Analizando la transición de una educación presencial a una educación remota: una experiencia en la educación superior durante la pandemia de la COVID-19

Analyzing the transition from face-to-face to remote education: an experience in higher education during the COVID-19 pandemic

Christian Jaramillo-Baquerizo
Universidad Andina Simón Bolívar, Ecuador
christian.jaramillo@uasb.edu.ec
https://orcid.org/ 0000-0002-8081-1318

Resumen

La integración de las TIC se ha convertido en una de las áreas de investigación más cruciales en el campo de la educación, especialmente durante la pandemia de COVID-19. Como sugiere la literatura especializada, su integración depende en gran medida del nivel de competencia y la voluntad de uso, ya que es el individuo quien finalmente decide integrar las TIC en sus actividades de aprendizaje. La presente investigación se centra en las experiencias de estudiantes y docentes de posgrado que se vieron forzados a integrar las TIC durante la pandemia de COVID-19. Comprender la experiencia de estos actores puede brindar información sobre las mejores formas de fortalecer el diseño y la implementación de iniciativas de desarrollo profesional que faciliten la integración de las TIC. En este estudio, se recogieron las percepciones de estudiantes y docentes a través de cuestionarios y entrevistas analizando su experiencia durante la drástica transición de una educación presencial a una educación remota. Los resultados de este estudio sugieren que, si bien las TIC son aceptado como la mejor alternativa posible durante el período de la transición, los

estudiantes y docentes perciben un nivel limitado de competencias en diseño instruccional. Estos resultados y sus implicaciones se discuten en vista de establecer pautas para futuras iniciativas de desarrollo profesional.

Palabras clave

Educación superior; COVID-19; integración de las TIC; desarrollo profesional, teoría de la autodeterminación.

Abstract

ICT integration has become one of the most crucial areas of research in education especially during the COVID-19 pandemic. As research suggests, its integration is highly dependent on the level of competence and willingness of usage, for it is the individual who ultimately decides to integrate ICT into their learning activities. The present study focuses on graduate students and teachers' experiences of integrating ICT during the COVID-19 pandemic. Understanding the experience of these actors can bring insight into better ways to improve the design and implementation of professional development initiatives focused on ICT integration. In this study, the perceptions from students and teachers were collected through questionnaires and interviews analyzing their experience during the drastic transition from face-to-face sessions to remote learning. Results of this study suggest that, while ICT is accepted as the best possible alternative during the first period of the transition, students and teachers perceive a limited level of competence in instructional design. These results and its implications are discussed in view of guidelines for professional development initiatives.

Keywords

Higher education, COVID-19, ICT integration, professional development, self-determination theory.

1. Introduction

The specialized literature suggests that ICT integration is highly linked with the individual's perception and level of competence who ultimately decides whether or not to integrate them in the classroom experience. Among the key actors, the literature highlights the role of the teacher as a key factor in ICT integration and the inclusion of innovative strategies (Farjon et al., 2019; Hattie, 2009). Despite the widespread use of technologies in everyday activities, including the educational context, institutions struggle to successfully witness how ICT improves the quality of education (Straub, 2009; Tondeur et al., 2016). Concretely, institutions face the challenging task of fostering the free and conscious adoption of technology by the main actors, that is, students and teachers (Scherer et al., 2019).

To foster ICT integration, models and frameworks such as the Technological Pedagogical Content Knowledge (TPACK) of Koehler et al. (2013) are used to provide insight into the type of knowledge and competence teachers need to successfully foster student learning. The TPACK framework highlights the importance of teachers' knowledge of the foundations of pedagogy, comprehension of the discipline they teach, a high level of competence to use specific technologies, and, more importantly, knowledge and ability on how to incorporate these three aspects into their teaching. However, for these models to work, and therefore to successfully integrate ICT, individuals need to first accept them and be convinced of their utility. In this line, there is a lot of debate on what variables determine the acceptance of ICT in an educational setting (Scherer et al., 2019). This debate has seen the rise of the

Technology Acceptance Model (TAM), a commonly used framework based primarily on the Theory of Planned Behavior (Ajzen, 1991) that analyzes individuals' motivational variables, namely: perceived usefulness (how I conceive it to be useful in my job), perceived ease of use (how I conceive it to be learned without much effort), and general attitudes towards technology (how I evaluate the use of technology in education); as well as outcome variables, i.e., behavioral intentions, technology use (see Schepers & Wetzels, 2007).

