

The Importance of Learning Resources for University Students During Emergency Remote Learning

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Abstract—Although several studies have evaluated online learning tools and resources, few have investigated how useful they are to students. This topic became even more relevant with “emergency remote learning” due to coronavirus disease 2019 (COVID-19). The present study was conducted at a state educational institution in Mexico that offers five university degrees. The objective was to differentiate the importance of online learning resources by degree and by employment status of the students. This quantitative, relational, cross-sectional study included 969 participants. Jamovi, SPSS, and RStudio were used to calculate descriptive statistics and to perform the Scheirer-Ray-Hare and Friedman tests. The results showed that the most important learning resources are lesson recordings, teacher explanations, instructional materials, and online demonstrations, whereas the least important are exams, videos, homework, and projects. These findings were consistent across the five degrees among students who are employed and those who are not. The results suggest that educational resources should be used according to their importance for student learning.

Keywords—online learning, emergency remote learning, higher education, instructional materials, pandemic

1 Introduction

The term “emergency remote learning” emerged in early 2020 [1] to refer to the mandatory transition from classroom teaching to distance education due to coronavirus disease 2019 (COVID-19) lockdown measures. As mentioned by [1], the health emergency gave little time to change from face-to-face to remote learning. Once online classes began, lesson preparation time increased. Similarly, instructors quickly realized that routine in-person dynamics involved greater effort in online learning. Teachers gradually incorporated recordings of their lessons into their subjects from educational videos and presentations. Materials had to be prepared in more detail as well as be more visual to fit the new environment [2]. Thus, the importance of online learning tools and resources was increased and required extra attention. Accordingly, several studies have

evaluated online learning tools and resources; however, few have investigated how useful they are for students [3]. This knowledge gap was precisely the motivation for conducting this research.

During the COVID-19 lockdown, environments and learning resources had to be adapted for online learning. Although it is true that there were antecedents in the literature on its impact and acceptance, these derived from a context prior to the pandemic. For this reason, studies performed to assess teachers and students' perceptions of educational tools and resources during the pandemic, such as those by [3] and [4], are relevant and justified because they aim at providing guidelines for understanding the current situation and improving the quality of education. These objectives seek to address understandable concerns because, as expressed by [5], online learning systems or platforms do not suffice on their own. Their use can be poor without elements such as collaborations, tutorials, resources, and well-articulated content. Tracking the level of student engagement in online lessons is also a difficult task [6]. In addition, during the COVID-19 pandemic, students may express a preference for face-to-face education [7] and may become averse to online learning. However, despite these adverse scenarios, there is evidence that in some contexts, synchronous online courses can be as effective as face-to-face courses [8].

Teachers have a variety of online educational resources available, including videos, presentations, assignments, projects, and online activities, during or after class. Depending on the knowledge area, strategy, and teaching objectives, demonstrations, interactive cases, online notes, animations, simulations, exams, games, and questions may be included [9]. For example, as an online educational resource, video can help to promote social connection as well as develop technical and communication skills [10]. In turn, activities or practical exercises should not be ignored in online learning and may include problems or questions [11]. Projects can also be part of a teaching approach that favors critical thinking, problem solving, teamwork, and communication skills [12]. Accordingly, the teaching and learning materials that teachers provide must have a purpose and increase student engagement [13] and creativity [14]. Similarly, free and open-source resources support pedagogical flexibility and equal access to materials [15].

The effectiveness, use, and evaluation of resources are crucial in distance education since content and quality have been correlated with student's self-efficacy [16]. Resources have been the object of much research. For example, [17] found that materials prepared by the instructor are perceived as more effective than textbooks. The author also found that lesson recordings are the most effective resources for students. In their research, [3] found that, regardless of subject, teacher-led lectures and PowerPoint presentations are the most beneficial components for learning and conversely, projects and reading assignments were the least useful for students. When students have adequate educational resources and the necessary software, distance education is appreciated and does not hinder learning [18]. In line with the above, [19] explains that multimedia resources are crucial to modern teaching-learning strategies. Also, [20] found that students highly value the educational resources that are included in online courses because they meet their needs and expectations, especially when provided on a recur-

ring base. Students also prefer immediate and asynchronous access to learning resources after the lessons as it helps them complete their assignments, study, and understand all the topics of the course [21].

