

Influence of Advantages and Levels of Reflection of Podcasts On Communicative Competences

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Abstract

An instrument was validated through factorial structure to measure the advantages, levels of reflection, and communicative competencies of the podcast, as well as to establish the levels of reliability and consistency of the measuring instrument. Likewise, confirmatory analysis was carried out to validate the proposed structural model and establish the relationships of the factors using the PLS-SEM methodology, Partial Least Squares Structural Equation Modeling. It was validated with a sample of 142 teachers. It was demonstrated that there is a causality relationship of the variables, given by the coefficient of determination R², the level of influence of the independent variables: levels of reflection and advantages; on the dependent variable, communicative competencies; the level of influence of the exogenous variable: advantages with the endogenous variable: levels of reflection in teachers. A high degree of construct validity was shown through the fit indices of the confirmatory factorial analysis.

Keywords:

Teaching; Virtuality; Podcast; methods; Skills and communication

Introduction

The Covid-19 pandemic has challenged the teaching competences of educators, who have been forced to replace face-to-face instruction with online instruction (Polyakova & Galstyan-Sargsyan, 2021). In this context, a new way of assuming academic and work relationships is generated, which has led to the emergence and diffusion of different digital tools, especially those designed to transfer knowledge in an agile, fun, and motivating way (Craig et al., 2021; Peled, 2021; Samuel-Azran et al., 2019). In this sense, various strategies have been promoted in the development of virtual learning sessions (Polyakova & Galstyan-Sargsyan, 2021), which for many teachers have caused methodological inconsistencies due to the lack of preparation of the educator in the use of digital content (Almendingen et al., 2021; Saeedakhtar et al., 2021), and the lack of connectivity has led to the use of podcasts as an educational tool to generate inclusive and informal learning (Ifedayo et al., 2021).



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The use of podcasts in secondary education has been an alternative mainly used to transfer knowledge and develop some dimensions of communicative competence (Basenko & Baskakova, 2021; Borja-torresano et al., 2020). This tool has the advantage of being able to be used online and repeated several times according to the user's time availability (Nalendra et al., 2020; Strickland et al., 2021). In addition, this technological resource allows teaching in a direct and secure way (Strickland et al., 2021), is accessible, free, massive, allows education (Basenko & Baskakova, 2021), and supports students with or without special needs (Alves et al., 2018). In conclusion, it has scientific and social knowledge, can be used in schools, and promotes critical and reflective attitudes (Celaya et al., 2020).

Review Literature

Regarding the literature review, studies have been found that focus on podcasts in the English language (Nalendra et al., 2020; Saeedakhtar et al., 2021), highlighting their effectiveness in oral skills, vocabulary, fluency, and reading comprehension, as well as promoting autonomous learning based on good teaching practices (Almendingen et al., 2021; Barrios-Rubio, 2021; Carson et al., 2021; Drew, 2017; Lowe et al., 2021). Podcasts assume a leading role in message production, inference, and reflection, as well as promoting collaborative work that stimulates critical thinking and allows for the exchange of ideas (González Conde et al., 2021; Saeedakhtar et al., 2021a), proving to be motivating and knowledge-generating.

There are gaps in the use of podcasts in the educational field in relation to knowledge transfer and good practices developed at the institutional level (Drew, 2017). Additionally, there is a need to explore the pedagogical and cost benefits compared to other methods (Almendingen et al., 2021). It is necessary to demonstrate that this learning tool is effective in the teaching-learning process (McNamara & Drew, 2019), and finally, there is a deficit of studies oriented towards the use of podcasts in the early, primary, and secondary educational stages in scientific production (Celaya et al., 2020). As can be seen, we have not found any studies on an instrument that measures the perception of podcasts from their advantages, communicative competencies, and levels of reflection in their perceived representation by teachers in digital pedagogical assignments used in distance education, which will contribute to its significant impact on practices and results obtained in distance education.

Therefore, this research responds to an initiative generated by the Ministry of Education of Peru in its proposal "Aprendo en casa" and "Experiencias de aprendizaje" carried out in 2020 and 2021 (R.M. No 160-2020-MINEDU, 2020), which has not been evaluated in terms of its impact and use at the level of teachers. Thus, this study examined how in-service

secondary education teachers perceive the different formats of podcast assignments in the context of virtual learning during the Covid-19 pandemic. This study aims to validate an instrument that can measure the advantages, levels of reflection, and communicative competencies of this tool and explore the success of professional development efforts for blended or hybrid teaching.

