OPEN PRAXIS

# Integrating Design-Based Learning and Mentoring Strategies into a Professional Development Program for Distance Education Instructors

RESEARCH ARTICLE

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## ABSTRACT

This study evaluates the effectiveness of the professional development program designed for distance education instructors, in which design-based learning and mentoring strategies are implemented consecutively. Eight university instructors from the same university in Turkey with one year of experience in online teaching participated in the study. The study first conducted a needs analysis, that revealed that the instructors were not accustomed to student-centered instructional methods, and they maintained direct instruction in their online courses. Moreover, the instructors' technology integration understanding was inadequate, and they were generally concerned about the students' low participation in online classes. Considering these findings, the professional development program was designed for the instructors who first joined a one-week design-based learning training and then attended mentorship for two weeks. The findings indicated that this approach was effective for the instructors' professional development. The implications of this approach and suggestions for professional development programs were discussed based on the findings.



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**KEYWORDS:**

design-based learning; distance education instructor; instructional design; mentorship; online teaching; professional development

**TO CITE THIS ARTICLE:**

Kayaduman, H. (2022). Integrating Design-based Learning and Mentoring Strategies into a Professional Development Program for Distance Education Instructors. *Open Praxis*, *14*(1), pp. 54–67. DOI: https://doi.org/10.55982/openpraxis.14.1.139

DOI: 10.55982/
openpraxis.14.1.139

## INTRODUCTION

Rapid developments in technology and learning sciences offer new technological tools and instructional methods and strategies for educational environments. Accordingly, education institutions change their models of delivering courses considering the circumstances of the digital era. Online campuses, certificate programs or courses are becoming widespread among people because they offer opportunities such as increasing access to learning, improving cost-effectiveness, providing personalized learning, or updating skills needed for a profession (Moore & Kearsley, 2011). Thus, the number of students enrolling in distance education programs is rapidly rising (Kim & Bonk, 2006). With the Covid-19 pandemic, education institutions moved their implementations online due to the lockdown procedures applied by countries to hinder the spread of the virus (Bozkurt et al., 2020; Bozkurt & Sharma, 2020; Crawford et al., 2020). This further increased the number of online students and augmented the importance of distance education practices.

Considering the widespread of distance education applications, the instructors play a critical role due to their responsibilities and they need to have a set of skills (Bawane & Spector, 2009; Beaudoin, 1990; Dabbagh & Bannan-Ritland, 2005; Egan & Akdere, 2005) and implement various practices (Baran, Correia, & Thompson, 2013) for effective online teaching. Although educational institutions are increasingly adopting distance education, the instructors' adaptations have been slow and limited (Natriello, 2005). Thus, the instructors experience various concerns as they switch from the face to face education to the distance one (Kayaduman & Demirel, 2019). With the Covid-19 pandemic, the instructors' concerns and challenges in the process of emergency remote education became even more evident since they compulsorily switched to distance education in a short time (Kayaduman & Battal, 2021; Bozkurt et al., 2020; Crawford et al., 2020). The research studies expressed that one of the most important reasons for the instructors' limited understanding of distance education before and during the Covid-19 pandemic were the lack of online teaching pedagogy (Kayaduman & Battal, 2021; Bao, 2020; Cutri, Mena, & Whiting, 2020) and correspondingly the persistence of maintaining traditional instructional methods in their online courses (Kreber & Kanuka, 2006; Roy & Boboc, 2016). At this point, professional development (PD) programs can help instructors to obtain the necessary knowledge and skills. Therefore, designing and implementing effective programs to facilitate the instructors' adaptation to distance education and to improve their PD is critical to yield more successful and sustainable online teaching practices.

## LITERATURE REVIEW

The PD programs are vital to helping the instructors produce high-quality online teaching (Adnan, Kalelioglu, & Gulbahar, 2017; Rosenberg, 2007; Signer, 2008; Stein, Shephard, & Harris, 2011). However, approaches to the PD programs before and during the Covid-19 pandemic are generally based on one-time training or workshops, which made few contributions to the instructors' PD (Kayaduman & Battal, 2021; Bickerstaff & Cormier, 2015; Bozkurt et al., 2020; Flint, Zisook, & Fisher, 2011). Hung and Yeh (2013) stated that there is a paradigm shift in instructors' learning. Accordingly, the PD programs should consider the instructors' needs and integrate student-centered pedagogies to let them reexamine their pedagogy and content knowledge in student and learning contexts (Baran, 2018; Ng, 2015; van As, 2018). Therefore, investigating the different PD strategies that can contribute to the instructors' effective online teaching practices is critical.

