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The Pedagogical Beliefs and Instructional Design Practices: Pre-Service IT Teachers' Case*

Emine SENDURUR [1]

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ABSTRACT

Purpose: Although studies have separately examined the instructional design processes of novice designers and the pedagogical beliefs of novice teachers, the manner through which they are linked is still unclear. In this study, the aim was to describe how pre-service teachers' pedagogical beliefs were embodied through instructional design practices within a real context. Therefore, having a closer look at the espoused and enacted beliefs in comparison to teaching performance from the instructional design perspective may contribute to facilitating and understanding novice teachers' transfer of knowledge to practice. **Research Methods**: This was an instrumental case study with 20 pre-service teachers. The data were collected through observation, portfolios, and interviews.
Findings: The results indicated that the participants tended towards blended beliefs, but they failed to transfer them into practice. Their teaching practices mostly included patterns of teacher-centered approach. Finally, the match between espoused and enacted beliefs was not very common among the observed participants. **Implications for Research and Practice**: Since pre-service teachers attend school practice during the last year of university, they may feel isolated and unprepared for the application of student-centered approaches. That may be the reason why they put too much emphasis on control of the classroom. If they had been practicing these approaches from the beginning of their university studies, they would have left such anxieties behind and be more capable of transferring their espoused beliefs into enacted ones.

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[1] Ondokuz Mayıs University, TURKEY, e-mail: eminesendurur@gmail.com, ORCID: https://orcid.org/0000-0002-0340-6378

Introduction

In teacher education practices, the transfer of pedagogical knowledge may not always be smooth. Since fields such as computer education are somewhat contingent upon tools, differences among school settings may hinder the transferring process. In addition to real settings, being a novice can lead to hesitations to utilize one's knowledge. Therefore, having a closer look at the espoused and enacted beliefs regarding teaching performance from an instructional design perspective may contribute to facilitating and understanding novice teachers' transfer of knowledge to practice.

Two main objectives construct almost every type of teacher education institution: providing students with a theoretical background and enabling students to transfer theoretical knowledge into practice. Unlike theoretical parts, it is not always easy to provide appropriate experiences that are meaningful for novice teachers. Project-based learning experiences can be considered valuable, due to their affordances with regards to transfer and practice of theoretical knowledge. In teacher education, there is a gradual transition from being students to being pre-service teachers; therefore, these individuals must be ready to teach in real settings. "School experience" and "teaching practice" are two final year courses. In the former, the candidate makes observations within real settings, whereas the latter requires real teaching. The imperfect settings of schools may contribute to the transfer of knowledge as well as challenges with implementation.

Similarly to other education programs, equipping Information Technology (IT) teachers with detailed pedagogical content is vital. Their primary tools are computers, which can serve as an enabler for the transfer of constructivist pedagogical beliefs (Becker, 2000; Tondeur, Braak, Ertmer, & Ottenbreit-Leftwich, 2017). Although the nature of IT teaching is quite appropriate for this line of beliefs, IT teaching can become more aim-oriented rather than tool-oriented within other pedagogical beliefs. The way teachers integrate or use the technology can reflect their beliefs. Teacher beliefs can be defined as "implicit assumptions about students, learning, classroom, and the subject matter to be taught" (Kagan, 1992a, pp. 65-66). Beliefs are different from knowledge and are embodied in different forms. For example, a teacher may not believe in the value of technology in the classroom, whereas another teacher may plan each lesson with the inclusion of a variety of technological tools. Although Kagan (1992a) named the term *teacher belief,* the term has been recently referred to as *pedagogical belief.* According to Pajares (1992), people "have beliefs about everything" (p. 315); although beliefs are connected within the system, there is a distinction between specific and general beliefs of teachers. In this study, based on Pajares' (1992) belief system, I used the term similarly to Ertmer (2005), in that learning and teaching specific beliefs of teachers are the focus.

Despite being very complex in nature, pedagogical beliefs can be roughly divided into three types: traditional, constructivist, and blended. Teachers with traditional beliefs value the final outcomes, rather than the process; thus, they value the retention of facts. The teacher controls the classroom and gives lectures (Ertmer,

Gopalakrishnan, & Ross, 2001). Teachers with constructivist pedagogical beliefs provide students with a wide range of learning experiences, resources, tools, and materials within authentic and rich learning environments through meaningful activities (Windschitl, 2002). Teachers give opportunities, collaborate with the students' knowledge construction processes, and both monitor and allow students to monitor their own learning via diverse assessment approaches (Ertmer et al., 2001). In short, unlike traditional beliefs, constructivist beliefs are quite flexible and open to the discovery of students' potentials. Learning outcomes can diversify, depending on the way the students learn and experience. Teachers with blended beliefs can show patterns of either constructivist or traditional beliefs. For example, a teacher can value being the only authority in the class, yet benefit from group work. If we consider the two aforementioned belief types as opposite ends, then blended beliefs fall into the middle.