Perception of the Podcast from the Educational Context

The podcast allows for a temporal organization of sounds, through voice audio files that are uploaded to different platforms with elements, rhythmic sequences, and meaning that can be stored and shared (Özperçin & Günay, 2020). It is also considered a digital tool created for native speakers that is available for free on the internet for asynchronous use (Basenko & Baskakova, 2021). Unlike podcasting, which tends to be more complex and involves technology, its dissemination is massive without considering a specific recipient or defined purpose (Pareja Aparicio et al., 2019). On the other hand, educational podcasts allow for the transmission of authentic, relevant, and multifunctional content, with defined purposes (Özperçin & Günay, 2020). As a result of the pandemic, teachers have explored different ways to supplement face-to-face teaching, which has allowed the use of this digital tool in the development of learning experiences carried out during the lockdown and to be aware of the benefits of this resource (González Conde et al., 2021).

The Podcast and the Levels of Reflection in the Development of Communicative Competences.

The use of educational multimodality incorporates diverse ways of seeing communication, as well as semiotic resources and organizational channels of the practice of meaning-making with varied methods, resources, and learning discourses, as a complementary domain that supports teaching in schools, fostering autonomy in students (Özperçin & Günay, 2020). Therefore, the use of podcasts promotes active learning, to develop communicative competence from knowing how to listen through stories to develop dialogic, argumentative, and inquiry-based capacity (Carson et al., 2021). As well as learning vocabulary, phonetics, and grammar (Basenko & Baskakova, 2021) and other auditory comprehension skills and motivation (Mirza Suzani, 2021; Saeedakhtar et al., 2021) and increasing vocabulary for better oral, fluent, and precise expression (Özperçin & Günay, 2020; Taylor & Blevins, 2020; Yeh et al., 2021). Consequently, communicative skills such as listening, speaking, writing, and reading (García-Herrera & Erazo-Álvarez, 2020) can be enhanced through the use of podcasts, generating greater autonomy in the development of communication skills (Özperçin & Günay, 2020).

The Advantages of the Podcast in the Levels of Reflection.

Reflection allows for internalizing and interpreting learning experiences, enabling the transfer of knowledge and experiences (Lowe et al., 2021), fostering a dialogic space to link personal experience with the conceptual understanding of pedagogical aspects used by teachers (Carson et al., 2021). Podcasts are useful for providing student-centered instruction, allowing for flexibility in learning at their own pace and convenience, with their descriptive study revealing the effect of teacher behavioral value as a partial mediator of podcast acceptance (Ifedayo et al., 2021).

A study highlighted that informal instruction strategies should possess positive psychological interventions (Dreer, 2021) that allow for these levels of internalization, reflection, and discussion. Furthermore, interprofessional collaboration is considered to foster good educational practices for their use and benefit (Almendingen et al., 2021).

The Advantages of Podcasting in the Development of Communicative Competences

Language is a tool that allows us to interact with other people, understand and construct reality; this is achieved with communicative competences developed in school, social, and cultural life, which complement and feedback each other (MINEDU, 2016), to achieve clear and correct communication in different contexts (Segovia et al., 2013; Martinet et al., 2004). In this sense, the use of podcasts proves to be effective and favorable, as it allows students to listen asynchronously, thereby improving vocabulary mastery (González Conde et al., 2021; Saeedakhtar et al., 2021). Another study highlighted those podcasts make time and space more flexible and agile, energizing educational content, in addition to using other resources (González Conde et al., 2021). Likewise, this educational tool is used interdisciplinary and favors the exercise of auditory comprehension, oral and written expression, promoting student participation and enthusiasm (González Conde et al., 2021; Green et al., 2020; Mirza Suzani, 2021; Romero-Velásquez et al., 2020).

In this sense, variables have been identified around the results of various investigations in the educational context, as presented in Table 1.

Table 1:
Studies on different variables

Variable	Researches
The Podcast and the levels of reflection	Authors (Özperçin & Günay, 2020), (Carson et al., 2021), (Basenko & Baskakova, 2021), (Mirza Suzani, 2021), (Saeedakhtar et al., 2021), (Taylor & Blevins, 2020), (Yeh et al., 2021), (García-Herrera & Erazo-Álvarez, 2020).
Advantages of the Podcast	Authors (Lowe et al., 2021), (Carson et al., 2021), (Ifedayo et al., 2021), (Dreer, 2021), (Almendingen et al., 2021)
Podcast communicative competences	(MINEDU, 2016), (Segovia et al., 2013; Martinet et al., 2004), (González Conde et al., 2021; Saeedakhtar et al., 2021), (Green et al., 2020), (Mirza Suzani, 2021), (Romero- Velásquez et al., 2020).

Source: Own elaboration

Methodology

This work adopted a non-experimental study, with a survey design, to validate a psychometric instrument of the Podcast, based on the experience carried out by high school teachers in virtual education. They completed an online questionnaire between December 9th to 16th, 2021, generated by the school closure due to confinement. To proceed accurately with the statistical analysis, 150 participants completed the survey, and some were excluded because they had at least one missing response in the variables of interest. Consequently, the final sample was formed by 142 teachers. Participation was voluntary, and respondents were recruited through an email invitation, WhatsApp, and advertising on other social platforms. Regarding inclusion criteria, it was decided not to filter by discipline since the podcast has been used for educational purposes interdisciplinarity in all curricular areas, regardless of experience with podcasts or not.