There are different strategies in the literature for designing effective PD programs. Design-based learning (DBL) and mentoring are two strategies that produced positive results for effective technology integration in different contexts (Alemdag, Cevikbas, & Baran, 2019; Kayaduman & Delialioglu, 2017; Baran, 2016; Koehler et al., 2004). The DBL strategy is one of the common practices in both preservice and in-service teacher education. In DBL activities, the instructors work collaboratively to solve authentic problems and design artifacts to reach the instructional goals and objectives (Koehler et al., 2011). The instructors can discover the complex relationships of technology, pedagogy, and content knowledge by engaging with design activities (Koehler et al., 2004). Furthermore, DBL activities can contribute to technology integration skills (Alayyar, 2011), self-efficacy beliefs (Kayaduman & Delialioglu, 2017), instructors' technological pedagogical content knowledge, and PD (Alemdag et al., 2019; Ansyari, 2015). Therefore, the

DBL strategy can be used in PD programs to examine learners' needs, solve authentic problems, and learn new technologies for effective online teaching (Baran, 2018).

In addition to the DBL strategy, the mentoring program is also an effective strategy to support the instructors' PD. In mentoring programs, mentors provide customized and contextual support to the mentees' needs (Baran, 2018), and this could be conducted online or face to face (Gabriel & Kaufield, 2008). Several mentoring models have been adopted in higher education to support the instructors' PD. They have some common characteristics, such as providing a vision for effective technology integration, fulfilling technical needs, forming learning communities, and collaborative relationships (Chuang, Thompson, & Schmidt, 2003). There are many benefits of mentoring programs reported in the literature. These benefits are a deep understanding of technology integration in education, increased confidence in using technology, professional growth, and improved teaching practices (Chuang et al., 2003; Gabriel & Kaufield, 2008; Kram & Isabella, 1985). Although the mentoring strategy provides more customized and contextual support (Baran, 2018) for instructors, it has similar contributions to the instructors as in the DBL strategy. Hence, there is a potential that the mentoring strategy can encourage instructors to put the activities learned in the DBL strategy into the actual practices and subsequently facilitate their adaptations to distance education. However, the research studies using these two strategies together to support instructors' PD are relatively rare. Therefore, integrating DBL and mentoring strategies into a single PD program and investigating their possible effects in the context of distance education is a critical area of research for the PD of the instructors.

### THEORETICAL FRAMEWORK

Technological pedagogical content knowledge (TPACK) is one of the prominent frameworks in education which emphasizes the combination of technology, pedagogy, and content knowledge (Mishra & Koehler, 2006). The knowledge domains proposed by the TPACK framework are technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK), technological content knowledge (TCK), pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), and technological, pedagogical and content knowledge (TPACK) (Mishra & Koehler, 2006). While the PCK expresses the knowledge of applying suitable instructional methods to particular content, the TCK states the understanding of transforming content with technology (Mishra & Koehler, 2006). The TPK implies the understanding of enhancing the effects of instructional methods with the help of technology (Mishra & Koehler, 2006), while the TPACK refers to the knowledge of integrating technology, pedagogy, and content within the given context to provide effective teaching (Mishra & Koehler, 2006).

Some research studies have used the TPACK framework to understand the instructors' PD. For example, Young et al. (2019) evaluated the effects of the PD program for mathematics teachers using the TPACK framework. Ansyari (2015) benefitted from the TPACK framework to evaluate the effectiveness of a PD program designed for English language teachers. Alemdag et al. (2019) used the TPACK framework to understand the PD of teachers working in a public education center. Considering that, the present study integrated the TPACK framework into the PD program to support distance education instructors.

## PURPOSE OF THE STUDY

The aim of the present study is to evaluate the effectiveness of the professional development program designed for distance education instructors, in which design-based learning and mentoring strategies are implemented consecutively. While the findings of needs analysis formed the DBL-based training, the topics of the DBL-based training guided the mentorship. The present study addressed the following research questions.

