PERCEPTIONS OF READINESS FOR ONLINE LEARNING FOLLOWING PARTICIPATION IN A MULTIPARTICIPANT ONLINE COURSE

Tami Seifert, Kibbutzim College of Education
Orna Feliks, Kibbutzim College of Education

ABSTRACT

Since online lessons lack a physical presence, different technological means are needed to create an environment for various teaching, learning, and evaluation methods and for creating a sense of belonging for students. This study investigated student-teachers’ attitudes, approaches, and willingness to engage with computer-assisted teaching and online teaching after they had participated in a multiparticipant online course. A mixed methods research paradigm combined both qualitative and quantitative data collection and analysis. The research findings indicate that the course goals were attained in terms of student-teachers’ acquiring the contents and attitudes, and that the careful design and organization of the course site, learning materials, and methods all contributed to the students’ acquisition of the contents and ability to cope with online learning and form positive attitudes regarding online teaching and learning. Although student-teachers felt that the online learning style was not suitable for them, they underwent a personal process, overcame difficulties, and developed positive attitudes towards ICT and its implementation. Hopefully, the research findings can inform the preparation of an optimal teaching-learning process for online teaching.

Keywords: online course, attitudes towards online teaching, learning management, collaboration, learning methods, multiparticipant course

LITERATURE REVIEW

Introduction

To meet the requirements of the rapid growth in online lessons and courses in higher education, institutions must harness the experience accumulated in the academic literature and examine the students’ point of view on online lessons and courses (Smidt et al., 2017).

Information and communication technologies (ICT) surround us and they have become a significant part of our lives and the lives of our pupils, and it is impossible to leave technology outside the school. Teachers and other educators face the challenge of finding ways to optimally utilize and integrate technology in their teaching and learning and interweave the technology, pedagogy, and contents to form meaningful learning and attain the goals that the teacher envisions (Koehler et al., 2014; Mishra & Koehler, 2006).

The research relies on a five-year attempt to teach a fully online, multiparticipant course that was improved and adapted for the needs of student-teachers. The course was taught through a model learning management system based on asynchronous communications. The course aimed to familiarize student-teachers with ICT learning environments and train them to apply these environments in teaching. The course included a component on technological skills learning in order to master different ICT environments, a component
on the application of pedagogical thinking for the integration of these environments in teaching, and a creative component in which the students were required to create computer-assisted learning activities. One of the purposes of the course was to develop and consolidate attitudes towards the integration of ICT in teaching in order to encourage student-teachers to integrate the computer into their teaching in an intelligent manner. Indeed, attitudes toward ICT are among the factors that might determine teachers’ intentions to use, and the actual acceptance of, ICT in classrooms (Imtiaz & Maarop, 2014; Marangunić & Granić, 2015). The first collaborative online course in which the student-teacher experiences teaching is of great importance in formulating their position and view on online learning (Seifert & Bar-tal, 2020). The research therefore aimed to test at the end of the course the student-teachers’ attitudes towards the integration of ICT in teaching and towards online teaching in general.

Online Courses in Higher Education Institutions

In an era of ever developing technology, many institutions of higher education are testing how to make their teaching programs more efficient. Various technological capabilities enable them to enrich traditional learning and in certain cases also replace some of the face-to-face lessons with completely online courses or integrated online and face-to-face lessons, i.e., hybrid courses that combine face-to-face meetings with online lessons (Broadbent, 2017; Moore, 2013). There is no clear consensus on the results of various studies concerning the advantages of online courses in comparison with face-to-face courses in terms of students’ academic achievements (Jahng et al., 2007; Wallace & Clariana, 2020; Zhao et al., 2005). Low academic achievements are frequently found in online courses among students who have a weak academic background or a lower level of preparedness for studying or who are younger (Figlio et al., 2013; Xu & Jaggars, 2014).

The Use of Technology in Online Teaching

Online teaching enables students to take responsibility for their learning, develop personal capabilities, and advance at their own pace (Seifert, 2017; Wong et al., 2019). Teaching according to this method has the potential to improve the students’ independent learning and provide a wider choice of learning methods, enrichment possibilities, and equal opportunities for each student. Moreover, online teaching offers a variety of easily accessible teaching tools on the internet and facilitates interaction among students and between the lecturer and the students. It also offers a flexible learning environment and allows for asynchronous interactions between students and teachers.

Many lecturers today were born before the development of the digital world and are now required to apply various new pedagogical models. One of the models is Technological Pedagogical Content Knowledge (TPACK), which conceptualizes the knowledge domains relevant for teachers wishing to implement technology in the teaching and learning processes (Voogt et al., 2013). Hammond and Manfra (2009) believe that TPACK can be applied as a common language when discussing the integration of technology in education. In their opinion, teachers first determine how they teach specific content and then consider the matching use of technology.