Regarding assessment, [22] found that students value detailed and meaningful feedback. Nonetheless, relevant concerns for them are assessment protocols, vagueness of rubrics, grading standards, assessment timelines, transparency, relevance, and fairness. Furthermore, there is evidence suggesting that online quizzes provide knowledge assessment rather than learning content [23]. In addition, [24] found that perceptions of exams may affect student performance. Students perform better when quizzes are announced in advance, and they have time to prepare.

The research presented in this article was conducted at a state educational institution in Mexico that offers five different university degrees: management (M.D.), foreign trade (F.T.D.), public accounting (P.A.D.), law (L.D.) and information technology (I.T.D.) degrees. However, academic contexts often have different features, even within the same university. As such, to research the importance of online learning resources during the pandemic, we considered two key factors, namely the degree and the employment status of the students, because each degree has a different orientation specific to its field of study, and students who are employed have different requirements to those who are not. Thus, a student with a job has less time available and must be better organized to learn and perform well academically.

In this study, the following research questions were raised: Q1 – How important were online learning resources by degree and employment status of the students? Q2 – how did the importance of each learning resource vary with the degree and employment status of the students? Q3 – What are the most and least important learning resources for students by degree and employment status? The study also had the following objectives: 1) to describe the importance of online learning resources by degree and employment status of the students, 2) to determine differences in the importance of online learning resources by degree and employment status of the students, and 3) to determine the most and least important online learning resources for students by degree and employment status.

The remainder of the article is structured as follows: the next section describes the methodology used in this work, after which the results are presented and discussed. In the last section, the conclusions are presented.

2 Materials and methods

2.1 Study design, population, area and period

This quantitative, relational, cross-sectional study was conducted at a school in a public state university in Mexico from November to December 2020. The study population consisted of 2,685 students from five degree courses, as outlined in Table 1.

Table 1. Study population: students enrolled at the school where this study was conducted. August–December, 2020 by degree

Degree	Student population
Management	729
Foreign trade	851
Public accounting	527
Law	356
Information technology	222
Total	2685

2.2 Description of the study groups

Throughout this research, five groups were considered for each of the degrees offered at the school where this study was conducted. Once the data was collected, the participants were also identified by their employment status when they completed the questionnaire. These data helped to break down the participants according to the objectives of each analysis.

2.3 Procedure

A questionnaire was designed in Microsoft Forms listing ten educational resources and shared in Microsoft Teams via an electronic link. Each resource could be rated on a Likert scale ranging from 1 to 5 according to their importance for the learning of each participant in the study period. The professors of the different degrees invited their students to participate in this study. Microsoft Forms delivered a Microsoft Excel book with all responses, which were adapted and imported into statistical software described in the “data analysis” section.

2.4 Inclusion criteria

The participants were students who were officially enrolled in one of the five degrees at the school where this study was conducted in the fall of 2020 and who regularly attended their online lessons during that period. The participants logged into an institutional account to access the Microsoft Teams platform, through which all online lessons were taught. No responses were excluded from this study.

2.5 Sample size

The sample size was calculated using the software EPIDAT 4.2 at a 95% confidence level and 5% sensitivity, considering the results from an initial test of the administration of the questionnaire to calculate the variation in responses. The sample sizes are outlined by degree in Table 2.

Table 2. Sample size by degree

Degree	Sample size
Management	231
Foreign trade	263
Public accounting	222
Law	115
Information technology	138
Total	969

2.6 Characterization of the participants

The description of the participants who answered the questionnaire is shown in Table 3. They are organized by degree and by employment status.

Table 3. Characterization of the participants

Degree	Not employed	Employed	Number of participants
M.D.	139	92	231
F.T.D.	148	115	263
P.A.D.	89	133	222
L.D.	60	55	115
I.T.D.	88	50	138
Number of participants	524	445	969

Note: Abbreviations: M.D. = management degree, F.T.D. = foreign trade degree, P.A.D. = public accounting, L.D. = law degree, I.T.D. = information technology degree.

2.7 Study variables

The study variables and types and the measurement scale are outlined in Table 4.

