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Exploring Teacher Motivation to Implement After an Online Professional Development by Using Expectancy-Value-Cost Theory

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Abstract

This case study investigated the variations in teacher motivation to implement an instructional design model (Understanding by Design, UbD) after a seven-week online professional development (PD). Data were collected through a motivation scale and formative and summative reflection forms. Based on the quantitative results, teachers had high task value but differed in terms of their expectancy of success. Our qualitative findings produced two significant perceived costs behind doubted ability beliefs: First, teachers expressed difficulties in integrating the elements of the UbD into the centralised national curriculum, which they found to be intensive and confusing. Second, the lack of on-the-job support after PD programs negatively impacted teachers' expectancy of success. This study emphasises the importance of considering teachers' expectancy of success and task value before, during, and after PD programs, highlighting the need for tailored support and activities to enhance teachers' motivation and successful implementation of new learning in their classrooms.

Keywords: expectancy-value-cost theory, online learning, professional development, teachers' motivation, understanding by design

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Introduction

One of the goals of professional development (PD) for teachers is to equip them with essential skills and knowledge so that their classroom practice improves, which leads to increased, positive student outcomes (Darling-Hammond et al., 2017; Desimone, 2009). The PD literature is replete with PD evaluation studies of different types reporting their effects on teachers' knowledge and skills (Dogan et al., 2016; Philippakos & Voggt, 2021), self-efficacy (Colognesi et al., 2020; Mouza et al., 2022; Nevenglosky, 2018), and teaching and instructional practices (Palermo & Thomson, 2019; Sandholtz & Ringstaff, 2016). Collectively, existing research shows that PD featured with a focus on content, pedagogy, active learning with prolonged duration, and alignment with schools' and teachers' goals could facilitate changes in various teacher outcomes (Darling-Hammond et al., 2017; Desimone, 2009).

On the other hand, one important, often neglected outcome of PD efforts on the teacher's side is their motivation to implement their learning in their setting with their students (Kennedy, 2016; Opfer & Pedder, 2011). It is a fact that teacher motivation has a key function in shaping what they will do after PD (Osman & Warner, 2020). Following a PD program, some teachers use their learning with excitement and consistently use it after the program. While some teachers rarely use their learning and never give it a try. Educational leaders often demand (and sometimes have concerns about) maximising using new professional learning in teachers' classrooms. Therefore, understanding the underlying reasons for the variation in teachers' implementation is essential to plan and facilitate PD activities.

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A comprehensive look at the extant studies shows that three constructs are interrelated in terms of teacher motivation to implement: teachers' willingness to apply their learning, their perceived value if they apply their learning, and the extent to which they believe they will find it helpful and useful in applying (e.g., Abrami et al., 2004; Emo, 2015). According to these three dimensions, teachers are more likely to implement if the possibility of achievement is high (expectancy of success), the perceived value of that implementation is much (task value), and the advantages of that implementation outweigh the costs (Barron & Hulleman, 2015; Eccles & Wigfield, 1995; Watt & Richardson, 2008).

Current and previous studies on teacher motivation focus primarily on their motivation during teaching (Kudo & Goda, 2020) or on the relationship with student outcomes (Bardach & Klassen, 2021). Most studies embrace teacher motivation as a factor in using technology or integrating technology into their classroom (e.g., the use of social media by Hashim and Carpenter (2019)). As Han et al.'s (2016) comprehensive review concludes, there are five areas where research on teacher motivation has been conducted: influencing factors influencing teacher motivation; teacher motivation and teaching effectiveness; teacher motivation and student motivation; teacher motivation research in different disciplines; and instruments for assessing teacher motivation. However, a specific focus on teachers' had experiences after a PD activity has been lacking, and what we have so far doesn't address motivation to implement teacher learning. The accomplishment of any PD efforts depends on the teacher's motivation to implement (Osman & Warner, 2020), which is considered a starting point for any research endeavours. It is also crucial to study this area because more motivated teachers are more likely to go beyond the learning they develop in a PD program (Hodkinson & Hodkinson, 2004). We need to explain teachers' motivated behaviours after PD, as described mostly by their belief about their skills, the purpose of why they behave like that, and the cost of their efforts (Barron & Hulleman, 2015; Eccles & Wigfield, 1995; Watt & Richardson, 2008). Therefore, through this study, we introduce a case of examining the motivation to implement science teachers who attended an online PD.

Evaluating teacher motivation in the PD context is also important because stakeholders and policymakers often question the value of PD activities in terms of time spent, efforts made, and the monetary resources available (Bümen & Uslu, 2020). If "it is not worth it," PD activities, despite being well-designed, become to have a mediocre reputation. Knowing teacher motivation is also important to avoid budget loss and time waste. If we know teachers' perceived value of their professional learning, we can design PD activities accordingly, and education leaders help teachers spend their time wisely.

Purpose and Research Questions

The purpose of this study was to explore teacher motivation to implement what they learned after they attended an online PD program within the scope of the expectancy-value-cost (EVC) theory. The study also sought an explanation as to what type of perceived cost teachers have that prevents them from implementing new learnings. This was not an intervention study and, although some teachers may have implemented their new learning after PD, the degree of implementation after PD was not the focus of the study. We focused only on the examination of motivations for implementation. Two research questions guided our efforts:

(1) What was the teacher motivation to implement after they completed a seven-week-long PD program?

(2) What costs were perceived by teachers who participated in PD as barriers to implementing what they had learned?

In an effort to shed light on the teacher's motivation during and after PD in this multi-stage online learning program, we employed an iterative data collection procedure.

Theoretical Perspective

Expectancy-value-cost Theory

Before implementing what they learn in a PD program, teachers think about their expectancies, values, and perceived costs (Barron & Hulleman, 2015; Eccles & Wigfield, 1995). The expectation-value theorists posit that "individuals' choice, persistence, and performance can be explained by their beliefs about how well they will do on the activity and the extent to which they value the activity" (Wigfield & Eccles, 2000, p. 68). Recently, this theory has been used with its dimensions: expectancy for success, task value, and cost (Barron & Hulleman, 2015; Osman & Warner, 2020).

Expectancy for Success. The likelihood of success in a particular task is defined as success expectations (Wigfield & Cambria, 2010). Expectancy beliefs for teachers are intimately tied to their motivation to learn within a PD program and their motivation to implement PD into practice subsequently (Henze et al., 2009). Teachers who think of themselves as successfully implementing what they learned through PD might implement more new teaching methods than those with low-ability beliefs (Thomson & Kaufmann, 2013). In other words, the inquiries made by teachers about their ability to implement (Can I do it?) what they have learned during PD determines their motivations about expectations for success (Henze et al., 2009; Thomson & Kaufmann, 2013). Previous studies showed that through PD programs with increased focus on teachers' beliefs, expectancy of success can be improved (Abrami et al., 2004; Xie et al., 2017).