Teaching an online course necessitates familiarity with digital pedagogy and understanding the value of technology and the methods by which it can be used. Intelligent exploitation of technology can enable the teacher to vary and enrich traditional learning and increase the level of learners’ involvement and the quality of the teacher’s teaching. It is important to provide guidance for the lecturers so they can make smart choices of which technological media tools to provide in response to pedagogical needs. It is also important to assist the students acquiring the basic skills needed to succeed in an online course and help improve their attitudes concerning their participation in an online course (Levine & Wake, 2000; Morgan, 2002). This involves educating the learners concerning the importance of time planning and self-discipline in an online course. The learning strategy should strike a balance between the learning contents and the subjects studied so that the students will be able to master a variety of teaching environments and be exposed to various pedagogic approaches and teaching and evaluation methods. Evaluation includes personal evaluation, evaluation by the teacher, peer evaluation, and automatic evaluation by the computer. It is important to provide assignments that require high order thinking and knowledge construction in both individual and
collaborative assignments in which the students take responsibility for their learning.

**Online Courses in the Higher Education System**

Online courses are frequently taught in higher education, and the professional literature estimates that five to seven million students participate in at least one fully online course per annum (Allen & Seaman, 2015). The key to creating effective online courses lies in the carefully planning the course content, suitably organizing the information, using appropriate media for the contents that is easily accessible for students, and clearly defining the time frame (Hughes & Edwards, 2012).

From the students’ viewpoint, learning in an online course allows them to combine the advantages of face-to-face courses with the advantages of technology assisted learning. These advantages include: the repetitive use of high-quality video, the use of automatic self-assessment, and the ability to exploit the time to understand the contents. The lecturers need the technological skills to plan the lessons and they need pedagogic and technical support.

**Characteristics that Contribute to Learning in Online Courses**

The distance in online learning is not only a physical distance as it forms a psychological and communication gap (Moore, 2013), but distance learning is structured learning, meaning that what makes traditional learning adequate is also what makes online learning adequate. The lecturer-student relationship is composed of many moments of unique personal contact, which contrasts with the group relationship between a lecturer and their class (Korthagen et al., 2014). The fundamental condition for creating a meaningful lecturer-student relationship is the formation of trust, and the lecturer needs to invest efforts into its development (Stieha & Raider-Roth, 2012). Studies show that while good design and clear goals are desirable for online courses, it is a regular and effective relationship between the lecturer and the students that contributes to students’ achievements in an online course (Jaggars & Xu, 2016).

The online classroom transfers the focus from the writer to the writing and from the lecturer to the contents (Burgess, 2015). In order to reduce the distance created between the lecturer and the student in online learning, some courses are based on the submission of multiple assignments, which involves frequent—sometimes too frequent—feedback for assignments (Ya Ni, 2013). This increase in feedback frequency influences lecturer-student relations, and the research reveals that students who receive frequent feedback feel that the lecturer is interested in them (Portolese et al., 2014; Seifert, 2017). Effective contact of this sort in the virtual environment was found to encourage the students’ commitment to the course and increased their academic performances. The importance of the lecturer’s involvement in the course is supported by the theory of Holmberg (1995), which argues that the lecturer should create an interpersonal connection with the students in order to improve their motivation to succeed. This theory therefore indicates that a broad range of opportunities to create this connection should be built into online courses. Following Holmberg’s theory, the literature notes a framework of successful courses based on theories such as Mutual Understanding Distance (Moore, 2013). Mutual Understanding Distance in distance learning relates to the lecturer-students interaction in a learning environment separated by physical distance. Such mediated learning by its very nature leads to misunderstanding between the lecturer and the students. It is noted that Mutual Understanding Distance also exists in face-to-face learning. According to this theory, three main characteristics determine the dynamic nature of online courses: (1) structure—the extent to which the course materials and evaluation methods are realized in a regulated and valued manner; (2) dialog—the extent of lecturer-student interaction that assists the students’ construction of knowledge; and (3) the student’s autonomy—the extent of the student’s freedom to choose what to study, the learning method, and how much to learn (Moore, 2013). When teaching includes dialog and the students’ construction of the learning material along with their autonomy, it is possible to reduce the Mutual Understanding Distance. This theory does not characterize the quality of the learning itself; rather, it suggests that different learners have different abilities and preferences. For example, a course with a strong Mutual Understanding Distance containing little dialog will be more challenging for a less autonomous learner. Different students have different perceptions of online teaching, and these views are fed by their prior learning experiences.
Some students expect that the online course will be easier for them not only in terms of the time and place of learning but also with regard to the amount of effort needed to succeed.

And indeed, the teaching design of the class is not a casual detail. In planning an online course it is important to relate to the teaching goals and plan the structure of the course, the course assignment, the evaluation methods, and the expected interaction with both the lecturer and other students. The role played by the lecturer is also significant and involves guiding the planning and mediation of teaching materials and encouraging interaction among the learners and between the learners and themselves in order to ensure discussion and deeper study of the course content while reducing the Mutual Understanding Distance (Moore, 2013). Different technological and communication means have different uses, and consequently, different students and lecturers have different preferences for these means. It is therefore advisable to use many different media in order to provide suitable responses for the needs of as many students and lecturers as possible in line with the goals of the teaching, the class contents, and the proposed means of evaluation.

