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A Cluster Analysis for Teachers' Designer Role: Three Profiles with Differing Focuses on Design

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Abstract

Teachers have a vital role in students' learning. This role is multifaceted in terms of their design skills and must be unpacked to clearly understand how teachers' daily routines differ with respect to instructional perspectives. This study introduces a comprehensive professional development (PD) program for teachers to build capacity in designing instruction and other design-related skill sets. Employing a person-centered methodology, the study aimed to identify different profiles of teachers in terms of their skills in designing instruction, implementing lessons, updating professional knowledge, digital learning systems, and facilitation/leadership. Through the application of cluster analysis on a cohort of 130 educators, three distinct designer teacher profiles emerged: high-designers (n = 29), mid-designers (n = 64), and low-designers (n = 37). These profiles delineate both shared attributes and discrepancies. In addition, the study delved into the variances within these profiles concerning teachers' grasp of curriculum development and self-reported utilization of innovative pedagogical methods. Means analysis further shows that as the profile gets higher, the curriculum development knowledge and the use of teaching and learning techniques increase. These findings hold significant implications, urging a departure from exclusively emphasizing technical design work when assigning roles to teachers, thereby recognizing the multifaceted dimensions of their contributions.

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Introduction

For almost three decades, teachers have been described as designers of instruction with an emphasis on several aspects (Carlgren,1999; Koehler & Mishra, 2005; McKenney et al., 2015; Penuel & Gallagher, 2009; Voogt et al., 2015). This discourse on the interplay of teachers and design is expansive but needs conceptual clarity (Warr & Mishra, 2021). There are "blurred definitions" and "multiple interpretations" (Persico & Pozzi, 2015, p. 232) as researchers define teachers as designers.

Warr and Mishra's (2021) comprehensive analysis of discourse in teachers and design showed that there are 10 strands that frame teaching and learning as designs, from designing pedagogy (Cope & Kalantzis, 2015) to "teaching is design" (McKenney et al., 2015) and from curriculum reform (Voogt et al., 2015) to patterns for learning (Laurillard, 2008). In their review, Warr and Mishra (2021) interpreted the collective idea as "teaching as design," which has been commonly referred to for more than two decades. Other scholars frequently use the role (and the term) of teachers as designers in technology-enhanced learning environments to extend existing design with technology knowledge (Kali et al., 2015). What has been noticed is that the concept of "design" is used interchangeably in different situations with inconsistent manners (Holmberg, 2014).

Warr and Mishra (2021) suggested that "teaching not only includes design activities but could be considered a design profession" (p. 1). This insight questions our definitions of teachers as designers because teaching practices need to be updated by the demands and needs of a new generation of students (Bartlett, 2021; Brown, 2004; Kalantzis & Cope, 2010; Scott & Lock, 2021). Teachers need to adjust to the expectations of their job (Pillen et al., 2013). For example, being a designer now means supporting other teachers through feedback for their lesson plans or creating networks for learning and sharing experiences of design knowledge. In addition, teachers must now build capacity in various skill sets to make better instructional decisions and help their students succeed (Kelting-Gibson, 2005; Trinter & Hughes, 2021). These skill sets range from being a practitioner who gives feedback to other teachers' performance in teaching, organizing, and facilitating professional development (PD) sessions to attending conferences to disseminate their professional learning. Teachers must become practitioners, mentors, or coaches to facilitate student learning and be actively involved in other teachers' professional knowledge (Darling-Hammond et al., 2017). These continuous demands from teachers to reconcile their design duties and different professional expectations characterize the development of a new teacher profile, not just a teacher focusing on design itself.

Considering this complicated nature of the term, it is essential to develop a more nuanced understanding of the design task of teachers and go beyond the time by extending it to the teaching profession. Therefore, the primary goal of this study is to explore teachers as designers from a different lens and examine the profiles of the teachers as they work on other design-related tasks. A design-focused PD program was created, which was expected to promote teachers' designer role and encourage them to use different skills for the benefit of other teachers. Our research questions were:

1. What are the teacher profiles after they complete a design-focused PD program?

2. How do teacher profiles differ regarding their knowledge of curriculum development and the frequency of using innovative teaching and learning methods?

The first research question, it was aimed to see if the characteristics/domains of teachers as designers are distributed with a pattern, such as one character having more emphasis than the other. This is because the previous studies show that certain types of teachers can be identifiable in the degree to which they follow a designer role and put effort into planning their professional practices.

