# Elementary Learners' Emotions, Emotion Regulation, and Enjoyment During Asynchronous Online Learning

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# Abstract

This study aimed to investigate elementary learners' emotions, emotion regulation, and enjoyment as they experienced asynchronous online learning in the postpandemic context. Gross's (2006) Process Model of Emotion Regulation was used to investigate the interrelationships between these three components, resulting in theoretical and practical advancement in the field of study. A total of 14 Malaysian elementary learners participated in this study. Data were collected through interviews and observations. Thematic analysis revealed two primary domains of emotion regulation that affect learners' enjoyment of asynchronous online learning: situational control and cognition/internal control. The analysis also identified both positive and negative activating emotions as significant components that optimise elementary learners' enjoyment. It is also critical to confront negative deactivating emotions promptly to prevent learners' enjoyment from being impeded. Regarding the interrelationships between emotions, emotion regulation and enjoyment, learners' enjoyment is increased or retained when emotions are effectively regulated; emotions take the lead when emotion regulation is lacking or ineffective, which in turn impacts the rise or fall in enjoyment. The implications provide instructors with encouragement to thoughtfully plan asynchronous online learning that takes elementary learners' optimal emotional and enjoyment fulfilment into account, utilising emotion regulation as a mediator.

# Keywords:

Asynchronous Online Learning, Elementary Education, Emotions, Emotion Regulation, Enjoyment

# Introduction

Technological-enhanced learning has gained prominence in recent years because of the COVID-19 pandemic. The education situation has undergone a significant transformation, which presents a remarkable opportunity to investigate how learners feel while experiencing online learning. In fact, learning online is not solely a cognitive or metacognitive process but also emotional. O'Regan (2019) stated that online learning elicits a variety of emotions in learners throughout the learning

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and teaching process. Ismail et al. (2023) found a significant relationship between online learning and emotions, as well as a positive correlation between learners' online learning emotions and enjoyment. If learners fail to effectively regulate their emotions during online learning, the likelihood of online classes becoming less engaging and the loss of enjoyment in the online learning process rises.

Concerning the emotional impact of online learning, there is a scarcity of follow-up research on the learners' online learning emotions after the pandemic. Several studies have taken the initiatives to reflect on the online learning that was conducted during the pandemic to shape an effective post-pandemic online education experience (e.g., Hill et al., 2024; Saleh et al., 2023), yet not focusing on learners' emotions. In this context, it was recommended that learners' emotions be considered as one of the aspects to enhance postpandemic online education (Aladsani et al., 2022; Hamzeh, 2021). Aladsani et al. (2022) and Hamzeh's (2021) studies highlighted that stress, loneliness, fear, anxiety, sadness, moodiness, guilt, and frustration were the prevalent emotions experienced by learners during online learning, which have the potential to possess a lasting impact on the development of online education in the future. However, these studies did not delve deeply into the emotional circumstances and regulation that the learners encountered, which could have yielded valuable insights to aid in the development of effective post-pandemic online education. Ismail et al.'s (2023) study has proven the close relationships between emotions and enjoyment indeed, but only focused on five emotional experiences (enjoyment, hope, pride, anxiety, and boredom) which limits its generalisability.

Consequently, it is becoming increasingly critical to comprehend the ways in which emotions affect the attitudes of learners and the ways in which learners manage their emotions in relation to a variety of learning environments, as today's educational system prioritises learners' engagement and enjoyment in their online learning activities (Borup & Archambault, 2023). One of the prevalent online learning activities was asynchronous online learning, in which learners can access learning materials, complete tasks, and participate in discussions at their own pace rather than in real-time. Previous investigations have demonstrated that elementary learners are apprehensive about learning online asynchronously because they are unconfident to learn independently due to the absence of hands-on coaching and continuous supervision (Kanyakumari, 2020; Wan, 2020). Tabiin et al. (2022) indicated that in the absence of a direct interaction with teachers and peers, younger learners experience feelings of sadness and isolation during asynchronous online learning. On that note, the investigation of elementary learners'

emotions regarding asynchronous online learning was given high attention during the pandemic, and the level of asynchronous online learning maturity among those learners was determined to be lower than that of adults (Hauk & Groschner, 2022). Conversely, it is interesting to note that some elementary learners demonstrated a genuine level of enjoyment for asynchronous online learning which had shown an effective emotion regulation within the context (Chzhen et al., 2022). Learners demonstrated a variety of emotions, levels of enjoyment, and ways of emotion regulation throughout the asynchronous online learning practices during the pandemic. Hence, the situation and the manner in which learners emotionally manage their asynchronous online learning practices necessitate a comprehensive investigation, as this could potentially assist the progression or shaping of online education in the post-pandemic era.

To bridge the research gap of the previous studies, this study investigates elementary learners' emotions and enjoyment when experiencing asynchronous online learning, by highlighting emotion regulation as a mediator. This study emphasises asynchronous online learning, as the majority of previous work has focused on online learning in general. In addition, the majority of emotional issues encountered by elementary learners are associated with asynchronous online learning. These demonstrate the significance of examining the emotions, emotion regulation, and enjoyment of elementary learners in the context of asynchronous online learning. As compared to the similar study conducted by Ismail et al. (2023), this study investigates learners' emotional experiences broadly to ensure the generalisability of the study findings.

# Literature Review

# Emotions in Learning

Based on decades of emotional development research and practice, emotions grow in supporting relationships with social and cognitive processes (Jones et al., 2019). Besides, during learning, emotions may be seen as subjective evaluations in response to achievement demands or outcomes (Wu & Yu, 2022) and the use of learning strategies and learning motivations (Tyng et al., 2017), which are often being influenced by instructional context and one's personal development. Recognising the nature of emotions in the educational setting is crucial, as emotions play a significant role in almost all facets of the teaching and learning processes. On that note, emotions may have an impact on learners' well-being (mental and physical states), role in socialisation, learning quality, and so on; in turn, teaching and learning processes may also elicit emotions in positive or negative ways.

Smith (2017) contends that addressing children's emotions is essential to advancing our understanding

of how children engage in learning and how they perceive or make meaning to their experiences. In this study, the emotional states of the children were determined by the significance attached to their responses and interpretations at any specific point of learning, as well as by their contemplation on the aspirations that they created i.e. personally or socially constructed goals, and correlational links between affective and cognitive processing. In precise, focus was placed on the learners' incidental and integral emotions. An incidental affective state, often known as "mood", is the one that brought on by prior experiences or by personal affective traits; however, integral emotion is brought about by the decision made by a particular learner based on the materials or tasks that he/she is working through (Blanchette & Richards, 2010).