1. How did the design-based learning strategy implemented in the professional development program contribute to distance education instructors?
2. How did the mentoring strategy which was implemented after the design-based learning strategy in the professional development program contribute to distance education instructors?

## METHOD

The present research is a case study (Merriam, 1998) in which a specific program was designed and implemented to support the PD of distance education instructors just before the Covid-19 pandemic. The reason for conducting a case study methodology is to provide an in-depth analysis of the specific topic. The research is based on the qualitative data obtained from individual interviews to evaluate the effectiveness of the designed PD from the perspectives of distance education instructors.

### PARTICIPANTS

The participants included in the present study are instructors from the same university in Turkey. The university is a developing university that has been established to conduct face-to-face education and has almost ten thousand students from different fields. All students in the university take the common courses online which are Turkish Philology, English Language, and the Revolution of the Turkish Republic. The instructors and Distance Education Center's primary responsibility is to conduct these online courses. Two of the instructors teach Turkish Philology courses, three teach English Language courses, and three teach History of the Revolution of the Turkish Republic courses. While seven instructors have master's degrees in their fields, one of them has a bachelor's degree. The instructors' face to face teaching experiences range from 3 to 33 years, and they have been conducting their courses via distance education for a year. There is no special support department for the instructors in the university's Distance Education Center, but the instructors can receive support upon request. The participants attended the PD activities as an invitation of the Distance Education Center, however, they voluntarily participated in the interviews and the questionnaire. While all instructors in the Distance Education Center attended the program, any other instructors did not participate. The instructors have computers and smartphones connected to the internet, and they use them for both job and personal purposes. Table 1 illustrates the characteristics of the instructors.

| FIELD | GENDER | AGE | FACE-TO-FACE TEACHING EXPERIENCE | ONLINE TEACHING EXPERIENCE |
|---|---|---|---|---|
| English Language | M | 32 | 3 | 1 |
| English Language | M | 44 | 20 | 1 |
| English Language | M | 47 | 22 | 1 |
| Turkish Philology | M | 39 | 6 | 1 |
| Turkish Philology | M | 46 | 24 | 1 |
| The history of the revolution of the Turkish Republic | M | 39 | 6 | 1 |
| The history of the revolution of the Turkish Republic | F | 39 | 12 | 1 |
| The history of the revolution of the Turkish Republic | M | 57 | 33 | 1 |

**Table 1** The Instructors' Characteristics.

*Note*: The age and teaching experience are represented in years. M = male, F = female.

### PROCEDURE

A needs analysis was carried out before the design and implementation of the PD program for the distance education instructors. Following that, the PD program was designed based on DBL and mentoring strategies. While the DBL strategy was implemented in five days of training (three hours a day), the mentoring strategy was conducted for two weeks (one hour a week). The instructors took the mentoring sessions as a group based on their fields. The researcher carried out both strategies as an expert holding a Ph.D. in Educational Technology.

### INSTRUMENTS

Individual Interviews. The researcher designed two individual interview protocols. While the first interview was for the needs analysis to reveal the current practices of the instructors regarding face-to-face and online education, the second interview was to evaluate the effectiveness of the PD program from the instructors' perspectives. The first interview included questions about

how they generally teach topics in their courses, which instructional methods and strategies are most appropriate for them, which digital technologies they benefit to lecture, whether there is a change in their instructional methods after teaching online, and the most concerning situation for them while teaching online. The second interview included questions about how the instructors found the PD program, how it contributed to their knowledge in distance education, unnecessary parts of the program, and recommendations for program improvement. All instructors took part in both interviews. Two experts holding PhDs in Educational Technology reviewed and finalized the questions.

Questionnaire. The researcher designed an online questionnaire that consisted of demographic questions and self-reported competence in using technology. The demographic part included questions regarding the field, gender, age, education level, face to face teaching experience, online teaching experience, computer and smartphone ownership status, and the purpose of using computers and smartphones. The following part included questions about the instructors' self-reported competence in using technology.