**Students' Attitudes in Online Courses**

Interest in the online environment has increased rapidly so that the opinions of participants also become significant, since the learners' views are tightly linked to the interaction that occurs in these courses. A lack of interaction causes feelings of isolation, and this increases the probability of student dropout or lack of academic success in online courses (O'Shea et al., 2015; Shelton et al., 2017).

Qualitative research investigated learning experiences that include using methods that increase interaction in the online environment and are based on collaborative assignments that stimulate cooperation. One study conducted a comparison between a group of learners who worked in interactive collaboration and a second group in which each learner studied independently. It was found that both groups were influenced by factors related to learning in the online environment such as personal approaches, changes in variables relating to the learner's personality, and mediated characteristics such as learning preferences and styles (Ozaydin et al., 2018).

**Background—The Research Context**

In recent years the number of fully online courses studied in the institute where the present study was conducted has increased. The research was conducted in a teacher education college in which students acquire the pedagogic-digital tools they need for their teaching processes and the learning and evaluation of their pupils. Thus, the variety of teaching methods that they experience may help them to develop attitudes towards the integration of ICT in their teaching and to consolidate models of teaching and learning they may use in their future teaching profession. The core of their course therefore includes technology, pedagogy, and course contents (Mishra & Koehler, 2006). The course studied in the present research involves intensive use of collaboration in different models according to the type of assignment, ranging from presentation of personal thought in a group discussion through creative processes performed in pairs and presented before the peer group. In line with the findings of previous research (Seifert et al., 2020), this research investigated a course where learners in a multiparticipant course were divided into small groups to create a sense of intimate learning. The course was intended to help participants develop their attitudes towards the integration of the computer in teaching and the role of the teacher. The course had declared goals and the learning program was constructed to meet these goals. The students submitted assignments whose performance necessitated the application of technology, pedagogic thinking, and thinking concerning the integration of technology in education.

**Research Questions**

1. What are the attitudes of the students who participated in the online course with regard to the contribution of technology to learning processes?
2. To what extent did the course influence the formation of students’ attitudes regarding online teaching and learning?
3. What is the perception of the students who participated in the online course concerning the extent to which the course contributed to the expansion of their application of what was learned in the course beyond the framework of the course?
4. What is the perception of the students who participated in the online course concerning the extent to which the course contributed to the development of skills needed for independent learning?

5. What insights were gained by the students who participated in the online course concerning the extent to which online teaching is appropriate for their learning style?

METHODOLOGY

The Research Population

The research was conducted in a teacher education college with a group of freshman students studying for a bachelor’s degree in early childhood education. The students participated in a fully online course on Teaching and Learning in Online Environments. The course had declared objectives that guided the construction of the course’s learning program. In the course the students learned how to use various technological platforms in a variety of learning environments and were exposed to several online technologies, ranging from office tools and graphic tools to web frameworks that include discussion groups, chats, blogs, social networks, virtual environments, and collaborative communication environments. Additionally, they learned how to apply technological pedagogical models ranging from imparting knowledge to consolidating knowledge, and from self-work to collaborative and community learning. The students examined a variety of tools and environments from the perspective of integrating them into teaching and the learning and assessment processes. The students studied experiential learning activities that combined content-pedagogy and technology. The course was primarily practical, and the students practiced literacy and communication using digital media. They also practiced working collaboratively in online environments and experimented with a variety of forms of assessment.

The students’ average age was 23.2 (SD = 3.5). The research was based on the responses of 206 out of 256 students (80.4%) who participated in the online course and answered an online questionnaire at the end of the course. In addition, 157 of the 206 students (61.3%) wrote blog entries and 143 students (55.9%) wrote a reflection.

This course was taught by a lecturer who is an expert in the digital teaching field and in teaching multiparticipant online courses.

Data Collection and Analysis Methods

This was an exploratory sequential study (Creswell et al., 2003) aiming to expose B.Ed. student-teachers’ attitudes towards online teaching. A mixed methods research paradigm employing both quantitative and qualitative research methods was used (Johnson & Onwuegbuzie, 2004; Keeves, 1998). The subsequent quantitative data is consistent with the sequential exploratory design, in which the quantitative component assists in the interpretation of qualitative findings (Creswell et al., 2003). IRB approval was obtained, and informed consent was collected from participants before their data were used.

Qualitative data collected from the students’ writing on a blog, the responses to open questions in a questionnaire, and the students’ reflections at the end of the course underwent interpretative content analysis to identify central themes (Gibton, 2001). Quantitative data from the closed questions in the questionnaire underwent quantitative analysis using descriptive statistics.

RESEARCH TOOLS

The Questionnaire

A specially constructed questionnaire was administered at the end of the course. The questionnaire to the student-teachers included consideration of different aspects of online teaching:

- The attitudes concerning the contribution of technology to learning processes (9 statements),
- the formation of attitudes following participation in the course (7 statements),
- the contribution of the course to the application of what has been learned in the course (4 statements),
- the contribution of the course to the development of personal learning abilities (6 statements), and
- the extent of the compatibility of online learning characteristics and consideration of online learning (4 statements).