Table 4. Definition of the study variables

Variables	Definition	Type of variable	Measurement scale
In-class activities	Importance of each learning resource perceived by each participant	Ordinal	Five-point scale: From 1=Not important to 5=Very important
Teacher explanations			
Assignments			
Projects			
Lesson recordings			
Instructional materials			
Online demonstrations			
Videos			
Slide shows			
Exams			

Major	Degree	Categorical, polytomous	1=M.D. (Management), 2=F.T.D. (Foreign trade), 3=P.A.D. (Public accounting), 4=L.D. (Law), 5=I.T.D. (Information technology)
Employment status	Indicator that determines whether the participant was working or not when completing the questionnaire	Categorical, dichotomous	0=Not employed, 1=Employed

Note: Abbreviations: M.D. = management degree, F.T.D. = foreign trade degree, P.A.D. = public accounting, L.D. = law degree, I.T.D. = information technology degree.

2.8 Data analysis

Statistical analysis was performed at various stages. First, the values of the descriptive statistics mean and standard deviation of elements grouped by degree and employment status of the students were calculated in JAMOVI 1.2.27 software. Subsequently, to assess the degree and employment status effects on the scores of each dependent variable (educational resource), Scheirer-Ray-Hare tests were performed in RStudio 1.3.1093 as described by [25]. The effect sizes of each significant test were also calculated manually in Microsoft Excel through the partial eta-squared statistic using the formula by [26] where the sum of squares of the significant effect is divided by the same sum of squares of the significant effect plus the sum of squared errors. Finally, SPSS version 25 was used to create ten study profiles considering both the degree and employment status. The objective was to perform Friedman tests for each profile to assess whether there were significant differences between the students' scores for the different teaching resources. If so, the most and least important educational resources in each profile would be extracted. If not, they would all be considered equally important. After each Friedman test, Kendall's W test was calculated to determine its effect size, which ranges from zero, indicating a null effect, to one, indicating a very strong effect (Tomczak & Tomczak, 2014).

3 Results

Below, the results of the importance of educational resources are outlined by degree in Table 5. Next, Table 6 outlines the results by employment status of the participants, and Table 7 presents a combined view of both perspectives.

The results of the Scheirer-Ray-Hare tests are presented in Table 8, showing significant differences between the degrees in the following resources: in-class activities, assignments, projects, and lesson recordings. The results of the post hoc tests that were significant are outlined in Table 9, showing that the management degree had higher scores than the others. Significant differences were also identified in the perceived importance of teacher explanations as a function of the employment status of the participants. Unemployed students considered teacher explanations more important than those

who were employed. The analysis of the interaction effect between the two factors, degree, and employment status, did not show significant differences between educational resources.

Table 10 presents the results from the Friedman tests. In all tests, significant differences were found between the learning resources under study. Therefore, the highest and lowest ratings were extracted in post hoc tests, thereby determining the most and least important resources based on the responses.

Table 5. Characterization of the importance of educational resources by degree

Resource	M.D. n=231	F.T.D. n=263	P.A.D. n=222	L.D. n=115	I.T.D. n=138
In-class activities	3.94 (0.79)	3.70 (0.84)	3.85 (0.92)	3.84 (0.90)	3.84 (0.82)
Teacher explanations	4.28 (0.76)	4.28 (0.74)	4.24 (0.81)	4.40 (0.73)	4.29 (0.79)
Assignments	3.66 (0.88)	3.44 (0.98)	3.64 (0.99)	3.52 (0.91)	3.55 (0.91)
Projects	3.77 (0.84)	3.51 (0.91)	3.55 (0.98)	3.50 (0.99)	3.71 (0.83)
Lesson recordings	4.47 (0.70)	4.17 (0.82)	4.27 (0.81)	4.44 (0.70)	4.36 (0.67)
Instructional materials	4.14 (0.71)	4.03 (0.77)	4.15 (0.78)	4.16 (0.78)	4.12 (0.72)
Online demonstrations	4.17 (0.74)	4.00 (0.81)	4.09 (0.83)	4.01 (0.78)	4.12 (0.76)
Videos	3.58 (1.05)	3.65 (1.01)	3.60 (1.11)	3.73 (0.92)	3.75 (0.90)
Slide shows	3.91 (0.82)	3.82 (0.83)	3.90 (0.86)	4.00 (0.82)	3.77 (0.88)
Exams	3.51 (0.86)	3.38 (0.94)	3.47 (1.05)	3.44 (0.91)	3.52 (0.83)

Note: Results are expressed as a mean (standard deviation). M.D. = management degree, F.T.D. = foreign trade degree, P.A.D. = public accounting, L.D. = law degree, I.T.D. = information technology degree. Interpretation: 1=not important, 5=very important.