Task Value. Task value is defined as the value assigned to a task as a result of subjective evaluations of the importance of a task (Eccles & Wigfield, 1995; Watt & Richardson, 2015). Task value is characterised mainly by four kinds: attainment, intrinsic, utility, and cost by Eccles and her colleagues. We will briefly define the first three in this section. Then, we explain the cost in more detail.

Attainment value is the importance of success in any individual task and refers to the idea that individuals validate various aspects of a task before being involved (Wigfield & Cambria, 2010). Teachers' implementation of what they have learned at the end of PD is closely related to their intrinsic motivation (Kennedy, 2016). Utility value is expressed as the usefulness of a task (Barron & Hulleman, 2015). In other words, the extent to which a task is effective in achieving a future goal determines its utility value (Pintrich & Schunk, 2002). Even if the task does not have a positive value for an individual, because he thinks that task will facilitate their work in the future, it is related to its utility value. When teachers find the skills they have developed and the methods they learned useful for their future teaching processes, their extrinsic motivation increases.

Overall, task value involves making sense of teachers' behaviours by focusing on what is important to them (Hwang et al., 2018). In general, it is known that teachers prefer to complete tasks that are aligned with their career goals and that have high added value (Gaines et al., 2019, Muwonge et al., 2017). However, it is seen that even teachers who value development in tasks supportive of their goals do not fulfil that task when they do not feel adequate for the skills in this task (Lai, 2019).

Cost. Recently, in the expectancy-value theory, the cost has been considered a third dimension (e.g., Flake et al., 2015; Osman & Warner, 2020). It corresponds to the effort and time that a person must give to complete the task (Eccles & Wigfield, 2002; Wigfield & Cambria, 2010). Cost is negatively correlated with the other three task value components (Hulleman et al., 2008).

Before teachers work on a particular task, they evaluate their perceived cost with the question "Is it worth the effort and time I spend?" The perceived cost is impacted by teachers' perceptions that putting what they have learned in PD into practice is time-consuming, exhausting, difficult, and unpleasant (Beymer et al., 2022). When individuals who believe that their task can be completed successfully and whose task value is high think that the perceived cost is heavy, their motivation also decreases (Osman & Warner, 2020).

Online Professional Development

Online learning is an intentional mix of synchronous and asynchronous online learning, also known as bichronous learning (Martin et al., 2020). It is different from blended learning in which face-to-face and online components blend. The definition that was coined in detail by Martin et al. (2020, para. 6) is:

> "blending of both asynchronous and synchronous online learning, where students can participate in anytime, anywhere learning during the asynchronous parts of the course but then participate in real-time activities for the synchronous sessions"

For the asynchronous part, email exchanges, discussions, recorded videos, quizzes, and new/updates can be used. For the synchronous part, the options might include instant and live meetings and chats including video and audio with interactive elements. There are PD studies integrating both asynchronous and synchronous components reporting positive results, such as improved teachers' content and pedagogy knowledge (Magidin de Kramer et al., 2012) and their satisfaction (Bragg et al., 2021) when coupled with effective PD design elements that took context into account (Nalbantoğlu, et al., in press).

In addition, there are studies using the EVC theory to examine teacher motivation to implement in the PD context. In a scale-development study, Osman and Warner (2020) collected data from teachers who attended three different PD programs. The focus was not on the online learning experience. The researchers reported that the teachers who participated in the two-day training were more motivated to implement than the teachers in the summer institute. In Bümen and Uslu's (2020) study, teachers who attended different PD opportunities at different times (only specified with the content in this study) were selected in terms of their motivation to implement after they complete any PD activity (mostly one-shot training or webinars). The researchers found that teachers who attended museum education training had higher expectancy for success; those who completed interactive whiteboard workshops had lower motivation to implement. Critically analysing these studies shows the inadequacy in terms of focus on a specific program or aspect of PD programs. Still, little is known about teacher motivation after a particular PD that includes both synchronous and asynchronous activities for teachers. It might produce similar results as the other types and formats of PD with face-to-face components. However, adding a research base and empirical evidence on online PD is important since the number of studies using both synchronous and asynchronous activities has been gradually increasing. We need to know if they motivate teachers to implement what they learn in their classrooms.

Our Professional Development Program

With an intentional blend of synchronous and asynchronous activities with a support mechanism (i.e., facilitation), our PD program included (1) Content focus: Understanding by Design (UbD), a curriculum development framework by Wiggins and McTighe (2005) to design unit plans for enduring understanding and transfer. (2) Collaboration: Teacher teams worked together to design a unit plan (asynchronous and synchronous). (3) Active learning: Teachers created learning materials (synchronous). Teachers were engaged in the fundamentals of the UbD through interactive videos with open-ended and multiple-choice questions embedded (asynchronous). (4) Span of time and duration: Seven-week long program with three synchronous weeks and four asynchronous weeks. Total contact time was between 25-30 hours. (5) Feedback and facilitator support: During the synchronous sessions, facilitators (designers and PD experts) guided the unit design and the group work activities with prompts and feedback. The facilitators also provided feedback on unit plans asynchronously four times during the program. (6) Best examples and their analysis: Used cases and sample unit plans were provided (asynchronous). Sample unit plans were also discussed and analysed during the sessions (synchronous). Appendix A contains a summary of the activities in our learning management system (LMS) used by the teachers during the PD, related to the six dimensions mentioned above. Appendix B is an example of how we received teachers' reflections and UbD plans through the LMS.

Methodology

Design and Participants

We used a case study (Creswell, 2012) to explore the motivation of science teachers in one school to implement what they learned after PD. While we considered the school and teachers as cases, our analysis was based on teacher motivation to apply what they had learned during the PD. We used quantitative data sources as well as qualitative to examine the case in depth as suggested by Yin (2014). Quantitative data were mainly collected to explore teachers' motivation to implement, while qualitative data were collected to enlighten the details and contextually sensitive evidence for the quantitative findings (Creswell & Plano Clark, 2018). The participants were 40 science teachers (nine male) working in four different schools at different grade levels (19 in middle school and 21 in high school).

