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Novice and experienced instructors' technology use and pedagogical skills in virtual classrooms

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Abstract

Effective teaching demands educators to have multifarious competencies and skills, which is quite challenging. Lots of research examining the difficulties relating to these concerns has been carried out in traditional face-to-face educational settings notably by focusing on classroom management skills and technological proficiency which are considered crucial for teachers. However, it remains uncertain how instructors use technology and their pedagogical abilities in virtual classrooms and how their approaches to using these skills vary depending on their teaching experience. To that end, by using mixed method research design this study first investigates the pedagogical and technological skills used by instructors in online classes by exploring the challenges instructors have while utilizing technology and employing pedagogical skills, as well as by addressing their way of overcoming those challenges. Furthermore, the research discusses the connection between teachers' demographic data centering on their field of study and their technological and pedagogical expertise in online classes. There are 50 instructors from a preparatory school of a private university as participants. The results show there is no substantial difference between the instructors with different levels of teaching experience while using technology and pedagogical skills in online classrooms. Since ELT teachers outperform those in other fields when using technology, the field is a determinant. To foster utilizing those skills more competently and firmly, seminars, where prospective teachers can apply their technological and instructional skills, could be incorporated into the curricula of each and every field. The provision of pre-service and in-service programs by decision-makers is another way to help present and future teachers in online language education become more technologically proficient. It would not be appropriate to generalize the results to the entire population because of the limited sample size.

Keywords: Online classrooms; pedagogical skills; technology use; novice instructors; experienced instructors

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1. Introduction

1.1. Introduce the problem

Online classrooms have replaced traditional classrooms because of the coronavirus-19 pandemic, which has changed the way that education is delivered. Hence, educators have used a variety of platforms to construct virtual classrooms, including Zoom, Google Meet, and Microsoft Teams. Instructors were required to utilize technology and use their pedagogical competencies in online classes. Consequently, a pedagogical revolution has occurred in how we teach and learn (Kim & Bonk, 2006). Accordingly, novel problems for higher education teachers have evolved with the expansion of online learning in colleges (Kilgour et al., 2018). In other words, online learning environments that need cutting-edge pedagogy and technology have become challenging terrain for teachers.

Previous studies have shown that teachers need to have a highly specific set of skills to teach online classes. Ke (2004) highlighted several specific demands for virtual classroom practices, which convey conventional teaching approaches in an unconventional setting. Likewise, Khurshid (2020) claimed that online instructors require a particular set of e-pedagogical skills to deliver courses online.

Given that we live in a technology era, online courses will likely become more commonplace. Regardless of their experience, this will become onerous and challenging for all educators. Concerning this, the present study intends to give educators some new perspectives on how both novice and experienced instructors employ their technological and pedagogical expertise in online classes to assist instructors in developing skills and self-confidence since it is crucial to make sure that online instructors are knowledgeable about how to use technological and pedagogical abilities when instructing in online classrooms. To do this, the research scrutinizes how novice and experienced instructors utilize their technological and pedagogical expertise in online classes by identifying the obstacles they encounter when using those skills, as well as the methods they use to handle difficulties relating to these issues in online classrooms. Moreover, the study also concentrates on the link between the instructors' field of study and their technological and

pedagogical competence in online contexts. Five research questions were developed for this study in line with its goals:

1. How do novice and experienced lecturers employ technology in online classes? How do they differ?

2. How do experienced and novice teachers utilize pedagogical skills in online classrooms? How do they differ?

3. What issues do they experience in virtual courses with technology and pedagogy?

4. How do they deal with problems concerning the use of technological and pedagogical skills in online environments?

5. What connection exists between teachers' pedagogical and technological expertise and their field of study?

The importance of a study's research questions cannot be denied. The study questions help the researchers pinpoint exactly what they are trying to learn, which helps them be more specific and goal-oriented in their work.

There seems to be a limited amount of research investigating the instructors' technology use in virtual classrooms despite numerous studies concentrating on instructors' use of technology in actual classrooms. Besides, the number of research analyzing the pedagogical skills of instructors in online classrooms is also very few.