For the second research question, it was examined if a teacher who embraces the designer role (1) has different professional knowledge to develop a curriculum, such as setting relevant goals (transfer and enduring understanding), creating authentic performance tasks, creating inquiry-based instruction, and (2) uses innovative and student-oriented teaching and learning methods to a certain extent (basing our argument to the better learning experience (Treagust & Tsui, 2014), the importance of authentic assessment (Care et al., 2016), transfer of learning (Stern et al., 2021), and student-oriented learning (Kangas et al., 2017)). The characteristics of teachers as designers were investigated by comparing the variations in teachers' skills in each profile regarding curriculum development and teaching and learning methods. It was explored that designers' stances are conducive to practicing what they believe and what they think they are. It is expected that a "design-heavy" position in teachers pushes them to develop better lessons and incorporate newer instructional strategies in the classroom. Such results might illuminate the validity and implications of our argument of the teachers as designers.

Theoretical Background

Teachers as Designers

The literature on teachers' role around design and instruction abounds (Carl, 2009; Kalantzis & Cope, 2010; McKenney et al., 2015; McTighe & Brown, 2020; Warr & Mishra, 2021; Wiggins & McTighe, 2005; Yurtseven et al., 2021). Most studies in the teachers as design field underlined the importance of teachers' design knowledge (Koehler et al., 2007) and how they design instruction through collaborative mechanisms (Voogt et al., 2015; Wood, 2020); some scholars added technology and other digital means to use and integrate in their design (Kali et al., 2015).

However, little is known about (1) how other skills that are different from design skills appear, (2) how they are interrelated to each other, and (3) how these skills describe teachers' changing roles. Previous studies put less emphasis on some aspects of teachers as designers, which encourages us to conceptualize a broader definition while maintaining the power of design (Warr & Mishra, 2021). In this sense, teachers' typologies or profiles might have implications that affect various aspects of teachers' daily professional roles. Such profiles might show differing focus as teachers design instruction and make design choices, inevitably impacting student achievement (Kim, 2019). Previous studies have overlooked investigating such aspects from this perspective (e.g., Barnes et al., 2018). If we desire to have students experience meaningful learning, it is necessary to emphasize the changing role of teachers in schools and PD programs because it has critical importance (McKenney et al., 2015).

Conceptual Framework: Designer Teacher

There are numerous ways to define teachers as designers using theories and previous studies on teacher development and instructional design (e.g., Scott & Lock, 2021). Our conceptualization of the designer teacher doesn't limit the scope of a teacher's professional efforts as a designers and goes beyond the sole focus of a design and its effectiveness. Based on data generated by a comprehensive literature review, teacher interviews, and surveys (more about the theoretical framework and psychometric properties of the domains in Yurtseven et al. (2021) in this study, "designer teacher" is characterized by five interrelated disciplines. We intentionally put "designer" up front to signal the importance of design, but at the same time, what other skill sets can interplay with designer skills were explored.

(1) Design/Development: This domain addresses teachers' capacity in planning instruction (Laurillard, 2008), which includes setting goals, preparing assessments, and creating learning activities (McKenney et al., 2005; McTighe & Wiggins, 2012). Designer teachers participate in curriculum development since their actual experiences in classroom settings are valuable (Lumbreras & Rupley, 2020). Designer teachers adjust and modify lesson plans and curricula to meet the needs and expectations of students (Bümen & Yazıcılar-Nalbantoğlu, 2020). S/he uses and develops authentic assessments, including projects, performance tasks, and other alternative methods and techniques (Wiggins & McTighe, 2005). In his/her classroom, students enjoy the learning activities. This domain underlines the importance of "teacher's own work" in that it limits adapting others' or commercial lesson plans for his/her classroom (Bartlett, 2021; Debarger et al., 2017).

(2) Implementation/Enactment: This domain has less to do with the delivery of instruction. It is more about facilitating and coaching the student learning process (Kelting-Gibson, 2005; Penuel & Gallagher, 2009). The designer teacher supports students in any of their efforts through various resources (McTighe & Brown, 2020). S/he asks students for feedback to improve instruction and exchanges experiences and practical ideas with his/her colleagues (Hauge, 2014). Implementation refers to being aware of the learning plan and taking necessary steps to improve it (Kalantzis & Cope, 2010). On-the-go changes are always visible in designer teachers' classrooms. Enactment is for actively using the designed/developed lesson plan in the classroom, which might differ in a real-life classroom. A designer teacher makes changes in his/her teaching based on feedback (Craig, 2012).