Instruments

Expectancy-value-cost in Professional Development Scale

Osman and Warner (2020) created the first scale (EVC-PD scale) to measure teachers' expectancies, values, and perceived costs of implementing what they learned in PD. In short, the scale measures "teachers' motivation to implement a PD experience" (p. 4.) through three dimensions, with three items each. Sample questions from the EVC-PD are, respectively: "I am confident I can do what was asked of me in this professional development," "I am excited to put this training into practice," and "I have to give up too much to put this training into practice" The items are in six-Likert type ratings ranging from strongly disagree to strongly agree. To fit our context, we used the validated and translated version of the EVC-PD scale by Bümen and Uslu (2020). They found high

coefficients of reliability for each dimension (.91, .86, and .80). The scale can be used either with three separate dimensions (first-order, as composites) or with one unifying construct (latent variable, second-order) of teacher motivation to implement. In this study, we chose the first use to provide a big picture of participating teachers' degree of motivation to implement.

Formative Reflections During the Professional Development

Formative reflections (FR) were the first form administered three times just after the participants completed a milestone (a two-week period of the program). The open-ended questions in the FR) asked teachers about their own judgement of their efforts and progress in their learning and motivation. One sample question from the FR was, "How do you design your individual UbD plan [after watching the PD videos and working with the facilitators]", "What do you need to improve your individual plan?"

Summative Reflection After the Professional Development

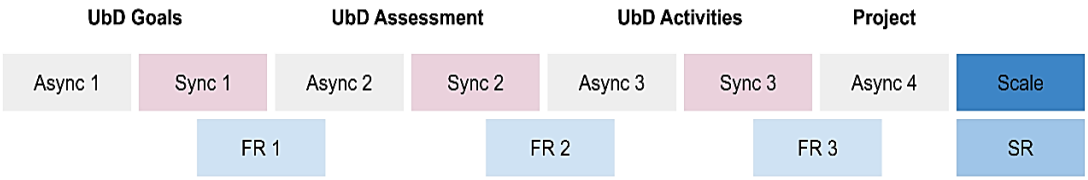
Summative Reflection (SR) was the second form that was administered at the end of the program after they submitted their final project to the learning management system. The questions in the summative and third formative reflections were different. Summative reflective questions aimed at teachers' general perceptions of the program. However, the last FR focused more on their efforts in the last two weeks. The open-ended questions in the SR asked teachers about their own judgement of their efforts and progress in learning and motivation. A sample question from the SR was "Where will UbD be for your school in the future? Where should it be? Do you want to take an active or leading role in your school's UbD plans?"

Data Collection

Our data collection included both during and after the PD program. Figure 1 shows at what point we collected data from the teachers.

Figure 1

Professional Development Process and Data Collection



Data Analysis

For the quantitative analysis, because our goal was to provide a general picture of teacher motivation to implement in terms of the EVC theory, we used descriptive statistics (averages and standard deviations) and scatter plots. The scores from each subscale of the EVC-PD scale were summed and reported.

We used the thematic analysis proposed by Braun and Clarke (2006) for the qualitative analysis. We analyzed the teachers' reflections using deductive and inductive coding. We developed an initial coding list that integrates the definitions and examples of expectancy-value theory (Abrami et al., 2004; Andersson & Palm, 2018; Flake et al., 2015; Osman & Warner, 2020; Wigfield et al., 2009). First, our deductive coding was based on analyses of teachers' responses about their degree of motivation, as well as expectancy and value beliefs, to implement UbD design principles into their lesson plan design process. Expectations for implementation and non-implementation, pertaining to motivation and expectancy, and different value beliefs that were given to open-ended questions in the reflections were categorized. For example, the following teacher quote was categorized as the teacher experiencing a utility value in the UbD design principles: 'In addition to its [UbD's] contributions to students' making meaning and using knowledge, the UbD also provides teachers with a great space to use their creativity and continuously supports their development.' When we captured different codes from the initial code

list, we used coding inductively and returned them to the literature to identify their categories. For example, we identified many perceived cost dimensions specific to Türkiye and its research context.

Credibility and Trustworthiness

To enhance validity and trustworthiness, the study used several techniques by considering the framework of Lincoln and Guba (1985) for triangulation, peer debriefing, and member-checking. First, we triangulated the scale and several reflections to gather in-depth data for our research questions. We also looked for common concepts across both sets of findings (qualitative and quantitative) to gather data on similar concepts during the quantitative and qualitative data collection. Second, we used a member-checking strategy to ensure the accuracy of the data and qualitative analysis. The first two researchers analyzed the qualitative data separately, and intermittent meetings were held to discuss and agree on the codifications without consensus. The last two researchers reviewed the whole coding process for peer debriefing. Last, we discussed together the whole steps of the data analysis to provide validation for all decisions.

Findings

Teachers' Motivation to Implement After PD

For the quantitative results, the average points and standard deviations of the quantitative results are listed in Table 1. Collectively, the dimensions of the EVC-PD scale provided a big picture of teachers' decisions and the extent to implement the UbD model in their own classrooms. Variations in the scores suggest that teachers' motivation to implement differs across teachers. Based on the results, the expectancy for success and the task value were closer to the highest point of six, which indicates that the teachers in our PD program had a high expectancy for success and high task value toward the UbD curriculum development model. The teachers believed that they could successfully use this model in their planning. They also felt that this model would be useful.

Table 1

Descriptive Statistics from the EVC-PD Scale

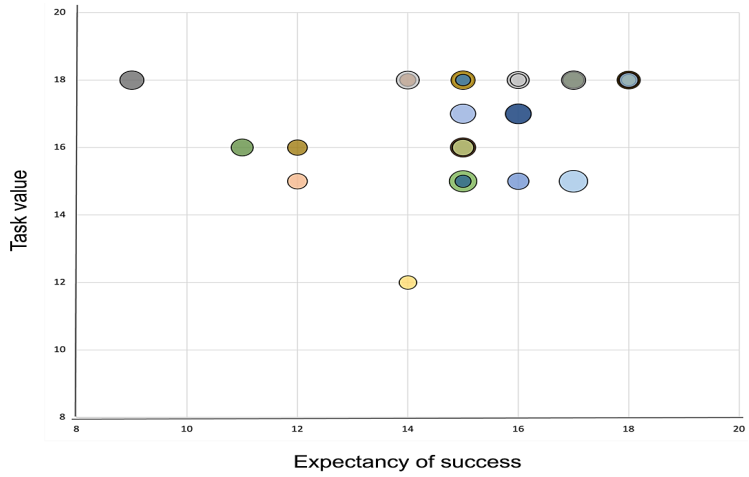
	Average	Standard Deviation
Expectancy for success	5.08	0.16
1) I am confident that I can do what was asked of me in this PD	4.97	0.89
2) I believe I can be successful applying this PD	5.27	0.69
3) I know that I can effectively put into practice the things in this PD	5	0.83
Task value	5.62	0.02
4) I am excited to put this PD into practice	5.60	0.62
5) Participating in this PD will help me in my job	5.62	0.65
6) It is important to me to apply what I learned in this PD	5.63	0.56
Cost	3.5	0.98
7) I have to give up too much to put this into PD practice	4.06	1.44
8) Applying this PD will require too much effort	4.06	1.24
9) Applying this PD will be too stressful	2.40	1.33

For cost, the points were lower than the first two dimensions. Ideally, lower points in the cost dimensions are expected because of the nature of the written items. The average cost dimension was 3.5, which indicates a moderate level of belief that using this model requires sacrifice. Supporting this argument, the average of item 9 "Applying this PD will be too stressful" was 2.4 out of 6, indicating that most of the teachers do not believe that using the UbD model will make them feel stressed. On the other hand, Items 7 and 8 were relatively higher than Item 9. This might show that the teachers felt that they needed to put a lot of effort into learning this model.