Like general beliefs, professional beliefs can be affected by many factors. Similarly, a teacher's pedagogical belief can affect his/her own way of teaching and learning (Ertmer, Gopalakrishnan, & Ross, 2001; Tondeur et al., 2017), acting (Pajares, 1992), and using/integrating technology (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012). Researchers generally study teacher beliefs within two dimensions: enacted (practiced) vs. espoused (expressed) beliefs. Although a match between both dimensions is expected, this does not always happen due to various barriers (Chen, 2008). Nevertheless, there are rare cases showing a match between both dimensions, regardless of the barriers (Ertmer et al., 2012). There might be variety of factors contributing to the evolution of teaching beliefs, but teachers themselves are at the top of these factors (Al-Amoush, Markic, Usak, Erdogan, & Eilks, 2014); therefore, teaching beliefs can change or develop over time. The way teachers are trained as well as their culture can also play an important role in shaping their beliefs (Tang, Lee, & Chun, 2012; Tekindal, Roehrig, Jakiel, Arrastia, Rawls, & Izci, 2017). Therefore, the interventions of belief systems may be sophisticated due to the complex connections among cognitive structures.

Anything in a teacher's life may affect his/her overall belief system. Therefore, the components included in teacher education programs can be an important issue. For example, IT teachers are offered an obligatory course named "instructional design" (ID), which is not included in other subject areas. Since preparing for teaching is a part of the ID process, the pre-service IT teacher can be considered as a double novice (either as a teacher or an instructional designer). ID can be defined as "a construct that refers to the principles and procedures by which instructional materials, lessons, and whole systems can be developed in a consistent and reliable fashion" (Molenda, Reigeluth, & Nelson, 2003, p. 574). Therefore, ID is a more comprehensive process than lesson planning, as the latter can be considered as one of the products of ID. Despite having different names and approaches (e.g., linear, iterative), there are numerous ID models with similar elements (Dick & Carey, 1996; Kemp, Morrison, & Ross, 1994; Seels & Glasgow, 1997; Willis & Wright, 2000). They all include the elements of the ADDIE framework—the abbreviation of Analyze, Design, Develop, Implement, and Evaluate. Nevertheless, expert instructional

designers (IDers) may not follow these models and prefer an eclectic approach instead. Novice IDers may have difficulties until they find their own style.

Being a novice in any field can be distinguished from being an expert, regardless of context. In the ID field of expertise, individuals' approaches to cases were observed as different (Hardre, Ge, & Thomas, 2005; Perez & Emery, 1995; Stefaniak, 2017) due to ill-structured nature of ID problems (Ertmer & Cennamo, 1995). Like in teaching practice, transferring ID models into practice may become distracting in real settings (Ertmer, York, & Gedik, 2009; Yanchar, South, Williams, Allen, & Wilson, 2010). Similarly to the instructional design field, school settings are considerably complex for novice teachers. In terms of classroom management skills, which are among the main concerns of novice teachers (Chesley & Jordan, 2012), the lack of expertise can bring about ineffective practices. A recent eye-tracking study clearly exemplifies this phenomenon. In that study, a group of pre-service teachers were observed as they taught, and the results showed the limited attention that was distributed among only a few students (Stürmer, Seidel, Müller, Haüsler, & Cortina, 2017). Before field experiences, pre-service teachers start constructing their own schema about the teaching context to assume unreal conditions with respect to students' attitudes, classroom facilities, etc. However, real situations might be very different than expected ones (Kagan, 1992b), which may even result in ineffective learning as novice teachers engage in real settings (Amador, 2016; Wolff, Bogert, Jarodzka, & Boshuizen, 2015). Therefore, observation within authentic practices that do not match with their espoused beliefs would be beneficial for pre-service teachers, as they would be aware of the potential of other pedagogical beliefs with regards to practice (Ertmer, 2005). As a result, the practitioners may become more eclectic.

In the literature, studies have shown how novice IDers design, as well as the pedagogical approaches of novice teachers. However, they are all separate studies. In the computer education and instructional technologies department, students are expected to gain expertise of both; therefore, it is important for pre-service IT teachers to practice both. This study aims to explore the transfer process of teaching practice with the integration of ID practice. Moreover, during this transfer, the shape and transformation of their pedagogical beliefs were the focus, as it is assumed that IT teachers should not have problems integrating technology into the classroom. However, there are limited studies investigating whether IT teachers can successfully integrate technology. Therefore, this study can provide insights into the integration process of pre-service IT teachers while relating to their pedagogical beliefs. In short, throughout the study, I tried to explore the following research questions:

1. How do pre-service IT teachers' enacted pedagogical beliefs match with espoused ones in terms of technology integration, classroom management, teaching methods, and evaluation?
2. How are pre-service IT teachers' instructional design practices transformed into real context in combination with pedagogical beliefs?