The literature suggests that among the variables analyzed in the TAM, individuals' perceived usefulness and perceived ease of use are the most crucial for ICT integration. This is in line with the literature that suggests fostering teachers' motivation to better integrate ICT over strategies of coercion (Jaramillo-Baquerizo et al., 2019). It seems logical, therefore, to carry out studies that analyze current experiences with ICT before designing professional development initiatives that aim at integrating ICT in the classroom, especially during the drastic transition to remote education due to the COVID-19 pandemic.

The present study applies one of the most authoritative motivational theories, The Self-Determination Theory (SDT) of Deci and Ryan (2000) to analyze the experience of students and teachers during the drastic transition of ICT integration due to the COVID-19 emergency. This macro-theory of motivation allows the study of individuals' natural capacity to experience fulfillment and wellbeing especially in a pressuring context of an emergency and a rapid transition to a new modality of learning. SDT suggests that individuals will experience fulfillment and wellbeing when their Basic Psychological Needs of autonomy, competence, and relatedness are satisfied (Ryan & Deci, 2000).

The psychological need of autonomy refers to the natural inclination an individual has to understand the fundamental reasons behind an activity and to act freely and consciously (Ryan & Deci, 2000). In an educational context, this translates into activities that would allow students to suggest the way to hand in a project or choose their topic of interest. Other aspects include fostering understanding and providing the reasons behind the class activities. The basic psychological need of competence refers to the inner desire to dominate our environment (Ryan & Deci, 2000). That is, an individual experiences wellbeing when they are capable of acting with a minimal amount of proficiency, thus providing the individual with a sense of satisfaction. This means that a teacher or student should be capable of using ICT with a level of confidence that provides security and satisfaction. Finally, the psychological need of relatedness is the natural desire every individual has of feeling loved, cared for, and supported by others, particularly during challenging times (Ryan & Deci, 2000). In the educational context, this translates into opportunities to share experiences, receive feedback and support from others. This framework of analysis allows for a thorough examination of the state of students´ and teachers' wellbeing during this transition as well as their general attitudes towards ICT. Hence, in view of fostering ICT integration is imperative to analyze the current state of affairs of ICT, specifically the perception of the main actors, students and teachers. A comprehension of their experience may facilitate initiatives that strengthen ICT integration in higher education.

The main research objective of the present study is to analyze the experience of transition from face-to-face to remote teaching due to the COVID-19 pandemic. To fulfill this objective, the following specific objectives were formulated:

Research objective 1 (RQ1).   Identify students and teachers' experience of the transition to remote learning

Research objective 2 (RQ2).   Analyze students and teachers' perceived satisfaction of their basic psychological needs

Research objective 3 (RQ3). Design guidelines for professional development initiatives aimed at fostering ICT integration in higher education

2.   Methodology

To fulfill the research objectives of this study, a mixed-methods approach was selected. That is, online questionnaires and semi-structured interviews were carried out by the author of this study during the months of January-November 2020, at Universidad Andina Simon Bolivar-Ecuador.

2.1   Participants

Participants for this study were graduate students and university teachers from the Department of Education of Universidad Andina Simon Bolivar - Ecuador. On a voluntary basis, participants were asked to fill out the questionnaire and to express a desire to take part in an interview to further understand their experiences. In total, 136 students took part in the questionnaire, and 2 interviews were carried out. On the other hand, 7 university teachers took part in the questionnaire, meanwhile, 5 university teachers participated in the interviews.