To analyse the relationship between the three dimensions of the EVC-PD scale, we created a scatterplot shown in Figure 2. The x-axis (horizontal) is the expectancy value, the y-axis (vertical) is the task value, and the size of the bubbles is the perceived cost of the teachers. Figure 2 is a representation of the extent to which the teachers varied along these three dimensions after participating in our PD program. The axes and the sizes display the total points in the corresponding dimensions.

Figure 2

The Interrelationship Between the Dimensions of Teacher Motivation to Implement in a PD



A visual analysis of Figure 2 showed that the majority of the participants were in the upper half of the expectancy of success and the task value. The quantitative data showed that the teachers in the program had high task value but differed in expectancy of success. The qualitative data from repeated reflections confirmed the variability of success expectancy in the left and right upper half of Figure 2. When our participants first heard that they would be participating in our PD program, they were confident in their ability to design plans with the UbD, although they had little hesitation about what they could do. They said that they felt particularly confident about creating knowledge and skills objectives in the UbD plans. However, as meaning-making and creating transfer goals were new to the teachers, we found that their beliefs about their abilities increased throughout the PD. Some of them believed that UbD would be essential for the future and they were very motivated to implement UbD principles in their classrooms. On the other hand, some teachers were undecided in their belief that they would be successful in implementing what they had learned.

> When I first heard this opportunity, I had questions. “Can I do it?” “How can I do it?” However, now I believe that I can implement it gradually. As I was engaged in the learning process and attending the sessions, I didn’t realise how the time passed. The pre-recorded videos, live sessions, and the feedback… They were all effective. [P7, SR].

> I have questions, but I hope they will all go away when I start implementing them. I would like to play an active role in UbD implementation, but first I need to try and implement it. I am still struggling to decide the right and best way to do this. It takes time to learn all these concepts, I think. [P32, SR].

When analysed in terms of task value, almost all teachers agreed on the high value of the task (see Figure 2). Through reflections, we identified three different reasons for the high task value presented by the quantitative data: (1) attainment value (perceived importance), (2) utility value (possible outcomes) and (3) intrinsic value (interests). Teachers valued the task of designing with the UbD because it aligned with their teaching philosophy and past experiences. In particular, teachers mentioned that they were used to writing knowledge and skills objectives in the UbD and had done so in previous plans. In addition, the fact that the UbD helps students to make connections to everyday life was very much in line with teachers' teaching philosophies and they attached particular importance to the UbD in this respect.

> I felt comfortable when creating transfer goals because I designed STEM courses before. I think the purpose of transfer goals is to blend maths, science, and engineering and integrate them in real-life. [P 25, FR 2].

Teachers who evaluated the usefulness of the UbD in planning their lessons reflected on possible outcomes related to enhancing and supporting student learning. For instance, Participant 7 revealed the utility value of the possible outcomes of the UbD when he said “*I believe we will see the positive effects of UbD when*

we begin implementing Backward Design and performance tasks. [P 7, SR]". These outcomes were possible perceptions of the contribution of the UbD to student learning as they had not yet implemented their plans.

In addition, the qualitative reflections helped us to deepen the high task value on the EVC PD scale in terms of intrinsic value. For example, the reflection data showed that the powerful elements of the PD, such as active group work, interactive videos, and facilitator support, were the reason why teachers had a task value even though they had not yet implemented the plans ([P 30, FR 3]).

> At first it's hard to create transfer goals and understanding, but the feedback I got in the live sessions, the sample UbD plans and the facilitation support during the group work was important. There are a lot of moving parts and you have to think from different perspectives, which is challenging. It's good to have examples and support from the facilitators. [P 30, FR 3].

Given that teachers' intrinsic motivation is also part of task value, we found that they were willing to learn during the PD and to implement what they had learned afterwards. For example, most teachers indicated that they would like to be involved in an active and leading role in planning lessons with UbD. In addition, some teachers had a meaningful intellectual engagement and many teachers attended this training from a lifelong learning perspective. Even some of the teachers who are in the Ph.D. studying process have a high intrinsic value of UbD planning because they want to do in-depth research on this topic.

Perceived Cost Dimensions

The cost was almost identical across the points in the upper half in Figure 2. These teachers believe that the UbD model will add value to their teaching and are aware of the effort involved. However, as the diameters of the bubbles were not very different, as can be seen in Figure 2, we used the reflections for detailed findings on teachers' perceived costs. In terms of perceived costs, the qualitative analysis focused on three dimensions: (1) task effort costs and (2) challenges (outside effort costs). These dimensions and their associated codes are presented in Table 2.

Table 2

Definition of Perceived Cost Dimensions and Related Codes

Perceived cost Dimensions	Definition	Codes
Task effort cost	The amount of effort required to engage in a task	Being able to action research Required practice and implementation the UbD Need for understanding the philosophy of UbD Being unfamiliar with UbD elements
Outside effort cost (Challenges)	Perceptions that other activities they do will make it more challenging to put forth effort on the focal task.	Existing curriculum structure Requiring time for the effective implementation Lack of required teacher support mechanism

Firstly, teachers associated their success in planning UbD and implementing UbD elements with having a researcher role. This was because they felt that designing quality UbD plans required not only strong subject knowledge, but also following current research findings so that they could easily design their activities about everyday life ([P 3, FR 1]). In addition, while some teachers had high expectations of success due to their mastery of the UbD philosophy (see the results for perceived expectations of success), others stated that they needed to learn more about it and that they should make an effort to do so. This was because of the UbD rhetoric to which they were not accustomed.

> I need to try it out and must read more. I realised that teachers' experience and knowledge are important in designing lessons. It's not just teachers' content/subject-matter knowledge… As teachers read more and learn more, it becomes easier… [P 3, FR 1].

