genetic, still, I researched properties."* Three teachers stated that they researched the risks about premature birth, and, on this, Derya said, *"I researched the causes of premature birth, and the negative effects it can have on the baby."*

Two teachers reported that they researched possible prenatal and childbirth-related problems. Songül, one of those two teachers, said, *"I researched about what kind of problems could be faced before and during my childbirth, and what could be done to prevent them from happening."*

Concerns About Their Children's Health After Giving Birth

On this subject, Aylin, one of the teacher-mothers, said,

> *My concerns started to lessen, but then I got new concerns. Most of the students' parents I met said that there was nothing wrong with their children as babies, but then later, they developed a disability. I guess that I was stuck at this point.*

On a related issue, five mothers reported that they started to check their children constantly. Ebru said, *"I started to check my child, even more, this time. Is he able to see fully, hear, understand me, make eye contact, and so on."*

Four teacher-mothers reported that they concerned about their children if they would have problems later in their lives. For example, Ayşe said,

> *After I gave birth to a healthy child, my concerns decreased; but this time around, new worries have started to take over regarding my child being able to hear and see fully or will they have any problems in the future.*

Four teachers shared their opinions on this issue and reported that they examined their children's actions. Serap, one of these teachers, said,

> *I started to observe and then rate all of my baby's actions without noticing; always checking to see if there is a problem. Will they start to walk on time? Will they talk okay? Is their hearing okay? Are there any signs of autism? And other such concerns like that*
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> .

Whether Having Prior Knowledge About the Prenatal Period and Childbirth Affected Their Positive or Negative Thoughts During Their Pregnancy

The last theme identified from the collected data about whether the teacher-mothers' prior knowledge about pregnancy influenced their positive or negative thoughts. Eight participant teacher-mothers reported that they had more concerns and negatively affected due to having detailed prior knowledge about pregnancy. On this issue, Hilal said,

> *It usually affected me negatively. A woman who learns they have conceived would not usually worry at all, but as we work with children with disabilities and listen to the parents' stories, this can make us be worried. We start to think differently from even the slightest sign.*

On this issue, five teacher-mothers reported that they were affected both negatively and positively as a result of their prior information regarding pregnancy. Aylin, one of these participants, said that,

> *Actually, it affected me both positively and negatively. It affected me positively because I know the groups of disabilities, their symptoms, features, and reasons they occur. I know how to act and what to expect during the prenatal, childbirth, and postnatal phases. It affected me negatively because I guess a female who is not working in our field will not give birth if they harbored all those questions. I mean, if a baby was left with no air during childbirth, they would most likely have some form of disability. Most women go into the operating theatre or the birthing suite, give birth, and then leave. On the other hand, we ask a thousand questions right up until and after the moment we give birth. We are concerned about many things that most people would not even think of, but which are a source of our concern.*

Discussion

Of the 13-participant teacher-mothers who shared their opinions, 12 reported that they felt ready to have children, nine said that their pregnancies were planned, while four said that their pregnancies were not planned. Studies provide a considerable amount of important information on women's perceptions of pregnancy, in terms of how pregnancy should proceed in a healthy manner, and whether the child will be born healthy. If women feel ready to have children psychologically, and socially, their pregnancy will likely be in a healthy process. Additionally, while the physiological changes due to pregnancy might negatively affect the bodies of some women, if the woman is yearning to have a baby and felt spiritually comfortable, ready physiologically, and socially, not under pressure; their body will likely adapt to the changes more easily (Bergbom et al., 2016). Therefore, it is very important for women who want to become pregnant that they feel ready for their pregnancy psychologically and physiologically and are also socially comfortable with their pregnancy as these factors can affect the development of their babies' health even before birth (Kaya & Serin, 2008).

The teacher-mothers' statements within the current research scope indicate that the mothers felt ready to have a child and considered accepting certain risks, despite the heavy burden and well-known concerns that come with pregnancy. Upon learning of their pregnancies, the teacher-mothers' opinions as to the first questions that they thought of were usually negative in their nature. All of the teacher-mothers expressed that they had concerns about their children's health. In this context, 13 mothers asked questions such as *"Is my baby going to be healthy?"; "Will I have prenatal, intranatal, or postnatal problems?"; "What if my baby is born with some form of disability?";* and, *"Will my pregnancy last to full term without any problems?"* Research has shown that expectant mothers go through several physiological and psychological changes during their pregnancy and these changes can lead them to experience several concerns. The reason for these pregnancy-related concerns could be explained simply as expectant mothers focus on their unborn child (Özkan & Bozkurt, 1999). Therefore, having a baby with some forms of disabilities, or is at risk of having some form of disability, a risky parturition that requires some medical intervention or procedure, making mistakes when alone in an environment they have never previously experienced, or not knowing how parturition should occur (Szeverenyi et al., 1998). Additionally, there is a reality that an accident might happen during parturition and harm the baby (Dönmez et al., 2014), all of which make expectant mothers concerned. However, the mothers' concerns in the current study included several topics reported in the literature, but only those that focused on the unborn child.

The interviews results revealed that they, during their pregnancy, were concerned most about their unborn children's health. In this context, the teacher-mothers expressed that they had concerns on the possibility of their babies that would have some forms of disabilities, the physical and cognitive development of their child, and the method of parturition in order for their baby to be born healthy. When the literature is analyzed, previous research findings support the findings of this study. These studies revealed that the sources of concerns related to parturition and pregnancy were notably diverse; these include the possible causes of harm to a baby during parturition, the inability of a newborn to survive for some reason, the potential for psychological or physiological harm to the mother, or even her death, distrust in the healthcare staff in charge of the parturition, the trauma and loss of

control during parturition as experienced by the mother, and also their excessive nervousness (Şahin et al., 2009). Toward the end of pregnancy, expectant mothers and fathers usually become concerned if the baby would be born with some forms of disabilities and thoughts about how comfortable parturition will be (Szeverenyi et al., 1998). While the expectant mothers were reported to have several concerns in most of these studies, the subjects of this study only expressed their concerns for their children, both during pregnancy and following childbirth.

In this study, the responses of the participant teacher-mothers about how they would like to give birth differed somehow. Seven teachers expressed that they had a preference for a normal (natural) delivery, whereas six preferred cesarean delivery. Irrespective of their preferred choice, the mothers regarded their preferred method of delivery as the best in terms of their children's health. The World Health Organization (WHO) (Hacettepe University Institute of Population Studies [HUIPS], 2014) reported that less than 15% cesarean delivery is considered normal among all deliveries, while they reported the rate for cesarean delivery is 37% of all cases in Turkey, largely due to the perception of having natural delivery more likely to have some negative outcome (HUIPS, 2014).

The most important factor that pushes expectant mothers toward opting for a cesarean delivery is fear as they mostly mention physical pain, difficulties in parturition, medical intervention, and fatigue when they talk about childbirth. These negative experiences, concerns, and fears direct expectant mothers to opt for a cesarean delivery (Mongan, 2005). In his study, Ryding (1993) reported that parturition-related fears played an important role in women's demand for cesarean delivery. In this study, almost half of the teacher-mothers expressed that they had a preference for a cesarean delivery as the method for delivery of their babies. This rate is above the aforementioned rate of cesarean delivery in Turkey and far above the rate that the WHO identified as being considered normal. While the teacher-mothers interviewed in the current study stated that they preferred cesarean delivery for the sake of their unborn children's health, the findings from previous studies revealed that mothers preferred cesarean section due to their fears of physical pain and complications during the parturition, which conflicts with the findings of this study. Besides, contrary to popular belief, there is no proven data that cesarean delivery decreases the prevalence of neurological birth defects that can stem from natural childbirth or increase intelligence performance (Gül, 2008).

The WHO validates the preference for natural delivery in terms of the health of the child and published six applications as a guide for staff carrying out parturition and suggested that as limited intervention as possible should be considered during the parturition process for the health of both the expectant mothers and their unborn children. These suggestions were as follows: (1) Allow the parturition to start on its own without outside intervention whatsoever; (2) Allow the expectant mother to move as she likes during parturition; (3) Provide the expectant mother with any kind of support (physical and emotional) from the start to the end of parturition; (4) Refrain from any unnecessary intervention unless a very difficult situation is or is likely to be encountered; (5) Other positions, as well as supine position, should be supported; and, (6) Allow the mother and the child to stay within the same environment following parturition (HUIPS, 2014).

The main approach to pregnancy today is the idea that, as a physiological process, parturition does not require much medical intervention (Turan, 2003). If the conditions are considered appropriate, normal (natural) delivery should be opted for and without intervention (Arney & Neill, 1982). All the natural hormones in the expectant mother are thereby activated to prepare both mother and unborn child for parturition. During a natural childbirth, the healthcare staff in charge of parturition should only perform the necessary health checks and then remain observant and on hand, and without imposing any form of medical intervention where possible. The secretion of hormones in the expectant mothers is what makes normal delivery preferable to cesarean section, and any intervention where there is no medical need can negatively affect both the process of parturition and the secretion of hormones. As neither pregnancy nor parturition is considered a form of disease (i.e., it is a natural process), it should be borne in mind that there is no automatic need for intervention, and that pregnancy is a natural and healthy function of the human body. The findings presented in the literature largely support the current study's findings, as more than half of the interviewed teacher-mothers expressed their preference for a natural childbirth.

The teacher-mothers' opinions about what they did to manage their concerns during pregnancy were analyzed under four subthemes. The first of these related to having blood tests and examinations other than those prescribed as routine pregnancy checks; and none of the teachers reported that they felt the need for such additional and non-routine tests.

In this context, the second subtheme related to the types of questions they asked their doctors during routine pregnancy checkups. The participant teacher-mothers mostly asked their doctors about the risks of their babies to be born with some forms of disabilities. They reportedly asked about the nuchal translucency of their babies, whether internal organs of the unborn child were complete, and whether the development of the baby appeared to be normal. The

teacher-mothers also asked their doctors questions about this nature may be linked to the level of detailed information they have access to regarding whether an unborn or newborn baby would have any form of disability.

Also, as the majority (n = 10) of the teacher-mothers asked their doctors about nuchal translucency, points to their concerns over Down's syndrome. Down's syndrome is a genetic disorder seen in almost one in every 550-1,000 newborn babies, and which can lead to intellectual disability. The rate of individuals born with Down's syndrome leading to intellectual disability is 15%-20% (Oster-Granite et al., 2011); in Turkey. This represents a population estimated to be around 100,000, with one in every 800 babies born with Down's syndrome (Morris et al. 2014). The teacher-mothers asked their doctors about Down's syndrome could be linked to the level and scope of the education they received, plus the fact that most of the children they teach have Down's syndrome.

The third subtheme that the teacher-mothers expressed was what else they did to give birth to a healthy child and manage their concerns about the topics they felt they needed to talk about with their doctors, other than their routine pregnancy checks. The teacher-mothers reported that they asked about the most appropriate delivery method in terms of the babies' health and their own and whether their babies may have some forms of disabilities. When the questions asked by the mothers to their doctors were examined, it can be seen that their concerns were mostly for the health of their unborn children due to their professions. The fact that special education departments in universities present many prenatal reasons for children born with disabilities could be considered to have directed the participant teacher-mothers in this study toward having such concerns. To the best of our knowledge, no studies examined such questions that expectant mothers asked their doctors during routine pregnancy checks, yet from the general scans, expectant mothers were usually observed to ask their doctors when and how they should exercise, what they needed to eat, how they could best cope with excessive weight gain as well as sexual intercourse during their pregnancy. Therefore, the questions raised by the teacher-mothers in this study conflicted with the literature in terms of studies associated with general pregnancy scans.