2.2   Quantitative instruments

To measures participants', need satisfaction a quantitative instrument was designed based on the theoretical framework of SDT. This questionnaire measures participants' need satisfaction through the constructs based on the SDT´s micro-theory of the Basic Psychological Needs of autonomy, competence and relatedness (Ryan & Deci, 2000). The questionnaire comprised of 31 items using a Likert scale ranging from 1 (totally disagree) to 5 (totally agree). Additional items aimed at gathering data regarding student access to infrastructure (3 items) and one item collected data about the students' perception regarding their teachers´ skills (My teachers had the necessary skills and abilities to teach in virtual environments). Sample items were: "I felt free to express my opinions to my teachers during this emergency period." (autonomy); "I felt capable of learning in online environments" (competence); "I felt support from my university during the period of online learning" (relatedness); "I had easy access to the internet" (access).

2.3   Qualitative instruments

To collect qualitative data, semi-structured interviews were designed using a deductive approach creating guiding questions that stem from the theoretical foundation of SDT (Cresswell, 2009). The interviews were comprised of two main parts. In the first part participants were asked a general question about their experience transitioning to remote learning allowing respondents to present their main ideas, i.e., "Could you please describe your overall experience of transition to remote learning?". The second part was based on the SDT framework with questions, i.e., "In which way did you feel free to choose and act according to your beliefs during this period of transition?" (autonomy); "Would you describe how you perceive your capacity to use ICT in education? (competence); "Please describe your experience regarding feeling support from others during this period of transition to remote learning" (relatedness). Additionally, an overall final question regarding their experience was asked so participants could add any ideas they may consider important: "Please describe the main challenges you have faced during this period of emergency".

2.4   Data collection

The questionnaire was administered online on a voluntary basis. Participants were required to have imparted at least one online lesson during the period of emergency.

Regarding the interviews, they were carried out online by the researcher of this study. Interviews were recorded lasting approximately one hour. Also, notes were taken during the interviews. In all instances, anonymity was guaranteed to all participants of this study as well as the academic program they were enrolled in.
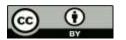
2.5 Data analysis

The quantitative data were analyzed using SPSS V19. Data was first screened for any missing values. The few missing values (n=3) were treated using mean substitution (Kang, 2013). Being descriptive statistical research, score identification for each variable was carried out. The qualitative data were analyzed using a deductive content analysis based on the theoretical framework of SDT. That is, using the predetermined constructs of autonomy competence and relatedness, a process of codification was carried out considering a complete idea expressed by a participant as a unit of analysis in the codification process (Cresswell, 2009).

3. Results

3.1 Student quantitative results

A total of 136 graduate students responded to the questionnaire (compared to only 7 teachers, thus impeding a statistical analysis to be carried out). The mean age of respondents was 34.5 years (61.7 % female and 38.3 % male). Among the categories analyzed, items belonging to the constructs of needs of autonomy, relatedness, and access to infrastructure show comparatively low scores, as shown on Table 1, which presents the items and their scores.

AUTONOMY			
ITEM	Female	Male	All
1. I prefer to learn in a face-to-face environment (R)	2.4	2.7	2.5
2. I felt that my learning was evaluated satisfactorily in online learning environments	4.3	4.4	4.4
3. I trust the education in online learning environments	4.3	4.4	4.3
4. I felt free to express my opinions to my teachers during this emergency period.	4.5	4.5	4.5
5. I believe that education in online environments is the best option in a period of emergency	4.6	4.4	4.5
6. I felt obliged to use virtual learning environments (R)	3.1	3.1	3.1
7. I feel that my university gives me the freedom to decide how to organize my classes in this period of emergency	4.0	3.9	4.0
8. I felt that the authorities at my university trusted the work I was doing during my online classes	4.5	4.4	4.4
COMPETENCE			
9. I felt capable of learning in online environments	4.4	4.4	4.4
10 I felt able to carry out my learning activities in online environments	4.5	4.4	4.4
11 I felt able to use the tools in online learning environments	4.5	4.6	4.6
12 I felt able to cope with internet connectivity difficulties	4.4	4.4	4.4
13 I feel like I need training in education in online environments (R)	2.0	2.4	2.2
RELATEDNESS			
14 I felt supported by my university during the period classes in online environments	4.3	4.4	4.4
15 I felt supported by my classmates during this period	4.3	4.2	4.2
16 I felt support and understanding from my teachers during this emergency period	4.5	4.6	4.6