The questionnaire items were measured on a 5-point Likert scale based on examples from the relevant literature and included open questions.
Two experts on assessment provided their input on the questionnaires and the implementation of self- and peer-assessment through Moodle.

*Writing on the Course Blog*

At the first stage, questions were derived from the blogs that the student-teachers wrote during the courses over the last five years related to the learning process, their teaching method, and their feelings. The student-teachers’ wrote during and after the submission of different assignments, and their blog writings underwent thematic analysis to identify themes. Questions were derived from these themes in line with the course goals and the student-teachers’ needs that related to the course contents and the teaching and learning processes. This process led to the construction of the research questionnaire. At the second stage, the questions were read by three lecturers, all experts in the field of ICT, and the final composition of the questions were altered and refined in light of their remarks and suggestions.

*Reflections on the Course*

At the end of the course, the student-teachers wrote their reflections on the course using metaphorical cards. The student-teachers were asked to write about their personal insights that they had derived from the course, which strengths they had discovered in themselves, or any other thought elicited by their (random) choice of a card that stimulates thoughts and emotions out of a collection of them. The card collection contained 50 cards showing pictures expressing different feelings and the student-teachers could choose any card independently from the other student-teachers. The pictures and the student-teachers’ written reflections were shared in the collective space although the writing was presented anonymously.

*The Research Process*

At the first stage, the research used the reflective writings of the student-teachers on the blog over the last five years during which the course operated. Students’ consents for using the reflective writing were obtained and respondents’ confidentiality was maintained. The texts were private, meaning that they were closed to other student-teachers on the course. Based on the analysis of these texts, the research questions were composed and the attitudes questionnaire for the research was constructed. The questionnaire was administered to the student-teachers at the end of the course.

**The Study’s Significance**

Educational institutions invest heavily in technological means to adapt teaching methods to dynamic and frequent technological developments. The importance of the research reported here is that it portrays a broad picture of the contribution of an online course to the extent of student-teachers’ readiness to learn and teach in an ICT environment and the development of their attitudes towards online teaching.

**Findings**

The responses to the questionnaire items underwent Principal Component Analysis (PCA) and Varimax with Kaiser Normalization statistical procedure and five factors were elicited. Table 1 provides the loading results in bold and the correlation between items (alpha). A mean index was calculated for each for further analyses.

As can be seen from Table 1, the first factor, attitudes concerning the contribution of technology to learning processes, explains 18.8% of found variance (N = 260, M = 3.5, SD = 0.9, alpha = .93). The second factor, formation of attitudes as a result of participation in the course, explains 17.5% (N = 260, M = 3.6, SD = 0.8, alpha = .90). The third factor, contribution of the course to the expansion of use of what has been learned beyond the confines of the course, explains 12.0% (N = 260, M = 3.4, SD = 1.0, alpha = .89). The fourth factor, the contribution of the course to the development of personal learning abilities, explains 11.6% (N = 260, M = 3.4, SD = 0.9, alpha = .84), and the fifth factor, the extent of the compatibility of the characteristics of online learning and consideration of online learning, explains 8.8% (N = 260, M = 3.2, SD = 0.9, alpha = .78). The variation explained by the five factors is 68.6% (N = 260, M = 3.2, SD = 0.9, alpha = .78).

Before attempting to answer the research questions, data are given in this section concerning the level of student dropout from the course and the student-teachers’ grades at the end of the course.

**Dropout from the Course**

All the student-teachers completed the course successfully, except one student, who dropped out after Lesson 2 of 15 lessons. This means that there was a very low dropout rate for the course at later stages.
Table 1. Factor Loadings for Attitude to Technology Implementation, by Questionnaire Item