Method

Research Design

In this study, I used case study methodology. Since I am interested in the issue of pedagogical beliefs in instructional design practices of pre-service IT teachers, this can be considered as an instrumental case study. Researchers conducting instrumental case studies try to understand "something more than just a particular case" (Fraenkel & Wallen, 2006, p.429). The reported findings are all limited to the participants. Pre-service IT teachers, who registered in the same course and practiced in the same elementary school, constructed the case itself. In order to find the answers of research questions and insights of the participants, I used more than one data source.

Research Sample

Twenty pre-service IT teachers (7 men; 13 women) were assigned to practice in a public elementary school. The aim of the inclusion of these pre-service teachers was to observe their way of practicing as both teachers and IDers, which is not a regular case for other teacher education programs. They were all final year students who had completed the ID course in the 2nd semester and the "School Experience" course in the 7th semester. None of the participants have out-of-school experience as a teacher or an IDer. In addition to the pre-service teachers, there were two mentor teachers per 10 pre-service teachers, and one supervisor, who is the author of this paper.

Research Instruments and Procedures

In the beginning of the semester, the supervisor, mentor, and the administrator of the public school met all the pre-service teachers to inform them about expectations and procedures. They were assigned to attend the regular IT courses in that school in addition to providing assistance with hardware-related issues. The pre-service teachers both observed the mentor and contributed to the teaching. As they practiced, they were responsible for creating a portfolio including weekly reflections, lesson plans, activities, evaluations, articles, and any additional components related to their professional development. After each week's observation, they wrote reflections about the lesson, mentor, students, materials, etc. The schedule for each pre-service IT teacher's teaching practice was decided with the mentor. They prepared a 40-minute lesson from the current IT curriculum. The pre-service teachers were all responsible for the lesson plan, materials, and evaluation. They had the opportunity to practice or observe the entire stages of instructional design as well as the teaching itself. In addition, they were active during their entire practice time, i.e., they helped the IT teacher in variety of activities, including fixing an overhead projector, designing network cables, dealing with students' problems, etc.

Data Analysis and Trustworthiness

Data were collected through observations, field notes, portfolios, and unstructured interviews with students and the mentors. Portfolios of the pre-service teachers consisted of printed reflection papers and any resource used during the semester. Worksheets, curriculum documents, observation notes, and administrative documents are a few examples of other printed sources in the portfolios. During the teaching practice, both the mentor and the supervisor filled the observation sheet with the following:

1. Content Knowledge: The student-teacher knows basic concepts, links them appropriately, uses suitable visuals, and makes interdisciplinary connections.
2. Pedagogical Knowledge: The student-teacher knows special instructional methods, benefits from the literature, answers students' questions, and ensures a secure learning context.
3. Planning: The student-teacher prepares clear lesson plans, states objectives and goals, selects appropriate methods, tools, and materials, decides on appropriate evaluation, and relates the content to other fields.
4. Instructional Process: The student-teacher uses time, methods, and techniques efficiently, is sensitive to individual differences, promotes student participation, uses tools and materials, provides feedback, and evaluates.
5. Classroom Management: The student-teacher prepares an effective introduction, strikes attention, provides a democratic learning environment, motivates, summarizes whenever needed, gives appropriate assignments, and takes care of students.
6. Communication: The student-teacher communicates effectively, provides clear and simple instructions, asks meaningful questions, uses appropriate intonation, listens to the students carefully, and uses effective gestures.
7. Evaluation and Recording: The student-teacher prepares appropriate evaluation materials, provides suitable feedback, grades student products, and keeps records of students' grades.

A colleague and I investigated all qualitative data separately for topics of relevance. Unstructured interviews, reflection papers, and observation notes from both supervisors and mentors were used as the main sources of data. I was also the supervisor of the pre-service teachers and conducted unstructured interviews with each participant and mentor separately. The overall issues mentioned during the interviews consisted of classroom management, teaching methods and materials, the use of technology, and overall instructional practices. As a result, these issues guided the formation of main themes. Content analysis was utilized to analyze all data sources. In the light of the main themes, the reflection papers, observation papers, and transcribed interviews were coded, then grouped in either categories and

subcategories, and then the overall data were reexamined to ensure the agreement between researchers as well as the coherence of relations.

To ensure the trustworthiness and credibility of the study, data were triangulated using different forms of data. The open-ended questions in the unstructured interviews aimed to foster deeper insights of participants; this provided detailed data, which is crucial to ensuring credibility. Moreover, confirmability was increased with the inclusion of two researchers during content analysis.

Results

Espoused Pedagogical Beliefs

Reflection papers in students' portfolios and interviews with students clearly revealed espoused pedagogical beliefs. In this study, I classify pedagogical beliefs as student-centered, teacher-centered, and blended. The findings from the qualitative data suggest that none of the participants have student-centered pedagogical beliefs. The majority of them (*N*=18) can be denominated with blended pedagogical beliefs. Only two pre-service IT teachers expressed prominent patterns of teacher-centered pedagogical beliefs.