The unintentional snowball sampling was composed of 142 teachers from Regular Basic Education of secondary level, between the ages of 20 to 65 years, mainly from Communication (36.6%); Mathematics (16.9%), Social Sciences (13.0%) and Science and Technology (7.8%) areas, belonging to the public sector (79.0%) and the private sector (20.9%), whose employment status is permanent (56.2%) and contractual (43.7%). Regarding years of service, mainly

in the studied sample, it corresponds to teachers with 26 to 30 years of service (30.7%); between 11 to 15 (16.9%); between 21 to 25, and 0 to 5 years of service (15.0%); from 6 to 10 years (12.4%), and between 16 to 20 years (9.8%).

The instrument was applied in December 2021.

For this reason, demographic data have been identified, presented in Table 2.

Table 2:
Demographic data

Sex	Age	Frequency	Percentage
Female	20 to 24 years old	4	2.8%
	25 to 29 years old	3	2.1%
	30 to 35 years old	9	6.3%
	36 to 40 years old	10	7.0%
	41 to 45 years old	14	9.9%
	46 to 50 years old	17	12.0%
	51 to 55 years old	22	15.5%
	56 to 60 years old	9	6.3%
	61 to 65 years old	2	1.4%
	Sub Total	90	63.4%
Male	20 to 24 years old	2	1.4%
	25 to 29 years old	1	0.7%
	30 to 35 years old	8	5.6%
	36 to 40 years old	5	3.5%
	41 to 45 years old	2	1.4%
	46 to 50 years old	8	5.6%
	51 to 55 years old	13	9.2%
	56 to 60 years old	10	7.0%
	61 to 65 years old	3	2.1%
	Sub Total	52	36.6%
	Total	142	100.0%

Source: Own elaboration

Hypothesis

The Bootstrapping technique was employed for hypothesis testing, which involved extracting a large number of bootstrap resamples (5,000) with replacement from the original sample and then estimating the model parameters for each bootstrap resample. A significance level of $p < 0.05$ was set, indicating that any result with a p-value less than 0.05 is considered statistically significant.

The tested hypotheses were as follows:

H1: The Podcast and the reflection levels -> Communication competences podcast

H2: Podcast Advantages -> The Podcast and the reflection levels

H3: Podcast Advantages -> Communication competences podcast

For each hypothesis, the results of sample means, standard deviations, statistical t-values, and corresponding p-values were presented. The p-values below 0.05 indicated statistically significant relationships between the variables.

The Instrument

They reviewed the literature of various authors with the purpose of identifying the variables to be studied. Subsequently, several items were developed, ensuring they were in line with the reviewed and consulted literature. Finally, they underwent the statistical procedure, resulting in the establishment of the instrument (questionnaire). The following presents three variables:

Variable: Advantages of Podcasting (PCV)

This online tool is flexible in terms of time and can be replayed based on the user's availability. In addition to being secure and direct, it's accessible, free, and valuable for educating students, including those with special needs. In summary, this tool contributes scientific and social knowledge; it's suitable for educational settings (Nalendra et al., 2020; Strickland et al., 2021; Basenko & Baskakova, 2021; Alves et al., 2018; Celaya et al., 2020).

Variable: Podcasting and the Development of Communication Competencies (PCDCC)

Language facilitates interaction and understanding. The communication skills learned in education and society enable effective communication. Podcasts enhance vocabulary and communication, offering flexibility in learning. They also invigorate education and promote auditory, oral, and written skills, exciting students (MINEDU, 2016; González Conde et al., 2021; Saeedakhtar et al., 2021; Green et al., 2020; Mirza Suzani, 2021; Romero-Velásquez et al., 2020).

Variable: Podcasting and Levels of Reflection (PDNR)

Podcasts allow for reflection on learning experiences, enabling the transfer of knowledge and experiences and proving useful for flexible and personalized learning. Additionally, they foster interprofessional collaboration, which enhances educational practices, promoting critical and reflective attitudes (Lowe et al., 2021; Carson et al., 2021; Ifedayo et al., 2021; Almendingen et al., 2021; Celaya et al., 2020).

TITLE: MEANINGS AND PERSPECTIVES OF TEACHERS ON THE USE OF PODCASTS IN VIRTUAL EDUCATION

PROPOSED TITLE: TEACHERS' PERCEPTIONS OF PODCAST USAGE IN VIRTUAL EDUCATION GENERAL OBJECTIVE: To examine teachers' perceptions of podcast usage in the context of virtual education during the Covid-19 pandemic.