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
<th>Component 4</th>
<th>Component 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of technology in teaching contributes to motivation to learn.</td>
<td>.86</td>
<td>.19</td>
<td>.05</td>
<td>.105</td>
<td>.15</td>
</tr>
<tr>
<td>Integration of technology in teaching contributes to enjoyment in learning.</td>
<td>.85</td>
<td>.17</td>
<td>.18</td>
<td>.07</td>
<td>.17</td>
</tr>
<tr>
<td>Integration of technology in teaching contributes to the learning experience.</td>
<td>.82</td>
<td>.29</td>
<td>.06</td>
<td>.09</td>
<td>.19</td>
</tr>
<tr>
<td>The course increased my willingness to integrate technology in my teaching in the future.</td>
<td>.71</td>
<td>.17</td>
<td>.41</td>
<td>.24</td>
<td>.22</td>
</tr>
<tr>
<td>Technology advances collaborative work with peers.</td>
<td>.67</td>
<td>.23</td>
<td>.08</td>
<td>.05</td>
<td>.16</td>
</tr>
<tr>
<td>I support the integration of technology for early childhood.</td>
<td>.67</td>
<td>.12</td>
<td>.43</td>
<td>.06</td>
<td>.21</td>
</tr>
<tr>
<td>I support the integration of technology in elementary school.</td>
<td>.63</td>
<td>.26</td>
<td>.26</td>
<td>.22</td>
<td>.13</td>
</tr>
<tr>
<td>The course increased my willingness to use technology in my contact with pupils' parents in the future.</td>
<td>.56</td>
<td>.48</td>
<td>.39</td>
<td>.18</td>
<td>.02</td>
</tr>
<tr>
<td>I employed critical thinking in the course.</td>
<td>.49</td>
<td>.385</td>
<td>.03</td>
<td>.25</td>
<td>.41</td>
</tr>
<tr>
<td>The course helped me to consolidate my attitudes in fields combining technology with education.</td>
<td>.21</td>
<td>.80</td>
<td>.05</td>
<td>.18</td>
<td>.10</td>
</tr>
<tr>
<td>Studying the course helped me to form my attitudes concerning the issue of integration of technology in teaching.</td>
<td>.08</td>
<td>.79</td>
<td>.07</td>
<td>.18</td>
<td>.12</td>
</tr>
<tr>
<td>The course helped me to think about ways to apply technology with parents.</td>
<td>.23</td>
<td>.73</td>
<td>.33</td>
<td>.14</td>
<td>.06</td>
</tr>
<tr>
<td>The course helped me to think about issues involved in the integration of technology for early childhood.</td>
<td>.17</td>
<td>.72</td>
<td>.30</td>
<td>.03</td>
<td>.27</td>
</tr>
<tr>
<td>The course helped me to think about issues involved in the fields combining education and technology.</td>
<td>.25</td>
<td>.67</td>
<td>.06</td>
<td>.21</td>
<td>.30</td>
</tr>
<tr>
<td>The course made me think about ways to apply technology for school children.</td>
<td>.34</td>
<td>.62</td>
<td>.18</td>
<td>.34</td>
<td>.05</td>
</tr>
<tr>
<td>Learning on the course increased my use of the computer in other courses.</td>
<td>.23</td>
<td>.12</td>
<td>.80</td>
<td>.29</td>
<td>.13</td>
</tr>
<tr>
<td>Learning on the course increased my use of the computer in my daily life as well.</td>
<td>.16</td>
<td>.08</td>
<td>.78</td>
<td>.29</td>
<td>.12</td>
</tr>
<tr>
<td>In the course I learned about subjects that I can apply to my daily life.</td>
<td>.30</td>
<td>.41</td>
<td>.56</td>
<td>.06</td>
<td>.25</td>
</tr>
<tr>
<td>The course improved my technological skills.</td>
<td>.18</td>
<td>.45</td>
<td>.46</td>
<td>.33</td>
<td>.09</td>
</tr>
<tr>
<td>The course contributed to my ability to undertake responsibility for my learning.</td>
<td>.13</td>
<td>.15</td>
<td>.12</td>
<td>.81</td>
<td>.13</td>
</tr>
<tr>
<td>The course improved my time management ability</td>
<td>.22</td>
<td>.25</td>
<td>.31</td>
<td>.68</td>
<td>.09</td>
</tr>
<tr>
<td>As a result of the course I learned that I have self-discipline and the ability to cope with online learning.</td>
<td>-.03</td>
<td>.09</td>
<td>.05</td>
<td>.67</td>
<td>.49</td>
</tr>
<tr>
<td>The course improved my ability for independent learning.</td>
<td>.15</td>
<td>.36</td>
<td>.35</td>
<td>.64</td>
<td>.14</td>
</tr>
<tr>
<td>The course improved my self-confidence concerning my ability to cope with independent learning.</td>
<td>.13</td>
<td>.24</td>
<td>.53</td>
<td>.58</td>
<td>.07</td>
</tr>
<tr>
<td>The course improved my confidence to learn technological subjects.</td>
<td>.26</td>
<td>.37</td>
<td>.48</td>
<td>.52</td>
<td>.12</td>
</tr>
<tr>
<td>The online learning style is suitable for me.</td>
<td>.33</td>
<td>.06</td>
<td>.15</td>
<td>.22</td>
<td>.76</td>
</tr>
<tr>
<td>Online learning is suitable for me because of the flexible time.</td>
<td>.17</td>
<td>.12</td>
<td>.08</td>
<td>.17</td>
<td>.68</td>
</tr>
<tr>
<td>I have a more positive attitude towards online learning as a result of the course.</td>
<td>.31</td>
<td>.25</td>
<td>.21</td>
<td>.12</td>
<td>.66</td>
</tr>
<tr>
<td>The course led me to think about ways to apply technology for early childhood children.</td>
<td>.37</td>
<td>.35</td>
<td>.40</td>
<td>-.21</td>
<td>.41</td>
</tr>
</tbody>
</table>
**Student Achievements**

With regard to their learning the course content, the student-teachers’ achievements were evaluated through assignments that they submitted over the course. The mean grade for the course was 94. These achievements show the success of the course with regard to the students’ active functioning throughout the online course and indicate that the course goals in terms of content and pedagogy were fulfilled.