Students with *teacher-centered* beliefs specifically focused on classroom management issues. They mentioned how hard and important it was to maintain control of the class and gain attention. They specifically emphasized the assurance of silence in the class. The following excerpts clearly indicate these concerns:

> "Since teaching includes gaining students' attention, making them willing to learn, transferring one's own knowledge, and reinforcing everything, I do not think I was able to achieve it all. During the introduction part of the lesson, I had trouble gaining the students' attention." (TC-1)

> "I was confident with my topic, but I was worried about controlling the students. I decided to stand on a strategic place that can help me dominate the class. I tried to make eye contact with students to keep them silent. I got around the class and explain the topic. Whenever I detected a movement, I immediately went near that student. In this way, I kept control of the class." (TC-2)

From the excerpts, the value placed on the authority of the teacher is clear. They believe that effective lessons are in the hands of the teacher who strikes attention all the time. Moreover, the pre-service IT teachers seemed to consider the teacher as the only source of the content. They believed that their instruction would fail if students talk, move, or giggle.

The themes extracted from the reflection papers and interviews showed that the majority of the participants' espoused beliefs are *blended*. In other words, their beliefs are both teacher- and student-centered from a pedagogical perspective. The pre-service IT teachers emphasized the importance of communication, student

participation, higher-order thinking, practice, and the physical structure of the laboratory. The following excerpts are good examples of blended beliefs:

> "I was confident and prepared, which facilitated the way I communicated. The exact and simple answers that I gave students made them eager to listen. Maintaining eye contact, listening to them, and valuing their answers increased their level of attention." (B1)

> "Active participation of students is important while teaching. Once it is provided, students are not interested in irrelevant things and then teacher does not get disturbed." (B2)

> "It is always a big deal for me to gain attention. I tried to overcome this with popular topics. For example, I gave examples of Facebook and Twitter database examples while explaining database subjects. I realized that students paid more attention and learned better." (B4)

> "I observed that students are too active, talkative, and sarcastic. They hardly pay attention to the lesson and they usually prefer to play computer games. That is why, like X teacher, I tried to strike their attention first. I preferred starting lessons with visuals, stories, and other interesting activities." (B6)

> "Because of their age, they can easily get bored. That's why I tried to integrate educational games into the lesson, so that they can enjoy it." (B10)

As the excerpts suggest, the pre-service IT teachers searched for ways to integrate technology or interesting tools to gain attention. They seemed to be sensitive to the needs of students. In addition, they considered the active participation of the students. However, it can be inferred that the source of the content is still the teacher.

The overall espoused beliefs can be summarized under four themes: *classroom management skills, method, challenges,* and *technology integration*. First, in terms of classroom management skills, participants are not very different from each other. They believe in the importance of eye contact, gaining attention, intonation, knowing students' names, and giving rewards, immediate feedback, and reinforcement. Unlike participants with teacher-centered beliefs, the participants with blended beliefs do not prefer to apply the ignorance strategy. Moreover, they value students' needs and consider the importance of participation. Second, in terms of methodology, participants with different beliefs varied except for a few issues. For example, they both emphasized linking the content of the lesson to real life. In addition, they do not prefer to stick to only one method/strategy/technique during a lesson. Instead, they are flexible to shift across them.

Participants with blended beliefs focused on the importance of brainstorming, providing examples, activating higher-order thinking, and establishing interdisciplinary links, unlike the participants with teacher-centered beliefs. They also valued untraditional methods, such as games or authentic practices. Third, in terms of challenges, both groups emphasized the challenge of keeping control of the students as well as being prepared for the lesson. They also agreed regarding the

challenge of the physical structure of the lab. Participants with teacher-centered beliefs find earning students' respect challenging. While they associated the quality of the lesson with the fluent flow, others associated it with fun. Fourth, in terms of technology integration, both groups mentioned the importance of practice, motivation, and rewards. However, unlike others, participants with blended beliefs relate their concerns about technology integration with providing opportunities for authentic experiences, exploration, and supplementary materials. Table 1 summarizes the findings.

Table 1
Themes & Categories for Espoused Beliefs

Espoused Beliefs	$f_{Teacher\text{-}Centered\text{-}Beliefs}$	$f_{Blended\text{-}Beliefs}$
Classroom Management Skills		
Communication		
Eye contact	2	2
Ignorance	2	-
Gaining attention	2	3
Intonation	2	4
Value		
Students' needs	-	5
Student participation	-	4
Knowing students' names	1	1
Giving rewards/immediate feedback/reinforcemer	2	2
Method		
Cognitive concerns		
Linkage to real life	2	2
Brainstorming	-	3
Examples	-	4
Activating higher-order thinking	-	1
Flexibility		
Shift across methods/strategies/techniques	1	1
Interdisciplinary links	-	1
Untraditional methods		
Games	-	1
Providing authentic practices	-	1
Challenges		
Classroom Management		
Controlling students	2	2
Preparedness	1	1
Earning students' respect	2	-
Quality of lesson		
Fluent	2	-
Funny	-	1
Technical problems		
Physical structure of lab	2	2
Technology Integration		
Practice	2	4
Motivation	2	1
Exploration	-	5
Authentic experiences	-	1
Supplementary materials	-	1
Rewards	2	1

Enacted Pedagogical Beliefs

The data from both the observation notes during teaching practice and the interviews demonstrated the pre-service teachers' enacted beliefs. Like the espoused beliefs, the enacted beliefs of the participants did not include student-centered pedagogical beliefs. However, contrary to the espoused ones, the majority of the participants (*N*=17) expressed teacher-centered pedagogical beliefs. Only three pre-service IT teachers expressed prominent patterns of blended pedagogical beliefs.