VARIABLE	DIMENSION	ITEMS
PODCAST AS AN EDUCATIONAL RESOURCE	ADVANTAGES Authors: Strickland, 2020; Basenko, 2020; Evtugina y Volkova, 2020; Borja et al., 2020.	1.-Enables asynchronous listening to educational content.
		2.-Allows for an engaging and dynamic listening experience with educational content.
		3.-Has a multifunctional nature.
		4.-Facilitates rapid and widespread dissemination.
		5.-Enables the exploration of current and diverse topics.
		6.-Enhances the understanding of the content.
		7.-Improves students' performance.
		8.-Identifies students' needs and interests.
		9.-Creates a conducive learning environment.
	BENEFITS Authors: Besser, 2021; Strickland, 2020, Basenko, 2020; Romero, 2020.	1.-Enables the achievement of educational objectives for both teachers and students.
		2.-Provides direct and secure teaching to students.
		3.-Improves socio-cultural and communicative skills.
		4.-Develops interdisciplinary skills, approaches, and competencies.
		5.-Promotes autonomy in learning.
		6.-Contributes to the formation of more committed students.
		7.-Deepens students' understanding of the learning material.
		8.-Reduces students' anxiety.
		9.-Benefits students in developing project management skills.
	MEDIATED BY TECHNOLOGY Authors: Strickland, 2020; Basenko, 2020; Romero, 2020; Hitchcock et al., 2021; Makina, 2020.	1.-It is an easy-to-use tool.
		2.-It is ubiquitous, agile, and interactive.
		3.-Leverages the use of ICTs in the teaching-learning process.
		4.-Stimulates dialogue, reflection, and analysis of the social context.
		5.-Allows for an expansion of knowledge in the use of technology.
		6.-It is a stimulating and effective tool.
		7.-Introduces new technological skills.
		8.-Enables content reuse and sharing to strengthen instruction.
		9.-Contributes to the construction of social networks.
		10.-Reduces the technological gap.
	IN THE DEVELOPMENT OF TEACHING STRATEGIES. Authors: Taylor, 2020; Blevins, 2020; Basenko, 2020; Peled, 2021; Andrade, 2020; Moreto 2020; Borja et al., 2020; Mascaro y Ulli, 2020; Franklin, 2007; Unisa, 2015.	1.-Facilitates interactions with teachers and peers on substantive matters.
		2.-Encourages frequent, timely, and constructive feedback.
		3.-Allows for scaffolding. Strengthens the teaching of complex and difficult topics for students.
		4.-Provides opportunities for the development of critical thinking.
		5.-Enhances students' cognitive skills.
		6.-It is a highly visual and auditory learning method.
		7.-Diversifies the teacher's didactic strategies.
		8.-Potentially allows for multitasking.
		9.-Enables innovation in pedagogical practices.
		10.-Consolidates students' knowledge.
	MEASURED BY ONLINE LEARNING Authors: Adawiyah et al., 2021, Richardson 2006	1.-I feel facilitated by online learning.
		2.-I can develop myself, be creative, and innovative with online learning.
3.-With online learning, I become technologically literate.		
4.-I often have problems using technology.		
5.-I am familiar with the podcast tool.		
6.-It allows for secure content delivery to students.		
7.-Motivates active learning in students through mobile technology.		
8.-Contributes to meeting students' learning expectations as a supportive technology.		
PODCAST ASSIGNMENT WITH LEVELS OF REFLECTION. Authors: Hitchcock et al., 2021; Evtugina y Volkova, 2020.	1.-Enables personal reflection.	
	2.-Allows for information synthesis.	
	3.-Connects theory with reality.	
	4.-Enables the generation of consistent and relevant arguments.	
	5.-Reflects on the meaning of the podcast.	
	6.-Reflects on the construction of the podcast.	
	7.-Allows for error management.	
	8.-Stimulates argumentative discussions among students.	
	9.-Enables feedback on learning.	
	10.-Considers ethical norms during communication.	
THE PODCAST AND THE DEVELOPMENT OF COMMUNICATION COMPETENCES Authors: Taylor, 2020; Blevins, 2020; Basenko, 2020; Peled, 2021; Andrade, 2020; Moreto 2020; Borja et al., 2020	1.-Improves listening and speaking skills.	
	2.-Develops reading and writing skills.	
	3.-Fosters vocabulary expansion.	
	4.-Enhances pronunciation and fluency in students' oral expression.	
	5.-Stimulates oral participation of students.	
	6.-Improves intonation and rhythm in students' oral expression.	
	7.-Allows for planning the writing process in a text.	
	8.-Enables the observation of spelling and grammatical errors in content scripts.	
	9.-Facilitates the use of synthesis and organization skills in content script writing.	
	10.-Stimulates imagination in students' content script compositions.	

The applied questionnaire was developed by the research team. The study variables were evaluated using a five-point Likert scale indicating the degree of agreement or disagreement with the following statements, where (1) is Totally disagree (2) Disagree, (3) Neither agree nor disagree (4) Agree, and (5) Totally agree.