Table 6. Characterization of the importance of educational resources by participants' employment status

Resource	Not employed n=524	Employed n=445
In-class activities	3.85 (0.83)	3.81 (0.88)
Teacher explanations	4.34 (0.75)	4.23 (0.78)
Assignments	3.61 (0.89)	3.51 (1.01)
Projects	3.59 (0.90)	3.64 (0.93)
Lesson recordings	4.36 (0.73)	4.28 (0.81)
Instructional materials	4.16 (0.68)	4.07 (0.83)
Online demonstrations	4.11 (0.79)	4.06 (0.79)
Videos	3.66 (1.00)	3.63 (1.05)
Slide shows	3.90 (0.81)	3.85 (0.88)
Exams	3.47 (0.89)	3.46 (0.98)

Note: Results are expressed as a mean (standard deviation). Interpretation: 1=not important, 5=very important.

Table 7. Characterization of the importance of educational resources by degree and by employment status

Resource	M.D.		F.T.D.		P.A.D.		L.D.		I.T.D.	
	Not employed n=139	Employed n=92	Not employed n=148	Employed n=115	Not employed n=89	Employed n=133	Not employed n=60	Employed n=55	Not employed n=88	Employed n=50
In-class activities	3.95 (0.80)	3.93 (0.78)	3.7 (0.83)	3.7 (0.86)	3.93 (0.88)	3.8 (0.94)	3.87 (0.81)	3.82 (1.00)	3.84 (0.81)	3.84 (0.84)
Teacher explanations	4.35 (0.77)	4.18 (0.74)	4.33 (0.70)	4.23 (0.78)	4.36 (0.71)	4.17 (0.87)	4.28 (0.86)	4.53 (0.53)	4.38 (0.79)	4.16 (0.79)
Assignments	3.74 (0.91)	3.55 (0.83)	3.52 (0.82)	3.34 (1.15)	3.69 (0.87)	3.61 (1.07)	3.65 (0.82)	3.38 (0.99)	3.47 (0.98)	3.72 (0.75)
Projects	3.76 (0.87)	3.8 (0.78)	3.54 (0.87)	3.49 (0.96)	3.47 (1.00)	3.62 (0.96)	3.5 (0.94)	3.51 (1.05)	3.61 (0.83)	3.88 (0.82)
Lesson recordings	4.53 (0.67)	4.39 (0.75)	4.22 (0.78)	4.11 (0.87)	4.35 (0.75)	4.23 (0.85)	4.33 (0.77)	4.56 (0.60)	4.39 (0.63)	4.32 (0.74)
Instructional materials	4.22 (0.72)	4.03 (0.70)	4.11 (0.65)	3.95 (0.90)	4.21 (0.68)	4.12 (0.85)	4.13 (0.74)	4.2 (0.82)	4.14 (0.66)	4.1 (0.83)
Online demonstrations	4.16 (0.80)	4.2 (0.66)	4.1 (0.78)	3.89 (0.84)	4.15 (0.79)	4.06 (0.86)	3.87 (0.89)	4.18 (0.61)	4.16 (0.74)	4.06 (0.81)
Videos	3.57 (1.14)	3.61 (0.91)	3.71 (0.93)	3.57 (1.12)	3.6 (1.05)	3.62 (1.15)	3.68 (0.85)	3.78 (0.99)	3.78 (0.90)	3.7 (0.90)
Slide shows	3.94 (0.82)	3.87 (0.82)	3.95 (0.74)	3.66 (0.91)	3.9 (0.82)	3.9 (0.88)	3.95 (0.79)	4.05 (0.87)	3.72 (0.89)	3.88 (0.84)
Exams	3.53 (0.91)	3.51 (0.80)	3.42 (0.84)	3.33 (1.06)	3.49 (0.99)	3.47 (1.10)	3.48 (0.89)	3.4 (0.95)	3.41 (0.83)	3.72 (0.80)

Note: Results are expressed as a mean (standard deviation). M.D. = management degree, F.T.D. = foreign trade degree, P.A.D. = public accounting, L.D. = law degree, I.T.D. = information technology degree. Interpretation: 1=not important, 5=very important.