Participants with *teacher-centered* espoused beliefs (*N*=2) valued the direct instruction method. They believed in the functionality of providing reinforcement in time. Since silence is a must during their instruction, they tried to eliminate noise whenever possible. Hence, their enacted and espoused beliefs matched well. The following statements show how they tried to maintain control during the lesson.

> "I tried more up-to-date and interesting ways for students to gain attention." (TC-1)

> "One of the most frequent errors was that I couldn't answer all the questions because different questions were asked by more than one student at the same time. I think this could have caused students to dislike the lesson." (TC-2)

There are inconsistencies across espoused and enacted beliefs for the majority of the participants. Although they expressed their pedagogical beliefs closer to the blended point, this was absent in performance, except for three pre-service IT teachers. They gave importance to discipline, including authority and control of the class, but they were also aware of the value of student-centered methods within a meaningful context. Since real settings are full of surprises, some novice teachers could not transfer their blended beliefs into reality. Only three students presented a successful practice of the blended approach, which was generally close to the constructivist end of the spectrum. The following are some examples of them:

> "…I think I taught interactively, consistently, and practically." (B7)

> "I realized that the students' thinking style is not abstract enough. After realizing this fact, I provided more appropriate ways of teaching." (B13)

Table 2 summarizes the observed themes. Pre-service IT teachers were observed spending too much time trying to gain attention due to the desire to maintain the sole control of the lesson. Although some of them value their students' needs, they spent a considerable amount of time keeping the silence. In their espoused beliefs, they explained the importance of untraditional methods, but most of them failed to turn this into practice. They mostly benefitted from brainstorming and advanced organizers as an introduction. Some of them were capable of shifting across methods/strategies/techniques. The participants' anxiety and concerns about gestures/intonation were clearly observed in their practice but were not mentioned in their espoused beliefs. The rest of the challenges were similar to their espoused beliefs.

Table 2

Frequency of Observed Themes during Teaching Practice

Enacted Beliefs	*f*
Classroom Management Skills	
Communication	
Eye contact	7
Ignorance	4
Gaining attention	10
Intonation	7
Value	
Silence of the class	9
Students' needs	7
Student participation	9
Democratic participation	1
Giving rewards/immediate feedback/reinforcement	8
Transfer of knowledge	1
Method	
Cognitive concerns	
Statement of objectives	1
Brainstorming	10
Examples/Analogies	7
Activating higher-order thinking	1
Use of advanced organizers	11
Flexibility	
Shift across methods/strategies/techniques	4
Use of multiple resources	11
Untraditional methods	
Games	5
Discussion	2
Problem solving	1
Cooperative learning	1
Drama	2
Direct instruction	5
Challenges	
Classroom Management	
Controlling students	4
Anxiety/fear	12
Gestures/intonation	5
Time management	1
Quality of lesson	
Fluent	5
Funny	4
Technical problems	
Physical structure of lab	3

Espoused vs. Enacted Beliefs

Comparing the espoused beliefs with the enacted ones, an interesting but explainable pattern showed up (Table 3). Participants with teacher-centered beliefs showed the same patterns during practice and, thus, were consistent. However, participants with blended beliefs mostly failed to transfer what they believed into action. Only three of them successfully practiced in a parallel way to their blended beliefs.

Table 3

Espoused vs. Enacted Beliefs

Espoused-Enacted match

	Teacher-centered *(N)*	Blended *(N)*	Student-centered *(N)*
Espoused	2	18	0
Enacted	17	3	0
Matches	2	3	0
Mismatches	0	15	0

Instructional Design Practices

In its generic form, ADDIE constitutes the main elements of any instructional design process. In its modified forms, the elements can be seen in different organizations. The flow of elements may differ with regards to IDers. The following starting and ending points were observed from the participants' explanations of their instructional design practices:

1. Starting point: analyzing students (*N*=7); planning lesson (*N*=5); preparing materials (*N*=3)
2. Ending point: evaluation of the materials (*N*=2); evaluation of the students (*N*=2); evaluation of the process (*N*=1)

Novice designers did not show common ID patterns, but it was observed that they had their own unique ID process. Their definitions of problems, focus of attention, main considerations, solution approaches, and linearity of process differed in practice. Pre-service IT teachers with more constructivist pedagogical beliefs and practices showed a common pattern of ID: the focus of the learners. They specifically paid attention to the needs and previous experiences of the target learners. In addition, they considered putting alternative strategies into practice. From a larger perspective, those participants' analysis and design elements were different from the rest. Those with more traditional pedagogical beliefs and practices were obsessed with environmental issues, such as seating plans. Therefore, they had difficulties in the analysis and implementation elements of the ID process. According to the

participants, they all followed the ADDIE model because of its simplicity, but it was not clearly demonstrated in their reflections or during teaching practices.