Theoretically, emotions in the learning context, according to Pekrun and Linnenbrink-Garcia (2012), can be identified through four facets: epistemic emotions, achievement emotions, topic emotions, and social emotions. It has been discovered that epistemic emotions and achievement emotions are particularly significant in computer-based learning due to technological constraints and a limited capacity to monitor learners' emotional states (Engelmann & Bannert, 2019). Learners experience epistemic emotions when interpreting new information and relating it with existing knowledge. For instance, when the new information is difficult to understand or contradicts learners' existing knowledge, it triggers epistemic emotions e.g. curiosity, surprise, confusion, anxiety, boredom, frustration and so on. Emotions such as fear, happiness, pride, hope, disappointment, and relief are examples of achievement emotions. These emotions are related to outcomes or achievements that are often evaluated using competency-based standards. In spite of that, all four facets were thoroughly investigated in this study.

According to Oatley et al. (2011), emotions can have an intrapersonal and interpersonal impact on a person's learning process. Emotional influences on cognitive processes are commonly considered as intrapersonal effects, in terms of attentional biases, emotionmemory congruence, and decision-making being influenced by emotions. With the influence of social context and emotional experiences, the interpersonal impacts of emotions influence one's social judgment and social perception. According to research, positivevalence emotions appear to have a beneficial effect on learning, and vice versa; however, some negativevalence emotions might positively relate to learning as well (Asikainen et al., 2018). For instance, Loderer et al. (2020) categorised emotions into three categories: positive activating emotions, negative activating emotions, and negative deactivating emotions. Mayer (2020) concluded that present studies that tend to investigate emotions in technology-enhanced academic learning should place particular emphasis on positive activating emotions such as happiness and negative activating emotions such as anxiety.

#### Emotion Regulation in Online Learning

Academic emotions can be pleasant and unpleasant, activating and deactivating, and beneficial and destructive, depending on an individual's emotions and situations. Of these, learners need to deal with emotional challenges when undertaking various kinds of academic tasks. The majority of self-regulation theorists asserted that self-regulation is a broader notion that encompasses the essential components of regulating emotions (Boekaerts, 1996). It is commonly assumed that emotions play a role in supporting or undermining the application of deep or superficial learning processes in self-regulated learning. Hence, emotion regulation plays a crucial role in the selfregulated learning process because it monitors, changes, and preserves the duration, valence, and intensity of learners' emotions (Boekaerts, 2011). This kind of regulation usually contributes to the development of positive emotions and the decrease of negative emotions during the learning process, which benefits learners' well-being and academic performance.

Gross (2014) classified emotion regulation into intrinsic and extrinsic emotion regulation. The intrinsic emotion regulation refers to an individual controlling and regulating his/her personal emotional experiences, emotion-related states, and emotional behavioural manifestations, whereas extrinsic emotion regulation refers to an individual regulating someone else's emotions (Gagne et al., 2021). At a broader level, Gross (2006) made a distinction between antecedentfocused and response-focused emotion regulation. Antecedent-focused emotion regulation e.g. attentional deployment, situation selection, situation modification, and cognitive reappraisal are those learners employ prior to the activation of emotion response tendencies, which involves the regulation of subsequent emotional responses. Response-focused emotion regulation e.g. expressive suppression describes the regulation of emotions that occurs during or after the emergence of response tendencies.

Recently, there have been calls to consider regulation practices in the context of online learning (Lai & Hwang, 2023) as well as the context of children online education (Alserhan et al., 2023; Lan et al., 2023). Regarding children's emotional development, Vergara et al. (2022) highlighted the significance of emotion knowledge in today's children to process their emotional information effectively and predict children's adjustment. Regarding the field of emotion regulation research, Harrington et al. (2020) indicated that the process of regulating one's emotional arousal and expression, so-called emotion regulation, is



crucial to a child's capacity to adjust to the changing demands of school surroundings. López-Pérez and Pacella (2021) also highlighted the significance of children's interpersonal emotion regulation to better manage their emotions of fear, anger, and sadness. According to Sanchis-Sanchis et al. (2020), however, children have less developed emotional regulation strategies compared to adolescents and adults. Nonetheless, there is not much research that examines children's emotion regulation as well as investigating children's emotion regulation in the context of asynchronous online learning.

# Enjoyment in Online Learning

This study conceptualised enjoyment as a process of positive feelings, perceived in a broader sense than a discrete emotion. Literally, enjoyment is an act of having fun or joy while carrying out a certain activity. Kawabata and Mallett (2022) precisely defined enjoyment as a proactive and psychological process that an individual engages in an activity that elicits hedonic or eudaimonic qualities of positive feelings, as opposed to passively waiting for something enjoyable or joyful to happen or simply reacting to a particular stimulus. It appears that proactive process of enjoyment is associated with approach motivation. Ebrahimzadeh and Alavi (2016) demonstrated the close relationships between motivation and enjoyment, showing that learners' motivation to learn in an online learning environment is predicted by how much they enjoy the process of learning. However, the manifestation of enjoyment by every learner is different. Some of them enjoy learning because of basic psychological need satisfaction, such as comfort, safety, ease, and effortlessness of the activity (pursuing hedonic quality of positive feelings); some of them approach learning because it is prized, meaningful, or challenging which often requires more efforts and emotion regulation (pursuing eudaimonic quality of positive feelings). We argue here that emotions and emotion regulation have distinct impact on enjoyment.

An increasing number of studies confirmed the positive effect of enjoyment on children's online learning, in terms of experience satisfaction (Espinosa-Curiel et al., 2020), sustainable or long-term learning (Ebrahimzadeh & Alavi, 2016), attitude and motivation (Smith & Li, 2020), and so on. However, these studies focused narrowly on enjoyment without consideration of learners' emotion and emotion regulation. There are few studies that link enjoyment to children's academic emotions and regulation (Obergriesser & Stoeger, 2020; Zaccoletti et al., 2020), yet the ones that do exist are limited to conventional classroom settings.

Although the studies reviewed here identified the significance of emotions, emotion regulations, and enjoyment in children's learning, none of them

investigated the interrelation between these three components specifically in the asynchronous online learning context. Thus, it is necessary to conduct an investigation to further explore children's emotions, emotion regulations, and enjoyment during asynchronous online learning.

Interrelationships Between Emotions, Emotion Regulation, and Enjoyment in Asynchronous Online Learning Context

There are a lot of "emotional blanks" caused by the asynchronous online learning context's deficiencies in time and place, interaction channel, and interaction content (Zhang & Yu, 2023). To further explain the "emotional blanks" as the particular difficulty that asynchronous online learning poses in relation to learners' emotional experiences, the lack of real-time interaction with teachers and peers limits learners' emotional responses to specific events that causes them to feel disconnected from people, leading to indifference, loneliness and isolation. This situation may trigger stress responses and a state of collapse that makes the practice of emotion regulation strategies more difficult as compared to other learning environments. Hence, this study highlights the significance of investigating the interplay between emotions, emotion regulation, and enjoyment in asynchronous online learning context.