### DATA ANALYSIS

The researcher pursued the content analysis procedures to understand the essence of the qualitative data (Miles & Huberman, 1994; Yıldırım & Simsek, 2013). Themes and sub-themes were not previously categorized and emerged from the data. First, the researcher transcribed the interview data verbatim and developed the initial themes. Then, the researcher pursued data reduction, data display, and conclusion drawing/verification steps. Two experts holding a Ph.D. in Educational Technology reviewed the themes, processed the data, and discussed the findings with the researcher. Consequently, the inter-coder reliability score was found appropriate (88%) using the below formula (Miles & Huberman, 1994).

$$\text{Reliability} = \frac{\text{Number of agreements}}{\text{Number of agreements+Number of disagreements}}$$

### VALIDITY AND RELIABILITY

The researcher applied different strategies to provide a valid and reliable research study. The researcher first explained the reasons for employing the case study, the participants' characteristics, the detailed procedure of the study, and instruments for the transferability of the study. Second, the instructors voluntarily participated in the present study, which helped ensure the study's credibility. Third, the researcher kept the data for confirmability and gave direct quotations in the present manuscript. Lastly, the experts holding a Ph.D. in Educational Technology checked the data's accuracy, examined if the data conforms with findings, and reviewed the consistency of the findings and conclusion of the study.

## NEEDS ANALYSIS

To conduct a needs analysis, the researcher first carried out an online questionnaire and then conducted individual interviews. The online questionnaire included self-reported questions about the instructors' competencies in using technology. Table 2 summarizes the findings from the questionnaire.

After the online questionnaire, the researcher conducted individual interviews with all instructors to determine the specific needs for distance education. Table 3 summarizes the findings. In the table, while n represents the number of instructors, f represents the frequency of data excerpts. E.g; if an instructor states a situation twice at different times of the interview, n becomes 1, and f becomes 2. According to the findings, there are two main themes: face-to-face and distance education. Regarding the face-to-face education theme, there are two sub-themes: implemented technologies and applied instructional methods and techniques. The sub-themes regarding distance education, on the other hand, were the situation that most concerned the instructors and applied instructional methods and techniques. Moreover, the instructors mostly implemented the direct instruction method enhanced by question-answer or discussion in their face to face teachings. They also used presentation tools such as PowerPoint and projectors to support their teaching. Consequently, the instructors maintained their direct

| COMPETENCE | *N* | *%* |
|---|---|---|
| Creating PowerPoint presentations | 7 | 87,5 |
| Creating PDF files | 7 | 87,5 |
| Creating Word documents | 7 | 87,5 |
| Attending Webinars | 6 | 75 |
| Assigning online homework | 4 | 50 |
| Creating video material | 3 | 37,5 |
| Creating a quiz or poll | 3 | 37,5 |
| Creating a concept map or infographic | 2 | 25 |
| Attending online forums | 2 | 25 |
| Creating audio files | 1 | 12,5 |

**Table 2** The Instructors' Self-Reported Competence of Using Technology.

*Note*: n = Number of instructors.

| MAIN THEMES | SUB-THEMES | | *n* | *f* |
|---|---|---|---|---|
| Face to Face Education | Implemented Technologies | Presentation Tools | 5 | 7 |
| | | Miscellaneous learning materials | 1 | 1 |
| | Applied Instructional Methods and Techniques | Direct Instruction enhanced by question-answer or discussion | 7 | 11 |
| | | Activity-based learning | 1 | 2 |
| Distance Education | The most concerned situation for instructors | Student Participation | 5 | 8 |
| | | Interaction problem with students | 4 | 4 |
| | | Technical Competency | 2 | 2 |
| | Applied Instructional Methods and Techniques | Online Direct Instruction | 6 | 7 |

**Table 3** The Findings of Individuals Interviews for Needs Analysis.

*Note*: n = number of instructors, f = frequency of data excerpts.

instruction method as online when they switched to distance education. One instructor (I1) explained:

> I did not have a radical change. I did almost the same thing. I mean the presentation. The change was because there were no questions and answers parts since we could not interact with the students. Apart from that, it was almost the same.

The instructors also expressed the low participation of students in online classes as their biggest concern in distance education. Moreover, they stated that they could not enhance the instructions with question-answer or discussion strategies due to the low engagement of the students. One instructor (I2) pointed out:

> There was a dramatic drop in the participation of students; hence, the question-answer part disappeared. Student eye contact has disappeared. I cannot measure whether the student understands the subject at that moment. Therefore, I cannot go beyond direct instruction.