The fourth subtheme about their concerns with the scan tests themselves during their pregnancy. Nine teacher-mothers mentioned that they had concerns on the risk of their children being born with some forms of disabilities; while seven stated that they felt something negative could happen at any point in their pregnancy.

Although the topics differed that the teacher-mothers talked with the parents of their students, whom each has some forms of disabilities, and the overall results were the same. The questions that the teacher-mothers asked gave the impression that they would like to protect themselves from experiencing similar situations, and their interest in how certain negative situations (in terms of child disabilities) stemmed from negative experiences during their childbirth. This finding may be due to the teacher-mothers' efforts in seeking information from their students' parents, who had direct experience in such matters, even though the teacher-mothers would most likely already have prior knowledge about the reasons during the prenatal and postnatal period for many forms of disabilities, due to their professions. Previous research also supports that prior knowledge of the causes of certain disabilities can play a very important role in preventing certain disabilities from occurring. In most of the published studies, the causes of disability are strikingly varied, yet the factors leading to many forms of disability can be analyzed under the following four groupings (Söhmen & Türkbay, 2003):

1. Prenatal: genetic reasons, malnutrition of the expectant mother, the mental state of the expectant mother, hormonal abnormalities, ailments the expectant mother experienced during pregnancy, medication taken without the approval of a doctor during pregnancy, drug and/or alcohol addiction, consanguineous marriage, or blood incompatibility;
2. Intranatal: inflammation in the birth canal, position of the baby during parturition,
3. Abnormal term: preterm or postterm birth, expectant mothers having been pregnant more than once;
4. Postnatal: child inflammatory diseases such as mumps, meningitis, measles, pertussis, jaundice, infant malnutrition, concussion, natural disaster, traffic accidents, military conflict).

In this study, the teacher-mothers' opinions about whether they had detailed prior information regarding special education led them to worry about it were found to be similar. In total, 11 of the teacher-mothers commented along the lines of their detailed knowledge of special education having led them to have several concerns, while seven mentioned that they started to check their child constantly. Four teachers stated that they had been concerned about problems during their parturition. As a result of their special education background, they were familiar with the types, causes, and prevalence of certain disabilities, the likely characteristics of individuals with certain forms of disability, the problems they face, and others' potential attitudes toward them, as well as having witnessed some of the trauma that many of their students' families had previously

experienced. As special education teachers have detailed information on such topics, it is not surprising for them to be concerned about their children, as no parent wants their children to be born with a disability. In other words, no parents prepare to have a child with a disability; on the contrary, they expected that their children would be smart, talented, and ultimately successful (Metin, 2012).

Disabilities are usually not changeable, but permanent. For this reason, meeting the needs of a child with a disability can often present a constant and challenging reality. In addition to the immediate needs of a child with a disability, such as their daily care, education, and health, social attitudes and judgments, uncertainties regarding both the current and future circumstances can pose significant distress for their families.

Unless the family manages to cope well with the child's disability, it can readily lead to emotional problems within the family (Çapa, 2009; Dereli & Okur, 2008; Karadağ, 2009; Turan, 2009). Special education teachers are all aware of this situation well, which can manifest as a special source of concern in terms of expecting a child of their own; even before their child is born, or without even knowing whether their child has any forms of disabilities. It could be, therefore, thought that expectant mothers who do not work in this field probably do not experience the same level or type of concern.

In this study's participant interviews, all teacher-mothers talked about their interest in specific topics of research on special education after finding out about their pregnancy. Nine participants reported that they undertook further research on autism spectrum disorder. Autism can appear during the early years of childhood, although its effects are seen for life, and it can considerably and negatively affect the social relations and communication skills of the diagnosed individual. Autism spectrum disorder is defined as a neurodevelopmental disorder that leads to apathy and repetitive behavior (Suhrheinrich, 2011). According to data published by the US Center for Disease Control and Prevention, autism is seen in one of every 68 live births. This constitutes around 1% of the world's population (Christensen, 2016), and its prevalence shows a high rate of increase, having increased up to one case of autism per every 150 births in the US in 2000, representing an increase of 119.4% to the previous figure of one in every 68 births (Baio, 2014). The number of individuals diagnosed with autism increased considerably between 2000 and 2014, with an annual upsurge of 6%-15% (Baio, 2014). The findings of the statement of the interviewed teacher-mothers in this study revealed that they undertook specific research on autism, and it indicates that their level of concern for their children being born with an autism spectrum disorder. It would be safe to say that the teacher-mothers' prior knowledge on autism and its prevalence may be as a result of their professions, as working with children with autism represents the most important group within special education.

The teacher-mothers interviewed in this study showed that their concerns also did not end once they had given birth to their children; instead, they became concerned over other matters and even started to constantly check the behavioral traits exhibited by their young children. The reason for their ongoing concerns and their continual checking of their children's behavior might result from their awareness of the possibility of a child becoming disabled even after birth. As no study could be found in the literature that addresses special education teachers' concerns following the birth of their own children, the researchers compared the present study's findings with those of studies conducted with mothers who were not teachers. The results of this comparison showed that the non-teacher-mothers usually remained immobile and dependent on those around them in the immediate days following childbirth. Afterward, they began to adapt to their new situations and started to take on the care of their newborn babies. In the case of the teacher-mothers, they took on new concerns following the birth, chiefly that they are not able to look after their child or that their breast milk might not be sufficient for their newborn babies (Beydağ, 2007). Also, thanks to their educational background, the teacher-mothers working in the field of special education might have concerns over certain severe postnatal inflammatory diseases, neonatal jaundice, malnutrition of the baby, as well as incidents of traffic accidents or even poisoning that do not present symptoms during parturition.

Eight participating teacher-mothers stated that being knowledgeable on prenatal and intranatal issues negatively affected them during their pregnancy, while five mentioned that they were both positively and negatively affected. One area in which the special education teachers were most knowledgeable is the description, causes, and prevalence of certain types of disabilities, which is considered a fundamental area of knowledge in their professions. Any lack of knowledge for such teachers would impede the precautions they may take during the education of individuals with a disability. The fact that the teacher-mothers in this study possessed detailed knowledge about special education and awareness that mistakes may present certain risks to their unborn or newborn children could be said to have negative effect on them.

Considering the problems encountered between the initial planning and the final steps of this study with a review of the relevant literature, the following recommendations for future research and

applications are suggested:

More detailed prenatal education could be provided for mothers working in special education field. Pregnancy support programs could be made available to teacher-mothers working in special education, aimed at helping them prepare for their pregnancy and childbirth through modification of their negative thoughts and concerns. Education could be provided for expectant mothers working in special education field in areas such as prenatal preparation, psychological and physiological preparations for parturition, additional information providing on pregnancy and parturition, guidance on physical exercises required during parturition such as stretching, instructions on breathing techniques and managing strain during childbirth, nutrition information for mothers and their babies after parturition, weight loss exercises after parturition, and general baby-care guidance. In addition, to increase the generalizability, this study could be replicated with more participants. The study could also be replicated by adding female teachers from special education who have yet to go through pregnancy. The study could also be conducted comparatively with expectant mothers working in different professions.

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Contextualised, not Neoliberalised Professionalism in Early Childhood Education and Care: Effects of Prescribed Notions of Quality on Educator Confidence in Australia

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Abstract

There is a standardised neoliberal inspired notion of what professionalism entails for early childhood educators. These standards tend to infiltrate much of the literature, reporting and pre-service educator training, creating a notion that educators are never quite good enough at what they do. Although constant reflection and aiming for excellence are strongly held Western ideals, the effect on educator confidence and their ability to recognise their own strengths and achievements can be real. This discussion paper seeks to challenge the idea that good quality early childhood practice can always be identified and standardised, arguing the need for professional discretionary decision-making in order to adjust practice to context. Drawing on an example from an Australian service, where knowledge, care, partnership and support for potentially vulnerable families to support their children was highly valued by parents, it illustrates that such qualities can go unrecognised by the staff themselves. What we risk losing when we prescribe what quality entails will be of interest to educational leaders, researchers and those who teach pre-service educators.

Keywords:

Professionalism, Qualitative Research, Neoliberalism, Early Childhood, Military Families, Education Policy, Mosaic Approach

Introduction

The notion of professionalism in early childhood education and care (ECEC) is an important one because it affects key stakeholders, and much is at stake. Stakeholders include children, educators, employers, pre-service teacher educators and the community. Aspects of professionalism in Australia, including pay, status, unpaid hours and burnout impacts the educator turnover rate which is very high. In turn, this impacts all stakeholders because it negatively affects the quality of education and care because of the

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importance of secure relationships with caregivers with young children (Sims, 2011). High staff turnover can be very expensive and challenging for employers because they have to spend more time training new staff and reassuring families they can adequately staff their service. Indeed, parents consider staff commitment and staff who experience job satisfaction as a marker of a quality service (Fenech, 2012).

It is questionable whether professionalism can be standardised across the many contexts, communities, families and children, that ECEC encompasses. There is now a standardised neoliberal notion of what this entails that is present in much of the literature, standards, policy documents, frameworks, reports and pre-service educator training, according to Sims (2017). This notion often directs educators' work (Grant, Danby, Thorpe, & Theobald, 2016; Hunkin, 2017) and could potentially undermine educator confidence as they strive for constant reflection and improvement, Western ideals that are glorified in neoliberalism. When we qualify and quantify quality, there is a risk that contextual variations of quality are unrecognised. This paper argues that educator professionalism needs to be viewed within the context of ECEC so practice is adapted to suit each unique environment, community, including the parents and children, and gives an example of how this was achieved in one setting.

Neoliberal framework

Neoliberal ideology is ubiquitous in 'laws, policies and programming at the international, national and local levels' (MacNaughton & Frey, 2015, p. 17). No longer confined to Western countries, the ideology brings the world together in a unified global economy with one method of production (McLaren, 2005). Described by Chomsky (1999, p. 11) as the 'immediate and foremost enemy of genuine and participatory democracy', neoliberalism is a style of governance that elevates free market consumerism and capitalism. Faith is put in the marketplace to control outcomes, rather than governmental responsibility, control and expenditure to create equitable outcomes. Labelled by McLaren (2005, p. 5) as 'dangerous', neoliberalism values competition and places people in competition with each other, rather than appealing to their altruistic tendencies that are a part of human communities and experiences (Monbiot, 2019). It is a type of capitalism that is 'untrammelled' in its' quest for profits, so it does not need to be held accountable to anybody except shareholders who only require profits (Dahlberg & Moss, 2005, p. 36). The neoliberal model views the state as inefficient and incapable of delivering services and state regulation as unwanted interference (Penn, 2002). Neoliberalism places blame for societies' ills on the vulnerable and distracts people with consumerism to make it easier to advance the policies and agendas of those with power (Chomsky, 1999, 2016). 'Instead of citizens, it produces consumers. Instead of communities, it produces shopping malls' Chomsky claims (1999, p. 11).

More than just an economic model, it is a way of governance, policymaking, political narrative deriving from the one ideology (Blackmore, 2019). While neoliberalism can produce high, but unstable, profit growth it seems to create a similar trend in social problems (Dahlberg & Moss, 2005). Although it is an economic model, neoliberalism is pervasive and has become deep rooted (Moss, 2014). It 'seeks to spread its values and practices into every aspect of life' (Dahlberg & Moss, 2005, p. 39), and has become a 'metanarrative that extends into every facet and niche of life' (Moss, 2014, p. 64). This means that systems such as education, healthcare, welfare and social work that were created from very different philosophies are struggling with the application of a model that is fundamentally a misfit (Rogers, Dovigo, & Doan, 2021).