> UbD has its own language and terminologies so it takes time to get familiar with them. What does understanding mean? Transfer? It's hard. It's a learning curve. But I will get it. [P2, FR3].

Secondly, we found that challenges as outside effort costs were the qualitative code that illuminates the largest part of the reasons for the quantitative result. The current curriculum structure was one of the main challenges for the perceived cost to teachers. In particular, the very limited course time of the Turkish high school curriculum made teachers reluctant to implement UbD, which aims at deep learning of understanding and teachers feel that adapting the existing curriculum to UbD principles requires extra effort. They also stated that they would need to invest time and effort in finding a solution for how it could be integrated with other teaching models they had already implemented.

> I found it difficult to understand the learning objectives. I think this is because I was so focused on the national standards that I missed how transfer, skills, knowledge and understanding differed from our own standards. [P1, FR3].

> Our school also runs a program called DLA (Digital Leaders Academy). We are making plans there too. I hope it will not be a waste of time, like transferring what is in DLA to UBD, transferring what is in UBD to DLA. I don't think I'm qualified to be a pioneer yet. [P2, SR].

In addition to the existing curriculum structure, 13 out of 30 teachers expressed uncertainty about implementing the UbD and stated that they needed time to do that. For example, the statement of P24: "*First of all, I need time. Time is very important to create in-depth activities related to our content*" was one of the examples of time needed to implement the UbD. Teachers who indicated that they needed time to effectively implement what they had learned from PD also expected support. They expected on-the-job support where new knowledge is learned, in some activities such as peer support during the implementation in the classes and receiving feedback from experts ([P32, SR]).

> I wish we had the experts during and after the implementation. We are just taking baby steps. We need someone to guide us and correct our mistakes. [P32, SR].

Discussion

The quantitative data showed that the teachers in our online PD had high task value but differed in their expectancy of success. In simple terms, the first group of teachers (upper right quarter in Figure 2) say “I can do this and I will benefit from it” similar to the results in Palermo and Thomson (2019). On the other hand, the second group (upper left quarter in Figure 2) stated, ‘I do not think I can do this effectively, but I wish I could because it could really help, ’ as in Lai (2019). We can explain the higher task value of teachers for two reasons. First, the UbD model is a complicated design model that responds to teachers’ need for design instructions that focus on enduring understanding and transfer (Wiggins & McTighe, 2005). They felt and believed that using the UbD would help because even the basic premises of the UbD would enhance their classroom practices. The teachers were aware of the usefulness of the task (i.e., learning UbD) (Barron & Hulleman, 2015). To achieve the task, they made persistent efforts (Guo et al., 2015) because they thought the UbD would facilitate their classroom work in the future (Pintrich & Schunk, 2002).

Second, the activities in the PD program were well grounded in research and practitioners’ work that contributed to teachers’ understanding of the UbD model (Nalbantoğlu et al., in press). The hands-on activities and discussion-based group works motivated the teachers extrinsically (satisfaction of learning a new, innovative model as a reward and recognition from the school) (Eccles & Wigfield, 2002). As the program was developed based on teachers’ needs, they also had higher task value. Teachers completed the activities aligned with their professional career goals with some added values (Gaines et al., 2019; Muwonge et al., 2017). In addition, our qualitative findings from the teacher reflections confirm this potential reason. Most teachers attributed the increase in the initial low expectation of success to the powerful elements (facilitation support, active learning, and expert feedback) of our PD program. These powerful elements in PD may have served as stepping stones for teachers' expectation of success and task value by strengthening the link between theory and practice.

We can also discuss the varying levels of expectancy-value in the participating teachers from the premises of expectancy for success. The second group described above (see Figure 2) believes that implementing the UbD model would be valuable, but they do not believe in their ability, which is similar to the results of Thomson and Kaufmann (2013). Lack of confidence and questioning their ability by asking “can I do it?” made teachers unmotivated to implement the UbD model. This knowledge has implications for the design and implementation of PD. First, PD designers should consider integrating particular activities to increase teachers’ beliefs about implementing new learning. Enhancing the emphasis on particular learning would help them succeed (evidenced in Abrami et al., 2004). Therefore, during PD activities, teachers should be encouraged to practice

their learning, receive feedback on their efforts, and be provided with a roadmap for implementation. Moreover, researchers should not simply ask teachers to use their learning. During and just after a PD event, a closer examination must be conducted to explore teachers' expectancy of success. One way to achieve this goal is to collect data during PD and measure the changes to investigate trends in this variable. One recommendation for future research is to ask teachers to write learning journals with prompts (aligned with the EVC theory) as they engage in PD activities.

The dimensions of the EVC-PD scale provided a big picture of the teachers' decisions and showed varying extents of the implementation of the UbD model. These differences might be helpful to consider because the variation would occur as teachers implement the UbD model in their classrooms. Exploring the extent to which the UbD model was used in the classroom is not the goal of this study. However, quantifying the levels of motivation to implement is helpful for us to know their motivated decision-making just after PD (a proxy for the effect of PD).

We found that the expectancy for success was high after the PD. Teachers are aware of the value of the model. Beyond their intentions, they were motivated to apply their learning. Similarly, the value for implementing the UbD model was scored high, showing that they "buy in" the UbD model and see the benefits of the model for their schools, classrooms or themselves. Not surprisingly, teachers who reported that the UbD model was compatible with their teaching philosophies and past experiences had a higher task value similar to Abrami et al., (2004) and Emo (2015).

Perceived Costs Related to Study Context

Iterative reflections revealed that some of the perceived costs reported were behind their low expectations of success. Some of the teachers stated that the centralised national curriculum was intensive and they were confused about how to integrate the understanding and transfer goal elements of UbD. They had limited time to complete all the content and were not sure how and to which extent they could implement the curriculum as they were working with unfamiliar elements of the UbD. For this reason, these teachers felt that they needed time to internalise their practices. This finding supports Andersson and Palm (2018), who state that new teaching practices need time to be used to become established and to develop the motivation to implement them. Therefore, supporting teachers with useful information on how to use new knowledge in their context can increase their motivation by reducing barriers to implementation.