Discussion and Conclusion

From the beginning of their university lives, pre-service IT teachers attend many classes and sometimes have the opportunity to practice their teaching skills. This study took place during their practices in real schools. The results clearly indicated that the pedagogical beliefs of pre-service IT teachers have been shaped over time. Although experiences as a student can contribute to their beliefs, in this study, most pre-service teachers explained how their way of teaching was shaped with the help of mentor observations. It is known that mentors can lead to belief changes and improvements (Grudnoff, 2011; Johnson, 2006; Yuan & Lee, 2014). The influence of the mentor is crucial, but his/her inappropriate strategies can sometimes transform pre-service teachers' teaching styles and beliefs. In our case, the pre-service IT teachers were frequently obsessed with providing silence, as they believed this facilitates control of the class (Chen, 2008). This was what has been observed and learned, in addition to complications with being a novice teacher (Kagan, 1992b, Yilmaz, Sendurur, & Sendurur, 2016). In that sense, the selection of mentors is very important. Of course, it is not always possible to find less traditional teachers. Pre-service teachers should be warned and guided about inappropriate styles. In addition to mentors, the pre-service teachers' own experiences can be quite effective in constructing beliefs. Teachers themselves are one of the most crucial factors in shaping one's own belief systems (Al-Amoush et al., 2014; Oleson & Hora, 2014). In other words, the way pre-service teachers are educated can influence the way they teach.

The majority of the participants' espoused beliefs tended to be blended, which is a combination of both student-centered and teacher-centered approaches. However, a few students explained their beliefs in a more traditional way. In modern teacher education programs, the value of student-centered approaches is a clear priority, but these IT teachers have been educated with more traditional approaches starting from elementary school. That might be the reason why they had difficulties practicing student-centered approaches. As a result, mismatches emerged between espoused and enacted beliefs, which is in line with other similar studies (Chen, 2008; Kul & Celik, 2017). Moreover, the participants explained that their ID practices were very linear, but in practice, what they conducted was not a complete ID process. It was observed that they nearly ignored evaluation aspects and focused on the analysis and design components. Considering both ID processes and teaching periods, the overall mismatch can be attributed to their inexperienced nature. Therefore, they might need another mentor to specifically guide the ID process, as novices generally need cognitive apprenticeship to gain ID expertise (Ertmer & Cennamo, 1995; Stefaniak, 2017). However, they cannot be considered complete novices, because during their education, they had opportunities to practice in the field. The data was collected

during their last semester, which means they should be ready to teach after three more months. However, some external factors might have caused this mismatch (Chen, 2008; Wolff et al., 2015). For example, some students mentioned crowded classes with inappropriate seating plans. Such a situation can discourage novices from trying modern methods due to the anxiety of silence and control. In other words, the mismatch between espoused beliefs and enacted beliefs can be a result of the mismatch between expected settings and real classes (Kagan, 1992b). The pre-service IT teachers expressed disappointment about the physical conditions, which might hinder their willingness to integrate modern methods.

To sum up, teacher education programs in Turkey usually emphasize constructivist theories and practices, but as this study showed, they might not be practiced in real settings. The results of the current study cannot be generalized due to the limited number of participants and culture/country specific conditions. Nevertheless, current conditions in IT teacher education programs might not function as educators expected. Policy makers should consider revisions of teacher education programs with respect to the integration of modern approaches to current school conditions, because these programs are crucial to shaping belief systems of teachers (Markic & Eilks, 2013; Tang et al., 2012). Since pre-service teachers attend school practice during the final year of university, they may feel isolated and unprepared for the application of student-centered approaches. That may be the reason why they put too much emphasis on classroom control. If they had been practicing from the beginning of their university studies, they would have left such anxieties behind. A comparative study clearly indicated that pre-service teachers who practice as they enter the university express more modern beliefs (Al-Amoush et al., 2014). University is the place where their career foundations are shaped; thus, it can also be the right place to change and shape their beliefs, as they can be shifted and improved before it is too late (Yuan & Lee, 2014). Finally, since the belief system includes more than one dimension, further studies may shed light on other constructs within both ID and teaching practices.