17	I felt that the authorities of my university understood the situation in which I was living	4.3	4.4	4.4
18	I felt difficulties interacting with my teachers in online environments (R)	3.2	3.2	3.2
19	I felt confident in my university during this emergency period	4.6	4.5	4.5
ACCESS TO INFRASTRUCTURE				
20	I had easy access to the internet from my home	4.4	4.3	4.41
21	I have an adequate infrastructure in my home to learn in online environments	4.2	4.1	4.1
22	My teachers had an adequate infrastructure in their homes for education in online environments	4.6	4.6	4.6
23	My teachers had the necessary skills and abilities to teach in online environments	4.4	4.5	4.50

Table 1. Scores for each item of the student questionnaire

*Scores lower than 4.4 are highlighted in red, except for the reverse scores. Among the categories analyzed, items belonging to the needs of autonomy, relatedness, and access to infrastructure show scores worth noting.

Regarding student trust in online education, the results show a comparatively low score (4.3). Related to this, female students' perceptions of the way their learning was evaluated in an online learning environment (4.3) raises a concern suggesting a certain distrust on behalf of students regarding the way their learning is evaluated. Additionally, students' response (2.5) when asked whether they prefer to learn in face-to-face settings, suggests a preference to continue in remote learning. Additionally, their response suggests a comparatively low perception (4.0) of feeling freedom from the university to organize their lessons during this period. In the same way, the need for relatedness shows relative low scores in comparison to the other items. Students reported a partially satisfying perception of feeling supported by their peers (4.2). Finally, their access to the internet suggests a comparatively low score of 4.1, raising concerns for the type of strategies best suited during this period of emergency.

3.2 Student qualitative results
The content analysis of the interviews suggests the following results which are now presented by each construct highlighting the main findings of students' and teachers' responses.

Respondents expressed an overall satisfaction regarding the academic experience during the transition to remote learning. In particular, they noticed teachers were understanding and considerate of the many challenges faced by the students. On the other hand, they also expressed their concerns. For example, they mentioned that although remote learning has its advantages, they miss the experience of relating with their peers and teachers, as one quote expresses this feeling: "it is stressful to see my friends only as a small square on the screen". Additionally, one of the biggest challenges was to constantly remain sitting in front of a computer for prolonged periods. As one participant mentioned: "biologically speaking this is the most stressful part. Before I was at least able to run to fetch the bus to arrive to class on time". The physical requirement of remote learning combined with telecommuting (working from home) which forces individuals to sit in front of a screen for long working periods, seems to influence the experience of remote learning.

Regarding the need of autonomy, respondents did not express feeling obliged to behave in any particular way. By their responses, it seems as it was "the only option available". They
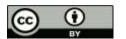
seemed to consider the transition to online learning environments as an unavoidable option.

Regarding the need of competence, students seemed to feel comfortable using ICT, since in some cases, due to their background as specialists in this field or because they are also teachers in this modality, they expressed comfort and a willingness to strengthened their knowledge and skills through the participation on training programs.

Regarding the need of relatedness, respondents emphasized the importance of fostering professional relationships among peers as a key aspect while facing the challenges of remote learning. Respondents mentioned that groups, which were naturally formed by affinity, continued during the period of emergency. Although in their classes, teachers may also encourage them to form groups, respondents expressed that the groups which were developed naturally by the daily interaction, established before the transition to remote learning, were maintained during this period. These small groups provide participants not only encouragement, but also support in areas related to academic activities such as reminders to hand in assignments, exchanging material, and collaborative construction of documents. On the other hand, the relation with teachers was limited to the classroom work, with almost no opportunity to relate when compared to the face-to-face setting when teachers seemed "more approachable to interact".