Table 8. Significant results of the Scheirer-Ray-Hare test

Comparison	Resource	H	P-value (Effect size)
By degree	In-class activities	11.45	0.02* (ES=0.01)
	Assignments	10.49	0.03* (ES=0.01)
	Projects	12.52	0.01* (ES=0.01)
	Lesson recordings	23.80	0.00** (ES=0.02)
By employment status	Teacher explanations	6.34	0.01* (ES=0.00)

Note: ES = Effect size, *p < 0.05, **p < 0.01

Table 9. Post hoc comparisons between differences in resources by degree

Resource	Post hoc comparison		Results of post hoc comparisons		
	D.1	D.2	Z	p-value	Adjusted p-value
In-class activities	M.D.	F.T.D.	3.23	0.00**	0.01*
Assignments	M.D.	F.T.D.	2.72	0.00**	0.06
Projects	M.D.	F.T.D.	2.99	0.00**	0.02*
	M.D.	P.A.D.	2.40	0.01*	0.05
	M.D.	L.D.	2.51	0.01*	0.05
Lesson recordings	M.D.	F.T.D.	4.51	0.00**	0.00**
	M.D.	P.A.D.	2.72	0.00**	0.02*
	F.T.D.	L.D.	-3.18	0.00**	0.00

Note: D.1. = Degree 1. D.2. = Degree 2, *p < 0.05, **p < 0.01, M.D. = management degree, F.T.D. = foreign trade degree, P.A.D. = public accounting, L.D. = law degree, I.T.D. = information technology degree.

Table 10. Results of the Friedman test

Degree	Employed?	N	Chi-square	p-value	W Kendall (Effect)	The most important	The least important
M.D.	No	139	267.09	.00	.21	Lesson recordings (7.42) Teacher explanations (6.78) Instructional materials (6.31)	Exams (3.97) Videos (4.45) Assignments (4.69) Projects (4.69)
	Yes	92	146.92	.00	.17	Lesson recordings (7.23) Teacher explanations (6.42) Online demonstrations (6.41)	Exams (4.23) Assignments (4.34) Videos (4.59)
F.T.D.	No	148	283.68	.00	.21	Teacher explanations (7.10) Lesson recordings (6.77) Online demonstrations (6.35) Instructional materials (6.32)	Exams (3.96) Assignments (4.28) Projects (4.50)
	Yes	115	173.64	.00	.16	Teacher explanations (7.03) Lesson recordings (6.64) Instructional materials (6.27)	Exams (4.23) Assignments (4.40) Projects (4.72)
P.A.D.	No	89	151.12	.00	.18	Teacher explanations (6.90) Lesson recordings (6.89) Instructional materials (6.30)	Projects (4.11) Exams (4.22) Videos (4.66)
	Yes	133	158.33	.00	.13	Lesson recordings (6.58) Teacher explanations (6.40) Instructional materials (6.33)	Exams (4.38) Projects (4.59) Assignments (4.85) Videos (4.92)
L.D.	No	60	114.90	.00	.21	Teacher explanations (7.07) Lesson recordings (7.03) Instructional materials (6.45)	Exams (4.07) Projects (4.13) Assignments (4.65)
	Yes	55	130.55	.00	.26	Lesson recordings (7.35) Teacher explanations (7.19) Instructional materials (6.25)	Assignments (3.93) Exams (3.95) Projects (4.30)
I.T.D.	No	88	204.50	.00	.25	Teacher explanations (7.18) Lesson recordings (7.17) Online demonstrations (6.40) Instructional materials (6.26)	Exams (3.81) Assignments (4.16) Projects (4.53)
	Yes	50	52.59	.00	.11	Lesson recordings (6.89) Teacher explanations (6.21) Instructional materials (5.99)	Videos (4.68) Assignments (4.72) Exams (4.93)

Note: Mean ranks are shown in parentheses. Abbreviations: M.D. = management degree, F.T.D. = foreign trade degree, P.A.D. = public accounting, L.D. = law degree, I.T.D. = information technology degree.