(3) Professional efforts (to update content knowledge): This domain is about designer teachers' efforts to network with other designer teachers and follow any opportunities regarding their subject matter (Boschman et al., 2015; Laurillard, 2008). Designer teachers are willing to learn art-of-the-state developments and changes in their field through participating in learning communities. Professional efforts in this domain also include teachers' collaborative efforts with other designer teachers teaching different subjects, such as mathematics teachers reviewing science curricula and meeting with other teachers to discuss potential connections between the two issues (McTighe & Brown, 2020).

(4) Digital competency: Online and digital learning systems and their designs are the primary focus of this domain (e.g., Voogt et al., 2015). Designer teachers can design a fully online course in distance or remote learning programs (Kim, 2019; McKenney et al., 2015). S/he can work effectively in cloud-based platforms to collaborate with other teachers (Paniagua & Istance,

2018). Designer teachers can efficiently complete reviewing, sharing, and commenting back and forth via technology (Yoon et al., 2005).

(5) Facilitation and leadership: This domain refers to designer teachers' professional capacity to support other teachers (regardless of them being designer teachers) in terms of designing instruction (Goodyear & Dimitriadis, 2013; Kalantzis & Cope, 2010). Designer teachers can provide feedback to teachers so that their lesson/unit plan improves (Caena, 2011). S/he has the knowledge to explain curriculum models/frameworks to other teachers and to sustain their efforts to design instruction using these models. One additional role of a designer teacher is about classroom observation. Designer teachers can coach teachers by observing them in their classroom and giving formative feedback on their teaching.

These five domains represent a teacher's varying skill sets, as they are closely related to design but have more to do with it. Other terminologies in the literature overlap with these five domains in terms of scope in design. For example, "teacher-designer" is a term coined by Rogers (2002). Teacher-designers "often do not have any background in instructional design theory or practices and have only just mastered the skills for using the delivery medium" (p. 2). Similarly, Drake and Remillard (2019), in their thematic research analysis, found five themes of teacher-designer: (1) teachers' engagement with the use curriculum resources and their capacity to use them, (2) alignment between design intentions and patterns of curriculum use, (3) ways in which curriculum resources influence instruction, (4) ways in which curriculum features are purposefully designed to achieve a particular purpose, and (5) dissolution of boundaries between design and use in the context of digital resources. Teacher-designer, as a term, has a sole focus on the design itself by making deep connections with its components. "Design thinking" is another concept that might have some similarities with the designer teacher, which implicitly focuses on the design process (Koh et al., 2015). Another term that can be interchangeably used for the designer teacher is "teachers as designers." Figuratively, this term has many commonalities with what the designer teacher entails. As mentioned in the first sections of this manuscript, however, "teachers as designers" has been heavily used for planning and developing learning environments (Warr & Mishra, 2021) and also in the field of design thinking recently (Scott & Lock, 2021) to define practical design efforts of teachers that are related to STEM and robotics and also technology-enhanced learning (McKenney et al., 2015).

In this study, the designer teacher is a role, a state, and a set of skills that a teacher can have through improvements in professional stance (Carl, 2009; Kalantzis & Cope, 2010; Yurtseven et al., 2021). It is not just using a particular design principle but building the capacity to use several together (Henriksen & Richardson, 2017). Designer teachers can self-evaluate themselves to see if they need PD and take a step to meet their needs. They pursue quality instruction for all (Wallace & Loughran, 2012) and proactively ask for that (Brown & Edelson, 2003), not just designing a lesson with technology enhancements (Kim, 2019).

Teacher Profiles

Since teacher design as a role is multidimensional, a group- or variable-centered approach might not capture the multiple perspectives that a teacher might hold. It is known that not all teachers experience design in the same way. Their experience with design-related tasks in and outside the school might also differ. Moreover, teachers experience PD activities differently.

There are subgroups among teachers whose learning might be high or low. However, these differences in terms of design still need to be explored/explained. For this reason, a person-oriented approach to exploring teacher designers is required. A person-oriented process is particularly valuable in this study because groups of teachers with different experiences in their design-related professional activities could be distinguished.