All in all, one can conclude that the instructors have a tendency toward direct instruction in their teachings, and they maintain it to conduct their courses in distance education. The technologies they utilized are limited to presentation tools, and their understanding of TPACK is inadequate. Furthermore, the instructors mostly do not implement student-centered approaches and are concerned about the low participation of students in their online teachings. Considering these findings, the researcher designed and developed the following program to improve the instructors' capabilities and understandings for effective online teaching and technology integration in education.

## DESIGN AND IMPLEMENTATION

The program was designed based on the needs analysis findings, and the TPACK and DBL strategy formed the basis of this program. The reason behind utilizing TPACK in this study, it is one of the prominent frameworks in the literature that can contribute to instructors' PD (Mishra & Koehler, 2006), and DBL is one of the most effective methods that can increase instructors' TPACK understanding (Alemdag et al., 2019; Baran, 2016). In this direction, the first topics of the training were chosen about effective technology integration in education since the instructors' understanding is limited to presentation tools. The TPACK framework and student-centered instructional methods and techniques were additionally elaborated because the instructors mostly apply direct instruction methods in their face-to-face and distance education courses. Following that, some web tools and the features of the university's LMS were indicated to increase the instructor's knowledge and skills in developing digital content and learning activity. Finally, a lesson plan design activity was conducted as a component of the DBL strategy to enable instructors to put all knowledge and skills into action. The training was carried out face-to-face before the semester started and took five days (three hours a day). Table 4 illustrates the components of the training.

**Table 4** The Components of the Training.

| DAY | TOPICS | APPLIED INSTRUCTIONAL METHOD |
|---|---|---|
| 1 | Effective Technology Integration in Education | Presentation and Discussion |
| 2 | Technological Pedagogical Content Knowledge (TPACK)<br>Instructional Methods and Techniques | Presentation and Discussion |
| 3 | Web Tools | Hands-on Practices |
| 4 | Learning Management System (LMS) | Hands-on Practices |
| 5 | Lesson Plan Design | Design-based Learning |

The description and features of technology and web tools, advantages of using technology, and how technology can facilitate learning and teaching topics were presented and discussed on the first day of the training. On the second day, student-centered instructional methods and techniques and the TPACK framework were introduced and discussed with the instructors. On the third day, the web tools (Kahoot, Bubbl.us, Quizlet, Canva, Google Documents) were demonstrated to the instructors, and they examined the affordances and limitations of these tools by hands-on practice. In addition, videos on how to use these web tools were also provided to the instructors. On the fourth day, the features of the university's LMS that they use for their online courses were demonstrated to the instructors, and they explored the features by hands-on practice. The primary purpose of these four days was to prepare the instructors for the design activities. Therefore, on the fifth day, the instructors designed lesson plans based on a guided template by considering the TPACK framework and the topics covered in the scope of the training. The instructors were grouped based on their major fields for the design activities. After the instructors completed the lesson plan designs, they discussed them.

Upon the completion of one-week training, the instructors designed their courses and started to conduct them online by considering the activities that they learned in the context of the DBL strategy. Following that, the instructors attended face-to-face mentoring sessions for the first two weeks of the semester. Each mentoring session was scheduled beforehand and took one hour. The instructors joined these sessions as a group from the same field. As the mentor holding a Ph.D. in Educational Technology and being experienced with online course pedagogy, the researcher guided the instructors on how to improve their current practices and implement more student-centered approaches in their courses in line with the topics of the DBL-based training. In addition, the mentor provided technical support for the web tools, and LMS covered in the DBL-based training if an instructor needed it.

After the mentoring sessions were completed, the researcher conducted individual interviews about the effectiveness of these two strategies and their possible effects on the current practices.

# FINDINGS

## CONTRIBUTION OF DESIGN-BASED LEARNING STRATEGY

To find out the first research question, the researcher conducted individual interviews with all instructors after the PD program was completed. Table 5 summarizes the findings regarding the instructors' opinions for DBL activities.