Neoliberalism also creates a complex system where managerialism excels (Giroux, 2013). Management is quite different to managerialism. Management is necessary because it involves the organisation of people's efforts to run an organisation successfully. Managerialism is where professional managers are relied upon or are viewed as necessary to manage worker's efforts, despite the competence and confidence of the workers. Managerialism does not mean that the worker is well looked after. Indeed, the worker is often distrusted therefore needing additional levels of management direction creating micromanagement, according to Giroux (2013; 2015). In this vain, managers frustrate workers by creating excessive busywork which is justified by the need for compliance and record keeping, taking them away from the activities they were trained for and want to do (Rogers, Sims, Bird, & Elliott et. al., 2020). There has been an assumption that the managerial reforms that may have been successful in other sectors, will automatically suit educational settings, justifying market solutions to solve social ills (Exley, Braun, & Ball, 2011).

This type of micromanagement often results in minutely detailed documents and checklists which take up inordinate amounts of worker's time to read and enact (Bradbury, 2012; Brown, 2015). Additionally, these documents and frameworks may inadvertently hamper innovation, individual creativity, contextual variations and a critique of the ideologies they represent or what they are trying to create (Sims & Waniganayake, 2015). Within early childhood contexts, Millei and Kallio (2018, p. 43) explain that 'ECEC settings are inherently political' and policies and curriculum documents cannot be made independently of politics. Indeed, educators are uncomfortable with

'business and politically motivated approaches' (Breacháin & O'Toole, 2013, p. 415) and do not want to use assessment, pedagogy and curriculum designed by others (Hursh, 2007). Whilst the neoliberal narrative positions this as the most effective for productivity and high standards, the experiences of workers is often the opposite as they struggle with the way this hegemony affects their practice (Hursh, 2007).

The impact of neoliberalism, educators' identity and their work in early childhood

An Australian example

Neoliberalism has impacted the ECEC field, including educators' work and their identity as education becomes a commodifiable service (Moss, 2014). According to Moss (2014), it is too simplistic to say ECEC has become a function of the dominant economic model, but its influences are pervasive and complex. Grant et al. (2016) explains that there are huge 'disjunctures between teachers' experiences and policy intent' (p. 44), resulting in time pressure and increased documentation, along with stress around accountability from external sources. In turn, this can create work practices that are unsustainable and can result in educator burnout (Grant et al., 2016). As Maloney et al. (2019) explains, professionalisation of ECEC is based on 'discretionary decision making that is premised upon an accepted body of knowledge' and 'neoliberalism imposes constraints from on top, identifying through various forms of curricula, legislated standards, and policies what is appropriate and desirable practice' (p. 1). There has been a dramatic increase in the number of ECEC policy documents, frameworks, and standards in the past decade in Western countries, according to Hunkin (2017). Often the documents are so comprehensive another document is published to help explain the original document in practical terms. This is often called 'A guide to .....' or 'The handbook for ....'. For example, *Being, Belonging and Becoming:* The Early Years Learning Framework (Department of Education Employment and Workplace Relations [DEEWR], 2009) was released in 2009 as a 51-page document. By 2010, a 150-page document was released called Educators Being, Belonging and Becoming: An Educators' Guide to the Early Years Learning Framework (DEEWR, 2010). It is not to say that any of these documents are poorly thought out, badly written, or were composed with any evil intent by the authors or authorities. That said, reflection is needed to think why over 200 pages were needed in the first place and how they have impacted educators' work within the sector. Similar to many Western countries, Australia has an increased number of education curriculum frameworks (Grant et al., 2016). For example, *Being, Belonging, Becoming:* The Early Years Learning Framework, (DEEWR, 2009), along with the Australian Curriculum (Australian Curriculum Assessment and Reporting Authority, 2019) and each state curriculum, for example New South Wales (see https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/years/kindergarten). While the latter two are generally related to schools, in recent years they have added early childhood years within the frameworks. Additionally, there are accreditation requirements (Australian Children's Education and Care Quality Authority, 2011; Australian Children's Education and Care Quality Authority, 2012) and national teacher standards (see https://www.aitsl.edu.au/).

It is not within the scope of this paper to critique each framework and guide however, questions have been raised to the way the EYLF strengthens neoliberal ideals (Millei & Jones, 2014) and discusses cultural competence (Sims, 2014). Some have argued that educators have the scope within the framework to exercise professional autonomy, as they can with the EYLF framework. Although educators can use great scope, they may be more likely to stick with what is prescribed and explained, especially if they are less confident, or in an environment where they believe they are being constantly scrutinised, rather than encouraged. When we give educators large documents describing what quality is and how it looks in practice, are we inadvertently curtailing their own forays into quality practice that suits their own context? If they do use initiative to provide quality care unique to their context, are they able to recognise it?

Interestingly, within the combined 201 pages of the EYLF and the Educators Guide to the EYLF, there is no mention of the strengths an educator brings to the ECEC setting. The educators, however, are asked to recognise and expand children's strengths in both documents. Educators Being, Belonging, Becoming: The Educators' Guide to the EYLF also directs them to consider and debate the strengths of various theories and 'strengthen policy making, service delivery and practice, and continually monitor, reflect on and refine this process' (Department of Education Employment and Workplace Relations, 2010, p. 27). In the same document, there is a hint that all stakeholders bring strengths to the partnership, and that educators should be mindful of that, but there is no direct mention of their strengths. While it is pleasing that the documents focus on the children, it does seem that the importance of educator strengths seems to be lost. To recognise and build on children's strengths through planning, implementation and scaffolding, requires the educators to have strengths of curiosity, social intelligence, kindness, fairness and creativity if using the Via Institute's List of Strengths (Via Institute of Character, 2021). Working from the same strengths list, the other two activities listed above (around theories, policy and practice) would require educators to have self-regulation, teamwork, perseverance, judgement,

love of learning and perspective. Thus, being an effective educator requires multiple strengths to be used simultaneously and it seems telling that they go unrecognised in documents such as these. It could be argued that these curriculum documents are not the place to recognise educator strengths, but it is hard to know where the recognition does belong. It certainly is not recognised in their Australian Government award wage (Fair Work Ombudsmen, 2020). Recognising and developing educator strengths is very important, especially for beginning educators, and assumptions cannot be made that every educator is getting encouragement and support within their service (Doan, 2014). When educators utilise their strengths, children, parents and the community benefit, however, attending to regulations may interfere with this process.

According to Bown and Sumsion (2007) accreditation requirements mean that educators 'may operate behind a metaphorical regulatory "fence" which contributes to their perceptions of safety but impinges on their professional freedom, integrity and passion for teaching' (p. 30), an unintended outcome of the documents. Indeed, there is a need to debate and question these frameworks (Millei & Jones, 2014), guides and accreditation requirements because they affect children, educators, and ultimately, our society. These documents portray a particular image of the child and a future citizen of the world so they need to be critiqued (Galdames-Castillo, 2017). In an Australian study, Fenech, Sumsion, and Goodfellow (2006) found the increased regulations in ECEC services created increased needs for documentation, increased time pressure and increased administrative needs. Conversely, the increased regulations assisted engagement with parents and some management processes. Since these studies, the National Quality Framework has been introduced to provide 'a national approach to regulation, assessment and quality improvement for early childhood education and care and outside school hours care services across Australia' (ACECQA, 2020, para. 1). In studying the effects of this regulatory system on educators, Grant et al. (2016) remark on the detrimental 'personal effects of external accountabilities' (p. 44). In the same study, educators related the difficulty of interpreting other people's expectations in some of these documents, the extra unpaid hours spent fulfilling documentation requirements that caused family pressures, reduced contact time with the children and families during work hours, time pressure to still attend to other required tasks, the need to justify their work, the discomfort of giving into the different philosophy the requirements require, and dealing with comments from parents that they would prefer the educators work with the children, rather than documenting (Grant et al., 2016). When this type of work stress impacts family life, such as in the example of working after hours, it doubles the worker's stress according to Beattie (2019).

Within other education sectors, the influence of neoliberalism has meant: there has become a normalisation of working additional hours (Bottrell & Keating, 2019), an expectation that work will need to be done outside of hours (Rea, 2018), work has intensified (Mayo, 2019) and an ideal worker is always working, even after hours and during annual leave (Sims, 2020). Thus, the reason behind the increase in the number of frameworks, policy documents, standards, guidelines and curriculum documents need to be questioned, and whether they are necessary and effective. We also need to question what the effects of all this extra documentation has on educator wellbeing and confidence. Standards of practice that have been externally created are a feature of ECEC in Australia, where educational leaders are supposed to ensure the educators and service are complying with the standards that are enforced through the national accreditation system (Maloney et al., 2019). Other countries question such standards and view them as a way to de-professionalise the industry as they allow governments to define quality and practice within their settings (Maloney et al., 2019) with their own agendas.

Preparing human capital

Within the early childhood sector, we need to be aware of those agendas and how they may have influenced our frameworks and curricula in the past, and potentially, the future. Sims (2017) and Sims and Waniganayake (2015) argue that there has been an increasing trend in Western countries toward higher levels of literacy and numeracy being emphasised within education documents, such as curricula, standards, frameworks and guides. This aligns with the ideas of children as future citizens who are required in the workforce, rather than working from a strengths-based framework where children's interests and strengths are utilised to create the best learning outcomes (Sims, 2017). Arguably, *Being, Belonging, Becoming:* The Early Years Learning Framework (EYLF)(Department of Education Employment and Workplace Relations, 2009) takes a more holistic approach. Indeed, we need to keep a strengths-based approach that builds on skills, encourages autonomy, enhances strengths and cultural knowledge and practices rather than working from a deficit-based perspective that focusses on fixing problems or gaps in skills (Green, McAllister, & Tarte, 2004). According to Hursh (2007), a focus on literacy and numeracy diminishes the opportunity for education about rights and responsibilities and the development of the whole child. This is 'due to assumptions being made about their human capital potentials' rather than their development as human beings (Hunkin, 2017, p. 443). Fielding and Moss (2012) explain the way education prepares future neoliberal citizens, stating

> *the dominant purpose is the production of autonomous subjects for an inescapable neoliberal world: the calculating and risk-bearing consumer, the flexible and lifelong-learning worker, homo economicus incarnate, equipped for a life of perpetual competition and instant responsiveness to the flickering of market signals (p. 1).*

Therefore, arguments for these regulations and frameworks around increased quality could and should be questioned in relation to whose quality is foregrounded (Hunkin, 2017), the government's or the needs of the child. The dominant neoliberal assumption at work is that the market will promote quality, through competition and regulations (Maloney et al., 2019). According to Dahlberg, Moss, and Pence (2007), quality is constructed by individuals and groups based on their interests, values and beliefs.