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Pedagojik İnançlar ve Öğretim Tasarımı Uygulamaları: Bilişim Teknolojileri Öğretmen Adaylarının Durumu

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Özet

Problem Durumu: Kuramsal bilginin uygulamaya dönüştürülmesi, öğretmen eğitiminin en zorlu aşamaları arasındadır. Problem-temelli öğretim, mikro öğretim, vb. deneyimler öğretmenlik uygulamasındaki deneyimler kadar gerçekçiliği sağlayamayabilir. Öğretmen adayları, 4 yıl boyunca edindikleri hem kuramsal hem de uygulamalı bilgileri gerçek okul ortamlarında, gerçek öğrencilere, gerçek dersler işleyerek sunma fırsatını 4. yılın son döneminde elde etmektedirler. Her öğretmende olduğu gibi öğretmen adaylarının da hem eğitimlerinden hem çevresel faktörlerden hem de kendilerinden kaynaklanan pedagojik inançları mevcuttur. Bu inançların şekillenmesinde ilk öğretmenlik deneyimlerinin de önemli bir yeri olduğu yadsınamaz. Öğrenci, öğrenme, sınıf, konu, altyapı, vb. yapılarla ilgili içsel varsayımların hepsi pedagojik inanç tanımlarında yer almaktadır. Bu varsayımların ön yargı oluşturması veya tam tersi esneklik oluşturması, acemi bir öğretmen adayında gözlemlenme ihtimali yüksek olan durumlardır. Bilişim Teknolojileri (BT) öğretmen adaylarında bu durum oldukça kritiktir, çünkü ön yargı oluşturabilecek inançlar nedeniyle bilgisayar gibi teknolojilerin öğretim sürecine entegrasyonunda sıkıntılar yaşanabilir. Diğer öğretmen adaylarından farklı olarak BT öğretmen adayları öğretim tasarımı eğitimi de almaktadır ve yine bunu uygulamaya dönüştürmek için "Öğretmenlik Uygulaması" dersinde fırsat elde etmektedirler, çünkü kısa süreliğine de olsa (2-4 hafta) süreci yönetme şansı mevcuttur. Bu süreçte, öğrencileri, ortamı, altyapıyı, resmi işleri, ders içeriğini, ölçme-değerlendirmeyi, mevcut materyalleri ve daha birçok faktörü analiz ederek dersini planlama, uygulama ve sonuçlandırma (değerlendirme) pratiği yapabilmektedirler. Fakat çoğu zaman öğretmenlikteki acemilik durumu öğretim tasarımcısı olarak da mevcuttur. Birçok etkene göre şekillenmekte olan pedagojik inançların öğretim tasarımı yaklaşımları üzerine de etkileri olduğu söylenebilmektedir. Öğretme ve öğretim tasarımı süreçleri oldukça karmaşıktır ve henüz acemi olan öğretmen adaylarının gerçek okul ortamında bu becerilerini sergilemesi zaman alabilir. Bu çalışmanın odak noktası da BT öğretmen adaylarının durumlarına göz atmaktır, böylece hem öğretme deneyimlerinde hem de öğretim tasarımı süreçlerinde izledikleri yaklaşımlarla sahip oldukları (espoused) pedagojik inançların şekil bulmasını gözlemlemek hedeflenmiştir.

Araştırmanın Amacı: Alanyazında acemi öğretim tasarımcılarını ve pedagojik inançlarını ayrı ayrı inceleyen çalışmalar mevcut olmakla birlikte her ikisini BT öğretmenleri üzerinde inceleyen çalışmaya rastlanmamaktır. 4 yıl boyunca şekillenmeye devam eden pedagojik inançların, henüz acemi olan BT öğretmen adaylarında nasıl ortaya çıktığını ve bunların öğretim tasarımı süreçleriyle bağlantısını incelemek bu çalışmanın temel amaçlarındandır. Bu bağlamda şu araştırma sorularına cevap bulunmaya çalışılmıştır: (i) BT öğretmen adaylarının pedagojik inançları, gerçek bağlamdaki öğretim tasarımı uygulamalarında nasıl somut hale bürünmektedir? (ii) BT öğretmen adaylarının ortaya koydukları pedagojik inançlarıyla içsel olarak benimsedikleri pedagojik inançlarının birbiriyle örtüşme durumu teknoloji entegrasyonu, sınıf yönetimi, öğretim yöntemleri ve değerlendirme açısından nasıldır?

Araştırmanın Yöntemi: Bu çalışmanın yöntemi araçsal (instrumental) durum çalışmasıdır. 20 gönüllü BT öğretmen adayının "Öğretmenlik Uygulaması" dersinde yaşadıkları durumlar üzerinden hareket edilmiş ve portfolyo, görüşme ve gözlemler yoluyla veriler toplanmıştır. Birden fazla veri kaynağının kullanılmasının nedeni veri kaybını önlemek ve mümkün olduğunca gerçek durumu yansıtmaktır. Katılımcıların hepsi hem pedagojik formasyon derslerini hem de öğretim tasarımı dersini almıştır. Bir önceki dönem tamamen gözlem yapan katılımcılar, bu dönem aktif ders anlatımı sürecindedirler. Bunun yanı sıra haftalık yansıtma raporlarını da danışman öğretim üyesine teslim etmektedirler. BT öğretmen adayları diğer öğretmen adaylarından farklı olarak, okulun teknolojik altyapısını sürdürülebilirliğiyle ilgili işlere de dahil olmaktadırlar. Bir dönem boyunca hem doküman olarak hem de gözlem ve görüşmeler yoluyla elde edilen veriler içerik analiziyle analiz edilerek kod ve temalar ortaya çıkarılmıştır. Birden fazla araştırmacı bu işlemleri yaptığı için kod ve temalardaki uyuşmazlıklar tespit edilerek üzerinde tekrar çalışılmıştır.