**Answering Research Question 1:** What are the attitudes of the students who participated in the online course with regard to the contribution of technology to learning processes?

As presented in Figure 1 and Figure 2, the students had a positive perception of the contribution of technology to the learning experience and learning process (N = 260, M = 3.5, SD = 0.9, alpha = .93).

![Figure 1. Attitudes towards the contribution of technology to the learning experience, motivation and enjoyment](image1)

The student-teachers saw that the technology contributed to their learning and enjoyment of the learning process and constituted a factor for their motivation to learn. Moreover, as emerges from Figure 2, most of the student-teachers who participated in the fully online course Teaching and Learning in ICT Environments held positive views at the end of the course concerning the contribution of technology to learning and expressed interest in integrating technology into their future educational work.

It also appears from the data in Figure 2 that most of the student-teachers who participated in the online course held positive views at the end of the course concerning the implementation of technology in education frameworks, such that insofar as the pupils were older, there was a higher percentage of student-teachers who held a more positive attitude towards integrating technology in these settings. The mean grade for the integration of computers in elementary school was higher (M = 3.6) than for the integration of technology for early childhood (M = 2.9).

**Answering Research Question 2:** To what extent did the course influence the formation of students’ attitudes regarding online teaching and learning?

The student-teachers were asked about their attitudes towards issues involving the application of technology to teaching in their future educational work. Their responses are displayed in Figure 3.

![Figure 2. Attitudes concerning the contribution of technology to the learning processes](image2)

As can be seen clearly from Figure 3, by the end of the course most of the student-teachers who participated in the online course held positive attitudes towards the application of technology to educational settings. The course stimulated the student-teachers to think about ways to implement technology, and it led them to deliberate, consider, and crystallize their attitudes concerning different issues involved in the integration of technology into teaching. It also enabled them to consolidate their attitudes towards the combination of technology with education.

**Answering Research Question 3:** What is the perception of the students who participated in the online course concerning the extent to which the course contributed to the expansion of their application of what was learned in the course beyond the framework of the course?

The student-teachers were asked about the
extent to which the course had contributed to their extended implementation of what had been learned beyond the course framework—their answers are summarized in Figure 4.

The student-teachers’ responses clearly indicate that the course influenced them beyond the course boundaries, and they testify that what they learned on the course increased their use of the computer in their daily lives (M = 3.0; SD = 1.3) and increased their use of the computer in other courses as well (M = 3.0; SD = 1.3). Moreover, what they learned in the course was considered both useful and practical and enabled them to improve their technological skills. The student-teachers also reported that the subjects they had learned in the course could be implemented in their daily life.

**Answering Research Question 4:** What is the perception of the students who participated in the online course concerning the extent to which the course contributed to the development of skills needed for independent learning?

From the data in Figure 5 it is evident that the student-teachers think that they have self-discipline and can cope with online learning. The student-teachers reported that the online course contributed to the development of their personal abilities that they needed for independent learning. They noted that the course advanced their time management skills, contributed to their self-awareness with regard to their abilities, and contributed to improving their ability to take responsibility for their learning. They also testified that they developed their self-discipline for learning online and that their confidence to cope with independent learning of technological subjects independently had also improved.

**Answering Research Question 5:** What insights were gained by the students who participated in the online course concerning the extent to which online teaching is appropriate for their learning style?

The student-teachers were asked about the extent to which online teaching was suitable for their learning style. Their answers are summarized in Figure 6.

The data in Figure 6 clearly indicate that most of the student-teachers think that the learning/teaching style of online learning is suitable for them but only to a reasonable extent (M = 2.7; SD = 1.1). Following their studies in the course, some of the student-teachers saw an advantage to the flexible time available in online learning, and their consideration of online learning is more positive and they are more amenable to the potential of implementing technology even with early childhood children.

**Exposure of Additional Layers in the Student-teachers’ Blog Texts and Their Reflections**

The findings for Research Questions 1–5 indicated that the course had strongly influenced the formation of the student-teachers’ positive attitudes towards various subjects involved in online learning and the inclusion of technology in teaching. The findings further indicated that the course had contributed to the personal skills they needed for independent learning and their ability to take responsibility for their learning. Moreover, the achievements of the student-teachers in the course
were very high. We were therefore surprised to learn that most of the student-teachers felt that the online learning style was not suitable for them. From the texts in their blogs and their reflections it was also evident that the student-teachers are not interested in studying an additional online course. Observation of the reflections that they wrote at the end of the course revealed additional aspects that were not represented in the answers to the research questionnaire and throw some light on the previous findings, as follows.