**Table 5** Instructors' opinions about DBL Activities.

*Note*: n = number of instructors, f = frequency of data excerpts.

| INSTRUCTORS' OPINIONS | | *n* | *f* |
|---|---|---|---|
| Benefits | Learning the student-centered approaches | 7 | 13 |
| | Learning web tools to be used for courses | 6 | 12 |
| | Gaining the TPACK perspective | 5 | 8 |
| | Increasing self-efficacy to integrate technology | 3 | 3 |
| Recommendations | Requesting continuous training | 5 | 7 |
| | Accessibility of the learning materials for future usage | 2 | 2 |

According to the findings, the instructors found the DBL activities very beneficial for their PD in distance education. Moreover, the instructors (n = 7, f = 13) expressed that DBL activities facilitated learning student-centered approaches that can be conducted in online courses. One instructor (I5) expressed:

> We are now making students more active by using technologies that we did not know before. We are trying to create student-centered education by adding different activities such as questions related to the topic of the week at the end of the lesson.

The instructor (n = 6, f = 12) also stated that the DBL activities helped them learn new technological tools to be used for their instructions. One instructor (I1) articulated:

> I have learned new technologies that I can use, such as Quizlet and Kahoot. Then, we explored programs like buble.us that we can use while preparing presentations... I knew that I had some deficiencies [when it came to] technology, but I thought I was using it well. But after this activity, I realized that I do not use it enough.

According to the findings, most of the instructors (n = 5, f = 8) gained the TPACK perspective as a result of attending DBL activities. One instructor (I2) said:

> We had the habit of using content and pedagogy knowledge at the same time. Now it has been very useful for me to integrate technology into this. That is, there were two components in the past, but now there are three components. Therefore, I think that it has been very good to integrate technology into instructions.

Lastly, some instructors (n = 3, f = 3) said that attending DBL activities increased their self-efficacy to integrate technology into their courses. One instructor (I8) stated:

> This increased our confidence. That is, I did not add any questions to the system last year, but now I can add them very easily. We did not use bubble.us or Kahoot for our course topics before, but we will use them from now on.

Besides, the instructors requested the learning materials such as the presentation files, videos, or activity sheets covered in the scope of the DBL activities for future usage. Consequently, they asked for a web portal to access the materials when they want to repeat something or need them. One instructor (I2) stated:

> These materials can be gathered in an online portal... The instructor can get support but it is not always possible. Therefore, if there is a portal like this, the instructors can take a look when they are stuck...

The instructors also requested continuous training to update their knowledge and be informed about new technologies. One instructor (I2) pointed out that "...Next year, this training should be repeated, and innovations or new technological developments should be given..."

In summary, the instructors especially learned new technological tools and the implementation of student-centered approaches for their online courses as a result of attending one-week training based on DBL activities. They also gained the TPACK perspective by integrating technology components into their content and pedagogy knowledge and increased their self-efficacy for technology integration. Finally, while they requested continuous training to keep themselves updated and informed about new technological tools, they also wanted to access the learning materials utilized in the scope of the training.

### CONTRIBUTION OF MENTORING STRATEGY

To find out the second research question, individual interviews were conducted after the PD program was completed. Table 6 illustrates the findings regarding the instructors' opinions for the mentoring sessions.

| INSTRUCTORS' OPINIONS | *n* | *f* |
|---|---|---|
| Receiving support to use web tools | 4 | 5 |
| Receiving feedback on the actual implementations of the design activities | 3 | 4 |
| Receiving mentoring upon request | 3 | 4 |
| Implementing the mentoring program continuously | 2 | 2 |

**Table 6** Instructors' opinions about Mentoring Sessions.

*Note*: n = number of instructors, f = frequency of data excerpts.

According to the findings, the instructors found the mentoring sessions very supportive for their PD, and they found opportunities to receive support and feedback on their actual practices. Furthermore, the instructors (n = 4, f = 5) mostly expressed that the mentoring sessions provided opportunities to receive support on using web tools in action after they explored them in training. One instructor (I1) expressed:

> It is one of the most beneficial things in the program. We were able to ask you what we could not do on the system. For example, you are preparing a quiz and cannot manage to add an image or a word. There was someone to help. This was very useful.

The instructors (n = 3, f = 4) pointed out for the mentoring program that they received feedback and guidance on the actual implementations of their online courses after the training. One instructor (I5) articulated:

> We received feedback on what we have done or what parts of the implementation could be improved, or how we can make students more active. That is, the theoretical part of this work became practical.

Besides, the instructors also noted the importance of continuity of the mentoring program. While some of the instructors (n = 3, f = 4) wanted to take mentoring sessions upon their request, the others (n = 2, f = 2) asked for the implementation of the mentoring program continuously to receive support and feedback on their implementations. One instructor (I6) articulated that "Mentoring should be demanded and responded upon request without any hesitation". Another instructor (I1) stated that "This mentoring program can be provided throughout the year".