The estimated reliability reached values higher than 0.700 which can be considered acceptable for the Omega and Cronbach's Alpha coefficient. (see Table 3)

Table 3:
Frequent scale reliability statistics

	McDonald's ω	Cronbach's α
Estimate per point	0.978	0.978
95% CI lower limit	0.973	0.972
95% CI upper limit	0.983	0.982

Source: Own elaboration

Analysis

For the exploratory analysis, the variables were processed using a Likert scale, as evidenced by the consistency and magnitude of each item in the instrument. Therefore, these items are correlated, resulting in a Cronbach's alpha of 0.978. The McDonald's omega coefficient is an appropriate measure of reliability, and if the principle of equivalence is not applied, a confidence interval higher than 0.983 will be obtained as a result.

Results

First, in the validation and standardization of the applied instrument, a preliminary test was conducted with 50 study units before the definitive application of the instrument, with the purpose of establishing an adequate discrimination of the instrument items and their corresponding factor, according to the theoretical construct used. Then, a preliminary Exploratory Factor Analysis (EFA) was performed to establish an adequate composition of the items with their corresponding factors, using JASP statistical software v.0.16.

The result of the Kaiser-Meyer-Olkin (KMO) test was 0.912, which is acceptable. The EFA test was satisfactory, using the following criteria: orthogonal rotation (varimax), number of factors: manual, ordering of factor loads by variable criterion and with the output option for each item greater than 0.500 (see Table 4).

Table 4:
Common factor items – factor loadings

	Factor 1	Factor 2	Factor 3	Unicity
PCV1	0.706			0.391
PCV2	0.710			0.391
PCV3	0.764			0.396
PCV4	0.642			0.508
PCV5	0.735			0.350
PCV6	0.723			0.405
PCV7	0.630			0.497
PCV9	0.641			0.447
PDNR3			0.641	0.466
PDNR5			0.613	0.489
PDNR6			0.648	0.559
PDNR7			0.743	0.373
PDNR8			0.686	0.447
PCDCC1		0.742		0.339
PCDCC2		0.601		0.389
PCDCC3		0.551		0.533
PCDCC4		0.668		0.359
PCDCC5		0.740		0.266
PCDCC6		0.734		0.295
PCDCC7		0.813		0.247
PCDCC11		0.620		0.426

Note: The rotation method applied is varimax.

Second, regarding the results of the model, Confirmatory Factor Analysis (CFA) tests were conducted as an analytical condition for the factors, and its application contributed to determining the consistency of the proposed model.

The Comparative Fit Index (CFI) had a value of 0.904, which resulted in a suitable fit. On the other hand, the Tucker-Lewis Index (TLI) is considered suitable for the model if it is $\geq .90$ according to Keith (2015, p. 312). However, the obtained result was 0.891, which is below the suggested threshold by Tucker-Lewis. (see Table 5)

Table 5:
Fit Index

Index	Value
Comparative Fit Index (CFI)	0.904
Tucker-Lewis Index (TLI)	0.891

Source: Own elaboration

Third, different authors suggest various criteria for validating fit measures, such as the case of RMSEA (Root Mean Square Error of Approximation), where values equal to or less than 0.05 would be valid (Brown, 2015, p. 72); however, it should be noted that authors such as Jöreskog and Sörbom (1996) suggest values of $P > .50$, while the obtained result is 0.082.

Regarding the SRMR measure, a value of $\leq .08$ for good fit is intuitively attractive, although $\leq .06$ can be a better

criterion (Keith, 2015, p. 312), and the obtained result is 0.071, which is acceptable according to the criteria explained above. Table 6 presents the achieved fit measures.

Table 6:
Fit Index

Metrics	Value
Root mean square error of approximation (RMSEA)	0.082
RMSEA 90% IC lower limit	0.070
RMSEA 90% IC upper limit	0.095
Standardized Root Mean Square Residual (SRMR)	0.071

Source: Own elaboration

Fourth, the structural design of the proposed model is suitable for Structural Equation Modeling (SEM) based on variances (PLS), using SmartPLS (v.3.3.3) for analysis (Ringle et al., 2015). The external loading test represents the contribution of the indicators to the idea of the theoretical construct so that the measurement model is composed of the indicators and their paths and corresponding factors. The values obtained are called external loadings, and they could range from 0 to 1, so the closer they are to unity, the stronger they are to explain the validity of the proposed model. Table 7 presents the valid factors for the model, which will be represented as independent variables:

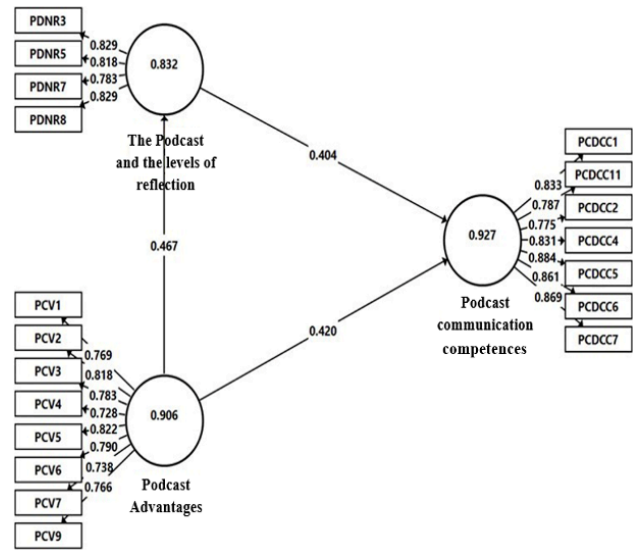
Table 7.
External loadings PLS SEM

	The Podcast and the levels of reflection	Communication competences podcast	Advantages of Podcast
PCDCC1		0.833	
PCDCC11		0.787	
PCDCC2		0.775	
PCDCC4		0.831	
PCDCC5		0.884	
PCDCC6		0.861	
PCDCC7		0.869	
PCV1			0.769
PCV2			0.818
PCV3			0.783
PCV4			0.728
PCV5			0.822
PCV6			0.790
PCV7			0.738
PCV9			0.766
PDNR3	0.829		
PDNR5	0.818		
PDNR7	0.783		
PDNR8	0.829		

Note:
PCDCC: Podcasting and The Development of Communication Competencies
PCV: Advantages of Podcasting
PDNR: Podcasting And Levels Of Reflection
Source: Own elaboration

The consistency of the model was expressed through Cronbach's alpha to establish the degrees of reliability of the indicators, the results exceed 0.700, being acceptable values for the structural model (Hair et al., 2010). (see Figure 1)

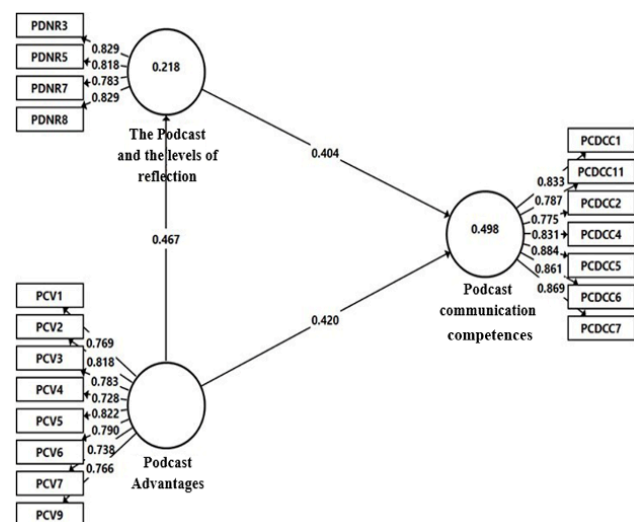
Figure 1.
Cronbach alpha of the SmartPLS model



In the measurement model, reliability and validity are obtained by calculating the Partial Least Squares (PLS) algorithm, for which different path coefficients are obtained. The results are explained based on the R², which reflects the goodness of fit to establish the relationship between the proposed factors in the model. In this sense, communicative competencies through the use of the Podcast are positively influenced by the level of reflection on its use and the advantages that come with its proper use, with a percentage of 49.8%, and the most influential variable being the advantages of its use.

The model also allows for the level of influence of the exogenous variable: advantages in the use of the Podcast on the endogenous variable: levels of reflection in teachers, based on the R² coefficient, which is 0.218, indicating that its influence would be 21.8%. (see Figure 2).

Figure 2.
R² from SmartPLS model



For the reliability and validity of the construct, correlation coefficients are taken into account. The values for the Cronbach's alpha, according to the proposed model, are between 0.832 to 0.927. Thus, they are statistically significant since they meet the minimum threshold recommended by F. Hair Jr et al. (2014). Regarding the Average Variance Extracted (AVE) values, they range from 0.604 to 0.698, which corresponds to the value suggested by Chong (2013) of 0.650. For Composite Reliability, the application of Bagozzi & Yi (1988) and Hair et al. (2012) is suggested. According to these authors, if the results are greater than 0.6, then high levels of internal consistency reliability are demonstrated for each of the variables. In this sense, the results obtained are between 0.888 to 0.942. The (rho_A) coefficient is used to verify the reliability of the values obtained in the construction and design of the PLS. The recommended results should be greater than 0.7. According to the data shown in Table 8, all coefficients exceed 0.700, demonstrating a high level of reliability.

Table 8.
Reliability and construct validity

	Cronbach alpha	Rho_A	Composite reliability	Average variance extracted (AVE)
The Podcast and the reflection levels	0.832	0.835	0.888	0.664
Communication competences podcast	0.927	0.929	0.942	0.698
Podcast Advantages	0.906	0.910	0.924	0.604

Source: Own elaboration

The discriminant or divergent validity, shows that constructs should not have any relationship. To establish this criterion of analysis, two methods were used. The first is the Fornell and Larcker method (Fornell & Larcker, 1981), which suggests that the square root of AVE in each variable, its resulting values should be greater than the results of the correlation between the studied variables. The results indicate that there is discriminant validity, therefore, it meets this requirement (see Table 9).