It appears that the student-teachers had strong resistance to the course for various reasons: opposition to the course content that dealt with the introduction of technology in early childhood, opposition and anxiety regarding learning that needs work with an ICT environment and practical coping with computer skills, and even fear of learning on an online course. Their resistance interrupted their learning and they had to undergo a personal process in order to succeed in enabling themselves to learn on the course. For example, S157 noted:

*When I heard about this course, I was very anxious that I would not be able to manage with the computers but I learnt to flow with it—I always have the environment around me to help me and sometimes I also need to know how to let things go and I enjoyed learning new things.*

S19 also expressed a similar process:

*At first it was very difficult for me to accept the idea of an online course, I do not like technology and it was really difficult for me to sit myself down for a lesson facing the computer...very slowly I began to understand that I was receiving not a few useful tools and then I was able to let things go...I agreed to flow with it...and then something wonderful happened, I began to enjoy the process and to implement a lot of what I had learnt in my personal life, not yet with the children, because it still clashed with certain principles, but I definitely found use for much of what I learnt.*

Understanding that the student-teachers felt resistance and anxiety from the beginning of the course reinforces the research findings and verifies the power and influence of the course. Despite this opening picture of resistance, the course succeeded in influencing them to a large extent, and they succeeded in developing positive attitudes towards ICT and its implementation in teaching. Also, the personal process that the student-teachers experienced during their learning on the online course produced impressive personal development.

Like the citations of the student-teachers, several of their reflections exemplify the personal process that the student-teachers underwent in the course—a process that at the beginning was overshadowed by resistance and anxiety concerning the course, continued through the documentation of the development of their personal ability to learn and internalize the contents, and ended with an understanding of the contribution of the course.

For S83, the course presented an opportunity to get to know the secrets of ICT and as she said:

*I always defined myself as someone who lacked any technological knowledge and so I chose to avoid it and to miss the great contribution that it could give to me. This course allowed me not to give up on myself and to open up to the ICT world and even to discover that it is most essential for the world of education.*

It emerged that learning in the online course meant that the student-teachers had to cope with various difficulties. Some of the student-teachers were studying for the first time in an online course and this meant that they had to prepare themselves for it and to cope with the difficulties involved. S117 noted:

*I experienced serious difficulty during the course since this was an online course and I had to find time to sit down and do the assignments in the best possible manner. And I am proud that I succeeded and learnt and derived a lot from the course.”*

And in the words of S53:

*This was a unique course, the first time that I had coped with an online course. During the course there were moments when I encountered difficult and challenging assignments, I continued to try to learn and overcome the difficulties that I encountered—knowledge is power.*
DISCUSSION AND CONCLUSIONS

This study examined the attitudes of student-teachers specializing in early childhood teaching who were studying on a multiparticipant fully online course dealing with technological and pedagogic knowledge in the field of teaching and learning in ICT environments. The research findings provide us with insights regarding the influence of the course on the student-teachers' attitudes.

Examination and analysis of the blogs and reflections indicated that the online course caused difficulties for the student-teachers and they underwent a personal process that enabled them to overcome those difficulties, cope with the learning, and complete the course successfully. Nevertheless, they adopted positive attitudes towards online learning. We assume that the strategy used to design and manage the course and the sense of visibility in the course were essential to attaining this success and that these should be used in other online courses. It should be remembered that these are Bachelor’s degree students and some of them testified that they prefer to attend a face-to-face course with fewer assignments and an exam at the end of the course rather than having a large number of assignments over the course that in their words “drain most of their time and energy.”

From investigation of Research Question 1, it appeared that by the end of the course most of the student-teachers held positive views concerning the contribution of technology to learning. Their attitude was that technology contributes to the enjoyment of the experience of learning and the motivation to learn, and it also promotes collaborative work with peers.

It is noted that there was only one dropout at the very beginning stage of the course and the student-teachers’ achievements at the end of the course were very high (M = 94). These achievements reflect the strong functioning of the student-teachers during the online course and indicate their attaining the goals regarding the course’s contents and pedagogy. It is assumed that the student-teachers who learned in the fully online course, which included complex learning processes, understood the strength of online learning and that it enabled meaningful learning for them and empowered their learning processes. For this reason, they were able to form a more positive consideration of online learning. This finding is very significant in terms of the importance of the course. Most teaching trainees arrive at the college without any foundation in the implementation of ICT environments in teaching, and so the course allows them for the first time to discover the many possibilities that technology offers in terms of the variety of teaching methods, and so on.

Investigation of Research Question 2 revealed that at the end of the course most of the student-teachers who had studied the online course held a positive attitude towards the integration of technology in different education settings. Insofar as the student-teachers were older, then they held a more positive attitude concerning the integration of technology in their education.

Examination of Research Question 3 indicated that the course had influenced most of the student-teachers by causing them to deliberate, think, and consolidate their attitudes on different issues involved in the application of technology in teaching, and that most of them were interested in using technology in their teaching work in the future and in their communications and meetings with their pupils’ parents.