# Figure 1

Hypothesised interrelationships between emotions, emotion regulation, and enjoyment



According to Figure 1, emotions are implied factors that indirectly impact learners' enjoyment in asynchronous online learning. Emotions are also essential factors that structure the manifestation of learners' enjoyment in asynchronous online learning. Nonetheless, emotions can be controlled, regulated, and changed by learners through emotion regulation to produce different emotional outcomes such as positive activating emotions, negative activating emotions, and negative deactivating emotions. This study recruited Gross's (2006) Process Model of Emotion Regulation to investigate the emotion regulation processes of asynchronous online learning learners, in terms of antecedent-focused emotion regulation (attentional deployment, situation selection, situation modification, and cognitive reappraisal) and response-focused emotion regulation (expressive suppression). In precise,

the emotion regulation serves as a mediator between emotions and enjoyment to modulate responses triggered by emotions and help to filter the pieces of information and motivate learners to attend to it in a way that would stimulate excitement and enjoyment in asynchronous online learning. For example, poor emotion regulation causes learners' actions and behavioural patterns always be at the mercy of their emotions. Whereas well emotion regulation allows learners to carefully judge and have better balance of their affective outcomes to embrace enjoyment when experiencing asynchronous online learning; consequently, the emotion regulation alters the initial identified emotions which ultimately demonstrated the noticeable change of enjoyment that triggers learners to pursue hedonic or eudaimonic qualities of positive feelings. Throughout the process, the preferred type of emotion regulation among learners were identified as well as how the implied emotions and emotion regulation process could impact learners' enjoyment in asynchronous online learning.

After reviewing fundament theories, concepts, and practices implied in the previous research, this study sought to investigate elementary learners' emotions, emotion regulation, and enjoyment when experiencing asynchronous online learning. The present study identified the types of emotion regulation that address different emotions, emotions that affect learners' manifestation of enjoyment, and how the emotions and emotion regulation impact learners' enjoyment in asynchronous online learning. Meanwhile, this study highlighted the interrelationships between emotions, emotion regulation, and enjoyment which could theoretically and practically advance the field of study, especially to enhance elementary learners' enjoyment in asynchronous online learning. This study addresses the following research questions:

- 1. What are the primary types of emotion regulation of elementary learners during asynchronous online learning?
- 2. What are the implied emotions that affect elementary learners' enjoyment in asynchronous online learning?
- 3. How do the learners enact different types of emotions and emotion regulation that impact their enjoyment in asynchronous online learning?

#### Method

#### Research Context and Design

Malaysia's education system has undergone a substantial transformation in the aftermath of the COVID-19 pandemic, which has prompted a transition to continuous learning and increased flexibility in the learning process (Amini et al., 2024). In Malaysia's post-pandemic education context, as is the case with other educational levels, the elementary educational system is incorporating blended learning in tandem with conventional classroom settings. Blended learning is an approach that combines online educational materials and online interaction with conventional place-based classroom method. The online learning platforms are usually equipped with a variety of learning resources and materials, which learners have unrestricted access according to their individual learning needs. This is what we called as asynchronous online learning. The resources and materials are distributed based on learning topics and are sequentially arranged from basic to complex, complementing children's sequential reasoning to acquire knowledge or solve problems (Bruner, 1960). Furthermore, the resources and materials come in different forms, including quizzes, games, videos, and so on, with the goal of drawing children's attention and interest throughout the learning process.

In that context, this study attempted to gain a deeper understanding of the elementary learners' emotions, emotion regulation, and enjoyment in asynchronous online learning, as well as to demonstrate the interrelationships between these three components. Therefore, an approach that would enable discovery is needed for this investigation. To gain a comprehensive and in-depth description of learners' learning experiences, Merriam's (2009) qualitative case study methodology was employed.

#### **Participants**

A Malaysian elementary school that is currently engaged in the School Transformation Programme 2025 (TS25) was purposefully selected. TS25 is a program proposed by the Ministry of Education (MOE) to improve learners' success rate and schools' quality in 21st century education (Harun & Hamzah, 2018). The selected school is currently engaged in the implementation of activities that are bounded to the TS25 modules, including the redesign of learners' learning experiences, the utilisation of digital tools and resources, and the establishment of a conducive learning environment (Lazarov, 2018; Ismail & Aziz, 2019). With the influences of TS25, multimodal methods of teaching and learning are highly encouraged in the school due to the post-pandemic educational change that focuses on 21st century skills at the basic educational level. The school ideally suited to the typicality of the case needed by this study due to its educational digitalisation led by TS25, which establishes asynchronous learning practices particularly in the form of blended or flipped learning. It was anticipated that the selected school would contribute significantly to the background information that could help achieve the objective of this study.

The participants were recruited using criterion sampling. Considering the limited manpower and



space available, the selected school proposed only third grade learners to be the target group for a longterm substantial active learning program training organised by the RITE Education Consultancy, despite the fact that all learners in the selected school are obligated to adopt the "new normal" teaching and learning under the instructions of their teachers. The RITE Education Consultancy provides a diverse array of physical and digital resources, as well as supporting materials to facilitate the learning program training. For this reason, third grade learners were chosen for this study, who were anticipated to adopt asynchronous online learning techniques and could provide rich data for this study.

14 Year-3 learners (age 9) from a Malaysian public elementary school participated in this study. There were 7 girls and 7 boys among them. According to Table 1, the distribution of gender was balanced to promote generalisability. A scoring system known as the standard-based performance assessment level is implemented in Malaysian schools to assess the prescribed level of performance of learners, which encompasses their knowledge, comprehension, and ability to perform. The participants' English performance level ranged from lower intermediate (LI), intermediate (I), to higher intermediate (HI) based on their English performance report in the current year. Only learners falling within the performance level range were selected because they reflected the average learner group, for the purpose of generalising results. Nonetheless, the required number of participants was contingent upon the point at which saturation was achieved, as if the data collection process had ceased to generate any new or pertinent information (Dworkin, 2012).

# Table 1

| Demographic information of p | participai | nts |
|------------------------------|------------|-----|
|------------------------------|------------|-----|

|              | · · · · · · · · · · · · · · · · · · · | - <u>·</u> |
|--------------|---------------------------------------|------------|
| Participants | Performance Level                     | Gender     |
| А            | LI                                    | Female     |
| В            | LI                                    | Female     |
| С            | LI                                    | Male       |
| D            | LI                                    | Female     |
| E            | LI                                    | Male       |
| F            | 1                                     | Male       |
| G            | 1                                     | Male       |
| Н            | I                                     | Male       |
| I            | I                                     | Female     |
| J            | 1                                     | Male       |
| К            | HI                                    | Male       |
| L            | HI                                    | Female     |
| Μ            | HI                                    | Female     |
| Ν            | HI                                    | Female     |

Source: Learners' standard-based performance assessment level report provided by the selected school teachers

#### Data Collection and Analysis

First, by conducting systematic observations of individuals in their natural environments, it is possible to obtain information that enables the researcher to observe their actions rather than their verbal declarations. Merriam (2009) indicated that every observation should include the setting, the participants, activities and interactions, conversations, even subtle factors that are less obvious in a phenomenon. Hence, in this study, by using "free writing", field notes were recorded based on the three main focuses of this study: (1) emotions - facial expressions, language and tones, reactions to stimuli; (2) emotion regulation - behavioural adjustments, self-reported strategies, help-seeking; and (3) enjoyment - engagement level, expressions of satisfaction. The "free writing" method of taking field notes did not adhere to any format or protocol in order to record any noteworthy events that may have addressed the three primary focal areas listed above.