We may claim that technology use and pedagogical skills implementation has a pivotal role in the teaching and learning process. For this reason, applying these skills in virtual classrooms must be emphasized especially when we consider the current conditions that may call for distance learning.

2. Method

2.1. Research Design

Using both qualitative and quantitative methods, this study adopted a mixed-methods approach. The quantitative data collected by the questionnaire required additional and detailed justifications, which were obtained through one-on-one interviews, hence the explanatory sequential design was utilized in this study. First, employing questionnaires, quantitative data was gathered. Next, through one-on-one interviews with the teachers, qualitative data was obtained. The participant selection model and the follow-up explanations model are the two variations of the explanatory design (Creswell & Clark, 2017). The follow-up explanations model was used in this study because it concentrated on the results that required more investigation. In short, the interviews were held to

supplement and deepen the findings of the study's questionnaire. The Hacettepe University Ethics Committee approved the study before any data were collected.

The first goal of this study is to learn more about the instructors' educational background, teaching experience, and knowledge of how to use technology and pedagogical skills in online courses. The second goal is to compare this information with the information gleaned from the interviews on issues including "what the instructors experienced relating to technology use and implementation of pedagogical skills in virtual classrooms," "how they handled the challenges they encounter," and "how they utilized technology." Researchers can gain a more thorough grasp of their research field by investigating phenomena from different viewpoints and using different research perspectives. All of these can be revealed by combining qualitative and quantitative data (Shorten & Smith, 2017). The research design for this study was also comparative and correlational because it seeks out how novice and experienced instructors use technology and some pedagogical skills in virtual classes differently, as well as how their subject field is related to their competency in using technology and pedagogical skills in online classrooms.

2.2. Context and Participants

At an English Preparatory School of a private university in Ankara, Turkey, the participants of the research are novice instructors with teaching experience ranging from 0 to 3 years, less experienced instructors with 4 to 7 years of teaching experience, experienced instructors with work experience varying from 8 to 11 years, and more experienced instructors with experience of over 11 years. The teachers that participated in this research varied in age from 22 to 65. The participants' educational backgrounds and genders differ, as well. They had 20 hours of sessions on Zoom that lasted 50 minutes. The study included 50 instructors. Since the data was gathered from teachers who were accessible to the researcher, the study uses a convenience sampling design to choose its sample size. Before collecting the data, the participants, who were chosen voluntarily, were informed about the study and given the opportunity to provide their consent through consent forms.

2.3. Instruments

Within the context of expert opinion, the researcher developed the questionnaire and interview questions that were used in the study. The required modifications have been made in light of the expert's feedback on the subject of ELT.

2.3.1. Structured Interview

Four novice instructors and four experienced instructors were interviewed face-to-face for nearly 10 minutes in an office setting. The study's goal and intended application were clearly explained to the participants prior to the meetings. They were also informed that

they might quit the study at any time without giving a reason. Pseudonyms were also used to inform them about the participants' confidentiality. Finally, their permission was obtained to record audio. A structured interview was utilized to increase the data's dependability. The researcher discussed the purpose of the interview without revealing too much about the study to prevent bias. To ensure the interview questions were pertinent and understandable to the participants, pilot research was conducted using them. One teacher's criticism led to the combining and simplifying of some questions.

2.3.2. Questionnaire

The researcher developed and made the appropriate edits to the questionnaire items following input from experts regarding them. The editing was merely done for simplification because there was no significant issue with the items' comprehension. The questionnaire's items were prepared using a standard four-point Likert scale, from strongly agree to strongly disagree, to obtain more precise answers by excluding the neutral response. There are a total of 18 items, all of which addressed the five research questions. Data from 50 instructors were gathered to examine how both novice and experienced teachers use technology in their classes, as well as how they employ pedagogical techniques including communicating with students and developing rapport, managing their classrooms and providing feedback on digital platforms. The questionnaire was also used to collect demographic data on the teachers, such as their academic backgrounds, teaching experience, and graduate degrees. The data was made more reliable because the questionnaire's items were used in a pilot study. As a result, some items were disregarded given that they were unclear or shared the same meaning as the other ones.