In summary, the instructors found the mentoring sessions very supportive for their PD. Moreover, the instructors put the activities that they learned in the DBL-based training into practice and receive guidance and support on their actual practices with the mentoring program. As the instructors found the mentoring program beneficial, they requested that the program should be implemented continuously or delivered upon request.

## DISCUSSION

The present study evaluated the effectiveness of the PD program designed for distance education instructors, in which DBL and mentoring strategies were implemented consecutively. The researcher first conducted a needs analysis because considering the contextual factors

and the instructors' needs before designing and implementing PD programs could be critical for its effectiveness (Alemdag et al., 2019; Ng, 2015). The needs analysis findings indicated that the instructors are not accustomed to student-centered instructional methods and strategies and continue to apply direct instruction methods in their online courses. The findings further revealed that the instructors' understanding of technology integration is inadequate, and they are generally concerned about the low participation of students in online classes. The research studies in the literature express that the instructors' implementation of traditional instructional methods in distance education is one of the most important reasons why their acceptance and involvement with online teaching is slow and limited (Kreber & Kanuka, 2006; Roy & Boboc, 2016). Kayaduman and Demirel (2019) suggested considering the TPACK framework while designing training for distance education instructors to let them learn technological tools and how to support instructional activities with these tools. Thus, in the present study, the researcher considered the student-centered instructional methods and strategies and technological tools that can support these methods and strategies under the TPACK framework while designing the PD program to facilitate the instructors' involvement in online teaching.

Based on the needs analysis findings, the researcher first designed and implemented five days of training during which the instructors engaged in discussions, hands-on practices, and collaborative design activities in the context of the DBL strategy. The DBL strategy was utilized because it is one of the effective methods to provide a TPACK perspective to the participants (Alemdag et al., 2019; Baran & Uygun, 2016). The study's overall findings indicated that the DBL strategy was very supportive for the distance education instructors' PD. More specifically, while most of the instructors learned new web tools and student-centered instructional methods and strategies that can be applied in online courses, some also gained an understanding of the TPACK and increased technology integration self-efficacy. Although the DBL strategy has been applied in different contexts and provided positive results similar to the current study (Alayyar, 2011; Alemdag et al., 2019; Ansyari, 2015; Kayaduman & Delialioglu, 2017; Baran & Uygun, 2016), the research studies utilized the DBL strategy to support distance education instructors are relatively rare. Therefore, the current study provided evidence from the perspectives of distance education instructors and contributed to this knowledge pool. Furthermore, distance education instructors need to have a set of skills and knowledge to implement effective online teaching (Baran et al., 2013; Bawane & Spector, 2009; Egan & Akdere, 2005). In that regard, PD programs should provide opportunities to instructors so that they can reexamine their pedagogy and content knowledge in the context of student and learning (Baran, 2018; Ng, 2015). Considering the findings of the current study, implementing the DBL strategy in a PD program to support distance education instructors can help instructors reconsider their pedagogical understanding.

Following the DBL-based training, the instructors designed their courses and then conducted them online. Chuang et al. (2003) state that it is difficult to provide specific content to each subject field in training involving instructors from different branches since every field has its ways to integrate technology. Accordingly, they emphasized the importance of providing mentorship to the instructors. Hence, as a continuation of the PD program, the instructors attended mentoring sessions for two weeks and received guidance and support in line with the topics of the DBL-based training. According to the findings, the instructors found the mentorship assistive, and they improved their actual practices. Rogers (2003) pointed out that applying innovation and seeing the consequences of the implementation can facilitate people's adaptation to innovation. Hence, the continuation of the PD program with mentorship and designing its topics in accordance with DBL-based training can drive the instructors to apply the knowledge they acquired from the DBL-based training and see its consequences. Moreover, mentorship can enhance the consequences of the instructors' implementations by providing guidance and support on the instructors' actual practices. Therefore, integrating DBL-based training and mentorship strategies into a single PD program and implementing them sequentially can improve the PD of distance education instructors.