Identifying teachers' profiles would help us understand other latent professional behaviors that are design-related but not well-discussed during teachers' daily routines. This approach has the potential to provide new insights into our current understanding of the different roles teachers play in the school. Given the known and unknown differences in teachers' design-related skills, a tailored approach to explore if other teachers' profiles in terms of design exist would be worthwhile. Considering this gap, the current study aimed to explore profiles of teachers who emerged after participating in a design-focused PD program that was expected to promote their designer role and other essential skills related to design and instruction.

Methodology

This study uses a cross-sectional survey design based on quantitative data collection from the teachers who participated in a PD program (Creswell, 2012). This design helps us describe potential teacher profiles after the PD program and examine teachers' just-after views on being designer teacher.

Context

The study is part of a more significant project in which the Designer Teacher Professional Development (DTPD) Program was offered to teachers. The primary goal of DTPD was to build capacity in teachers' design skills and transform teachers' roles from being sole designers to active professionals whose focus is beyond the design itself. The DTPD was developed using theoretical frameworks created by Doğan and Yurtseven's (2021) model of PD (based on Desimone (2009) and Darling-Hammond et al. (2017)). The program had eight features: (1) Sustained duration: The program lasted five months. (2) Adequate contact time: 60 hours of in-person, live, and asynchronous activities. (3) Content: Pedagogical and instructional strategies (Hattie, 2009), as well as skills in developing a curriculum focused on understanding and transfer (UbD framework and backward design, Wiggins & McTighe, 2005), were incorporated. (4) Active learning: The teachers had hands-on opportunities, such as designing unit plans, authentic assessment tasks, and making presentations. (5) Collaborative learning: Groups of teachers from the same subject worked together and were guided by the teacher facilitators. (6) Examples of best practices: The teachers were provided with sample UbD unit plans. (7) Support and facilitation: A group of teacher leaders who were experts in facilitating teachers' learning and knowledge about UbD and effective instruction was involved in the DTPD. (8) Feedback and reflection: Structured activities for the teachers to think and review the drafted unit plans.

Participants

150 teachers from 35 cities within the scope of 20 subjects all over Türkiye attended the study. However, some of them did not fill in the data collection instruments. After removing the missing data, we had 130 teachers from both public (f = 55) and private schools (f = 75) at different K-12 levels. The teachers were notified through the official DTPD website and social

media accounts, and they were invited to sign up. Teachers without PD experience and teachers from disadvantaged regions were privileged to participate in the DTPD program, comprising 25% of the participants. Of the participating teachers, 103 were females, and 110 were males (The other data was missing). The occupational experience (year) of the teachers was less than 0-5 (f = 17), 6-10 (f = 29), 11-15 (f = 38), 16-20 (f = 30), and 21 and above (f = 16). No data could be reached about teachers' previous experience in curriculum design and their school's structure on curriculum design. Still, only 10% of the teachers had attended a month-long PD before.

Data Collection Tools

Through the data collection process, one scale and two surveys were applied. The Designer Teacher scale was used to identify teachers' level of being designer teachers. Since the designer teacher is closely related to curriculum, design, teaching and learning methods, and assessments, the two surveys were used to associate them with the scale.

Designer Teacher Scale

A scale was used which was already developed and previously published by Yurtseven et al. (2021) to measure the frequency of which domains a teacher shows and reflects as a designer teacher (For more information about the scale, see Yurtseven et al. (2021)). The scale with 36-item incorporated five dimensions of the designer teacher as follows with sample items: Design/Development (13 items) "I plan my lesson before I even begin teaching" and "I often use various assessment methods in my lesson designs," Implementation/Enactment (10 items) "I put efforts to make sense of the curriculum I am teaching" and "I try to attract my students' attention during my teaching," Professional efforts to updating content knowledge (3 items) "I attend and participate in teacher networks in my field of the study" and "I always update my knowledge with the recent news and developments," Digital competency (5 items) "I design online and technology-based lessons" and "I collaborate with my colleagues on cloud-based systems (e.g., Google Documents) to design lessons," and Facilitation and leadership (5 items) "I give feedback to lesson plans my colleagues design" and "I guide my colleagues to help them use their time effectively during their teaching." The options of the scale were in frequency and ranged from 1: never to 5: always. Cronbach alpha coefficient is calculated to be .86 for Design/Development, .93 for Implementation/Enactment, .72 for Professional efforts to update content knowledge, .86 for Digital competency, and .84 for Facilitation and leadership.