Regarding the challenges faced by students during the transition to remote learning, they mentioned the noticeable need to strengthen teachers' digital competence, especially in instructional design. Although teachers show a willingness to help students during these challenging times, it is evident to the respondents the difference in the level of digital competence among teachers. In the same line, the limited skills are evident in the difficulty to engage in direct communication between students and teachers. In other words, when teachers can engage in digital environments, the communication and understanding of expected outcomes are much easier to grasp when compared with the learning experience with teachers who lack digital competence. As one student mentioned: "some teachers impart the class in online environments in the same way as they teach a face-to-face lesson".

Concretely, the gap in digital competence among teachers translates into drastic differences in the learning experience of students. As one respondent mentioned the "passivity" in learning when receiving a class with a teacher whose digital competence is limited, compared with the "active" and "engaging" approach to learning when the class is imparted by a teacher whose digital competence is evident. Furthermore, a respondent mentioned how time management is highly effective when a teacher's instructional design translates into a well-organized online learning environment. In other words, time is easily managed when the online environment provides clear instructions, the syllabus is followed as a map route, and expectations are presented from the beginning of the course. Moreover, a participant appreciated the experience of a teacher allowing them to work on the assignments during the classroom time, preventing an overlap with other responsibilities, e.g., professional and domestic duties. This modality seems to be preferred rather than an approach where assignments are given outside classroom time, conflicting with other duties that accompany the life of students during this period of emergency, as shown in the following statement: "teachers need to learn more about methodology...I don't like assignments such as 'go read and do a conceptual map' or 'just listen to the class that I will give you'. In the same line, "I don't like debates that turn into a soap opera where people tell their sad stories ... then you lose the focus and purpose of the class". As for recommendations to the institution, students mentioned that continuous formation in ICT methodologies and instructional design for both students and teachers are needed.

3.3 Teachers' qualitative results

3.3.1 Autonomy

One participant mentioned that during this period they felt "forced, by the circumstances to use the online learning environment". However, this mandatory transition is seen with a positive attitude for it has become an opportunity for teachers to learn new teaching strategies. As one respondent mentioned: "before the pandemic, I seldom used the online learning environment".

Another participant mentioned that since the emergency started there is a feeling of not being part of the process of decision-making. Thus, resulting in a perceived alienation due to a "top-down" structure at the university limiting teachers to receive instructions from the authorities regarding the changes made in response to the pandemic. In the same way, the same participant expressed feeling a "great deal of uncertainty" due to the pandemic. This also translates to tensions inside the classroom experience in online learning environments, suggesting the difficulty to interact with students compared to the face-to-face settings before the pandemic. Overall, participants expressed feeling obliged not by the institution or by any individual, but by the circumstances to be enclosed and isolated, promoting a sense of stress and uncertainty.

3.3.2 Competence

Respondents did acknowledge that their limited digital competence became evident during this period, mentioning their proclivity to give the online lecture in the same way as in face-to-face, recognizing that this is not considered an eLearning strategy. Nonetheless, respondents recognized that this period has fostered their professional learning thanks to their participation in training programs, which have helped them during this transition, as the following quote suggests: "Now I feel more comfortable (in online learning environments), before receiving training I used to give the lecture just as in the face-to-face environments". Additionally, participants report that now they prepare their classes more diligently because of the nature of the modality. They report that remote education requires more effort, planning, and organization compared with face-to-face scenarios. As for challenges, besides the natural inclination to limit the online class to a lecture, participants mentioned the inability to foster a debate among students and to successfully form groups to work on a project.

3.3.3 Relatedness

Teachers did express difficulties when relating with students through online learning environments, stating that certain aspects, such as tutoring, were highly affected. In this line, teachers mentioned that students' own initiative and motivation are determinant factors. In other words, highly capable and committed students showed interest in the class, finding ways to relate and maintain channels of communication via online learning environments, suggesting that students' attitudes towards learning are essential regardless of the modality.

Another interesting aspect highlighted by respondents is the difference in the support given to students. During this period, teachers found it challenging to identify and address students who struggle during online classes. On the other hand, during the face-to-face environments, these difficulties became visible and therefore were addressed on site. Nonetheless, a participant suggested that by using online learning environments, tutoring became "more organized, for there are no students that just pop-up (without appointments)".