Table 9.
Fornell-Larcker criterion analysis for discriminant validity and verification

	The Podcast and the reflection levels	Communication competences podcast	Podcast Advantages
The Podcast and the reflection levels	0.815		
Communication competences podcast	0.600	0.835	
Podcast Advantages	0.467	0.609	0.777

Source: Own elaboration

Another method for verifying discriminant validity is the one proposed by Henseler, C. M. Ringle, and M. Sarstedt (Henseler et al., 2015), called Heterotrait-Monotrait (HTMT). The results obtained are justified because their values are below the conservative threshold of 0.850 proposed by Franke and Sarstedt (2019), although they can go up to 0.90 if the constructs are conceptually similar (Benitez et al., 2020; Henseler et al., 2015; Ogbeibu et al., 2018). According to the results, the values obtained are below 0.85 (see Table 10).

Table 10.
Heterotrait-Monotrait Criterion - HTMT for verification and discriminant validity

	The Podcast and the reflection levels	Communication competences podcast	Podcast Advantages
The Podcast and the reflection levels			
Communication competences podcast	0.681		
Podcast Advantages	0.524		0.658

Source: Own elaboration

The hypothesis testing was conducted using the Bootstrapping technique, which is a process of extracting a large number of bootstrap resamples (5,000) with replacement from the original sample and then estimating the model parameters for each bootstrap resample. Considering the significance level for the P Value ($p < 0.05$), all the hypotheses proposed are accepted. (see Table 11).

Discussion

The coefficient of determination indicates the predictive accuracy of the model and the combined effect of the independent variables on the dependent variable. Overall, the SEM analysis results have supported a significant influence among all proposed hypotheses. From a practical perspective, this study has shown that H1 The Podcast and reflection levels positively influence the development of communication competencies, finding that they enhance pronunciation, fluency, intonation, and rhythm in oral expression; foster writing skills and increase vocabulary with a high factorial loading. Similarly, it was found that the podcast is a didactic resource capable of promoting oral, reading, and writing skills; in addition to being a useful digital tool for feedback, correction, and enhancement of communication skills (Loja-Gutama et al., 2020; Taylor & Blevins, 2020; Mirza Suzani, 2021; Yeh et al., 2021). It also creates need for discipline and commitment in its listeners (Özperçin & Günay, 2020; Shamburg, 2020), likewise leading to self-reflection and monitoring of their performance regarding technical challenges, language difficulties, and progression. Moreover, it

Table 11.

Hypothesis testing - Bootstrapping

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	Statistical † (O/STDEV)	P Value
H1 The Podcast and the reflection levels -> Communication competences podcast	0.404	0.415	0.087	4.637	0.000
H2 Podcast Advantages -> The Podcast and the reflection levels	0.467	0.476	0.083	5.663	0.000
H3 Podcast Advantages -> Communication competences podcast	0.420	0.408	0.121	3.471	0.000

Source: Own elaboration

contributes to developing their oral communication skills in a thoughtful manner (Özperçin & Günay, 2020) by allowing them to record their voices, listen to themselves, and edit the final version of their multimodal communication.

Regarding H2 the advantages of Podcast positively influence the levels of reflection perceived by teachers, their articulation with theory and reality is identified with high values, followed by feedback and metacognition. Thus, it is affirmed that the use of podcasts favored the creation of spaces for discussion, reflection, and collaboration in group tasks that were more attractive because they started from reality (Almendingen et al., 2021). In addition to this, the result of using the podcast as a social, technological, and discursive space where narratives and stories are shared, which were analyzed collaboratively and critically, moved to an emotional and conceptual level (Carson et al., 2021), must be prioritized for better teaching. Therefore, in continuous professional development, recorded dialogues and reflective responses should be used to examine transformations in thinking and action of their teaching beliefs and practices (Lowe et al., 2021), which benefit their successful implementation of the podcast in an enjoyable and flexible way (Besser et al., 2021; González Conde et al., 2021; Ifedayo et al., 2021).

H3 The advantages of the Podcast have a positive influence on the development of communication competencies, which are reflected in the factor loadings: PCV5, the Podcast allows for the treatment of current and diverse topics; PCV2, the Podcast allows for enjoyable and dynamic listening of educational content, and PCV6, the Podcast deepens the understanding of the content, which are the perceptions assumed by teachers. These findings are similar to other studies, as it flexibilizes space and time, is an innovative, motivating, and effective resource that enhances linguistic, social, and personal formation (González Conde et al., 2021; Mirza Suzani, 2021). Additionally, it strengthens auditory skills of various texts with high educational and satisfaction

value (Green et al., 2020; Mirza Suzani, 2021; Romero-Velásquez et al., 2020).