In answer to the questionnaire administered at the end of the course, it appeared that most of the student-teachers felt that technology contributed to learning and they held a positive attitude towards the integration of technology into education. We have no proof that these attitudes were formed just because of the course. Nevertheless, most of the student-teachers reported that the course enabled them to form their opinions concerning different subjects involved in the application of technology in teaching. Thus, it is possible to deduce that the course is what helped them to develop their recognition of the contribution of technology to learning, and that it influenced the development of their positive attitudes towards the application of technology in teaching. This finding is significant because the course’s goal was to train the student-teachers to apply ICT to their teaching, and of course their positive attitudes are likely to encourage them to implement the knowledge that they gained in the course and apply it practically in their future educational work.

As noted above in the section that described the course and its characteristics, the course contents, activities, and teaching methods were shaped carefully in line with aspects of the contents,
pedagogy, and technology (Koehler et al., 2014; Mishra & Koehler, 2006). Thus too, the planning took into account difficulties produced by a fully online multiparticipant course and a suitable policy was created for the management of the course and the division of the learners into small groups. We assume that the strong influence of the course on the development of the student-teachers’ positive attitudes towards technology and its contribution to learning processes stemmed from the careful mix of all the noted aspects. Moreover, most of the student-teachers think that the course contributed to the improvement of their abilities to take responsibility for their learning and to their self-awareness concerning their ability to cope with online learning, and that it enhanced their confidence in their ability to independently learn, which is something that is essential for 21st century learners and especially for those who intend to become teachers.

Also, the course was found to have an influence beyond the course boundaries. Learning in the course increased the student-teachers’ use of the computer in their daily life, and it increased their use of the computer in other courses too. This finding testifies to the strong success attained by the course contents on technology and is strengthened by the way the course was designed.

Most of the student-teachers thought that online learning was not suitable for them, and they were not interested in studying an additional online course. This finding was rather surprising and seemingly contradicts the student-teachers’ positive attitudes towards the contribution of technology to learning processes, and most of the student-teachers reported that the online course contributed to their personal development and advanced their personal skills needed for independent learning and taking responsibility for their learning. Yet, this finding can be explained by findings stating that the first collaborative online course in which the student-teacher experiences teaching is of great importance in formulating a position and attitude towards online learning in future courses (Seifert & Bartal, 2020).

**SUMMARY**

This study examined the attitudes of 206 student-teachers who studied a fully online asynchronous course that dealt with the technology and pedagogy of computer-assisted teaching. The course, like those suggested in the relevant research literature, included complex learning units. The structure of the course site, the learning materials, and the manner in which the learning was managed were designed very meticulously so that the student-teachers could succeed in their learning despite its complexity (Hughes & Edwards, 2012).

The course had a clear learning process and included many short assignments using different collaborative learning methods. The course site was designed to enable easy orientation, and varied methods were used for them according to detailed measures. The course lecturer sent messages at the end of each learning unit and followed up closely on the assignments, which contributed to the student-teachers’ sense of being visible to the lecturer and their sense of personal consideration (Jaggars & Xu, 2016). The learning took place in small groups over the entire course, which contributed to a sense of social affiliation and student visibility in the course. This careful planning helped to overcome the restrictions of physical distance and to bridge the psychological and communication gap (Moore, 2013).

Studying the student-teachers’ reports from the course revealed that all the student-teachers completed the course, except for one student who dropped out of the course after the second lesson. Thus the goals relating to the course content were attained. The average grade was 94, an achievement that indicates the course’s success regarding the student-teachers’ active functioning in the online course and in relation to attaining goals regarding the contents and pedagogy of the course.

At the end of the course most of the student-teachers expressed positive views towards the integration of technology into education and towards online teaching, and they were interested in including ICT in their educational work. As described in the relevant research literature, it seems that participating in the course influenced the formation of these positive views (Levine & Wake, 2000; Morgan, 2002). Moreover, coping with the online course enabled the student-teachers to develop the personal skills needed for time management, independent learning, and online learning.

Despite their success in the course and despite
their personal growth in learning management and independent learning, the student-teachers indicated that the course set serious challenges and difficulties, and they needed to be open to and agree to accept a learning method that necessitates abilities and self-discipline in order to succeed in the course (Seifert, 2017; Wong et al., 2019). The student-teachers expressed their reservations concerning their desire to participate in an additional online course, and we assume that the reason for this lies in the difficulty involved in coping with the many assignments in the course.

The course was carefully designed to include various characteristics intended to enable the student-teachers to succeed in the multiparticipant online course. We therefore conclude that even though the course, which dealt with technology and pedagogy, was demanding and challenging, when it was done in an optimal manner, it enabled significant success in multistage learning through complex assignments, and it could influence the development of the student-teachers’ positive attitudes and self-efficacy towards the integration of technology in their own teaching work and in other learning/teaching settings. The course was also able to empower the student-teachers’ skills for learning management and life-long independent learning.

As more courses and entire programs go online, students often feel unprepared for and uncomfortable with the online learning environment, but often the instructors and program directors are unaware of the students’ trepidation. This study might encourage programs and institutions to design an online preparatory course for students to make them more familiar with the technology and learning styles needed to be successful in the online environment.
REFERENCES