Regarding the relationships with colleagues, respondents mentioned missing the "causal chat in the hallway". Evidently, the lack of physical presence in the university has affected the relations among colleagues. However, the administrative aspect seems not to be affected by the use of online environments. A particular case of a respondent, an adjunct professor, is worth mentioning. The responses of this case suggest an appreciation for the online learning experience not only for the practical convenience of mobility but for the possibility to give students individual support thanks to the virtual environments, a challenging task before the pandemic.
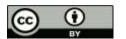
3.3.4 Challenges

Regarding the challenges, they faced, teachers reported their lack of knowledge of all the potential aspects of online learning. They reported a basic comprehension of the vast possibilities to enrich the learning experience of students via online learning. However, they still report challenges such as "not knowing how to operate the blackboard" to its full potential or to be able to "relate with students in the same way as before the pandemic". Infrastructure on behalf of students seems to be another challenge for teachers. Respondents reported losing connectivity while lecturing, resulting in difficulties not encountered during the face-to-face sessions. A participant reported that students evaluated teacher's performance with a lower score compared to the evaluations received before the pandemic. Despite this negative effect, the participant complemented this experience expressing that the amount of work has not decreased, on the contrary, it has increased due to the steep learning curve the new modality of education demands from teachers. Another participant mentioned the challenging task of getting students to do the work outside of classroom hours. It seems that students arrive "unprepared, i.e., without having done the reading assignments". This connects to a response by another participant who expressed their concern for students "who are not able to cope with various responsibilities at the same time", i.e., family responsibilities, work, school, and others.

As an overall learning experience, teachers reported not only the need to learn specific ICT to integrate into the classrooms but as one participant mentioned: "I need to learn how to plan my classes better and to relate my classes to concrete and real scenarios". In the same line, a participant mentioned the pleasant feeling of accomplishing much despite the challenges faced during this period. It seems as if learning how to cope with this situation brings a feeling of satisfaction once the job is done, as the following quote suggests: "you do feel nervous but then you feel pleased with yourself". Additionally, the participant suggested the importance of taking care of oneself during this period of emergency to perform better and take care of any negative influences on teaching performance.

4. Discussion and guidelines for professional development initiatives

The present study analyzed the experience of transition from face-to-face to online education due to the COVID-19 pandemic in a graduate university of Ecuador. Applying the theoretical framework of SDT, students and teachers participated in a mixed-methods study suggesting important implications for research, institutional policy, and practice. The results of this study suggest that both students and teachers did feel pressure, not by an individual or the institution, but by the circumstances to behave in ways contrary to their inclinations. This apparent feeling of autonomy frustration is highlighted in the SDT literature to lead individuals to frustration, emptiness, and stress (Ryan & Deci, 2000). This state of affairs calls for institutions of higher education to design strategies that address this feeling of frustration to prevent teachers from feeling "alienation from the decision-making

process". As the literature in higher education suggests, vertical approaches to decision-making in terms of professional learning are highly questioned by university teachers (De Rijdt et al., 2016). In this line, institutions should consider university teachers' perspectives while making decisions that will affect all the actors involved. Although decisions during a period of emergency are characterized by their swiftness due to the limited amount of time available, efforts should be made to limit teachers and students feeling isolated. For example, professional development initiatives could become adequate environments where students, teachers, and authorities can collaborate in the decision-making process to benefit the institution as a whole.

In this line, learning how to integrate ICT in a university should not be put forth as an occasion to coerce the behavior of students or teachers. If institutions need to make drastic transitions, special care should be taken to avoid disregarding the individual needs of participants. In this line, the SDT literature provides valuable insight on how to present professional development initiatives - not as a mandatory endeavor aimed at correcting weak areas - but as an opportunity for growth and fulfillment (Jaramillo-Baquerizo et al., 2021). In the same way, universities are encouraged not to ignore feelings of uncertainty and constant worry expressed by their students and teachers. Their psychological well-being should be addressed and considered a priority in the design of institutional policies. Institutions will be negatively affected in the long-term due to the constant stress of their members, as the literature suggests (Hagenauer et al., 2018).