The role and effects of neoliberalism in universities teaching pre-service early childhood educators

Australian pre-service educator training degrees require accreditation from the Australian Children's Education and Care Quality Authority (ACECQA) (2012) who implement the National Quality Framework (NQF) and the National Quality Standards (NQS). If it is a combined degree to teach birth to age 8 or birth to age 12, it also requires the relevant geographical state education regulatory authority. On another level, the university itself requires accreditation in accordance with the Higher Education Standards Framework (Tertiary Education Quality and Standards Agency, 2015)(TEQSA). The government justifies this in terms of quality outcomes for education and teaching through a complex web of quality assurance tools (Grant, et. al., 2016). Conversely, Hill (2004) argues that units within university courses have been simplified to keep the students, who have been positioned as customers, satisfied with the product (the qualification) and feel as though they are receiving value for money (Hil, 2012; McLaren, 2005). Indeed, MacNaughton and Frey (2015) note that in many Western countries, access to free higher education has reduced dramatically as fees increase and free spaces are based on merit. As education systems are marketised, the economy dictates educational aims and critical thought are suppressed as education becomes a 'sub-section of the economy' (McLaren, 2005, p. 6). Further to this, Sims (2020), Connell (2019) and Watts (2017) explain the inherent problems and far-reaching effects on education quality and academic freedom this type of over-regulation causes within universities. For example, Sims (2020) explains that neoliberal managerialism that is justified to promote quality, position the university worker as 'weak, obedient, and passive' (p. 140). In turn, this affects workers' identity as they are less able to do their work, but spend a lot of time justifying their work to ensure it meets management or government standards of perceived quality. This results in internalised oppression and the way workers view themselves, resulting in higher levels of stress within the workplace, negatively impacting the quality of their work (Rogers et. al., 2021). The stresses within the higher education sector impacts pre-service educators as they complete their teaching qualifications in a highly regulated, stressed environment with over-stretched staff.

The effect on educators

Within the ECEC sector, the effect of over-regulation in ECEC can result in a reduction in creativity and confidence and a moulding of what good early childhood practice should be (Rogers et. al., 2021). Accreditation, standards, guidelines and frameworks are prescriptive and part of the quality control of neoliberal inspired education policies, as described by McLaren (2005). Providing the quantity of evidence accreditation takes a great deal of educators' time, often reducing their ability to work with children's interests in a creative and relaxed manner which encourages innovation. This challenges educator identity and agency, because the documents can be perceived as authoritative and comprehensive, rather than guidelines of what quality might entail, which will vary greatly within the context of different services, demographics, communities and individual children. Maloney et al. (2019) assert that externally determined quality means educators become mere practitioners, further undermining their confidence. This is problematic, because ECEC practice is complex and nuanced (Cumming, Sumsion, & Wong, 2015). Educators need to regulate and watch their behaviour to fit in with external mandates which 'sometimes means that working "with" the grain can be an uneasy experience' taking away 'the opportunity to exercise professional autonomy, and potentially undermine their professional confidence, engagement and satisfaction' (Cumming, Sumsion, & Wong, 2013, p. 230). Educators' notions of quality are often shaped in terms of regulations and qualifications, as the study by Gibson (2015) found. Furthermore, McLaren (2005) describes the pressure on educational services to behave like businesses or risk being uncompetitive in a marketised system. Press, Woodrow, Logan, and Mitchell (2018) explain that in the neoliberal inspired marketisation of ECEC, the parent is placed as the consumer. In Australia and New Zealand, ECEC is the most privatised sector of education and market forces have changed the public discourse about the sector and shifted government and community responsibility onto the market (Press et al., 2018).

Over-regulation can also change the nature and focus of educator's work, to gather evidence for the large quantity of documentation required to prove their compliance and the quality of what they do (Grant, et. al., 2016). For example, reporting

to parents, gathering documentary evidence to prove their competence and educational quality can often undermine engagement with children as the focus can easily slip away from the child to the documentation requirements (Rogers et. al., 2021). Educators can also lose their sense of 'professional integrity and responsibility' in the face of accreditation requirements that require 'unquestioning compliance' (Bown & Sumsion, 2007, p. 47). It is questionable that the documentation improves or reflects the quality of education or care, but perhaps it satisfies authorities that important work is being done. The large quantitative study exploring the imposed quality measurements used in Australian long daycare centres by Fenech, Sweller, and Harrison (2010) concluded that quality measurements can inform policy, but they 'give conflicting messages about quality' and create many questions about the foundations of 'existing and changing' quality levels (p. 294). Indeed, Fenech (2012) argues against the dangers of imposing a positivist conceptualisation of quality that needs to be measured, and instead calls for a nuanced conceptualisation of quality in the ECEC sector. The findings of the Grant et. al. (2016) study show that since the implementation of the National Quality Framework, there are still many problems in this area. Therefore, there is a need to question the influences of the way quality is conceptualised, imposed and measured in ECEC and the way this has changed the work of educators and their belief that daily proof of children's engagement is required. Further, Vintimilla (2014) asserts that 'early childhood education serves the neoliberal project by maintaining the status quo through a sort of political apathy that is symptomatic of the diminishing criticality' (p. 85). How an imposed notion of quality affects educators' notions of their own work is of interest to the discussion in this paper.

Challenging the idea of standardised practice in ECEC

The increased presence of these neoliberal inspired documents in the ECEC sector raises a number of questions (Rogers et. al., 2021). The authors of these frameworks, standards and curriculum guidelines assume good quality ECEC practice can be identified and standardised, rather than being a complex, nuanced notion as Fenech (2011) describes. Whether the documents support educators and create better education and care is debatable, or, as Grant et al. (2016) suggests, they just create greater accountability and increased documentation. Perhaps these documents and high levels of accreditation jeopardise other ideals within ECEC, by using 'an economic lens ... (that) endangers the transformative and emancipatory potentials of ECEC' (Hunkin, 2017, p. 11). This paper argues a need and a responsibility to challenge this position and practice so that children have the best opportunities to thrive as recommended by Sims (2017). To further this argument, I present findings from research conducted with educators within a very specific community context which requires particular knowledge of the families' situation, their community and the ideals, expectations and associated challenges of the organisation that employs the parents.

Research context

The research project was entitled 'Young children's understandings and experiences of parental deployment within an Australian Defence Force (ADF) family' (Rogers, 2017a). Ethics approval for the study was gained through The University of New England and pseudonyms were given to all participants. The main research participants were 2-5-year old children, and the majority of these were attending an early childhood service in Australia, attached to a military base. The in-depth study had participants from eleven families, with nineteen children involved overall because a number of families had multiple children. Children needed to be from military families who had experienced parental deployment. From these participants, six case study children provided extra data that became a rich source of learning about their experiences and understandings of parental deployment. The families connected with the service were all recruited using convenience sampling. Parent consent and children's assent were used and all participants were able to withdraw from the study at any time. Additionally, children were able to opt in or out of various research activities as they pleased and their peers who were not involved in the study could do the research activities with them if they chose to, although their data was not used. Three extra families, not connected with the service were also involved to broaden the collection of data to include families from four different military bases and three different geographical states in total. Non-ADF parents and early childhood educators were also participants. They provided data with informed consent, providing valuable clarification and verification of children's responses, and extra background information through informal chats, emails, telephone calls and sharing family photos. Data was analysed using thematic and narrative analysis.

The unique stressors for these families included frequent and prolonged parental separation due to training and deployment which generally lasted between three to nine months (Baber 2016; Rogers-Baber, 2017b). The families also experienced frequent relocation at least every two years, which is common for many military families (Brooks, 2011) throughout the world. Military organisations and families can be described as 'greedy organisations', both demanding devotion, time, energy and great sacrifices from their members (De Angelis & Segal, 2015). When the two intersect, tensions arise and it is within this intersection

that military families live (Segal, 1986). As shown in Figure 1, children can respond to parental deployment emotionally (Paris, DeVoe, Ross, & Acker, 2010), socially (Hollingsworth, 2011), physically (Lester & Flake, 2013) and cognitively (Chandra et al., 2009). This creates added strain on the parent at home and the returning parent when the family reunites (Rogers, Bird, & Sims, 2019b). In order to answer the research question 'what are young children's understandings and experiences within an ADF family', a participatory research methodology was chosen.

Figure 1:
Children's responses to parental deployment (Source: Rogers et. al., 2019b)

Methodology

The participatory research Mosaic approach was chosen to capture the voices of young children who had previously been marginalised in military family research in Australia and globally (Rogers & Bird, 2020; Rogers, Bird, & Sims, 2019). While research had been done with military families, the data about children was either secondary data from parents, or collected from a deficit-based psychological model, rather than a strengths-based resilience model (Rogers, 2017a). The framework for listening to children's voices was proposed by Clark and Moss (2011) and is based on three tenets, as displayed in Figure 2. Firstly, the framework asserts that children are adept communicators and are capable of making sense (Mazzoni & Harcourt, 2013). Secondly, the framework states that children have a right for their opinions and voices to be heard as outlined by the United Nations (1989), which has been ratified by many countries, such as Australia, so therefore is subject to international law. Lastly, it states that children are knowledgeable about their own lives and issues that affect them (Clark & Statham, 2005).

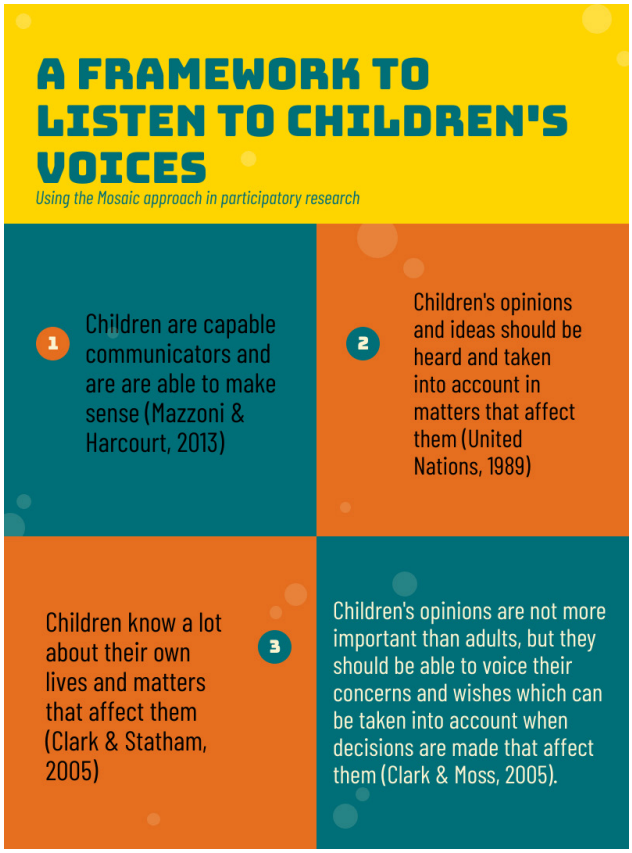

Figure 2:
A framework for listening to children's voices (Adapted from Clark & Moss, 2011)

Using this framework, the voices of children were captured using a range of tools, including observations, chats, photo and story elicitation, discussions, artwork, craftwork, rhymes, raps, role and puppet play, photos the children took and instructed their parents to take, shared family photos and a researcher reflective journal (Rogers & Boyd, 2020) as recommended by (Greenfield, 2011). Most research activities started with a reading of one of the storybooks the researcher had written about a family where a parent is away on deployment (e.g. Now that I am big: Anthony's story, Rogers, 2018b). This would act as a springboard for group discussions and the practical arts-based activities. I also gathered the voices of their non-ADF parents and their early childhood educators. These small pieces of data were grouped into themes using thematic analysis, then on reflection of all the themes, a clearer picture of what the children understood and experienced when their parent deployed. This is

similar to a mosaic picture that is made up of small pieces of colour that is arranged in patterns, then when you get enough perspective from a distance, you can see the whole picture (see Figure 3). A socio-ecological lens was also applied to the findings, utilising the model by Bronfenbrenner (1979, 1986). To do this, each child from the case studies connections and supports were viewed and plotted within their socio-ecological model. This framed the discussions about the protective factors each child connected to.