The observation process was conducted every week by capturing any significant occurrence that could potentially address the research questions throughout the three-month investigation; whereby the teachers and learners of the selected school engaged in weekly asynchronous online learning activities in accordance to their academic schedule. The researcher collected as much data as possible without adhering to a set time frame until information saturation was reached (Merriam, 2009); wherein after three months of investigations, no new information was found in the data collected. For observation purposes, participants were asked to enable online conferencing while engaging in asynchronous online learning. To prevent participant sensitivities from being observed or susceptible to the "Hawthorne Effect", the researcher told the participants that observations will be made during the study but did not tell them when or how long it would take. Since the observation was conducted by a single researcher, the way to reduce the observer bias was through regular reflection on potential biases, strived to only observe progress adhering to the precise guidelines (the three main focuses of the study - emotions, emotion regulation, enjoyment) for the behaviours and emotions that need to be noted, and being humble and non-judgmental throughout the study. To further reduce observer bias, the researcher also made repeated observations to establish a consistent trend for obtaining data.

Besides, participants were requested to attend 45-minute audio-visual interviews, using their native language; if more information was needed, follow-up questions would be addressed. The interviews were conducted after observations to cross-check the information obtained from subjective perspectives. This is because observations are susceptible to observer bias. Furthermore, observations are limited to noticing participants' interactions but not the reasons they behave the way they do. This study requires an approach that enables deep understanding of participants. To put it briefly, the interview was adhered to Merriam's (1998) case study interview procedure, which calls for probing, insightful questioning and interaction, recording, and data analysis. The interview protocol in this study was semi-structured, developed by borrowing some elements from the National Children's Advocacy Center Child Forensic Interview Structure (NCAC CFIS) (National Children's Advocacy Center, 2019). This is because NCAC provides a model for the forensic interview of a child which has a semistructured format that can be adapted to children of different ages and cultural backgrounds; whereas the NCAC CFIS emphasises a flexible, thoughtful, decisionmaking approach throughout the interview and does not recommend a scripted format. The researcher also took references from Patton's (2002, pp.343-349) general interview guide approach, as well as from reviewing the literature on interviewing children. With the participants' consent, interviews were recorded for later transcription and analysis.

Thematic analysis was implemented to establish codes, generate categories, and develop themes. To ensure that the data could address the research questions, the first step was to conduct coding in conjunction with ongoing reflection. Data collected from interviews was analysed using In Vivo coding, while descriptive coding was employed for data collected from observations. Then, second-cycle coding was conducted and generated codes for descriptions through focused coding. In order to demonstrate the relationship between each code by generalising code patterns and categories, this study implemented Saldana's (2015) code mapping approach. In the "first iteration" of code mapping, a large number of codes were identified. Followed by "second iteration", the initial codes were categorised resulting from comparing and sorting all the codes to determine which one seems to come together. During the "third iteration", the previous categories were further classified into more specific groups; some categories found in previous categories were downgraded into "subcategories". The analysis process then continued with the second cycle coding via focused coding. Focused coding is a more rigorous analysis that filters the codes and generates interpretation and description for emerging patterns, categories, and themes through constant comparative analysis. Eventually, the researchers applied the "code weaving" (Saldana, 2015) technique by integrating themes into narrative form to see how the puzzle pieces fit together and address the research questions.

To ensure rigor in the thematic analysis process, the researcher employed member checking and constant

reflexivity. Member checking involved sharing findings or themes with participants to validate that interpretations accurately represent their experiences and integrating their feedback to refine and validate themes. Reflexivity required the researcher to keep reflective journals to note biases, assumptions, and influences on the analysis, helping to ensure that the analysis was conducted more objectively and transparently. These strategies contribute to producing more reliable and valid findings in thematic analysis.

#### **Ethical Considerations**

Informed consent was obtained from the school principal, participants, and participants' parent(s)/ guardian(s) prior to the study. The researcher kept participants' identities anonymous to safeguard the privacy of the participants. All the data collected were stored in a pin-secured hard disk. Hence, the information given by the participants would be kept confidential and were not shared with other people outside of this study.

#### Results

# Primary Types of Emotion Regulation During Asynchronous Online Learning

The results indicated that elementary learners exhibit a high inclination towards intrinsic emotion regulation. In that context, antecedent-focused emotion regulation received more attention than responsefocused emotion regulation.

According to Table 2, there is no significant difference between which type of antecedent-focused emotion regulation being commonly applied by elementary learners in online learning. Each type of emotion regulation plays a significant role in specific aspect. For instance, situation selection and modification help learners to select and modify situations which generate pleasant emotions that encourage them to keep learning. Followed by attentional deployment and cognitive appraisal which assist learners' emotion regulation in terms of cognition and internal control. Entirely, learners' emotion regulation result in beneficial outcomes, as though an increase in positive activating emotions and effective switch from negative deactivating to negative/positive activating emotions.

Besides, response-focused emotion regulation in terms of expressive suppression significantly aids learners to deliberately control their reflexive behavioural expression of emotions. Consequently, it results in positive emotion regulation. For example:

Participant J is taking a video of his project presentation. He sets his camera. He then gets to his feet and holds his work in his hands. He glances over



# Table 2

| Antecedent-focused | emotion    | reaulation                              | amona e | lementary | /learners |
|--------------------|------------|---|---------|-----------|-----------|
|                    | 0111011011 | 100000000000000000000000000000000000000 | 0       |           | 100111010 |