2.4. Data Collection and Analysis Procedures

Thematic content analysis was applied to the qualitative data to be examined. To start, the researcher meticulously hand-transcribed the audio tracks obtained from the interviews. Then, the most common and significant phrases in the transcribed verbatim were highlighted, and some critical notes were taken to classify the codes. The deductions were made more methodically and objectively as a result of conceptual analysis, which improves the validity and reliability of the data.

Descriptive statistics were employed to analyze the Likert scale to get a general impression of the sample. A t-test was performed to examine the quantitative data to determine the importance of the variations in group means. Since the study analyzes and contrasts the statistics of two different groups, an independent samples t-test was utilized by using the SPSS tool. The data were entered into the statistical software program Statistical Package for the Social Sciences to confirm and reveal frequencies and descriptive conclusions from the data (SPSS 25). Before using descriptive statistics, the data were verified for any null values. The Skewness-Kurtosis normality distribution test was used to determine the data's parametric or non-parametric status.

Table 1. Summary of the Methodology

Research Question	• **Instruments &** • **Data Collection Method &** • **Data Analysis**	• **Sample &** • **Number of Participants**
1. How do novice and experienced instructors use technology in virtual classrooms? How do they differ?	• Questionnaires, Interviews • Mixed Methods • Thematic Content Analysis and Descriptive Statistics	• University Preparatory School Instructors • 50
2. How do novice and experienced instructors use pedagogical skills in virtual classrooms? How do they differ?	• Questionnaires, Interviews • Mixed Methods • Thematic Content Analysis and Descriptive Statistics	• University Preparatory School Instructors • 50
3. What kind of problems do they have regarding technology and pedagogy in virtual classrooms?	• Interviews • Qualitative Research Method • Thematic Content Analysis	• University Preparatory School Instructors • 8
4. How do they overcome the problems regarding technology and pedagogy in virtual settings?	• Interviews • Qualitative Research Method • Thematic Content Analysis	• University Preparatory School Instructors • 8
5. What is the relationship between instructors' demographic information and their pedagogical and technological skills?	• Questionnaires • Quantitative Research Method • Descriptive Statistics	• University Preparatory School Instructors • 50

All in all, the first research question's data was gathered through both interview and questionnaire items that asked participants to rate their ability to integrate technology into their online instruction, their level of comfort and competence when using technology in virtual classrooms, their use of technology to teach language areas and skills online, as well as their ability to plan technology-based discussions for online classes, track their students' progress, and evaluate their knowledge or skills online. The information for the second research question was also acquired utilizing interviews and questionnaires that inquired participants to rate their proficiency in managing students, effectively communicating with students, developing relationships with students in virtual classrooms, and resolving issues relating to these issues. To address the third and fourth research questions, data was gathered through interviews. Participants were asked what issues concerning pedagogy and technology they had in virtual classes and how they overcame them. Data were collected through the questionnaire items on their demographic information to respond to the final research question.

3. Findings and Discussion

The results of the research are presented in this chapter. To examine respondents' answers to the items in the questionnaire, "descriptive" and "inferential" statistics were applied using Excel and the Statistical Package for the Social Sciences (SPSS 28) program. After the key results of the questionnaire were emphasized, the qualitative interview data was shown and reviewed using tables that included the codes designated for each category and the frequency of those codes. The discussion part is also discussed in the chapter by explaining the researcher's thoughts on the results of the study as well as reviewing the pertinent literature, with many researchers' varied viewpoints on the topic of instructors' use of technology and pedagogical skills in online classes.

RQ (1): How do novice and experienced instructors use technology in virtual classrooms? How do they differ?