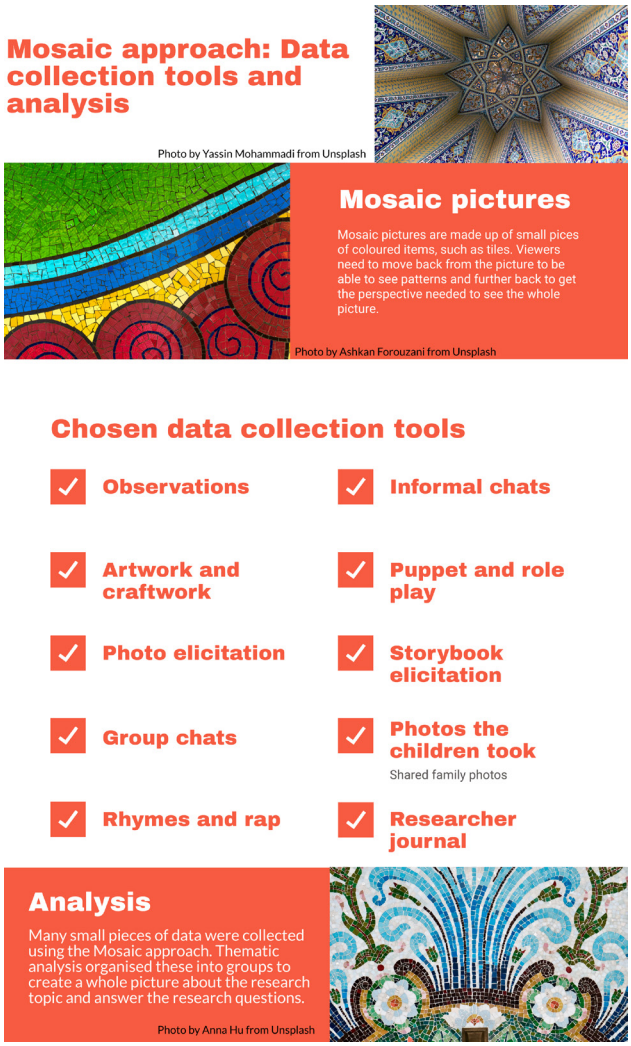

Figure 3:
Mosaic data collection tools and analysis

Results and links to ECEC and military family literature

> *'Simon leaves tonight for six week's training, and Bella (2-years old) has been just awful to him in the lead up to him going....Just yelling at him, refusing to cuddle him and saying she doesn't like him 'cause he's going and stuff like that. It's awful. I am so upset and Simon is devastated'. Parent 1*

> *'The educators lent me books about emotions for Bella (2-years old), because she wasn't coping. The books really helped me work through strong emotions with her, like anger and sadness. Her behaviour really started to improve after that'. Parent 1*

> *'I am a mess for the last two weeks (of deployment). I fear something might happen to him. It's when the shit happens, at the end'. Parent 1*

> *'My hardest week is week 3 or 4 of deployment. I think it really sinks in then. When I am not coping, Emily's (2-years old) emotional state and mine are a bad mix. We sort of feed off each other. It helps me to cope if I just tell everyone I am doing it tough. I do that with my friends, my Facebook friends and Emily's educators. Emily's educators give extra support to us both and it really helps. They understand defence families'. Parent 2*

> *'The educators at this centre really support them emotionally, I think. We thought of moving Cassie (3-years-old) when we moved houses, but both agreed, their understanding and support of defence kids is worth the extra drive'. Parent 3*

The data revealed many themes within the project and the research question was answered. This paper does not discuss the answers to the overall research question, but concentrates on one particular theme, using the vignettes above, about the positive relationships children and parents had with the children's early childhood educators. This was also revealed in the literature by Hollingsworth (2011) who explains that positive relationships and social supports with others outside the family act as protective factors, coping strategies or buffers during stressful times in military families. The parents listed the educator's knowledge of military family needs as a major strength of the service and their ability to support the child and the family (Rogers-Baber, 2017b).

Parental deployment creates stress for families (Gewirtz, DeGarmo, & Zamir, 2016; Siebler & Goddard, 2014). The at-home parent needs to cope with their own feelings of grief and loss, as well as deal with the responses of children (Rogers, 2018a). These responses mean higher levels of attention and care are needed as the child struggles to cope with the sudden absence of their parent. Leaving the house is often very stressful, as the child might withdraw socially (Hollingsworth, 2011) and no longer wants to go to places they previously enjoyed, such as early childhood settings. So, the parent is often exhausted physically, sleep deprived, emotionally spent, and having to make extra effort to avoid social isolation. In turn, this can affect their ability to appropriately support their child(ren)(Cai, 2020). The ability of the educator to recognise and understand this stress, respond appropriately and offer support is key for the at-home parent (Rogers, 2020).

In this example, Bella's mother (Parent 1) reported that she received emotional support and empathy from educators for Bella and herself within the early childhood centre, something that was not identified through quality assurance processes. They loaned her resources that helped her explain some of the strong emotions that Bella was experiencing. These resources acted as springboards, giving them a way to talk about

the emotional responses Bella was having when her father deployed. Arthur, Beecher, Death, Dockett, and Farmer (2018) state this is a marker of quality care as well as sensitivity to the diversity of family structures, challenges and experiences of families. Parents seek care for their infants and toddlers based on warm relationships and stress the importance of health and wellbeing (Ahnert, 2005). Additionally, Bella's parents matched their own underlying beliefs with the childcare service as Otto and Keller (2014) describe in their paper about alloparenting. Parents, educators, extended family and adult friends take on varying care roles forming multiple attachments for a child, which Ahnert (2005) calls alloparenting in humans. Although we do not know as yet the long-term effects of alloparenting through early childhood services, and the way they socially embed care, we do understand its' importance (Otto & Keller, 2014).

Transitions, such as moving on to school, can disrupt the protective factors provided by relationships with ECEC educators. In one example, a parent communicated her fears around sending her child to a school nearby to where they lived because the teachers at some schools would not have the cultural knowledge and understanding of defence families. The children enrolled from the school were almost all from the general community, with only one or two from defence families. This was in contrast to the educators at the early childhood service who only taught children from military families. Additionally, Parent 3 communicated they had kept their child at the service despite moving suburbs and having to travel an extra 40 minutes every day to keep her at the service because the educator understood and supported military families. The mother revealed this decision was based on the professionalism of the staff who provided emotional support and understanding of the needs of children and families from the military community. Apart from transitioning to schools and moving suburbs, frequent relocations to other towns and cities inhibit these protective factors (De Pedro & Astor, 2011) because new relationships with staff and peers need to be formed, along with adjusting to changes in practices, expectations and settings.

Early childhood educators need to develop respectful relationships with parents to best support the child (Newman & Pollnitz, 2005). Emily's mother (Parent 2) valued the knowledge and understanding of military families and reported that they were a strong source of emotional source for both Emily and herself. This was achieved through respect, genuine empathy and authentic emotional support. Jennings (2014) articulates that educators have the important role of providing emotionally and socially supportive learning environments. Unlike in the US context, Australian educators are expected to learn about military families within their services because no culturally appropriate formal training or resources have been available. Due to the high level of turnover in the ECE sector, this is problematic. It is also challenging when a family is using a service who has had no previous experience in supporting military families. This lack of guidance is being addressed through the provision of free, research-based resources and programs for educators (and parents and family support workers) to be piloted in 2021 (see https://ecdefenceprograms.com/). So, the educator's responses to the families in this example (conducted prior to the creation of the programs), are remarkable.

In order to achieve quality relationships and the trust and loyalty of parents who transitioned in and out of the service as their families were moved about by the military, the educators at this service needed specific knowledge of the military culture and be willing to support it. For example, specific military commemorative days were observed at the service, for example, Anzac Day and Remembrance Day. They also included military uniforms in the dramatic play area, decorated the foyer with army colours, camouflage nets and toys dressed in military uniforms, and they included toys that were military themed in a toddler play area (Baber, 2016). They also supported the narratives the parents had developed with the children to help them explain when their parents were going away, and when they would return from deployment (Baber, 2016). Despite frequent relocations, educators needed to build rapport and partner with parents to know what was happening at home to assist them to support the child during times of transition (e.g. deployment and training). They needed high levels of empathy to assist children during the initial deployment and reunions because children responded emotionally, socially and physically as outlined in Figure 1. The educators also provided the non-deployed parent with additional support due to fatigue, and increased parenting and emotional stress.

Using the Via Institute of Character (2021) strengths list, this support required educators to demonstrate social intelligence, perspective, love of learning, judgement, curiosity, zest, perseverance, love, kindness, fairness, teamwork, leadership, hope, prudence and self-regulation. Again, this shows how complex and nuanced educators' work is and how many strengths are needed to do the work well. The most surprising finding was when I relayed the messages of the parents back to the educators, they were shocked. Despite their many years' experience in the ECEC sector, they had not recognised their own strengths, knowledge and value and were clearly unaware of the loyalty this engendered from the families. The educators' inability to recognise their own value is partly due to working in a figured world through the use of neoliberal inspired policies that make

educators feel that they are never good enough, that they must constantly try to improve their practice. This figured world 'positions workers as incompetent, untrustworthy and in need of micromanagement to perform effectively' making it challenging to maintain a sense of self-efficacy or self-worth' (Sims, 2020). Indeed, Moore and Robinson (2016) and Rogers et. al., (2021) note that in neoliberal inspired micromanaged environments, workers lack confidence, fear doing anything that is not prescribed and feel undervalued. This makes it very difficult to ensure educators can resist these neoliberal influences and determine what is good practice, as described by (Maloney et al., 2019).

Discussion about neoliberalism in ECEC

The inability of these experienced educators to recognise and value what they did is deeply concerning and raises many questions about the neoliberal inspired context in which they work. While the neoliberal mantra of constant reflection and improvement may sound appealing, it may have it left us with educators who cannot see their own worth. The prescriptive standards, frameworks, curriculum and guidelines may not build the confidence and skills of educators because they are a form of neoliberal-inspired micromanagement. The neoliberal worker, as described by Dahlberg and Moss (2005), is adaptive, flexible, self-reflective and self-analytical but clearly, in this situation, lacks confidence. It has made them only value what is prescribed, rather than determine what quality looks like in their own context. Workers who feel valued and competent tend to stay longer in their jobs, but the early childhood profession has a very high attrition rate in Australia, affecting the education and care of the children and the support given to parents.

Therefore, we need to challenge the idea that good quality ECEC practice can or should be identified and standardised (Maloney et al., 2019), and question why authorities are allowing the neoliberal agenda to unfold in the ECEC field (Dahlberg et al., 2007). As Macías (2015) notes, other related fields, such as social work are also being affected by the neoliberal agendas of regulatory bodies, education authorities and policy makers. She argues that

> *neoliberal market rationalities are sustained by discourses of practise standardization that reduce risk associated with social workers who either over-step professional boundaries or exercise personalized judgement. Discourses of standardization capture interpersonal and potentially unpredictable social work relationships within a rationality of objectivity, predictability, calculability and rational action' (Macías, 2015, pp. 256-257).*

There is a need for professional discretionary decision making in order to adjust practice to context. If we challenge standardisation in the neoliberal context, it opens up opportunities to support educators. Unfortunately, neoliberalism is not a finished project, it is still unfolding within Western societies and its' affects are far reaching and may increase if we are not vigilant and resist their excesses (Macías, 2015). Neoliberalist documents consist of a very particular type of language, and language itself changes the way we think (Jones & Hoskins, 2016). Although we may resist neoliberalism, most of us tend to take on aspects of it in the way we view ourselves and the way we work and act (Macías, 2015). Indeed, such language and philosophies become part of our figured world, that is our socially constructed understandings of our world (Cleland & Durning, 2019) and how we behave and practice in that world. Cumming et al. (2015) remind us of the complexities and nuances of ECEC practice that are constructed between children, the context and broader regulatory environment. The way neoliberal ideologically inspired documents infiltrate our organisations makes them part of the organisational narratives that underpin mission statements, aims, goals, directives and priorities. Narratives are innately important to humans and we are attracted to them (Gleeson, 2012; Gottschall, 2012; Rogers, 2019, 2021). According to Monbiot (2019) they are the 'means by which we navigate the world. They allow us to interpret its complex and contradictory signals' (1.26 minutes).