Regarding the need of competence, both students and teachers highlighted the need to improve digital competence, especially for teachers who are responsible for the design and implementation of classroom activities. A natural trend seems to be to transpose the face-to-face lecture to an online synchronous environment. Remote learning, which is what most universities have adopted during the emergency period, is not limited to synchronous virtual conferences. It embraces strategies from both distance learning and online learning environments. Hence, institutions should make it a priority to present professional development initiatives in ICT as a means to improve the quality of education as well as the personal wellbeing of both students and teachers. As the literature on professional development suggests, mandatory teacher professional development may cause resistance and adversity from teachers directly affecting students learning experience through a lack of transfer of learning (Gegenfurtner et al., 2009).

The results of this study emphasize the importance of fostering teachers' knowledge on instructional design and not limit professional development on ICT usage only. The pedagogical foundation for online learning seems to be a key missing factor in the context of this study. Both students and teachers agree that to improve the quality of education, knowledge on how to design and impart an online class is more important than knowledge on how to use technology. In this line, the educational literature provides concrete guidelines on how to design learning environments that support the psychological needs of students (see Su & Reeve, 2011). As one student mentioned in the interview, teachers whose digital competence is limited tend to provide an unorganized online learning environment causing uncertainty and stress. On the other hand, SDT literature suggests the need for teachers to provide clear guidelines, structure, and expectations to enhance student motivation, engagement, and learning (Reeve, 2009).

Regarding the need for relatedness, the results of this study point out the challenges faced by both students and teachers to develop and maintain interpersonal relationships to feel support through online learning environments. Although the transition to remote education seems to not have affected the daily administrative affairs, it has limited significantly the

human aspect of relating to others. As SDT suggests, all individuals have the basic need to establish interpersonal bonds and feel cared for by others (Ryan & Deci, 2000). However, the transition to remote learning has limited this natural tendency, although some respondents mentioned attempts to maintain these bonds via online environments, they all mentioned the positive aspects of engaging in the premises of the university. Thus, fostering the need of relatedness seems to be the most challenging one to address during this period of emergency. In this sense, attempts should be made to recur to an instructional design that fosters collaborative work, peer evaluations, and other strategies where students and teachers can engage in activities fostering not only a learning experience but a necessary feeling of support.

4.1 Guidelines for teacher professional development

One of the aims of this study was to gather initial data that may contribute to the development of guidelines in the design and implementation process of professional development initiatives that foster digital competence and improve the quality of education. Following the theoretical framework and the results of this study, the following guidelines are presented in Table 2, following the basic psychological needs.

Autonomy	Competence	Relatedness
Foster a needs analysis where teachers actively participate voicing their opinion on the areas where they see a need to learn	Focus the content of professional development primarily on instructional design rather than the technology itself.	Relatedness seems to be the most challenging need to address
Provide teachers with a voice to avoid feeling isolated in the process of decision making during a transition to a different modality of teaching and learning	Despite the emphasis on instructional design as the core of professional development teachers also need specific knowledge on the use of ICT	Students and teachers need to learn how to establish bonds through online learning environments
Present teachers with the reasons behind the need to engage in professional development initiatives and avoiding recurring to mandatory participation	Due to limited time available for teachers, asynchronous programs could provide a viable option	Collaborative learning may foster relations among students and teachers, e.g., projects, PBL, and others
Provide teachers with various options not only of content but of the modality of participation (e.g., online, asynchronous) regarding professional development initiatives	Emphasis is made on how to integrate ICT to forming collaborative networks among students and teachers	Professional learning communities may help teachers continue their professional development while establishing relations and possibilities for mutual support

Table 2. Guidelines for professional development in universities

As this study suggests, professional development initiatives should not be focused exclusively on the use of technology. These initiatives should have a broader reach by beginning to discuss and help the main actors (students and teachers) comprehend the importance and beneficial aspects of integrating ICT through a deep knowledge of instructional design and autonomy support. In other words, the emphasis of this study is to highlight the importance of comprehending the pedagogical role technology plays in the

learning process more than the use of technology itself. For this, it is recommended to design professional development initiatives aimed at the comprehension of the pedagogical foundation of learning in remote education, i.e. instructional design. Without an understanding of the theoretical foundation of the learning process and knowledge about the curriculum design in online environments, the use of technology may become a limited goal, when instead, the creation of environments conducing to learning should be the ultimate goal of professional development.