According to the study's quantitative findings, the groups demonstrate similar patterns of technological skill utilization. The findings of the independent t-tests revealed, according to Levene's Test, that there is no substantial variation in how different experience groups use technological skills in virtual classrooms. It was unexpected and startling because the researcher had anticipated that novice instructors would be better at using technology in online classes than more experienced ones. Regarding the qualitative findings, when asked how they used technology in their daily lives, the instructors responded that they could use PCs, laptops, smartphones, and web tools. The instructors used their "smartphones" the most frequently in daily life. When asked to rate their level of comfort using technology in their daily life, every novice instructor gave a good response; yet, all experienced instructors, except one, gave a negative response. When it came to the teachers' opinions toward the use of technology in online classes, all of the answers given by novice participants were negative, in contrast to the replies given to the previous questions.

Similar unfavorable responses were given to this question by the experienced instructors, except one of them. When asked if technology was used to teach language skills and areas, the NPs most frequently stated that it was employed to teach "writing" abilities, particularly through using the "Padlet" platform. In a similar vein, experienced educators opted to emphasize teaching writing skills using technology. Just like the inexperienced educators, they all cited the website Padlet.

RQ (2): How do novice and experienced instructors use pedagogical skills in virtual classrooms? How do they differ? & RQ (3): What kind of problems do they have regarding technology and pedagogy in virtual classrooms? & RQ (4): How do they overcome the problems regarding technology and pedagogy in virtual settings?

The quantitative analysis indicated that there was no significant difference between novice and experienced teachers, even though experienced instructors were assumed to outperform in managing online classrooms based on their level of teaching experience. However, the qualitative outcomes supported the researcher's expectations. In short, it revealed that all the novice participants had difficulty retaining control of the lesson. The primary issues mentioned by them regarding classroom management included getting students to collaborate and keeping control over them throughout activities, managing students while they answered questions in online sessions, and making sure that students used cameras and were present. The challenges with classroom management were addressed by them through defining and reminding the rules, placing some restraints, punishing violators, and holding classroom discussions instead of separating the pupils into breakout rooms. In comparison to the novice group, the experienced teachers had superior control over the classroom. Like the issues NPs encountered, EPs brought up the instance of the student who couldn't even turn on their cameras. A few of them also had some trouble getting to the breakout rooms. One of the issues was the students getting involved in other activities outside of class. Experienced teachers stressed the value of adhering to the rules, and as a last alternative, they removed the students from the class. Lesson planning, maintaining the students' attention both physically and mentally, and grouping the students rather than partnering them up for breakout room activities are some methods recommended by experienced teachers to handle their courses. In this research, instructors' attitudes towards addressing these challenges support Wolff et al. (2015)'s analysis of how novice and experienced teachers view the concept of classroom management claiming that whereas novice teachers considered the term as something closely related to students' behavior and discipline, experienced teachers regarded as something quite associated to the pedagogical decisions teachers take to increase and maintain learning in the classroom. The results of the current study, however, contradict those of Sari's (2013) study, which argued that novice teachers are more compatible than more experienced educators who put emphasis on rules and orders in the classroom.

All the novice teachers gave negative answers to the question about online interaction, arguing that the biggest problem impeding interaction in online classrooms is students' reluctance to use their cameras and microphones and take part in the classes. The options

put forth by them included sending warning emails to the students, being stricter and notifying them of the rules, or else dismissing the offender from the session, beginning online lessons with traditional classroom strategies, and enforcing some restrictions and punishments. The main issue for the experienced teachers was with the pupils who weren't focusing enough on the lesson, attending to what the teacher was discussing, and using their cameras. Instead of student-to-student interaction, there was a teacher-to-student exchange. They recommended alerting the kids, explaining the rules to them, and employing a variety of games and approaches, such as asking questions, giving the students control, and choosing participants from a list of names.