Curriculum Development Survey

This survey, developed and published previously by Yurtseven et al. (2021) was used this survey that includes 24 five-Likert-type items that were adapted from the Understanding by Design (UbD) framework (McTighe & Wiggins, 2012; Wiggins & McTighe, 2005; 2011). The survey items mainly focused on teacher skills and knowledge based on three main components of UbD. Sample items: "I can write understanding as goals," "I can explain WHERETO and its elements," and "I can enhance my instruction by creating activities to support higher-order thinking." This survey differs from the Designer Teacher Scale in that it measures teachers' perceived knowledge/ability in a specific curriculum development model. The results of the principal factor analysis (PFA) showed that the Curriculum Development Survey has a unidimensional structure. Cronbach alpha coefficient of the scale is found to be .86.

Teaching and Learning Methods Survey

This survey was prepared by Yurtseven et al. (2021) to measure the extent to which teachers perform/use different instructional methods while teaching. "I perform collaborative learning methods and techniques" and "I provide feedback for my students" are the two sample items. The items in this survey and the Curriculum Development Survey don't overlap. The scale options are from (1) never to (5) highly frequent. Cronbach alpha coefficient of the scale is found to be .82. The PFA results indicate that there is one underlying dimension that accounts for common variance.

Data Analysis

A cluster analysis was implemented to discover the designer teacher profiles using the data from the Designer Teacher Scale. Cluster analysis is an exploratory multivariate statistical technique that arranges teachers into relatively homogenous groups based on designer teacher dimensions, including design, implementation, digital proficiency, professional development, and leadership. As recommended in the literature (Billieux et al., 2015), z scores of all five domains were used for equally contributing to establishing clusters. In the clustering process, researchers use two different approaches, namely hierarchical and non-hierarchical. Hierarchical clustering starts by considering each data set as a distinct cluster. Next, it aims to identify and merge similar data into relatively homogenous clusters iteratively.

On the other hand, the non-hierarchical technique begins with a predetermined number of clusters and groups the data into the clusters in accordance with their proximity (Kern & Culley, 2015). In the current study, both hierarchical and non-hierarchical clustering techniques were employed to recognize the proper number of clusters that appropriately represent patterns within the data set. SPSS 24 software (Statistical Package for the Social Sciences, Armonk, NY) was implemented for data analysis.

After a solution to our cluster analysis was chosen, each cluster was considered as an independent variable, and one-way ANOVA and post hoc tests were applied to evaluate identified clusters of the designer teachers and investigate cross-cluster differences between two relevant variables: curriculum development and teaching and learning methods ($p < .05$ was for all analyses).

Findings

Three distinctive profiles of the designer teachers were identified, demonstrating a particular set of skills and the degrees attributed to these skills being relevant to reflect teachers' designer roles. Also, comparisons were provided to have an insight into how each profile used other skills related to the designer teacher.

Profiles of Designer Teachers

First, a hierarchical clustering analysis produced an agglomeration schedule that showed several solutions equal to the number of cases. Table 1 shows the agglomeration schedule for the final 10 clusters and the changes in coefficiency at each level. The most significant change in the coefficient was observed moving 1 to a 2-cluster solution. However, fairly large changes were observed when moving from 2 to 3 and 3 to 4. Thus, two, three, and four cluster solutions

were adopted for the subsequent analysis. Second, non-hierarchical cluster analyses with k-means cluster analyses were conducted.

Table 1

Agglomeration Schedules for the Last Ten Clusters

Number of Clusters	*Agglomeration Coefficient (Rounded)*	*Change in Coefficient to Next Level (%)*
10	86.000	4.93
9	88.245	14.90
8	101.394	22.44
7	124.151	39.75
6	173.503	3.87
5	180.222	9.86
4	198.000	1.59
3	201.156	52.35
2	306.473	146.173
1	754.454	-

Employing repeated k-means cluster analyses, the three-cluster solution was chosen for a few reasons. First, it was aimed to determine different designer teacher profiles. The two-cluster solution that dichotomized teachers' designer roles only into two profiles did not meet the aim. Second, with the four-cluster solution, the homogeneity of the profiles was not clearly observed. Third, with the four-cluster solution, the number of teachers in one of the designer teacher profiles was very small, which was very likely to restrain statistical comparisons. Table 2 presents descriptive statistics for the three-cluster solution in terms of all five domains.