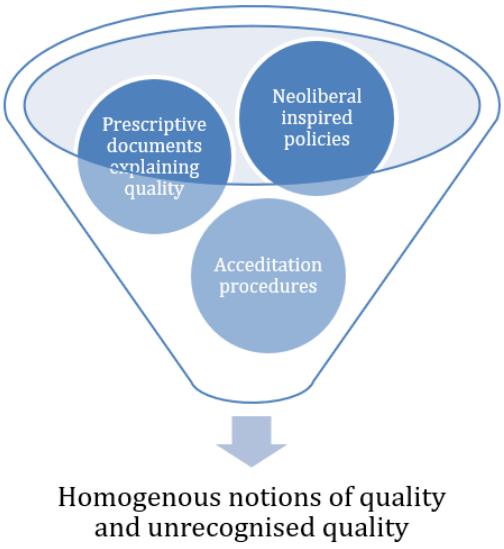

Figure 4:
The potential path to homogenous notions of quality and unrecognised quality

In this project, we can see that the educators had taken on the neoliberal narrative notion that quality and value is only what was prescribed in neoliberal ideologically inspired documents, rather than the quality they were providing in their unique context. This is summarised in Figure 4, where the neoliberal

inspired policies, documents, accreditation systems can potentially create a homogenous notion of quality and an inability to recognise contextual quality. The educators failed to see the nuanced complexity of their work, as autonomous decisions were devalued by neoliberal inspired requirements, as explained by Cumming et al. (2015) and Cumming et al. (2013). The educators had also taken on the neoliberal logic that there is a need for constant improvement and that there is always more to be done, despite their best efforts (Mayo, 2019). This disempowering and disenchanting mantra is demonstrated by the educator's inability to value and recognise the quality in their own practice. Such devaluing of their work is worrying, given the low levels of pay and the high levels of attrition in the ECEC sector (Page, 2019), because high attrition and low job satisfaction affect all stakeholders.

Limitations

This was only one set of educators in one service and therefore cannot be applied to other setting. It is not assumed that the educators' lack of recognition of their own strengths and quality practices within their unique context is widespread. It does however, invite important discussion about prescribed notions of quality and how this might impact educators.

Conclusion

Therefore, we need to be vigilant and question the influence of neoliberalism on our educators and ECEC sector, or risk 'political apathy or conformism that keeps alive the neoliberal status quo and allows it to remain unthought' (Vintimilla, 2014). The dominant discussion in early childhood hides behind the guise of quality, but arises from neoliberal philosophy and a positive stance which requires technical application with managerial oversight (Dahlberg, Moss & Pence, 2007). As Galdames Castillo (2017) explains 'ECEC has become one of neoliberalism's technologies for control and domination of children as a future workforce' (p. 171). Thus, many educators and pre-service educators have not known any other model than neoliberalism, so it is harder to identify the influence of neoliberal policies, or imagine another way of functioning (MacNaughton & Frey, 2015; McLaren, 2005). Despite this, we need to encourage educators to recognise and value their unique strengths within their own unique contexts and communities. In turn, this encourages them to recognise and value the strengths of their colleagues within their unique context. Hunkin (2017, p. 452) states

> *'a concerted effort by ECEC stakeholders is needed in order to break down the taken-for-granted authority of the dominant assumption that quality is universal, measurable factors. Spaces need to be created for the quality of ECEC settings to be acknowledged as a contestable, complex notion, likely to differ in meaning across populations and time'.*

Neoliberalism was designed as an economic model, which has now been applied to other aspects of society, such as education. Unfortunately, the system does not fit well and has had a deep impact in the ECEC sector and is often reasoned as a way to improve quality, which is debatable. It has been responsible for increased busyness associated with the work of educators as they strive for constant improvement, reflection and accreditation, constantly proving their worth and ability against pre-determined prescribed measures. This busyness itself is a distraction that assists the neoliberal agenda to unfold. Indeed,

> *'as long as the general population is passive, apathetic, and diverted ... then the powerful can do as they please, and those who survive will be left to contemplate the outcome' (Chomsky, 2016, p. 56).*

We need a concerted effort to raise awareness, discuss these issues, and resist the problematic effects of neoliberalism's infiltration into education (Hil, 2012). Similarly, Giroux (2015) states that resistance to neoliberalism is 'not a luxury but a necessity' (p. 200), and Press et al. (2018) stress the need to 'reclaim the purpose of education' (p. 337). Within ECEC, educators and pre-service educators need to feel valued and competent so they can continue their work in their own unique contexts and recognise and value contextualised quality and professionalism. Educator's confidence and feelings of competence will hopefully assist them to have long and rewarding careers in this important profession and go on supporting young children and families.

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Analysis of Longitudinal Relationship among Elementary and Middle School Students' Multicultural Acceptance, Self-concept, and Community Consciousness using the Latent Growth Model

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Abstract

As the proportion of multicultural family increases in Korea, there has been an acceleration in the emergence of a multicultural and multiracial society, resulting in more students with different cultural backgrounds in schools. Therefore, it is necessary to achieve harmony and integration among people from various cultures and backgrounds. The purpose of this study was to identify how multicultural acceptability affects self-concept and community consciousness by using longitudinal data collected for elementary and middle school students using a latent growth model, and to confirm the relationship between these variables. As a result of the study, first, it was confirmed that the multicultural acceptance of elementary and middle school students influences the development of self-concept and community consciousness. Second, a positive correlation was found between the three variables of multicultural acceptance, self-concept, and community consciousness. This study has implications for establishing educational measures relating to multicultural acceptance, self-concept, and community consciousness for adolescents, who are at the stage where perceptions and attitudes toward diverse races and different cultures are cultivated.

Keywords:

Elementary and Middle School Students, Multicultural Acceptance, Self-concept, Community Consciousness, Longitudinal Analysis

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Introduction

As the proportion of multicultural family increases in Korea, there has been an acceleration in the emergence of a multicultural and multiracial society. Accordingly, the number of students enrolled in higher education institutions with diverse cultural backgrounds and nationalities is

increasing every year (Lee, Chung, Jang, Jang, & Kim, 2017). Therefore, a discriminatory attitude toward multiculturalism will make it difficult to coexist with people from diverse backgrounds and cultures (Yang & Kyun, 2020). With the recent crisis caused by the COVID-19 pandemic, internationalization has rather regressed, and a new difficulty has arisen in the acceptance of multiculturalism. The number of multicultural households nationwide in Korea is about 353,800 (Korea National Statistical Office, 2019); thus, efforts to harmonize and integrate Koreans and people from various backgrounds are indispensable to a multicultural society (Lee, 2015). Efforts are required to change the perspective, perception, attitude, and values of members of society toward people from various cultural backgrounds (Choi, 2014). This multicultural attitude is a necessary competency for living in a modern society (Kim, Lee, & Song, 2020)

In the context of schools, an increase in the number of students from different cultures has made it imperative to develop an attitude to accept diverse cultures and backgrounds in school education (Cha & Mo, 2017). A lack of multicultural acceptance can affect not only students' perception of and behavior toward others and other cultures, but also their own psychological and social well-being; thus, efforts are needed to increase multicultural acceptance in educational situations (Choi & Kim, 2015).

Multicultural acceptance refers to the level of accepting as members of a society a group of different races and diverse cultural backgrounds along with the change of a multicultural society (Lee et al., 2017). It is an attitude that supports social values in order to accept the change into a multiethnic and multicultural society and to coexist among various ethnic groups and races (Hwang, 2010). From the perspective of multiculturalism, it can be said that multicultural acceptance is a positive attitude toward multiculturalism that acknowledges and respects diverse cultural backgrounds with an open mindset toward other cultures and recognizes migrants as objects of coexistence (Yoon & Song, 2011).

Multicultural acceptance, a new perception of diversity, is an important quality that children of multicultural families and adolescents who form peer groups in school must possess (Baek & Jeong, 2017; Park, 2014). This will enable adolescents to create harmonious relationships through acceptance of other people and other cultures and establish their own human view (Yoo, 2007), as well as to develop positive perceptions of different races and diverse cultures (Han, Kim, & Jeon, 2014). Based on these prior studies, this research intends to define the concept of multicultural acceptance as an unbiased and tolerant attitude toward people from various backgrounds and cultures.

On the other hand, self-concept, which is the whole of self-perception, is related to multicultural acceptance in that it has an effect on individual perception (Jang & Eo, 2013). Self-concept is a prerequisite for respecting and looking at others positively (Banks, 1975), and research by Yang and Kim (2015) found that people with high self-esteem positively perceive and respect others. As such, individuals can establish self-understanding, self-acceptance, and self-identity, and on the basis of this, they can understand others and accept their perspectives (Bak, Kim, & Bang, 2016). Self-concept can be defined as an individual's perception and assessment of self (Shavelson, Hubner, & Stanton, 1976). Lee and Kho (2017) defined the overall perception of oneself, including one's abilities, attitudes, and feelings, as self-concept, and because of its multifaceted characteristics, self-concept is also used as a sub-domain in other fields (Lee & Kim, 2017). Also the environment is having an important influence on the formation of student self-concept (Ramazan & Çiftçi, 2020). In other words, self-concept is a comprehensive objective evaluation of oneself formed through various experiences and processes (Hong, 2019).

Erickson (1968) suggests that in adolescence, the objective perception of self is expanded and the self-concept is established through interaction with others in society. Harter and Whitesell (2003) emphasize that the self-concept is formed by recognizing external evaluation of oneself in the complex interactions of society. Lee and Lew (2014) emphasize a positive self-concept that recognizes oneself as a competent and valuable being, while at the same time empowering one to have strong power within oneself. In other words, by developing a positive ego, it is possible to develop a tolerant attitude toward different cultures and races (Bennett, 2009).

Another major factor influencing multicultural acceptance is community consciousness (Seo, Jo, & Kim, 2015), which is defined as a sense of belonging that is influenced by each organization in the society and formed in the interactions among members with a sense of influence (Kang & Jang, 2013).

Community consciousness (Hahn & Oh, 2013), which represents psychological states such as a sense of belonging, intimacy, homogeneity, and family consciousness felt by members of the community, is related to lifestyle habits and attitudes that are naturally created in the community environment (Chae, 2013). That is, community consciousness is an indicator of how personal and social problems are closely related in today's world and how people think of the community they belong to (Cho & Kang, 2016). In addition, social contraction of adolescents can be a factor that influences multicultural acceptance, with research showing that adolescents with low social

contraction indicate positive and high self-esteem (Park & Yun, 2018).