The second perceived cost was related to the lack of support on the job after PD programs (left alone during implementation). Although our teachers stated that they learned through productive activities during the PD, they stated that they were left alone and sought support after the PD. This result confirms several studies (Andersson & Palm, 2018; Beymer et al., 2022) that have found that excessive workload, combined with a lack of collegial support in practice and insufficient support from the administration, affects the implementation of new learning. Our findings suggested that teachers needed the support of colleagues to internalise what they had learned in PD. This finding is not surprising given that studies have reported that teachers who are supported by their colleagues are positively motivated to practice (Colognesi et al., 2020; Sandholtz & Ringstaff, 2016). Furthermore, our teachers who reported high perceived costs requested not only colleague support but also on-the-job support from experts after PD. In other words, one of the barriers for teachers to implement what they have learned is that they are not sure what and how to apply it in the real context. Therefore, we argue that potential costs are eliminated when teachers receive expert feedback on their post-PD practice, highlighting studies (Colognesi et al., 2020, Philippakos & Voggt, 2021) that report that teachers' belief in their performance can be increased through follow-up work related to on-the-job support. In sum, lack of time and support as barriers to changing teachers' lesson planning habits is not a new finding. This can be seen as a reason for the increase in perceived costs. In conclusion, following the suggestion of Nevenglosky (2018), we believe that another issue that future PD designers should consider is providing teachers with the necessary resources and support when it comes to using new lesson planning methods.

To sum up, the perceived cost of using the UbD model exists as a stand-alone dimension and is meaningfully different than the expectancy of success and the task value (Osman & Warner, 2020). Thinking of these two dimensions (task value and expectancy of success) in isolation doesn't add to our discussion but together with cost, it provides more perspective of teachers' beliefs. In our study, the teachers perceived a high sense of value in the UbD model and a low sense of stress in implementing the model. These teachers will possibly use the model in their classrooms. On the other hand, some teachers after the PD had a high degree of value yet a low degree of effort and sacrifice. These teachers may implement the UbD model differently. As exemplified by

Osman and Warner (2020), the teachers in our PD understand the potential usefulness of using the UbD model for their students and themselves. Thus, they will overcome difficulties, such as time commitments and heavy workloads, and stay motivated to apply their UbD learning. Future studies can explore this relationship further with more participants using the same EVC-PD scale. Researchers also dive deeper into examining how cost interplays with task value using interviews and class observations. Moreover, measuring the perceived cost of implementation can guide PD designers to consider their options, such as the intensity of active learning opportunities or the duration of PD activities.

Limitations

Several limitations to this study must be emphasised. First, our data came from a group of motivated teachers who voluntarily attended our PD. Since their motivation was both internal (for personal and professional goals) and external (support from their schools), the EVC-PD scale didn't produce diversified results (we had only two main categories). PD providers and researchers should consider the potential driving forces, such as willingness when designing PD activities. Our working group wasn't counted as a diverse group that represents a general population, either. They were teachers who were working at similar schools with similar expectations. Qualitative studies investigating teacher-related variables that encourage or hinder teacher motivation to implement are also needed.

Second, although we attempt to deepen the generalisable data generated by the EVC-PD scale through iterative reflection, we acknowledge the limitations of this reflection, such as the lack of probes and social desirability bias. Teachers might be inclined to present themselves in a favourable light or conform to perceived norms and expectations, leading to responses that align with social desirability rather than objective reality. Therefore, in future studies, we recommend researchers to support reflections with interviews and observations to overcome the limitations of the scale.

Despite these limitations, this study makes important contributions to the literature. It provides an overview of EVC theory in the real PD context and it has highlighted the limitations of the scale to measure the teachers' motivation after PD programs. Unfortunately, the EVC-PD scale alone is not sufficient to measure teachers' motivation to implement. Other analyses may also benefit from using a mixed research perspective, to discuss how teachers' motivation to implement varies according to seniority, seniority, branch, type of school and the type of PD program attended, and to define the perceived costs that prevent implementation of what has been learned. In this context, this study contributed to the literature by elaborating on the perceived cost dimension of the EVC-PD scale.

Code of Ethics

Ethical approval was granted by the Georgia Southern Institutional Review Board on August 15, 2023 (protocol number H23327) upon the application of the second author.

References

Abrami, P. C., Poulsen, C., & Chambers, B. (2004). Teacher motivation to implement an educational innovation: Factors differentiating users and non-users of cooperative learning. *Educational Psychology, 24*(2), 201–216. https://doi.org/10.1080/0144341032000160146.

Andersson, C., & Palm, T. (2018). Reasons for teachers' successful development of a formative assessment practice through professional development–a motivation perspective. *Assessment in Education: Principles, Policy & Practice*, *25*(6), 576–597. https://doi.org/10.1080/0969594X.2018.1430685.

Bardach, L., & Klassen, R. M. (2021). Teacher motivation and student outcomes: Searching for the signal. *Educational Psychologist*, *56*(4), 283–297. https://doi.org/10.1080/00461520.2021.1991799.

Barron, K. E., & Hulleman, C. S. (2015). The expectancy-value-cost model of motivation. In J. D. Wright (Ed.), *International encyclopedia of social and behavioral sciences* (pp. 503–509). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.26099-6.

Beymer, P. N., Ponnock, A. R., & Rosenzweig, E. Q. (2022). Teachers' perceptions of cost: Associations among job satisfaction, attrition intentions, and challenges. *The Journal of Experimental Education, 1–22. https://doi.org/10.1080/00220973.2022.2039997*.

Bragg, L. A., Walsh, C., & Heyeres, M. (2021). Successful design and delivery of online professional development for teachers: A systematic review of the literature. *Computers & Education, 166*, 104–158. https://doi.org/10.1016/j.compedu.2021.104158.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://www.tandfonline.com/doi/abs/10.1191/1478088706qp063oa.

Bümen, N., & Uslu, Ö. (2020). Adaptation of the expectancy-value-cost for professional development scale into Turkish. *Gazi University Journal of Gazi Education Faculty, 40*(3), 905–942. https://doi.org/10.17152/gefad.787116.

Colognesi, S., Van Nieuwenhoven, C., & Beausaert, S. (2020). Supporting newly-qualified teachers' professional development and perseverance in secondary education: On the role of informal learning. *European Journal of Teacher Education*, *43*(2), 258–276. https://doi.org/10.1080/02619768.2019.1681963

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research*. Sage Publications.

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*(3), 181–199. https://doi.org/10.3102/0013189X08331140.

Dogan, S., Pringle, R., & Mesa, J. (2016). The impacts of professional learning communities on science teachers' knowledge, practice and student learning: A review. *Professional Development in Education, 42*(4), 569-588. https://doi.org/10.1080/19415257.2015.1065899

Eccles, J. S., & Wigfield, A. (1995). In the mind of the actor: The structure of adolescents' academic achievement related-beliefs and self-perceptions. *Personality and Social Psychology Bulletin*, *21*(3), 215–225. https://doi.org/10.1177/0146167295213003.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, *53*(1), 109–132. https://doi.org/10.1146/annurev.psych.53.100901.135153.

Emo, W. (2015). Teachers' motivations for initiating innovations. *Journal of Educational Change, 16*(2), 171–195. https://doi.org/10.1007/s10833-015-9243-7.