Araştırmanın Bulguları: Portfolyolar ve görüşmelerden elde edilen analizler sonucunda katılımcıların büyük bir çoğunluğunun karma (blended), yani hem öğretmen hem de öğrenci merkezli, inançları benimsedikleri (espoused) ortaya çıkmıştır. İlginç bir şekilde, hiçbir katılımcı öğrenci-merkezli pedagojik inancı benimsememiştir. Bunun yanı sıra sadece 2 katılımcının benimsedikleri inanç öğretmen-merkezlidir. Katılımcıların ortaya koyduğu (enacted) pedagojik inançlarda da öğrenci-merkezli yaklaşım yokken, diğer yaklaşımlardaki durum benimsenen inançların tersi yönünde çıkmıştır. Yani, çoğunluğun ortaya koyduğu inançlar öğretmen-merkezli olarak tespit edilmiş ve benimsedikleri karma yaklaşımı ortaya koyamadıkları gözlemlenmiştir. Sadece 3 öğretmen adayında karma inançlara uygun yaklaşımlar gözlemlenmiştir. Benimsediği inancı öğretmen-merkezli olan adayların ortaya koydukları performans tutarlılığını korumuştur. Öğretim tasarımı süreci odaklı bakıldığında ise herhangi bir ortak desene rastlanmamıştır. Her öğretmen adayının kendi stili ve kombinasyonu vardır. Fakat yapılandırmacı yaklaşıma daha yakın inançları ve performansları olanlar arasında ortak bir nokta gözlemlenmiştir: öğrencilerin ihtiyaçlarına ve önceki bilgilerine hassasiyet göstererek alternatif stratejiler üretmeye çalışmışlardır. Diğer yandan geleneksel inançlara sahip olanların özellikle öğrencilerin oturma düzeninden dolayı analiz ve uygulama aşamalarında zorlandıkları tespit edilmiştir. Bütün katılımcılar, ADDIE modelin aşamalarını uyguladıklarını söyleseler de yansıtma raporlarında veya gözlemlerde bu durum net olarak gözlemlenememiştir.

Araştırmanın Sonuçları ve Öneriler: Çalışmada gözlemlenen öğretmen adayları aslında karma inançlara sahip olmakla birlikte bunların hayata geçirilmesinde (hem öğretme hem de öğretim tasarımı boyutunda) aksaklıklar yaşamaktadırlar. Bunun sebeplerinden biri yeterli tecrübeye sahip olmamaları olabilir. Bu bağlamda, öğretmen adaylarının daha erken dönemde gerçek ortamda öğretmenlik uygulamalarına dahil olmaları sağlanabilir. Böylece sessizliği sağlamak, oturma düzenini kontrol etmek ve endişe/korku gibi duyguları yönetmek erken dönemde sağlanmış olur. İlerleyen dönemlerde ise öğretmen adayının inançları daha esnek biçimde şekillenerek hayata geçirilebilir. Öğretmen adaylarının her hafta eşlik ettikleri kılavuz (mentor) öğretmenlerin seçimi de oldukça önemlidir. Her ne kadar

pedagojik inançları tersine de olsa zaman zaman gözlemledikleri öğretmeni model alarak inançlarının tersine hareket edebildikleri gözlemlenmiştir. Benimsedikleri ve ortaya koydukları inançlar arasındaki uyuşmazlığın nedeni de yine bağlamdan ve tecrübesizlikten kaynaklı olabilir. Bu durumun öğretmenliğin ilk yıllarında da ortaya çıkabileceği riski düşünüldüğünde, erken dönemde yani eğitimlerinin ilk yıllarında öğretmen adaylarının gerçek ortamlarda kılavuz eşliğinde deneyim kazanması gerektiği aşikardır. Böylece önyargılarından uzaklaşabilir kendi pedagojik inançlarıyla tutarlı olmayı başarabilirler. Öğretim tasarımı açısından da çizgisel yaklaşım sergileyen bu adayların daha esnek uygulamalar yapabilmeleri için daha çok uzmanlaşma ihtiyaçları olduğu tespit edilmiştir. Bu bağlamda uzman öğretim tasarımcılarının kılavuzluğunda staj imkanı sağlanabilir. Yani diğer öğretmenliklerden farklılaşan bu durum göz önüne alınarak BÖTE bölümlerine ek uygulamalar getirilebilir.

Anahtar Sözcükler: deneyimsiz öğretmen, öğretim tasarımcısı, öğretmen inançları, öğretmenlik uygulaması.