Table 2

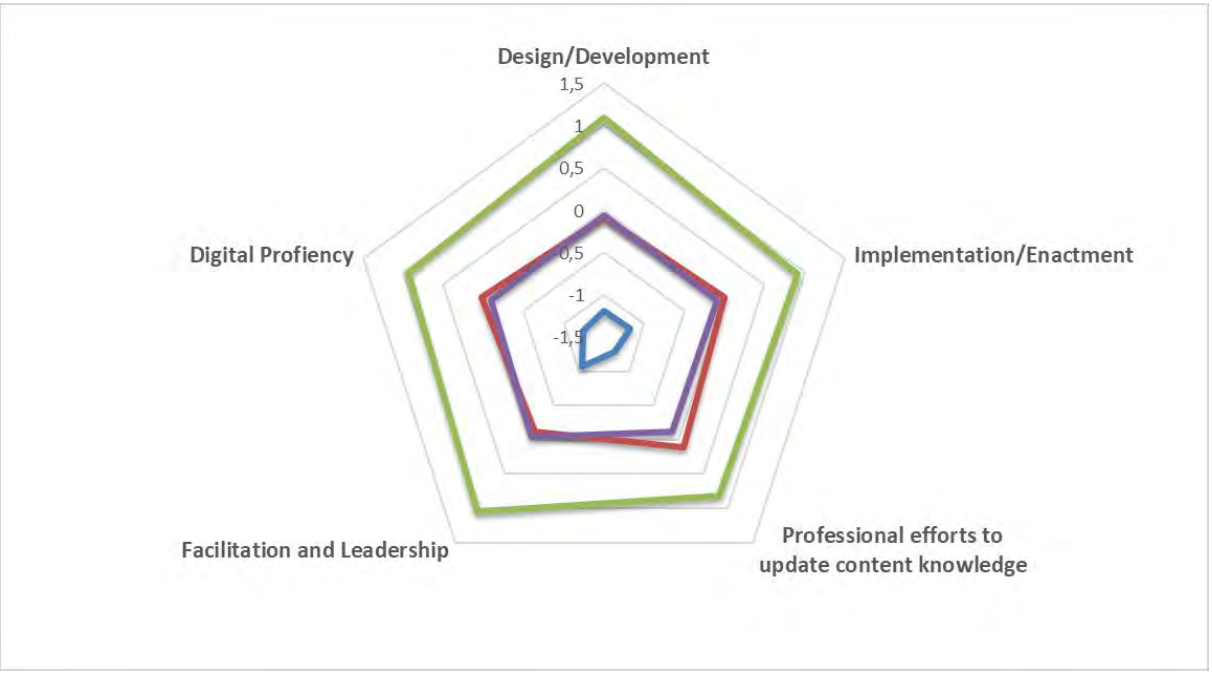
Descriptive Statistics for Three Teacher Designer Clusters (N = 130)

Designer Teacher Domains	*Cluster 1 (n = 29)*			*Cluster 2 (n = 64)*			*Cluster 3 (n = 37)*		
	M	*SD*	*z*	*M*	*SD*	*z*	*M*	*SD*	*z*
Design/Development	46.34	4.55	-1.19	53.90	4.28	-.09	54.52	3.13	1.09
Implementation/ Enactment	36.65	5.47	-1.17	42.97	3.32	.001	49.91	2.20	.91
Digital Proficiency	15.06	3.24	-1.24	20.28	2.81	.02	24.02	1.51	.93
Facilitation and leadership	14.62	2.19	-1.06	18.56	3.26	-.12	23.43	2.10	1.04
Professional efforts to update content knowledge	10.51	1.05	-1.28	13.01	1.40	.17	14.29	.84	.81

The values of each construct were standardized from 0 to 1, whereby a positive number means above the mean, and a negative number means below the mean (see Table 2). The profiles of three designer teacher clusters are illustrated in Figure 1.

Figure 1

Profiles by Domains



Note. Green line: High-designers; Red line: Mid-designers; Blue line: Low-designers. Purple line: standardized means (Z-scores) of the entire sample.

Cluster 1 (Blue line) included teachers whose level of designing instruction was low. Teachers in this cluster (profile) had less usage in all teacher designer dimensions compared to the mean score. Cluster 1 was named "low designers." One noticeable difference among the domains in this cluster was in the facilitation and leadership domain. It was relatively higher than other domains, as the image indicated (The teacher designers rated this domain the highest). Low designers perceive themselves as a supporter of other teachers.