| Types of Antecedent-fo-  | Change of Emotions  |   | - Evented of Events  |  |
|--|---|---|--|--|
| cused Emotion Regulation   | Types of emotions   | Facet of emotions   |  |  |
| Situation selection<br>Justification<br>Choosing a situation that<br>generate more pleasant<br>emotions. | Increase of positive<br>activating emotion<br>[Intrapersonal – deci-<br>sion making]                        | Topic emotion: Inter-<br>est → Courage<br>[Integral]              | I will be more interested to attempt because no one<br>has ever succeeded beforemostly because I have<br>never tried. So, I give it a try. (Participant H/Inter-<br>view/396-400)  |  |
|  | Increase of positive<br>activating emotion<br>[Intrapersonal – deci-<br>sion making]                        | Epistemic emotion:<br>Passion → Satisfac-<br>tion<br>[Integral]   | I will go through all the learning materials I can gain<br>more knowledge. (Participant I/Interview/182-186)<br>I feel like I can learn more things. We must learn<br>everything, not to learn halfway. (Participant F/Inter-<br>view/245)   |  |
|  | Increase of positive<br>activating emotion<br>[Intrapersonal – deci-<br>sion making]                        | Achievement<br>emotion: Confident<br>→ Grit<br>[Integral]         | I want lesser control from the teacherI hope teacher<br>does not interrupt what am I doingI want teacher to<br>let me do it by myself. (Participant L/Interview/243-273)<br>I prefer to do the work by myself, even though some-<br>times I need help Teacher helps me when I face<br>problems. (Participant E/Interview 02/269-280)   |  |
|  | Negative activating →<br>Positive activating<br>[Intrapersonal –<br>emotion-memory<br>congruence]           | Epistemic emotion:<br>Confused → Secure<br>[Integral]             | I feel like it is better to start from one to fiveI feel like it<br>is safer. (Participant K/Interview 01/112-114).<br>I always start from number oneI feel confused if I skip<br>here and there. (Participant F/Interview/219)  |  |
|  | Negative activating →<br>Positive activating<br>[Interpersonal – social<br>judgement/ social<br>perception] | Social emotion: An-<br>noyed → Determined<br>[Integral]           | I don't want other people to influence meThey may<br>say something, but I am not going to do thatI must<br>insist because I want to do the thing I prefer to do.<br>(Participant F/Interview/382-411)  |  |
|  | Negative deactivating<br>→ Positive activating<br>[Intrapersonal –<br>emotion-memory<br>congruence]         | Achievement emo-<br>tion: Unattained →<br>Pride<br>[Integral]     | My work isn't really good. Therefore, I don't show it to<br>my friendsI dare to show it when I have improved, or I<br>have done it better than them. (Participant J/Interview<br>02/167-177)<br>I think she is not confident in doing the work. She will<br>join the discussion on other subjects because she is<br>confident. (Participant C/Interview/148-149)<br>I will show them the very hard onesince it makes<br>me feel a little bit more accomplished. (Participant K/<br>Interview 01/381-389)<br>I want them to be jealous. (Participant N/Interview<br>01/455) |  |
|  | Negative deactivating<br>→ Positive activating<br>[Intrapersonal – atten-<br>tional biases]                 | Topic emotion: Over-<br>whelmed → Interest<br>[Integral]          | I have a hard time to choose the learning materials<br>When I need to choose, I will choose my favourite one.<br>(Participant M/Interview/178-206)   |  |
| Situation modification<br>Justification  | Increase of positive<br>activating emotion<br>[Intrapersonal – deci-<br>sion making]                        | Epistemic emotion:<br>Passion → Satisfac-<br>tion<br>[Integral]   | Participant N expressed that "harder is better". (House/<br>Observation/MChat/00:59:23)  |  |
| to change its emotional impact.  | Negative activating →<br>Positive activating<br>[Intrapersonal – deci-<br>sion making]                      | Achievement emo-<br>tion: Dependence →<br>Confident<br>[Integral] | Some of the questions, I ask other peopleI don't ask<br>them every question. Sometimes, I do it by myself.<br>(Participant F /Interview/449-461)   |  |
|  | Negative activating →<br>Positive activating<br>[Intrapersonal –<br>emotion-memory<br>congruence]           | Epistemic emotion:<br>Confused → Attain-<br>able<br>[Integral]    | I learn with my friends because the work is confusing,<br>or it is too hard for me. If I learn alone, that means I<br>know how to do it by myself, I know how to do it prop-<br>erly. (Participant K/Interview 02/48-50)   |  |
|  | Negative activating →<br>Positive activating<br>[Interpersonal – social<br>judgement/ social<br>perception] | Social emotion: Guilt<br>→ Self-compassion-<br>ate<br>[Integral]  | I am not that part of myself sometimes Sometimes,<br>I want to make my mother proud Sometimes, I think<br>learning can help me to gain more knowledge, more<br>friends. (Participant M/Interview/480-523)<br>Sometimes, I learn for others. Sometimes, I learn for<br>myself I learn for parentsI want them to be proud.<br>(Participant N/Interview 01/426-436)   |  |
|  |   | 324   | _  |  |