Dewaele et al. (2018) discovered a positive correlation between student engagement levels and the pedagogical skills of experienced teachers regarding the teachers' engagement with students in online courses, and the qualitative results of the present study supported it showing that the novice instructors found maintaining their students' interest in online classes tough by emphasizing how challenging it was on online platforms. To tackle the problems with student engagement, they used strategies like pair and group work tasks like having discussions, specific tools like PPTs, and a range of websites to keep their students interested in online classrooms. Additionally, they used techniques like giving compelling examples and projecting a positive image to put students at peace and boost their engagement in sessions. On this matter, the experienced lecturers had differing opinions. Two of them were content with the circumstances, but the others ran into some issues. Few students paid attention even though teachers tried to get them interested in the material by including games, different platforms, and e-tools, as well as by using certain personal questions to establish a special connection. The results of the study conducted by Kocabaş and Bavl (2021) suggest that teachers' insufficient passion for technological illiteracy, absence of pedagogical competency and technological pedagogical knowledge, and inability to change their design for the online environment hinder student involvement in online courses. Even though the causes of certain teachers' problems with involvement and engagement were not quite evident, Kocabas and Bavl's research suggests that they may all be related.

Except for one participant who found it easier, the novice participants indicated their discontent with the online platform for giving feedback. They claimed that it was inefficient to provide feedback online. They chose two alternate techniques for giving feedback to address this problem: immediate feedback during the online course and delayed written feedback. With respect to the EPs, it was the opposite. All the EPs, except one, concurred that giving online feedback was easier and faster when utilizing e-tools including chat boxes, word documents, and breakout rooms. By pointing out that in online courses, students could access all written outcomes and feedback, they highlighted its effectiveness. One of them discussed how difficult it was to manage the classes during the feedback sessions and how giving feedback in breakout rooms worked better for written input than oral feedback. All the NPs gave positive feedback and appreciated the connections formed with the pupils through online platforms. The EPs dissented and offered a variety of responses. One of them stated both the advantages and disadvantages of online courses by

prioritizing the physical classrooms involving gestures and mimics, which supported Aoun's (2011) claim that it can sometimes be challenging or even impossible to recreate the interactions observed in a conventional classroom and Glazier's (2016) assertion that the online setting makes it hard to develop a relationship between the instructor and the students. However, the other one managed to forge a respectable rapport through private talks. The opinions of the other two teachers weren't positive. They used games and personal inquiries to relate the lesson's content to the students' lives as solutions. Ratliff (2018) confirmed the idea that rapport-building is still possible in online settings even when face-to-face interaction is not there. This notion was supported in this way by the experiences of two novice instructors and one veteran instructor. In this regard, the researcher's viewpoint resembles that of Rodrigues-Manzarenes (2012), who argued that while rapport may be quickly built between teachers and students in traditional settings, it requires more planning and work to achieve in online settings.

Regarding communicating with students in online classes, the quantitative results revealed that there are no statistically significant differences between instructors with different teaching experiences despite the observation of Simsek et al. (2020) exhibiting that instructors' communication skills improve with experience. Likewise, O'Conner (1998) reported that educators communicated at a substantially better level than less experienced ones.

RQ (5): What is the relationship between instructors' demographic information and their pedagogical and technological skills?

Regarding applying pedagogical skills involving online classroom management, communication, and rapport building, the results show that there was no great disparity between the instructors whose field was ELT and those who specialized in the other fields. However, there was a substantial difference between these groups with respect to the utilization of technology in online classrooms. In comparison to the instructors from the other departments, the ELT department's instructors were superior at using technology. Given that their courses centered on pedagogical abilities, it was believed that instructors having a bachelor's degree in ELT would do better in pedagogical aspects. Surprisingly, however, the ELT-trained teachers excelled only in the utilization of technology in online classes, not in the use of pedagogical abilities. Both the course "' Computer Education and Instructional Technologies" offered for the students in the Faculty of Education and "Instructional Technologies and Material Design" offered in the ELT department may have had a good impact on the lecturers. Additionally, it's possible that individual talent variations caused this disparity.

4. Conclusions and Pedagogical Implications

The initial aim of this study was to examine how diverse teaching backgrounds of instructors use technology and implement pedagogical skills in virtual classrooms. The second goal was to determine the challenges that teachers had while utilizing technology

and exploiting pedagogical skills and how they dealt with them in online settings. The study's last focus was on the relationship between the instructors' expertise in technology use and pedagogical skills implementation in online classrooms and their subject fields. The study's overall goal was to assess the technological and pedagogical abilities of the instructors with various teaching backgrounds and to determine the strategies they used to address the challenges caused by these problems in online courses.