Cluster 2 (Red line) included teachers who were almost in the mean of the entire study sample. Their level in the design/development and the facilitation and leadership domains was slightly below the mean. Their scores in the implementation/enactment and digital proficiency domains were similar to the average. The professional efforts were relatively higher than the mean. Cluster 2 was named "Mid-designers." The teachers in this profile showed relatively higher scores across all five domains than in Cluster 1. The main difference was their efforts to update their content knowledge and their willingness to collaborate with teachers teaching different subjects.

Cluster 3 (Green line) included teachers with a greater level than the mean score in all domains. The design/development domain was observed to be the highest average. The professional efforts domain was relatively lower compared to other domains. Cluster 3 was named "High designers." The designer teacher profile in this cluster, compared to other two clusters, are highly possible to lead curriculum design efforts with collaboration and through giving feedback. They are expected to ask for more feedback as they teach and have no problems making revisions to their instruction. Developing online lessons and using technology-based tools is among their skill set, relatively more frequent than the other two clusters.

Teacher Profiles: Curriculum Development and Teaching and Learning Methods

To test our hypotheses, one-way ANOVA was applied to investigate the differences between clusters, if any. Teacher designer profiles were taken as a factor (independent variable) with three levels in the comparisons. The descriptive results are presented in Table 3.

Table 3

Descriptive Results Comparing Study Variables by Designer Teacher Profiles

Profiles	*n*	*Curriculum Development*		*Teaching and Learning Methods*	
		Mean	*SD*	*Mean*	*SD*
C1: Low designers	29	83.53	11.07	53.27	5.80
C2: Mid-designers	64	88.15	14.36	60.64	6.67
C3: High designers	37	95.45	18.25	63.70	9.96

A one-way ANOVA test was conducted to examine whether the designer teacher profiles differed regarding teachers' perceived skills in curriculum development and teaching and learning methods, shown in Table 4. The results confirmed a statistically significant difference across designer teacher profiles (F (5.473) = .005, p < .05, Eta squared = .08 in the curriculum development variable). Tukey post hoc tests revealed a significant difference between Clusters 1 and 3 (p = .005). The high designers have more knowledge in curriculum development than the mid-designers and the low designers.

Table 4

Comparison Results of Three Designer Teacher Profiles on Study Variables

Study Variables	*df*	*Sum of Squares*	*Mean Square*	*F*	*p*
Curriculum Development					
Between groups	2450.256	2	1225.128	5.47	.005
Within groups	28431.092	127	223.867		
Total	30881.348	129			
Teaching and Learning Methods					
Between groups	1842.520	2	921.260	15.97	.000
Within groups	7326.257	127	57.687		
Total	9168.777	129			

It was investigated whether the designer teacher profiles showed any statistically significant difference in terms of teachers' frequency of utilizing various teaching and learning methods. The result from a one-way ANOVA suggested that using teaching and learning methods varied across the designer teacher profiles (F (15.970) = .000, p < .01, Eta squared = .201). Tukey's post hoc tests found statistically significant differences between Clusters 1 and 2 (p = .000) and between Clusters 1 and 3 (p = .000). The low designers have used innovative teaching and learning methods less than the high designers and the mid-designers.

Discussion

The results from this study (to respond to the first research question) identify three profiles highlighting the different combinations of the teacher designer domains relevant to various emphasized roles. Across all clusters, the design/development capacity appears prominent, which is expected after they participate in our design-focused PD. In addition, the lower designers think they are good at facilitating and leading other teachers (might be within and/or between clusters); the mid-designers believe they put effort into updating their content knowledge and like teacher collaboration. The high designers are proficient in all five domains. Comparing the three profiles indicated that as the profile gets higher, the curriculum development knowledge and the use of teaching and learning techniques increase. Below, the profiles are discussed together with their comparisons.

The results from the cluster analysis indicate that the level of teachers' design skills suggests the extent to which teachers use other skill sets (as evidenced in previous studies by Boschman et al., 2015). As teachers' design skills sharpen, their capabilities to provide feedback, lead professional learning activities, and develop technology-based lessons become more apparent. Studies showed that embracing a designer role in the school is a way of having effective teachers in the classroom (Bartlett, 2021; Kalantzis & Cope, 2010; Scott & Lock, 2021) and improving student achievement (Kim, 2019). Therefore, we need to leverage this role in the schools so that teachers begin blending the power of design and other professional domains that make them more competent.