# Table 2

# Continue

|  | Negative deactivating<br>→ Positive activating<br>[Interpersonal – social<br>judgement/ social<br>perception] | Social emotion: Mor-<br>tified → Acceptance<br>[Integral]          | I will make an effort to do better than him and prove to<br>him that I am better. So that he will stop making fun of<br>me. (Participant J/Interview 02/181)   |
|--|---|--|--|
|  | Negative deactivating<br>→ Positive activating<br>[Intrapersonal – deci-<br>sion making]                      | Social emotion: Iso-<br>lated → Enlightened<br>[Integral]          | Participant N, C, and J are discussing about their works<br>at the chat box. Teacher gives guidance. Participant<br>C learns alone most of the time, but today, he joins the<br>conversation. Whereas Participant N is active in asking<br>and responding as usual. (House/<br>Observation/MChat/00:11:31-00:20:44)  |
| Attentional deployment   | Increase of positive<br>activating emotion<br>[Intrapersonal –<br>emotion-memory<br>congruence]               | Topic emotion: Inter-<br>est → Excitement<br>[Integral]            | >I am always happy< with my learning because I<br>don't think about when the "best time" of my learning<br>is. (Participant M/Interview/48-60)   |
| Shifting attentional focus within an emotional scene   | Negative activating →<br>Positive activating<br>[Intrapersonal –<br>emotion-memory<br>congruence]             | Epistemic emotion:<br>Uncertain → Passion<br>[Integral]            | I start by copying the answers from my friends since<br>I have no idea how to do it. After that, I think I should<br>consider what I want to learn and do throughout the<br>learning process. I then attempt to do it on my own.<br>(Participant E/Interview 01/457-460)   |
|  | Negative deactivating<br>→ Positive activating<br>[Intrapersonal – deci-<br>sion making]                      | Achievement emo-<br>tion: Despair ? Grit<br>[Integral]             | I want to keep studying even if there are moments<br>when I feel like giving up. I refuse to give upI will<br>put a lot of effort if I still not sure. (Participant G/Inter-<br>view/497-505)  |
|  | Negative deactivating<br>→ Positive activating<br>[Intrapersonal – deci-<br>sion making]                      | Achievement emo-<br>tion: Afraid → Grit<br>[Integral]              | I am not willing to take part in the online learning at<br>the beginning because I am afraid that I won't be<br>able to accomplish the works on my own. Then, I tried<br>to fit in, and I found it interesting. (Participant L/Inter-<br>view/33-37; Participant F/Interview/58)   |
|  | Negative deactivating<br>→ Positive activating<br>[Intrapersonal – deci-<br>sion making]                      | Achievement emo-<br>tion: Afraid → Grit<br>[Integral]              | I feel like I am not going to success I think my grade<br>is too low, so I am going to give uphowever, I feel like<br>I have to self-adjust after that (Participant J/Interview<br>02/134-149)   |
| Cognitive reappraisal<br>Justification<br>Restructure attributions to<br>prevent from entering into<br>a negative believe cycle. | Increase of positive<br>activating emotion<br>[Intrapersonal – deci-<br>sion making]                          | Achievement emo-<br>tion: Pride → Grit<br>[Integral]               | We will look at each other's work after we have<br>finished our workI think my friends may find my work<br>to be quite excellentbut I won't stop working on my<br>work despite compliments from friends or teachers.<br>(Participant D/Interview/380-398)  |
|  | Negative activating →<br>Positive activating<br>[Interpersonal – social<br>judgement/ social<br>perception]   | Social emotion: Un-<br>secure → Self-com-<br>passionate [Integral] | Maybe my work is good, just that teacher doesn't say<br>it out I think they are proud of me or maybe I make<br>a lot of mistakes I don't feel accomplishedI feel sad,<br>a little bit angry and not feeling proudJust don't think<br>about it. That will make me feel better.<br>(Participant M/Interview/431-445)   |
|  | Negative activating →<br>Positive activating<br>[Interpersonal – social<br>judgement/ social<br>perception]   | Social emotion: Guilt<br>→ Self-compassion-<br>ate<br>[Integral]   | If teacher is satisfied with my learning performance,<br>I have no reason to judge myself as "I am not good".<br>(Participant J/Interview 01/433)  |
|  | Negative activating ?<br>Positive activating<br>[Interpersonal – social<br>judgement/ social<br>perception]   | Social emotion: Un-<br>secure → Appreciate<br>[Integral]           | I posted my work. They could say anything like, "Wah<br>↑ You are good" or "You make a mistake". That does<br>not bother me, and I am happy they point out my<br>mistakesIt don't mind if people don't compliment me,<br>as long as they tell me *oh! you make mistakes here*<br>and I correct itI am happy there is someone who can<br>tell me where am I done wrong and where am I done<br>right. (Participant A/Interview/70-90)<br>I feel okay if my friends say my work is nice. I feel like I<br>can do better if they say my work is not nice.<br>(Participant L/Interview/328-330) |
|  | Negative deactivating<br>→ Negative activating<br>[Interpersonal – social<br>judgement/ social<br>perception] | Social emotion: Mor-<br>tified → Acceptance<br>[Integral]          | I am not happybecause I have already worked so<br>hard, but teacher doesn't praise me I think maybe I<br>am not doing good enough. I need to work harder until<br>teacher praises me one day.<br>(Participant G/Interview/523-535)   |

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his work a few times before he is ready to speak. He seems nervous. Then, he inhales deeply and starts to present his project. (House/Observation/0:37:41VT-0:38:32VT)

The above scenario demonstrates the participant's attempt at expressive suppression to regulate his tense emotion in order to calm himself down throughout the project presentation.

Despite elementary learners demonstrating a tendency for intrinsic emotion regulation, some of them performed prosocial behaviour in an effort to reduce their peers' negative emotion to achieve a desired outcome. Consider the following situation:

My friends are feeling frustrated to resolve problems by themselves. I teach them how to resolve it. I guide them to work harder, learn more, and think deeper...I will ruin their day if I never encourage them. (Participant A/Interview/454-476)

Participant A's action in the scenario led to effective regulation of her peers' emotions through situation modification (extrinsic emotion regulation), which offered specific support that helped to reduce peers' frustration when trying to resolve problems.

# Emotions That Affect Elementary Learners' Enjoyment Manifestation in Asynchronous Online Learning

Emotion regulation leads to either positive or disruptive emotions as the natural consequence. On that note, positive activating emotions inevitably increases elementary learners' enjoyment of asynchronous online learning. Elaborating from Table 2, the most prevalent emotion among elementary learners that contributes to the increase in asynchronous online learning enjoyment is grit. The grit emotion was elevated by their intrapersonal drive when they have to decide how much persistent effort is required to achieve particular learning goals. Followed by interest, an intrapersonal type of emotion that falls under the facet of topic emotion. It is the second prevalent emotion that positively influences students' asynchronous online learning enjoyment when students engage with the learning topics. This study discovered the emergence of enjoyment in a range of emotional practices, including decision making, attentional biases, and emotion-memory congruence. In short, enjoyment encompasses a broad range of situations.

Thirdly, learners' enjoyment of asynchronous online learning is positively impacted by passion, a type of epistemic emotion elevated by learners' intrapersonal beliefs about the nature of knowledge and knowing, in terms of their enthusiasm for ongoing learning within the asynchronous online learning context. The fourth emotion that has a substantial impact on learners' asynchronous online learning enjoyment is self-compassion. In contrast to the above emotions, it is an interpersonal type of emotion which falls under the facet of social emotion. In precise, learners' selfcompassionate emotion is driven by social judgement and perception; the social environment has a big influence on learners' self-compassionate emotion, which in turn influences their enjoyment of learning. Although other positive activating emotions such as excitement, courage, satisfaction, confident, secure, determined, pride, attainable, acceptance, enlightened, appreciate, and calm have a positive impact on learners' enjoyment of asynchronous online learning, however, this study identified them as the less influential emotions on learners' asynchronous online learning enjoyment.

On the other hand, this study discovered negative activating emotions as an inferior feature that proportionally raises elementary learners' enjoyment of asynchronous online learning, with emotion regulation acting as a catalyst. From the facet of epistemic emotion, learners' emotions of confusion and uncertainty occurred when they experienced emotion-memory congruence. However, they never stop learning in dedication to resolve their confusion and uncertainty. From the facet of achievement emotion, learners who had engaged in asynchronous online learning were found to be nervous and dependent when it came to making their own decisions. Nonetheless, nervousness encouraged learners to be more cautious and focused on their learning, whereas the feeling of dependence assisted learners in obtaining support for scaffolding which guarantees continuous learning. Furthermore, social emotions such as annoyance, guilt, and unsecure often arise during interpersonal interactions. Despite being in the midst of difficult situations or dragged by negative emotions, learners were still able to participate actively in the asynchronous online learning process.

The positive and negative activating emotions discovered in this study fall under the category of integral emotions, resulting from learners' consideration about decision parameters or its implications. In any events, negative deactivating emotions must be carefully attended because they evidently retard learners' learning engagement and decrease their asynchronous online learning enjoyment, such as the feeling of unattained, overwhelmed, mortified, isolated, despair, afraid, unconfident, demotivated, disinterest, neglect, and lost, as being identified by this study. Negative deactivating emotions are a mixture of integral and incidental emotions.