Interaction in the community from childhood to adolescence is important (McGue, Elkins, Walden, & Iacono, 2005), and adolescence is a period in which a sense of community consciousness develops by forming relationships with peers with different values in school (Yang & Kyun, 2020). Community consciousness is an important variable that can affect school life, relationships with peers, and satisfaction with life at home during adolescence (Choi & Moon, 2013). In addition, community consciousness, like multicultural acceptance, is important in various relationships between individuals and their surroundings (Koo, 2015), and being a social and environmental aspect, can affect multicultural acceptance (Yang & Kyun, 2020). According to Park, H. S. (2014), who considered community consciousness as a sub-concept of global citizenship and studied its association with multicultural acceptance, the sense of community in the first year of middle school makes the level of multicultural acceptance significant in the second year of middle school. Therefore, it is important to recognize the relationship between multicultural acceptance, self-concept, and community consciousness based on prior research.

As for the age distribution of children of multicultural families in Korea, 9-11 year olds, who are in the upper grades of elementary school, account for 45.8%, 12-14 year olds in middle school for 24.1%, 15-17 year olds for 16.4%, and 18 years and older for 13.8% (Ministry of Gender Equality and Family, 2019). It is important to introduce multicultural acceptance in the elementary school period because adaptation to elementary school life affects the psychological and social development of students (Choi & Kim, 2015). In other words, the high grade of elementary school is an appropriate time to increase multicultural acceptance (Yang & Kim, 2015). Thus, a longitudinal study of high school students who have many opportunities to meet people with diverse cultures and different races will be meaningful.

Therefore, the purpose of this study was to clarify how multicultural acceptability affects self-concept and community consciousness by using longitudinal data collected for elementary and middle school students using a latent growth model, and to confirm the relationship between these variables. For this purpose, the research questions to be confirmed in this study are as follows:

Research Question 1. Does multicultural acceptance of elementary and middle school students influence the development of self-concept and community consciousness?

Research Question 2. What is the relationship between multicultural acceptance, self-concept, and community consciousness of elementary and middle school students?

Method

Research Subjects

The purpose of this study is to clarify how multicultural acceptance of elementary and middle school students affects self-concept and community consciousness, and to confirm the relationship between these variables. To this end, five-year panel data of the Korean Education Longitudinal Study (KELS) from elementary school 5th grade to middle school 3rd grade was used for the period from 2013 to 2017. The sample panel consisted of 7,324 fifth grade elementary school students. After excluding the missing values, 5,468 students (male: 2,635; female: 2,833) were targeted. The distribution of the research subjects is shown in Table 1.

Table 1.
Distribution of research subjects

		Frequency (persons)	Ratio (%)
Gender	Male	2,635	48.2%
	Female	2,833	51.2%
	Total	5,468	100.0%

Measurement Tool

Multicultural acceptance. To measure multicultural acceptance, 11 items from (KELS, 2019). Grouped into two sub-factors (perception of foreigners and relation with foreigners and multicultural friends) were used. However, in this study, as in the study of Yang and Kyun (2020), only two of the five items of perception of foreigners, a sub-factor of multicultural acceptance, were used. According to the analysis of Kim, Kang, & Lee (2014), Koreans generally had positive attitudes toward foreigners in Western countries, but showed low acceptance toward foreigners and immigrants from Asian backgrounds. Therefore, Yang and Kyun (2020) judged that the items classified as perceptions of foreigners in KELS (2019) were mixed with items on two levels that showed these different results. In other words, Yang and Kyun (2020) deleted three items that could confuse the "definition of foreigners" because it seemed to focus on the perception of immigrants from Asian multicultural family backgrounds. Yang and Kyun (2020) have selected all five items in "perception of foreigners", and the reliability of scale is .665 (2015), .695 (2016), .700 (2017), on the other hand, the reliability of scale, excluding the ones that were deleted because it was judged that the respondents felt confused due to the definition of foreigners in the item, was .689 (2015) and .723 (2016) and .735 (2017).

Thus, the multicultural acceptance tool in this study comprised a total of eight questions, two about perception of foreigners and six about relation with foreigners and multicultural friends. Each item was rated on a Likert 5-point scale ranging from "not at all (1 point)" to "very much (5 points)," with a higher score indicating higher multicultural acceptance. The reliability of the multicultural acceptance was computed .899 in 2013, .908 in 2014, .907 in 2015, .924 in 2016, .931 in 2017.

Self-concept. For the self-concept tool, questions from KELS (2016) were used. A total of 20 questions, five each for the four factors of self-concept (social, family, physical, and academic self-concept) were included. Each item was rated on a Likert 5-point scale, with higher scores indicating higher self-concept. The reliability of the self-concept was computed .925 in 2013, .929 in 2014, .930 in 2015, .938 in 2016, .938 in 2017.

Community consciousness. For the community consciousness tool, items from KELS (2019) were used. A total of six items were included for analysis. Of these, two questions were about participation consciousness and four about consideration for others. Each item was rated on a Likert 5-point scale, with higher scores indicating higher community consciousness. The reliability of the community consciousness was computed .843 in 2013, .858 in 2014, .839 in 2015, .847 in 2016, .847 in 2017. The composite reliability of the measurement tools used in this study are shown in Table 2.

The results of CFA in the first year in this study are shown in Table 3.

Table 3.
Fitness Indices of the measurement tools

χ^2/df	CFI	TLI	RMSEA	RMR
13.974	.930	.923	.049	.031

As shown in Table 3, CFI and TLI were above .90, and RMSEA was .031. Fitness indices shows overall positive results.

Research Model

In this study, a latent growth model was used to examine the effects of multicultural acceptance of 5,468 students from elementary school 5th grade to middle school 3rd grade on their self-concept and community consciousness. The research model used in this study is shown in Figure 1.

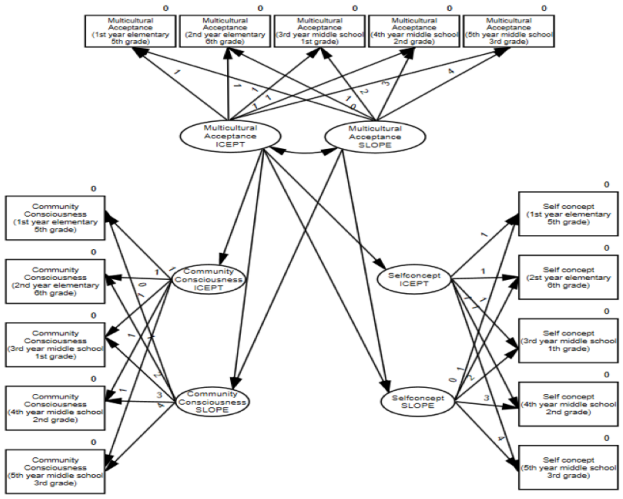

Figure 1.
Research model

Table 2.
Composition and reliability of the measurement tools

Variables		Number of items	1st year (elementary school 5th grade)	2nd year (elementary school 6th grade)		3rd year (middle school 1st grade)		4th year (middle school 2nd grade)		5th year (middle school 3rd grade)	
Multicultural Acceptance	perception of foreigners	2	.732	.792	.899	.813	.908	.843	.907	.861	.924	.931
	relation with foreigners and multicultural friends	6	.911	.918		.912		.930		.936		
Self-concept	society	5	.862	.879	.925	.894	.929	.919	.930	.924	.938	.938
	family	5	.905	.920		.934		.942		.948		
	physical	5	.861	.867		.868		.875		.883		
	Academic	5	.874	.884		.878		.897		.902		
Community Consciousness	community consciousness	2	.681	.698	.843	.678	.858	.656	.839	.636	.847	.847
	consideration for others	4	.814	.831		.821		.835		.843		

Analysis Method

Latent growth model analysis is an analysis method that estimates the magnitude of change at the level of a specific group or individual using longitudinal data measured at least three times through structual equation modeling (SEM) (Kwon & Lee, 2017). There are observational and latent variables as variables constituting the Latent growth model. The latent variables are composed of the initial value and a rate of change, and the initial value and rate of change are estimated based on the longitudinal data measured each time.

The method and procedure of this study using latent growth modeling is as follows: In this study, the analysis will be performed using the overall score on a multidimensional scales not one by one with the sub-dimensions. first, in order to check whether the research subject was suitable for the research model, normality of the data was confirmed by reviewing descriptive statistics such as mean, standard deviation, skewness, and kurtosis using SPSS 25.0 program. Then, to examine the latent growth model of variables, the non-change model and the linear change model were measured using AMOS 25.0 program. After comparing the fit, the linear change model of each variable, which showed more appropriate values, was adopted. Finally, the relation between initial value and change rate was verified by synthesizing the linear change model of individual variables and connecting each path.

The full information maximum likelihood (FLML) method was used as the parameter estimation method for the latent growth model. In order to verify the fit of the model, the fit indices comparative fix index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA) were used (CFI and TLI are .90 or more, RMSEA is .80 or less) (Bentler, 1990; Browne & Cudeck, 1993; Tucker & Lewis, 1973).

Results

Descriptive Statistics Analysis

Descriptive statistics for the variables of multicultural acceptance, self-concept, and community consciousness used in this study are shown in Table 4. In the case of self-concept, the average decreased from 3.99 to 3.90 from the 1st to 5th year. As for community consciousness, as the average increased from 3.83 to 3.94 in the five years, community consciousness also tended to increase. Finally, in the case of multicultural acceptance, the average from 1st to 5th year ranged from 4.19 to 4.27, showing a tendency to gradually increase as the year increased. The data in this study has already been proven as public data, and data cleaning has been performed. Therefore, outliers outside the range 1-5 of this scale were identified through descriptive statistics. And there were no outliers, and the analysis was conducted with no missing data.

For all the variables, the absolute value of skewness was less than 2 (-0.65 to -0.06) and that of kurtosis was less than 7 (-0.30 to 0.34), confirming the normality (Kline, 2015).

Table 4.

Descriptive statistics for the variables

Measure	M	*SD*	Skewness	Kurtosis
Multicultural Acceptance (1st year: elementary school 5th grade)	4.19	0.66	-0.55	-0.18
Multicultural Acceptance (2nd year: elementary school 6th grade)	4.26	0.62	-0.54	-0.27
Multicultural Acceptance (3rd year: middle school 1st grade)	4.13	0.58	-0.40	-0.23
Multicultural Acceptance (4th year: middle school 2nd grade)	4.23	0.62	-0.48	-0.12
Multicultural Acceptance (5th year: middle school 3rd grade)	4.27	0.63	-0.65	0.34
Self-concept (1st year: elementary school 5th grade)	3.99	0.58	-0.54	0.28
Self-concept (2nd year: elementary school 6th grade)	3.97	0.58	-0.38	-0.08
Self-concept (3rd year: middle school 1st grade)	3.95	0.58	-0.22	-0.24
Self-concept (4th year: middle school 2nd grade)	3.92	0.61	-0.21	-0.17
Self-concept (5th year: middle school 3rd grade)	3.90	0.63	-0.19	-0.12
Community Consciousness (1st year: elementary school 5th grade)	3.83	0.66	-0.25	0.12
Community Consciousness (2nd year: elementary school 6th grade)	3.87	0.64	-0.08	-0.24
Community Consciousness (3rd year: middle school 1st grade)	3.91	0.62	-0.14	-0.04
Community Consciousness (4th year: middle school 2nd grade)	3.91	0.62	-0.06	-0.30
Community Consciousness (5th year: middle school 3rd grade)	3.94	0.63	-0.21	-0.08

Correlation between Variables

The correlation coefficients for the variables used in this study are shown in Appendix. As is evident, self-concept, community consciousness, and multicultural acceptance showed positive correlations in all areas ($p < .01$).