Flake, J. K., Barron, K. E., Hulleman, C., McCoach, B. D., & Welsh, M. E. (2015). Measuring cost: The forgotten component of expectancy-value theory. *Contemporary Educational Psychology*, *41*, 232–244. https://doi.org/10.1016/j.cedpsych.2015.03.002.

Gaines, R. E., Osman, D. J., Maddocks, D. L. S., Warner, J. R., Freeman, J. L., & Schallert, D. L. (2019). Teachers' emotional experiences in professional development: Where they come from and what they can mean. *Teaching and Teacher Education, 77*, 53–65. https://doi.org/10.1016/j.tate.2018.09.008.

Guo, J., Marsh, H. W., Parker, P. D., Morin, A. J., & Yeung, A. S. (2015). Expectancy-value in mathematics, gender and socioeconomic background as predictors of achievement and aspirations: A multi-cohort study. *Learning and Individual Differences, 37*, 161–168. https://doi.org/10.1016/j.lindif.2015.01.008.

Han, J., & Yin, H. (2016). Teacher motivation: Definition, research development and implications for teachers. *Cogent Education*, *3*(1), 1217819. https://doi.org/10.1080/2331186X.2016.1217819.

Hashim, A. K., & Carpenter, J. P. (2019). A conceptual framework of teacher motivation for social media use. *Teachers College Record, 121*(14), 1–18. https://doi.org/10.1177/016146811912101405.

Henze, I., Van Driel, J., & Verloop, N. (2009). Experienced science teachers' learning in the context of educational innovation. *Journal of Teacher Education*, *60*(2), 184–199. https://doi.org/10.1177/0022487108329275.

Hodkinson, P., & Hodkinson, H. (2004). The significance of individuals' dispositions in workplace learning: A case study of two teachers. *Journal of Education and Work*, *17*(2), 167–182. https://doi.org/10.1080/13639080410001677383.

Hulleman, C. S., Durik, A. O., Schweigert, S. A., & Harackiewicz, J. M. (2008). Task values, achievement goals, and interest: An integrative analysis. *Journal of Educational Psychology, 100*(2), 398–416. https://psycnet.apa.org/doi/10.1037/0022-0663.100.2.398.

Hwang, M. Y., Hong, J. C., & Hao, Y. W. (2018). The value of CK, PK, and PCK in professional development programs predicted by the progressive beliefs of elementary school teachers. *European Journal of Teacher Education, 41*(4), 448–462. https://doi.org/10.1080/02619768.2018.1471463.

Kennedy. (2016). How does professional development improve teaching? *Review of Educational Research, 86*(4), 945–980. https://doi.org/10.3102/0034654315626800.

Kudo, Y., & Goda, Y. (2020, December). Synchronous distance learning for ımprovement of elementary school teachers' motivation to teach English. In *2020 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE)* (pp. 797–802). Japan. https://doi.org/10.1109/TALE48869.2020.9368315.

Lai, Y. (2019). Accounting for mathematicians' priorities in mathematics courses for secondary teachers. *The Journal of Mathematical Behavior*, *53*, 164–178. https://doi.org/10.1016/j.jmathb.2018.08.001.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Sage.

Magidin de Kramer, R., Masters, J., O'Dwyer, L. M., Dash, S., & Russell, M. (2012). Relationship of online teacher professional development to seventh-grade teachers' and students' knowledge and practices in English language arts. *The Teacher Educator, 47*(3), 236–259. https://doi.org/10.1080/08878730.2012.685795.

Martin, F., Polly, D., & Rithzaupt, A. D. (2020, September 8). *Bichronous online learning: Blending asynchronous and synchronous online learning.* Educause Review. https://er.educause.edu/articles/2020/9/bichronous-online-learning-blending-asynchronous-and-synchronous-online-learning

Mouza, C., Mead, H., Alkhateeb, B., & Pollock, L. (2022). A virtual professional development program for computer science education during COVID-19. *TechTrends, 66*, 436–449. https://doi.org/10.1007/s11528-022-00731-y.

Muwonge, C. M., Schiefele, U., Ssenyonga, J., & Kibedi, H. (2017). Determinants of persistence among science teacher-trainees: Examining the role of self-efficacy, task value, and academic hope. *Journal of Science Teacher Education*, *28*(6), 522–548. https://doi.org/10.1080/1046560X.2017.1379860.

Nalbantoğlu, U. Y., Dogan, S., Korkmaz, Z. S., & Agaclı Dogan, N. (in press). The effects of online professional development on teachers: Perceived barriers to teach online. *Journal of Educators Online.*

Nevenglosky, E. A. (2018). *Barriers to effective curriculum implementation* [Unpublished doctoral dissertation]. Walden University.

Opfer, V. D., & Pedder, D. (2011). Conceptualizing teacher professional learning. *Review of Educational Research*, *81*(3), 376–407. https://doi.org/10.3102/0034654311413609.

Osman, D. J., & Warner, J. R. (2020). Measuring teacher motivation: The missing link between professional development and practice. *Teaching and Teacher Education*, *92*, 103064. https://doi.org/10.1016/j.tate.2020.103064.

Palermo, C., & Thomson, M. M. (2019). Large-scale assessment as professional development: Teachers' motivations, ability beliefs, and values. *Teacher Development*, *23*(2), 192–212. https://doi.org/10.1080/13664530.2018.1536612.

Philippakos, Z. A., & Voggt, A. (2021). The effects of distant professional development model on second grade teachers' instruction and students' quality of procedural papers. *Reading and writing*, *34*(7), 1791–1822. https://doi.org/10.1007/s11145-021-10120-1

Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in education: Theory, research, and applications*. (2nd ed.). Prentice Hall.

Sandholtz, J. H., & Ringstaff, C. (2016). The influence of contextual factors on the sustainability of professional development outcomes. *Journal of Science Teacher Education*, *27*(2), 205–226.https://doi.org/10.1007/s10972-016-9451-x

Thomson, M., & Kaufmann, E. (2013). Elementary teachers' views of their science professional development attendance: An expectancy-value approach. *Eurasia Journal of Mathematics, Science and Technology Education, 9*(1), 45–58. https://doi.org/10.12973/eurasia.2013.915a.

Watt, H., & Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learning and Instruction, 18*(5), 408–428. https://doi.org/10.1016/j.learninstruc.2008.06.002.

Watt, H., & Richardson, P. W. (2015). Teacher motivation. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (pp. 64–71). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.26082-0

Wigfield, A., & Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. *Contemporary Educational Psychology, 25*(1), 68–81. https://doi.org/10.1006/ceps.1999.1015

Wigfield, A., Tonks, S., & Klauda, S. L. (2009). Expectancy-value theory. In K. R. Wenzel, & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 77–104). Routledge.