The quantitative data revealed that there were no significant differences among the instructors based on their teaching experience in terms of using technology and pedagogical skills in online classrooms. However, the instructors who were from the ELT department differed from the other experience groups by performing much better in using technology online, which means the subject field was determinant.

The qualitative data showed the main differences between novice and experienced instructors regarding online technology use, and pedagogical skills utilization by focusing on the issues they encountered during the online sessions in detail. With respect to technology use online, considering their greater involvement and exposure to technology given the period in which they were raised, it was anticipated that novice instructors would not have any challenges with the usage of technology in online classes. However, both novice and experienced instructors found it compelling. In particular, the experienced participants struggled with technology use due to a lack of expertise, whereas the novice participants faced technical concerns.

Similar to this, Banerjee and Waxman (2017) noted that despite their expectation that new instructors would be tech-savvy given their youth, a different study revealed that even they found it hard to incorporate technology into their teaching methods. Ertmer (1999) proposed that there are internal and external obstacles to ICT integration, while Johnson et al. (2016) investigated the difficulties of applying technology under the headings of internal and external constraints. These issues relate to the types of issues instructors confront.

In a similar vein, this study demonstrated that while novice instructors faced external challenges like technological difficulties, some experienced educators faced internal challenges including a lack of proficiency with technology. Dinh (2009) asserted in his study that an experienced instructor was incompetent in the use of technology, and this led some institutions to draw the conclusion that they do not effectively support professional development. Therefore, the present study, in accordance with Dinh's study, underlined that preservice and in-service training in technology-enhanced teaching pedagogies and fundamental technical competencies should be provided to teachers and candidates for teachers.

The qualitative results discovered some significant differences in how online classroom management was carried out. According to the findings, novice instructors had more difficulty managing online classrooms than experienced ones in terms of the issues such as

leading students while they replied to questions in online courses, keeping students under control while they were involved in activities, making certain that learners used cameras and were physically present.

Based on the qualitative findings, both novice and experienced instructors struggled with certain aspects of interaction and engagement in online platforms. All the novice teachers stated the key concern impeding interaction in online classrooms was students' reluctance to switch on their cameras and microphones and take an interest in the classes. The main issue for the experienced teachers was with the pupils who weren't focusing on the lecture, attending to what the instructor was stating, and using their cameras. Consequently, there was mostly teacher-to-student interaction in online classes. As to engagement, the main issues were related to the challenge of keeping students' interest and focus on materials and the online lesson itself.

When it came to giving feedback, novice participants indicated their frustration with the online platform, however experienced participants claimed that doing so online was simpler and faster than doing it in face-to-face classes. While there were two adverse comments from the EPs who claimed they had weak bonds with students, all the NPs reacted positively, valuing the development of bonds with the pupils through online platforms.

The results have some pedagogical implications for teachers with various backgrounds in the classroom. To teach future English teachers how to employ technology for online language instruction, policymakers and the government may develop a course. The creation of in-service education programs on the use of technology for online language learning by authorities and lawmakers is feasible. The internship training duration may be prolonged since offering novice instructors more in-person classroom exposure will help them develop as teachers and widen their experience there. Universities can conduct research on already present online platforms and tools by holding conferences to train instructors about the online tools available to help them interact and communicate with their pupils. Coaching in providing constructive feedback in both online and conventional face-to-face situations can be a cornerstone of preservice education. Instructors should be aware that every method for engaging and interacting with learners in person may be applied in online classrooms, rather than perceiving the scarcity of gestures and mimicry as a restriction on the online platform. There should be courses in every field's curriculum that foster using and integration of technology.

Regarding the study's limitations, it was carried out in Turkey with a limited sample size, making it challenging to extrapolate the findings to the full population. Due to their workload, it was difficult to schedule each instructor's interview and observation time. However, the solutions shared in this research by the instructors at various levels of experience may highlight the key pedagogical and technological skills needed in virtual

environments. As a result, the findings presented here might be useful to academics studying educational technology now and in the future.

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