Model Verification

The growth model of self-concept was determined by comparing and reviewing the non-change model and linear change model. Consequently, the linear change model was adopted as it showed a better fit of CFI, TLI, and RMSEA than the non-change model. The initial values for mean and variance of self-concept were 3.996 (p < .001) and .225 (p < .001), respectively, whereas the change rate was -.024 (p < .001) for mean and .013 (p < .001) for variance, that is, the mean decreased by .024 every year from the 1st to the 5th year. Further, the initial value and variance of change rate is also statistically significant, indicating that there is an individual difference between the initial value and change rate of self-concept. In the case of community consciousness, the linear change model was found to be good, and hence was adopted. The initial values for mean and variance of community consciousness were 3.845 (p < .001) and .245 (p < .001), respectively, whereas the change rate was .025 (p < .001) for mean and .013 (p < .001) for variance. As the mean of the change rate is significant, it can be seen that community consciousness increased by .025 every year from the 1st to the 5th year, and the initial value and variance of change rate is also statistically significant, indicating that there is an individual difference between the initial value and change rate of community consciousness.

As for multicultural acceptance, the linear change model was found to be better than the non-change model in terms of fit indices CFI, TLI, and RMSEA, and hence was adopted. The initial values for mean and variance of multicultural acceptance were 4.213 (p < .001) and .251 (p < .001), respectively, whereas the change rate was .021 (p < .001) for mean and .018 (p = .001) for variance. As the mean of the change rate is significant, it can be seen that multicultural acceptance increased by .021 every year from the 1st to the 5th year, which can also be confirmed as statistically significant variance between the initial value and the change rate, indicating that there is an individual difference in the initial value and change rate of multicultural acceptance. Table 5 for model verification is as follows.

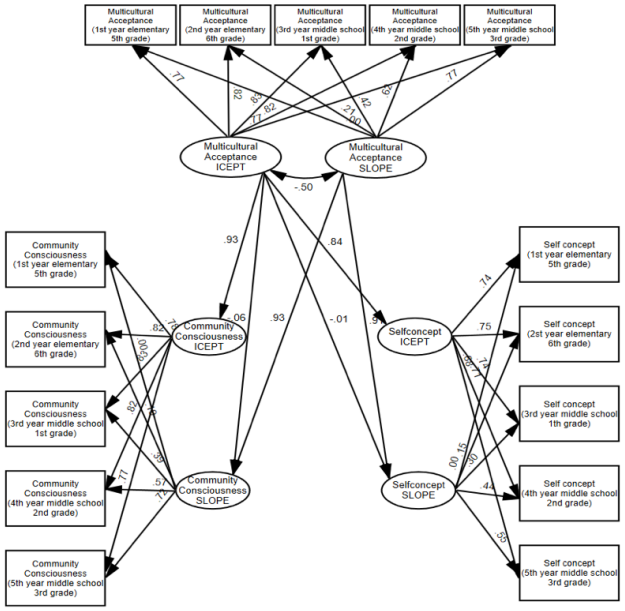

Figure 2.
Causal Model (Standardization coefficient)

Effect of Multicultural Acceptance on Self-concept and Community Consciousness

A multivariate latent growth model was set up by

Table 5.
Model Verification

variable	Model	χ^2	*df*	CFI	TLI	RMSEA	Mean		Variance	
							initial value	change rate	initial value	change rate
Self-concept	non-change model	1727.933***	17	.87	.92	.13	3.948***		.201***	
	linear change model	216.029***	14	.98	.98	.05	3.996***	-.024***	.225***	.013***
Community Consciousness	non-change model	1048.139***	17	.88	.93	.10	3.894***		.186***	
	linear change model	242.184***	14	.97	.98	.05	3.845***	.025***	.245***	.013***
. Multicultural Acceptance	non-change model	1039.131***	17	.89	.93	.11	4.238***		.175***	
	linear change model	270.196***	14	.97	.98	.06	4.213***	.021***	.251***	.018***

combining three verified univariate models to reveal how multicultural acceptance of elementary school 5th grade to middle school 3rd students (from the 1st to 5th year) affects their self-concept and community consciousness. The independent variables of the research model are the initial value and change rate of multicultural acceptance, and the dependent variables are the initial value and change rate of self-concept and community consciousness. The value of the path coefficient of the research model is shown in Table 6.

The initial value of multicultural acceptance was found to have a positive effect on the initial value of community consciousness (β = .929, p < .001), and the change rate in multicultural acceptance also had a significant and positive effect on the change rate in community consciousness (β = .932, p < .001).

Thus, it can be predicted that the higher the multicultural acceptance rate in the fifth grade of elementary school, the higher the community consciousness; and the higher the rate of increase (= change rate) of multicultural acceptance, the higher the rate of increase (=change rate) of community consciousness (see Figure 3). Further, the initial value of multicultural acceptance had a positive effect on the initial value of self-concept (β = .763, p <.001), and the change rate in multicultural acceptance also had a significant and positive effect on the change rate in self-concept (β = .913, p <.001). Consequently, it can be predicted that 5th grade elementary school students with high multicultural acceptance have a higher self-concept, and a higher rate of increase (= change rate) of multicultural acceptance indicates higher rate of increase (= change rate) of self-concept.

Conclusions

This study aimed to clarify whether multicultural acceptance affects the development of self-concept and community consciousness from the 5th grade of elementary school to 3rd grade of middle school, and to confirm the relationship between multicultural acceptance, self-concept, and community consciousness. The results of the study confirmed that multicultural acceptance has an effect on the development of self-concept and community consciousness, and that there is a positive relationship between the three variables. Further, it was confirmed that in the 5th grade of elementary school, the higher the multicultural acceptance level, the higher the community consciousness and self-concept; and the higher the multicultural acceptance rate (= change rate), the higher the increase rate (= change rate) of community consciousness and self-concept. The above-mentioned research results are discussed in comparison with the findings of the previous studies as follows:

First, in this study, it was confirmed that multicultural acceptance of elementary and middle school students influences the development of self-concept and community consciousness; thus, it could be predicted that the change in multicultural acceptance contributed positively to the subsequent changes in self-concept and community consciousness. These results differ from those reported by Koo (2015), which analyzed differences in community consciousness and multicultural acceptance of children and adolescents, and reported that both community consciousness and multicultural acceptance decreased in the 6th grade compared to the 5th grade. Further, Koo (2015) suggested that citizenship retardation might occur in the 6th grade of elementary school; however,

Table 6.

Value of path coefficient of the research model

Path	B	β	S.E.
Multicultural Acceptance initial value → Community Consciousness initial value	.959	.929***	.014
Multicultural Acceptance initial value → Community Consciousness change rate	-.013	-.063**	.005
Multicultural Acceptance initial value → Self-concept initial value t	.763	.836***	.015
Multicultural Acceptance initial value → Self-concept change rate	-.001	-.007	.004
Multicultural Acceptance change rate → Community Consciousness change rate	.915	.932***	.016
Multicultural Acceptance change rate → Self-concept change rate	.856	.913***	.012

** p < .01, *** p < .001

the present study suggests that actively cultivating the awareness of and attitude toward others while experiencing various cultures and races in the high grade of elementary school can foster correct perception in the interaction between individuals and society. Lee and Kim (2013) suggested that children who have good relationships with friends, teachers, and neighbors and have developed community consciousness have higher multicultural acceptance, which is consistent with the results of this study.

The findings are also consistent with the research results of Sul, Lee, and Kim (2019), which confirmed that multicultural awareness has a major influence on the self-concept of adolescents, but are somewhat different from those of Lee and Jeon (2014), which confirmed that self-esteem did not directly affect multicultural acceptance. Baek and Jeong (2017) researched middle to high school students and revealed that there were changes in community consciousness depending on the developmental pattern of multicultural acceptance. These results are similar to our findings that individual differences exist between multicultural acceptance, self-concept, and community consciousness. Therefore, it is necessary to adopt a different approach to foster self-concept and community consciousness according to the development pattern of multicultural acceptance.

Second, a positive correlation was found between multicultural acceptance, self-concept, and community consciousness. As with the research results of Choi and Kim (2015), which revealed that community consciousness has a positive effect on multicultural acceptance for elementary school students, this study also confirmed that there is a close relationship between community consciousness and multicultural acceptance. In addition, the research results of Yang and Kyun (2020), which revealed that community consciousness in the first year of middle school has a positive correlation with multicultural acceptance, and Un (2016), which analyzed the factors influencing the multicultural acceptance of adolescents and found that multicultural acceptance increases as community consciousness increases, are in line with the present study, which shows that community consciousness and multicultural receptivity can be connected in a society in which mutual bonds and interactions are established.

According to Jang and Eo (2013), which studied multicultural awareness, there was a high correlation between the personal self, the social self, the academic self, and multicultural acceptance among self-concept. Kim, Cho, and Hong (2020) also showed that adolescents' self-awareness, community consciousness, life satisfaction, and multicultural acceptance were related.

This study reveals the longitudinal effect of multicultural acceptance of elementary and middle school students on self-concept and community consciousness, and has implications for establishing educational measures relating to multicultural acceptance for adolescents, who are at the stage where perceptions and attitudes toward diverse races and different cultures are cultivated. In addition, it was confirmed that multicultural acceptance in adolescence requires effective educational intervention for positive self-concept and community consciousness.

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Appendix

Correlation between major variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1														
2	.629**	1													
3	.523**	.640**	1												
4	.462**	.563**	.675**	1											
5	.422**	.514**	.604**	.683**	1										
6	.668**	.436**	.357**	.309**	.275**	1									
7	.430**	.664**	.430**	.376**	.332**	.513**	1								
8	.348**	.441**	.620**	.448**	.391**	.420**	.516**	1							
9	.318**	.392**	.470**	.619**	.473**	.375**	.444**	.563**	1						
10	.303**	.375**	.427**	.477**	.619**	.338**	.401**	.496**	.580**	1					
11	.474**	.320**	.260**	.222**	.197**	.575**	.402**	.319**	.281**	.270**	1				
12	.335**	.505**	.326**	.290**	.243**	.398**	.612**	.392**	.348**	.323**	.532**	1			
13	.274**	.347**	.489**	.340**	.299**	.320**	.388**	.591**	.413**	.376**	.430**	.512**	1		
14	.245**	.283**	.336**	.454**	.326**	.296**	.324**	.396**	.582**	.420**	.382**	.444**	.563**	1	
15	.223**	.271**	.307**	.355**	.453**	.262**	.300**	.364**	.428**	.596**	.352**	.411**	.500**	.585**	1

** $p < .01$ note: 1. Self-concept (1st year: elementary school 5th grade), 2. Self-concept (2nd year: elementary school 6th grade), 3. Self-concept (3rd year: middle school 1st grade), 4. Self-concept (4th year: middle school 2nd grade), 5. Self-concept (5th year: middle school 3rd grade), 6. Community Consciousness (1st year: elementary school 5th grade), 7. Community Consciousness (2nd year: elementary school 6th grade), 8. Community Consciousness (3rd year: middle school 1st grade), 9. Community Consciousness (4th year: middle school 2nd grade), 10. Community Consciousness (5th year: middle school 3rd grade), 11. Multicultural Acceptance (1st year: elementary school 5th grade), 12. Multicultural Acceptance (2nd year: elementary school 6th grade), 13. Multicultural Acceptance (3rd year: middle school 1st grade), 14. Multicultural Acceptance (4th year: middle school 2nd grade), 15. Multicultural Acceptance (5th year: middle school 3rd grade)