# The Impact of Emotions and Emotion Regulation on Learners' Enjoyment of Asynchronous Online Learning

Drawing from the previous discussion of learners' enactment on how they effectively regulate

their emotions, this study identified four types of interrelation patterns between emotions and emotion regulations, which have positive impacts on learners' asynchronous online learning enjoyment:

| Positive activating emotion    | $\rightarrow$ | Positive activating emotion | = Increase of enjoy-<br>ment |  |  |
|--------------------------------|---------------|-----------------------------|------------------------------|--|--|
| (Pos                           | sitiv         | e emotion regulation)       | )                            |  |  |
| Negative activating<br>emotion | $\rightarrow$ | Positive activating emotion | = Increase of enjoy-<br>ment |  |  |
| (Positive emotion regulation)  |               |                             |                              |  |  |
| Negative deactivating emotion  | $\rightarrow$ | Positive activating emotion | = Increase of enjoy-<br>ment |  |  |
| (Positive emotion regulation)  |               |                             |                              |  |  |
| Negative deactivating emotion  | $\rightarrow$ | Negative activating emotion | = Increase of enjoy-<br>ment |  |  |

(Positive emotion regulation)

Unfortunately, there are instances where the failure of emotion regulations leads to disruptive emotional outcomes and a decrease in enjoyment. For instance:

| Negative deacti-               | ightarrow Negative deacti- | = Decrease of |  |  |
|--------------------------------|----------------------------|---------------|--|--|
| vating emotion                 | vating emotion             | enjoyment     |  |  |
| (Disrupted emotion regulation) |                            |               |  |  |

I won't take any action if I am not curious. (Participant D/Interview/274)

I will not write anything when I lose my confidence. (Participant A/Interview/559)

The above scenarios demonstrated emotion dysregulation, showing learners were unable to break out from the destructive emotional cycle (disinterest/ unconfident?demotivated) which retarded their learning progress and their effort to pursue hedonistic enjoyment.

Not all activating emotions will be positively elevated after learners make effort to regulate their emotions. Consider the following situation:

| Negative activat-              | → Negative deacti- | = Decrease of |  |  |
|--------------------------------|--------------------|---------------|--|--|
| ing emotion                    | vating emotion     | enjoyment     |  |  |
| (Disrupted emotion regulation) |                    |               |  |  |

I am not sure how to proceed...I don't understand...but I tried to complete the easy one...then, I tell teacher that I don't know how to solve the other one...I wait for the answers. (Participant E/Interview 01/402-428)

Although participant E was confused at the beginning of his learning, he still tried to solve his learning problem. However, he failed to effectively manage his confused emotion while he was learning, he felt despair and lost enjoyment in continuing trying and learning.

Furthermore, elementary learners frequently struggled to predict their learning capacity accurately, which then stimulate various emotions within their learning context. Consider the following situation: Positive activating → Negative deacti- = Decrease of emotion vating emotion enjoyment (Disrupted emotion regulation)

I think I am ready for something more difficult. But when I am working on a difficult task, I feel like I should be doing something easier... I have no idea what I want. (Participant M/Interview/577-583)

The participant presented a disrupted emotion regulation of her passion in learning, which eventually led herself lost while predicting her learning ability. This situation results to a decline in eudaimonic enjoyment of discovering the meaning of learning.

# Discussion

To address the research question 1, this study identified situational control and cognition/internal control as two major domains of emotion regulation in elementary learners' asynchronous online learning. Nonetheless, this study underscored that the functions of these two types of emotion regulation are not significantly different from one another; rather, they complement one another both internally and externally, which helps learners' emotions remain stable during asynchronous online learning. For instance, Participants L attempted to consciously shift her attention away from feeling afraid of learning independently in asynchronous online learning (internal control); concurrently, she engaged with her self-learning capability and deliberately avoiding the teacher's intervention (situational control), the learning circumstance provided her more opportunities to project herself which subsequently stimulated her learning interest in the context. This study's finding is supported by Gross's (2014) study, stating that emotional reactions can alternatively be either internal or can be described in terms of the aspects of external environment. This is because emotional responses often lead to changes in the environment that affect the probability of subsequent instances of other emotions.

According to Zhang et al.'s (2023) study, learners who tend to practice antecedent-focused emotion regulation were more likely to repair unpleasant emotions in a more optimistic manner, while those who prefer to practice response-focused emotion regulation experiencing less positive affect. Despite expressive suppression, a form of internal regulation, was not identified as a major type of emotion regulation among elementary learners in this study, the finding potentially challenged Zhang et al.'s (2023) perspective, arguing that response-focused emotion regulation e.g. expressive suppression may provide notable positive affect, as if learner like Participant J found it easier to concentrate on task after suppressing his emotional response and avoid distractions during his presentation. This type of response-focused emotion regulation motivated Participant J to confront



learning challenges, which imperceptibly stimulated his self-confidence to perform or strive for his best if he was able to overcome the challenge, as he stated that "I dare to show it when I have improved" and "I will make an effort to do better than him". Nonetheless, there are many factors that influence learners' expressive suppression, such as individual differences and development in socialisation experiences, culture, and traits, which worth to be further investigated (Gross & Cassidy, 2019). Undeniably, expressive suppression comes with cost over time, such as increased stress and decreased satisfaction, and it usually results in greater unpleasant emotions in response to negative affective stimuli. This study suggests asynchronous online learning instructors to create a more open and supportive virtual learning environment where learners feel safe to express their emotions. Instructors can also incorporate various emotion regulation strategies, such as teaching cognitive reappraisal to help elementary learners reframe their thoughts and mindfulness techniques to enhance emotional awareness.

On the other hand, extrinsic emotion regulation, a person's initiative to regulate the emotions of others, was lacked among elementary learners. Learners are inclined to regulate their own emotions than to influence other people's emotions. Despite the fact that learners were generally observed to exhibit empathy for their peers, this did not necessitate engaging in other-oriented behaviour, as highlighted in Singer and Klimecki (2014). This finding demonstrated that learners at this stage are in the process of learning to understand and manage their own cognitive and emotion; they still struggle with emotional expression which would enable them to navigate social interactions more effectively. Hence, this study goes in line with Pollak et al.'s (2024) initiative, suggesting the needs of social-emotional learning programs for elementary learners to foster a sense of community and mutual respect that would positively support peer relationships as well as classroom climate in the asynchronous online learning context. However, an issue that should be taken into consideration is that asynchronous online learning environments often limit direct peer interaction and hinder learners' skills development to regulate not only their own emotions but also understanding and responding to the emotions of others. Instructors are encouraged to design more structured peer activities and to schedule synchronous check-ins via video calls or chats to provide opportunities for real-time interaction and emotional support.