4 Discussion

The assessments of the educational resources are considered positive because the mean score indicates a tendency toward the “high importance” zone in the scale used in this study. Significant differences in the importance of the in-class activities, assignments, projects, and lesson recordings were identified between the five degrees. Accordingly, the management students gave the highest scores to the resources. Conversely, as a function of employment status, significant differences were only observed in teacher explanations, which was valued more by those students who were not employed. However, the practical implications of these differences are limited because the mean scores were close to each other, as shown by the considerably low effect sizes. The low p-values may be due to the sample size because, as indicated by [26], when increasing the sample size, the p-value tends to decrease.

The most important learning resources for the students were lesson recordings, teacher explanations, instructional materials, and online demonstrations, as shown by statistical analysis. Conversely, the least important instructional materials were exams, videos, assignments, and projects. These trends were repeated in the ten analyses performed in this study as a function of the degree and employment status of the participants. In these cases, low-to-moderate effect sizes were assessed. In turn, in-class activities and slide shows were in an intermediate zone of importance.

In this regard, it seems that the learning resources that were viewed less favorably required more effort on the part of the students. This could be explained by the excess of assignments and academic stress to which the students were subjected, since the study was conducted during the period of total confinement due to the COVID-19 pandemic. At that time, the courses were entirely online, and the professors relied on the students' independent work. This may have caused an overload of work for the students. However, these aspects were not researched in this study and are proposed as future lines of work.

On the other hand, exams, videos, assignments, and projects are extremely useful resources that help improve the quality of education. However, they should be used in a strategic, planned, pertinent manner and always accompanied by supplementary information to ensure that students are aware of their purpose and their contribution to the teaching-learning process. In this sense, teachers have the challenge of making these resources more interesting and promoting student creativity. In other words, they should not be merely a rigorous means of grading. For this reason, teachers must also confront their preconceived ideas and rethink their work scheme and the structure of their online subjects.

The results corroborate the findings of [3] during the pandemic and those of [17] before the pandemic because they also found that instructor-led lessons, instructional materials shared with the students, and lesson recordings remain the most useful elements for learning according to student perception. Furthermore, projects are regarded as particularly beneficial.

The findings are considered relevant because they provide consistent evaluations across five degrees and invite teachers to reflect on the learning resources that they use in their classes, the importance they attribute to them, and the actual usefulness based on their students' perceptions.

This research has some limitations, including its focus on the quantitative evaluation of educational resources according to the students' perception. Neither the frequency of use of each resource was assessed, nor its latent impact on school performance. Also, this study did not focus on the student's expectations on how to evaluate their learning outcomes. Furthermore, the list of resources analyzed was not exhaustive, and the evaluations addressed the general experience of the online courses that the students took, that is, they did not focus on any specific course. Moreover, the context was limited to a single higher education institution.

This study may be continued to overcome its limitations. Other qualitative perspectives and the implementation of a mixed research design may also enrich this research. In turn, the relationship between the use of educational resources, their perceived importance for learning and observed school performance may also be investigated in future studies.

5 Conclusions

This article characterized and differentiated the levels of importance of various types of online learning resources used during the COVID-19 pandemic as perceived by university students. The results show that for students, traditional media, such as teacher explanations and instructional materials, are perceived as having high levels of importance, whereas assignments, projects, and exams are the least important. Conversely, lesson recordings were also perceived as a relevant and well-valued educational resource because they enable students to review the contents asynchronously, in addition to providing a sense of security to reduce the stress of missing content in the event of a technical failure during live lessons. These findings are consistent across the five degrees under study, even though they all have different areas of knowledge and approaches. They were also consistent regardless of the employment status of the participants.

Although exams, videos, assignments, and projects scored the lowest, they are incredibly useful in the teaching-learning process. However, their implementation should be well-planned and accompanied by supplementary information to clarify their contribution. Thus, professors face the challenge of making these resources pertinent, interesting and engaging to foster students' creative ideas. Professors should be aware that students may feel overwhelmed by the abundance of tests, assignments, and projects. For this reason, it is recommended that this load be balanced throughout the school term so that students have sufficient time to prepare.

This work provides a closer approach to the analysis of effective learning resources and invites other researchers to approach this same topic from other perspectives. Similarly, this research fosters a process of self-questioning and reflection. Are professors

prioritizing educational resources in accordance with their importance for student learning? Are professors taking into consideration their students' workload and academic stress when setting assignments, exams, and projects? Is the effort invested to produce learning resources heading in the right direction? Each context has different characteristics. Therefore, these studies acquire new relevance in each educational environment where they are conducted.

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