On the other hand, the findings indicated that many instructors requested continuous training and mentorship to keep themselves up to date and receive guidance and support. Sustaining the PD programs could be critical since the distance education instructors might have several concerns and challenges regarding their implementations, especially during the Covid-19 process (Kayaduman & Demirel, 2019; Kayaduman & Battal, 2021). Their successful adaptation to online

environments requires systematic and continuous efforts (Baran, 2018). At this point, Gabriel and Kaufield (2008) emphasize the importance of the institutions' commitment and vision for the sustainability of these types of programs. Therefore, it is essential that universities or educational institutions have a vision that continually supports their instructors through PD programs.

## CONCLUSION AND IMPLICATIONS

The present study has several implications to better understand the components of the PD programs for distance education instructors. The study first conducted a needs analysis to determine the instructors' needs and designed the PD program in which DBL and mentoring strategies were carried out consecutively. Conducting a needs analysis was critical for the effectiveness of the PD program (Alemdag et al., 2019; Ng, 2015). As a result of attending DBL activities constructed by the needs analysis's findings, the instructors learned web tools and student-centered instructional methods and strategies for their online courses, gained a TPACK perspective, and increased self-efficacy for technology integration. Therefore, constructing the design activities based on the need analysis's findings can facilitate the implementation of effective online practices by increasing instructors' knowledge and skills.

In the present study, the instructors first joined a one-week DBL-based training before designing their online courses and then attended the mentorship program after implementing their online courses. In other words, while the instructors learned activities to improve their online courses with the DBL-based training, they had the opportunity to receive guidance and support on their actual implementations with mentorship. That is, the present study carried out a mentorship program to complement the DBL strategy. The findings indicated that this approach was effective for the PD of distance education instructors since they could associate what they learned in the program with actual teaching practices and consequently receive technical and pedagogical guidance and support. Therefore, utilizing the DBL and mentoring strategies in the same PD program and implementing them consecutively can further contribute to the PD of distance education instructors and facilitate their adaptation to distance education. Thus, the challenges with the instructors' acceptance and involvement in online teaching (Kayaduman & Demirel, 2019; Kayaduman & Battal, 2021; Kreber & Kanuka, 2006; Roy & Boboc, 2016) can be overcome to some extent with the help of this strategy.

Considering the increase in the number of teachers that are teaching remotely (Bao, 2020; Bozkurt et al., 2020) and their weaknesses in online teaching pedagogy (Kayaduman & Battal, 2021) in the Covid-19 times, the present study can provide a guideline for instructional designers, researchers, educational planners, or administrators to design and develop effective PD programs for distance education instructors. They could promote the distance education instructors' PD through the development of programs in which the needs analysis forms the DBL-based training, and the topics of the DBL-based training guide the mentorship.

## LIMITATIONS AND FUTURE RESEARCH

Although the present study has provided rich data and answered the research questions at hand, future studies are needed to address the limitations and to gain a broader perspective on designing PD programs for distance education instructors. First, the present study includes a small sample of eight distance education instructors from a developing university in Turkey. Hence, the instructors' characteristics and small sample size should be considered when interpreting the findings. Future studies should form a larger sample and include instructors from different backgrounds or universities. Second, the data in the present study were collected only from the instructors. Hence, future studies could collect data from different sources such as students or administrators regarding the effects of PD programs on the quality of the courses. Third, although the PD program in this study influenced the distance education instructors, its long-term effects have not been investigated. Therefore, future studies should also investigate the long-term effects of PD programs. Fourth, future studies can utilize valid and reliable scales to probe the effectiveness of the PD program in detail. Lastly, the researcher conducted the present study before the Covid-19 pandemic and found positive contributions to instructors. Therefore, future studies should also evaluate the effectiveness of this PD to expand the current body knowledge.

## COMPETING INTERESTS

The author has no competing interests to declare.

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**TO CITE THIS ARTICLE:**
Kayaduman, H. (2022). Integrating Design-based Learning and Mentoring Strategies into a Professional Development Program for Distance Education Instructors. *Open Praxis*, *14*(1), pp. 54–67. DOI: https://doi.org/10.55982/openpraxis.14.1.139

**Submitted:** 10 September 2021
**Accepted:** 15 March 2022
**Published:** 25 November 2022



*Open Praxis* is a peer-reviewed open access journal published by International Council for Open and Distance Education.

INTERNATIONAL COUNCIL FOR OPEN AND DISTANCE EDUCATION