Research question 2 aims to identify the emotions that implied in elementary learners' emotion regulation, as the key factors that should be considered when determining learners' enjoyment in asynchronous online learning. This study emphasised both positive and negative activating emotions as important components that optimise elementary learners' enjoyment of asynchronous online learning. This was a move forward over Mayer's (2020) study, which practically demonstrated that these two types of emotions were worthwhile to be explored when investigating emotions in technology-enhanced academiclearning. Despite the inevitable effectiveness of positive activating emotions, this study stands in line with Wu and Yu (2022), proved that negative activating emotions is advantageous for asynchronous online learning indeed. To provide further context for this statement, for instance, confusion/uncertainty could be addressed by suspending the ongoing task to consider other options, by trying things out, or elevating critical thinking. Trying out various solutions not only addresses learners' confusion/uncertainty but also deepens their understanding of knowledge. Moreover, learners must evaluate different options, consider various perspectives, and make informed decisions to navigate confusion/uncertainty through critical thinking and analytical skills. Consequently, successfully overcoming confusion/uncertainty can provide a sense of accomplishment. This positive reinforcement enhances learners' confidence and motivate them to tackle future challenges, adding to their overall enjoyment of the asynchronous online learning experience.

Negative deactivating emotions do arise in the context of asynchronous online learning, as indicated by previous research (Aladsani et al., 2022; Hamzeh, 2021). According to the study's findings, negative deactivating emotions, such as boredom, frustration, and anxiety significantly reduced learners' motivation and confidence to engage in the learning activities, and increased learners' cognitive load, making it harder for learners to process information, concentrate, and retain knowledge. These situations caused avoidance behaviour such as avoiding challenging tasks and discourage learners to interact with teacher and peers, leading to feelings of isolation. This study suggested attention to specific negative deactivating emotions that anticipate further actions from instructors to improve the state of asynchronous online learning enjoyment among elementary learners. Rather of considering the influence of learners' intrapersonal emotions on their asynchronous online learning enjoyment, instructors must be aware of the influences of social environment in that context which is closely associated with the interpersonal impact on learners' emotions manifestation, as highlighted by Kamei and Harriott (2021).

Research question 3 concerned the relationship between emotions, emotion regulation, and enjoyment, regarding how the elementary learners carry out the regulation process during asynchronous online learning. The finding of this present study refutes the findings of Sanchis-Sanchis et al. (2020), arguing that children normally have weak emotion regulation skills. Based on the elementary learners' demonstration of the interrelation pattern between emotions, emotion regulation, and enjoyment, this study discovered the possibility for children to further expand their emotion regulation practices through asynchronous online learning due to a high incidence of successful emotion regulation in the context. For instance, elementary learners possessed a pleasant ability to regulate their emotions during asynchronous online learning, which led to an increase or persistence of positive emotions. Consequently, those positive emotions such as interest and excitement prompted learners' hedonic enjoyment of feeling effortless to pursue happiness through pleasurable asynchronous online learning activities. To extend further, the development of positive emotions brought about by efficient emotion regulation also increased learners' eudaimonic enjoyment in achieving long-term contentment by accepting more challenging asynchronous online learning tasks. Hence, emotion regulation was identified to be an action that significantly determines learners' emotion manifestation in the learning context, simultaneously established a close connection between learners' emotions and hedonic or eudaimonic qualities of enjoyment. Nonetheless, learners occasionally lacked or struggled with emotion regulation. Here comes the outcome that indicates an emergence of negative emotions like feeling despair or tendency to give up. Consequently, it caused a fall in hedonic enjoyment (e.g. I won't take any action if I am not curious/lose confidence) and a fall in eudaimonic enjoyment (e.g. I feel like I should be doing something easier). Regarding this matter, Keane and Griffin (2018) indicated that young learners are often hard to predict individual strengths and weaknesses that hinders their attempts to pursue hedonic or eudaimonic qualities of enjoyment or positive feelings. Initiatives that help in developing children's emotion regulation skills should be incorporated, in both preventive and treatment interventions in asynchronous online learning to improve the current situation.

### Conclusion

This study initially looks into the background and theoretical underpinnings of emotions, emotion regulation, and learning enjoyment in the postpandemic asynchronous online learning context of Malaysian elementary education. Subsequently, readers were provided with detailed methodological information to determine whether the practice is pertinent to their own context. Research questions were addressed. As per research question 1, this study identified situational control and cognition/internal control as two complementing domains (internally and externally) of emotion regulation that influence learners' emotions stability and enjoyment during asynchronous online learning. Meanwhile, responsefocused emotion regulation such as expressive suppression can also have positive effects, like improved learners' concentration and motivation, if synchronous online learning instructors carefully guide elementary learners to manage their emotions effectively. In addition, fostering a sense of community and mutual respect through extrinsic emotion regulation is significant because it would positively support peer relationships as well as classroom climate in the asynchronous online learning context.

While addressing research question 2, this study identified positive and negative activating emotions as important components that optimise elementary learners' enjoyment of asynchronous online learning. At the same time, specific attention should be put to negative deactivating emotions that anticipate further actions from instructors to avoid hindering learners' enjoyment during asynchronous online learning. To address research question 3, this study has explored how elementary learners regulate their emotions to maintain or increase their enjoyment during asynchronous online learning. Furthermore, this study also identified the interrelationships between emotions, emotion regulation, and enjoyment which resulting in desired and undesired outcomes that suggest advancement to the field of study.

Nonetheless, this study only investigated 14 elementary learners from single Malaysian school. Future studies should involve more participants from a wider range of academic levels and institutions to strengthen the findings on learners' emotion, emotion regulation, and enjoyment of asynchronous online learning. Besides, this study did not relate learners' gender and academic achievement with their emotions, emotion regulation, and enjoyment in asynchronous online learning. Future studies may delve deeper into these domains to uncover worthful insights and enhance the field. Since different online learning approaches and platforms may provide different affordances to learners, it would be useful for future studies to investigate learners' emotions, emotion regulation, and enjoyment in other online learning context, such as synchronous online learning.

Despite the limitations, there are theoretical and practical implications that may be drawn from the study's findings. From a theoretical perspective, the present study extends previous studies on elementary learners' emotions, emotion regulation, and enjoyment to an asynchronous online learning context. Within this context, the findings offer a novel understanding of the interrelation between emotions and emotion regulation in relation to asynchronous online learning enjoyment. From a practical perspective, this study proposed that instructors should provide opportunities



to raise elementary learners' understanding of their emotions and awareness of regulating the emotions in order to improve or maintain their enjoyment of learning. Instructors should consider both situational/ environmental control and cognition/internal control as two major domains of emotion regulation to be cultivated in elementary learners when designing asynchronous online learning. Furthermore, this study suggests instructors' attention to enhance learners' positive and negative activating emotions, while restricting learners' negative demotivating emotions that significantly impede their enjoyment of learning.

# **Ethics Board Approval**

This study has been officially approved by the Educational Planning and Research Division (EPDR), Ministry of Education (MOE), and District Education Department.

# **Conflicts of Interest**

The author has no conflicts of interest to declare.

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