Furthermore, if internalized collaboratively, it improves auditory comprehension achieving a vocabulary domain, because audios can be listened to and adapted asynchronously. (Saeedakhtar et al., 2021).

The document contributes by delivering an instrument that measures the perceived value of podcast perception and value as a means of reflecting on the methodology employed and its effect on student learning from the pandemic context. Coinciding with the fact that educational podcasts need to seek theoretical frameworks that allow the development of these in unique learning environments (McNamara & Drew, 2019). A second contribution is reflected in the adoption of the podcast tool by teachers in the Southern region of Peru, showing that the three variables have significant representativeness (Basenko & Baskakova, 2021; Borja-torresano et al., 2020).

The results of this research confirm outstanding factors to determine the usefulness and value of teachers in the significant use of podcasts. Therefore, by implementing podcasts as an online teaching and learning strategy, it leads to teachers being informed about the characteristics of the tool, its technical problems, as well as its usefulness, so that they feel secure and can plan its use, coinciding in the sense that educational podcasts are feasible if they have a positive impact on learning (McNamara & Drew, 2019).

The practical implications of this study were presented in the interaction among the three variables, as it represents the first investigation that examined the advantages of podcast use, the value of communicative competence, and levels of online reflection from the perception of secondary education teachers. In general, we believe that these results can be particularly interesting to shed more light on the validity of the instrument model. However, the benefit of this task offered a variety of practical transferable skills related to technology and

focused on teaching-learning and the need to quickly adapt and respond immediately to the difficulties of digital gaps mediated by technology. This digital tool demands double learning, first to familiarize oneself with the use of the device, second to make didactic use of the podcast that allows for meaningful learning (Ifedayo et al., 2021).

This study provided a limited sample of the perceptions of public and private sector teachers, mostly from the Communication area. Therefore, it is suggested that it can be replicated with other groups of teachers and analyze the effects of the perceptions and subjective value of teachers on their own experiences in the use of the podcast in the educational context. Although a significant influence was found among the three factors PCDD, PDNR, and PCV, the study did not measure different theoretical frameworks used to support the methodology employed in the use of podcasts in virtual learning environments. Therefore, it would be advisable to analyze these cognitive, social, motivational, and other experiences (McNamara & Drew, 2019). As well as, to evaluate the impact of hybrid or blended teaching on the use of podcasts at both the student and teacher levels.

Conclusion

The results of this study confirm the validity and reliability of the psychometric instrument for measuring the advantages of using podcasts, levels of reflection, and communicative competences, based on the methodological and practical aspects exercised by high school teachers in virtual education. The findings confirm that the communicative competences factor through the use of podcasts is positively influenced by the level of reflection and advantages. A causality relationship is also observed between the "advantages" variable and the "levels of reflection" variable, referred to the teachers.

This questionnaire has multiple uses, among them, it can be highlighted that it is useful for research that seeks to evaluate the impact of using podcasts, identify gender-related factors that influence their use and advantages.

Until now, there is no similar quantitatively and statistically validated instrument in the literature. This construct analysis facilitated the exploration and clarification of the podcast as a didactic resource in the educational field and by demonstrating versatility, it opens up the need to focus on new studies on the theoretical assumptions of the educational podcast. It is suggested that future research could evaluate the degree to which podcasts contribute to learning, according to the standards and competencies developed in educational curricula, as well as the methodologies employed by teachers and their effectiveness and impact.

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Appendix 1

Instrument

Advantages of Podcasting (PCV)

- PCV1: Podcasting as an advantage allows educational content to be listened to asynchronously.
- PCV2: Podcasting as an advantage allows for educational content to be listened to in an enjoyable and dynamic way.
- PCV3: Podcasting as an advantage has a multifunctional character.
- PCV4: Podcasting as an advantage allows for rapid and massive dissemination.
- PCV5: Podcasting as an advantage allows for treatment of current and diverse topics.
- PCV6: Podcasting as an advantage deepens understanding of content.

Podcasting and the Development of Communication Competencies (PODCC)

- PODCC1: Podcasting allows for improvement of listening skills.
- PODCC2: Podcasting allows for improvement of speaking skills.
- PODCC4: Podcasting promotes an increase in vocabulary.
- PODCC5: Podcasting improves pronunciation and fluency in oral expression for students.
- PODCC6: Podcasting stimulates oral participation for students.
- PODCC7: Podcasting improves intonation and rhythm in oral expression for students.
- PODCC11: Podcasting stimulates imagination in script writing for student content.

Podcasting and Levels of Reflection (PDNR)

- PDNR3: Podcasting articulates theory with reality.
- PDNR5: Podcasting allows for metacognitive reflection.
- PDNR7: Podcasting stimulates argumentative discussion among students.
- PDNR8: Podcasting allows for feedback on learning.