Wigfield, A., & Cambria, J. (2010). Students' achievement values, goal orientations, and interest: Definitions, development, and relations to achievement outcomes. *Developmental Review*, *30*(1), 1–35. https://doi.org/10.1016/j.dr.2009.12.001.

Wiggins, G., & McTighe, J. (2005). *Understanding by design*. ASCD.

Xie, K., Kim, M. K., Cheng, S. L., & Luthy, N. C. (2017). Teacher professional development through digital content evaluation. *Educational Technology Research and Development, 65* (4), 1067–1103. https://doi.org/10.1007/s11423-017-9519-0.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Sage Publications.

Çevrimiçi Bir Mesleki Gelişim Sonrasında Öğretmenlerin Uygulama Motivasyonlarının Beklenti-Değer-Bedel Teorisini Kullanarak Keşfedilmesi

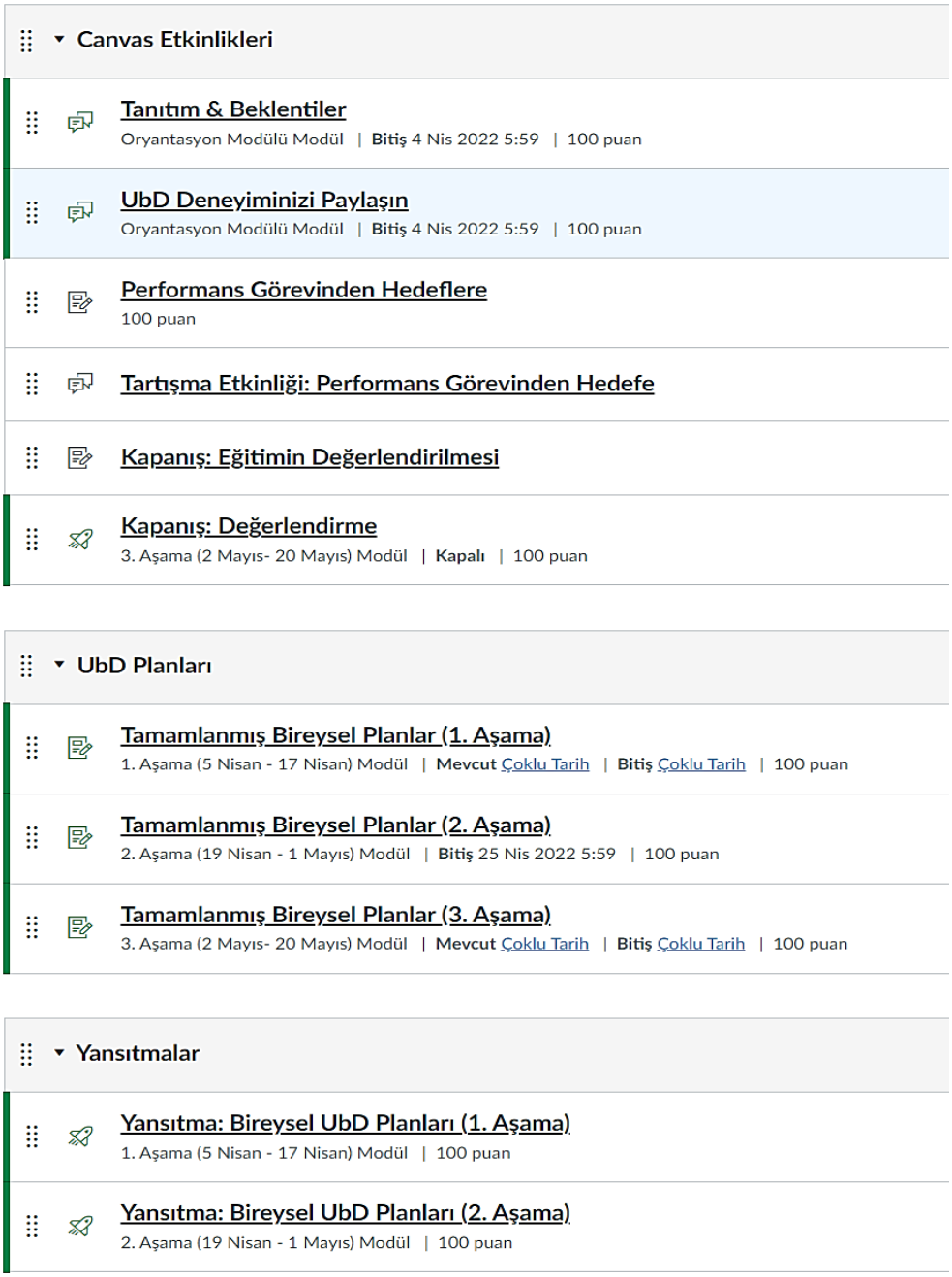
Öz

Bu vaka çalışması, yedi haftalık çevrimiçi mesleki gelişim (MG) sonrasında öğretmenlerin bir öğretim tasarımı modelini (Tasarımla Anlama, TA) uygulamaya yönelik motivasyonlarındaki değişimleri araştırmıştır. Veriler bir motivasyon ölçeği ile biçimlendirici ve özetleyici yansıtma formları aracılığıyla toplanmıştır. Nicel bulgulara göre, öğretmenler yüksek görev değerine sahiptir ancak başarı beklentileri farklılık göstermektedir. Nitel bulgular, şüphe duyulan yetenek inançlarının ardında iki önemli algılanan bedel ortaya çıkarmıştır: İlk olarak, öğretmenler TA'nın unsurlarını yoğun ve kafa karıştırıcı buldukları merkezi ulusal müfredatla bütünleştirmede zorlandıklarını ifade etmişlerdir. İkinci olarak, MG programlarından sonra iş başında desteğin olmayışı öğretmenlerin başarı beklentilerini olumsuz etkilemiştir. Bu çalışma, öğretmenlerin başarı beklentilerini ve görev değerlerini MG programları öncesinde, sırasında ve sonrasında dikkate almanın önemini vurgulayarak, öğretmenlerin motivasyonunu ve yeni öğrenilenleri sınıflarında başarılı bir şekilde uygulamaları için özel destek ve faaliyetlere duyulan ihtiyacı ortaya koymaktadır.

Anahtar kelimeler: beklenti-değer-bedel teorisi, çevrimiçi öğrenme, mesleki gelişim, öğretmen motivasyonu, tasarımla anlama

Appendices

Appendix A: A Summary of the Activities in PD Program



Appendix B: Examples of Reflection Questions in LMS