Consequently, professional development initiatives should aim at satisfying the need of autonomy of participants providing rationales at least to the main learning activities so to engage participation and foster learning (Aelterman et al., 2014). In the same way, participants should be able to have a voice in deciding key elements of professional development. In this aspect, the present study suggests seeking a balance between presenting participants the importance of learning specific content, e.g., instructional design (and how it will help them in their job performance) and the freedom of participants to choose, e.g., the modality of participation (online asynchronous, face-to-face workshops, and others). Since university teachers and graduate students are professionals with challenging workloads and responsibilities, professional development needs to be flexible and accessible to this type of professionals.

Regarding the need of competence, professional development initiatives should above all foster participants´ ability to comprehend the fundamental aspects of pedagogy. In other words, it is not enough to learn how to use a specific ICT but instead comprehend its role in the pedagogical process and how its usage may foster learning. Since the theoretical foundation of SDT suggests a strong link between competence and relatedness (Ryan & Deci, 2000) it is recommended to foster the creation of support groups or workshops among colleagues to learn new skills regarding instructional design for online and remote learning. These strategies may enhance the need of competence, i.e., to develop new transferable skills, as well as the need of relatedness, i.e., the need to feel support from others.

The need of relatedness seems to be the most challenging one, especially for university teachers. Since academia may be a profession with limited opportunities for collaborative work, where each individual may work in isolation particularly in regards to lesson planning, more needs to be done to encourage collaborative work among peers to foster the need of relatedness. Regarding students, learning activities should be designed in view of collaborative tasks fostering a balance between individual accountability and positive interdependence assigning clear goals and expectations to the learner (Cheon et al., 2019; Johnson et al., 2000).

5. Limitations and directions for future research

The present study collected data from teachers and students who belonged to one specific department. Future studies should collect data from other departments as well as other levels of education to comprehend the universality of the results and their implications. In the same way, the present study's quantitative approach was limited. Future studies should include quantitative results to establish benchmark data to gain insight into the different characteristics of individuals and the challenges they face regarding ICT integration. Moreover, intervention studies are needed to examine the way professional development initiatives foster the acceptance and integration of ICT and its impact on participants' perceptions and its impact in the quality of education. This study focused on the period of transition towards remote learning, hence, longitudinal studies are needed to understand the way in which students' and teachers' perceptions towards ICT has changed after a significant period of time.

6. Conclusion

The present study sought to analyze the experience of transition to remote learning due to the COVID-19 pandemic in the context of higher education. For this, data was collected from graduate students and teachers through interviews and questionnaires. Results for this study suggest the need to strengthen students' and teachers' digital competence with an emphasis on instructional design over specific usage of ICT. Applying the SDT framework, this study suggests the importance of designing professional development initiatives that consider the autonomy of participants (providing choice and rationales), develop specific skills (competence), and fostering relations among peers (relatedness) in view of experiencing satisfaction and well-being amid the current pandemic with the ultimate goal of improving the quality of education. Hence, this study emphasizes the need to design professional development initiatives aligned with the individual needs of students and teachers by previously gathering data of their current experience, thus avoiding unnecessary impositions on the main actors of the educational system.

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Author

CHRISTIAN JARAMILLO-BAQUERIZO obtained his Bachelor of Science degree in Education and a Master of Arts in Theology from Seton Hall University, South Orange, NJ, USA. He also obtained a PhD in Educational Sciences from Ghent University, Ghent, Belgium.

Currently he is the Academic Director of the Department of Education at Universidad Andina Simon Bolivar – Ecuador. His research interests are teacher professional development, transfer of learning, and autonomy-supportive learning environments.