The high designers have essential skill sets to professionally influence other teachers by contributing to their professional learning. They are strong in terms of design, development, implementation, and enactment aspects, which means they can design an understanding-based curriculum that helps students transfer their learning to real-life situations (McTighe & Wiggins, 2012; Wiggins & McTighe, 2005). A high-designer teacher prefers to design his/her own instruction (Bartlett, 2021; Debarger et al., 2017) because it is his/her belief that a tailored lesson is what students need. They interpret teaching as design and evaluate almost all possible aspects of instruction in the pursuit of their professional goals (Brown & Edelson, 2003). Thus, they are "curriculum makers" who might affect instructional decisions in their schools (Craig, 2012)

Moreover, in this profile, because all five domains are relatively higher in value, these teachers might help other teachers to be designers (as evidenced in the description of competent teachers in Kalantzis and Cope (2010)). These teachers can develop or support others to create localized versions of curriculum to meet student's diverse needs, which requires more than design and development knowledge. Digital competency is one of the terms that designer teachers can use to engage in technology-rich learning. Through cloud-based technologies, they can collaboratively build on new materials and share their know-how, know-why, and know-what (Boschman et al., 2015). Additionally, the daily life of the teachers in this profile includes frequent exposure to challenges and moving parts ranging from student interaction to management and to the school learning community (Henriksen & Richardson, 2017). A high designer can function in this complex world by solving problems and supporting other teachers. They have a strategic way of approaching all instructional problems.

The mid-designers are teachers willing to learn and improve their professional learning through different avenues. We can't say their design skills aren't worthwhile, which were around average scores in this study. Their focus on updating their content knowledge is the most visible characteristic, including being current in recent work and publications on their subject (Yurtseven et al., 2021). A mid-designer is willing to learn more about his/her field because s/he believes being a lifelong learner is a teacher's responsibility. They can search for new insights, innovative methods, or opportunities for collaboration outside their school (Macià & Garcia, 2016). Mid-designers join teacher networks, such as professional learning communities or informal teacher groups, to achieve this. These groups offer teachers learning opportunities in a common space through reflective practices and support activities (Macià & Garcia, 2016). They can spend several hours engaging in professional dialogue with their peers in informal learning environments (Eraut, 2011) and PD events through cooperation with other teachers (Moolenaar et al., 2012).

The low designers have a tendency to facilitate and support other teachers during their design efforts. Giving feedback on lesson/unit plans is one of the mechanisms they use (Caena, 2011). Teachers in this profile assist other teachers and explain curricular processes (Kalantzis & Cope, 2010). Formulating objectives and creating new and authentic assessments with other teachers are among their specialties (Yurtseven et al., 2021). Compared to the other two profiles, the low designers have relatively less knowledge in all five domains of the teacher designer. However, they have a targeted focus on collaboration with other teachers.

Articulating the profiles with their descriptions is worthwhile. However, future research is needed to provide more details about each profile. All our arguments presented here are based on the theoretical framework of the designer teacher (Yurtseven et al., 2021). More evidence will improve our understanding of what, for example, a mid-designer practices during his/her classroom time or outside the school. Qualitative case studies are useful in this respect. They can provide an in-depth understanding of what and how these profiles function in practice. Complex behaviors and instructional experiences need to be investigated by exploring different aspects of interacting with each other. Comparative case studies are also desired for understanding how teachers in the same profile from different contexts perceive and practice design and other design-related skills. Similarities, differences, and/or patterns across all three profiles must be revealed to understand a teacher's designer role.

Responding to the second research question, it was found out that the profiles differed in terms of professional knowledge and use of innovative teaching methods. Across all three profiles, the design/development and implementation/enactment domains are strong. However, a noticeable difference exists in the curriculum development knowledge. The high designers have more knowledge in setting learning goals, designing authentic assessment tasks, and planning learning activities. Although all teachers are generally guided by the same (formal) curriculum, their personal interpretation of the formal curriculum might be different (Shawer, 2017). This interpretation leads to a single curriculum that is a multiple-taught curricula by learning experiences. Considering the result of the current study, the high designers might have a more effective interpretation of the formal curriculum. Hence, high-designer teachers could aim for particularly transferable learning outcomes through more authentic content and teaching strategies, and assessment rather than low-designers. In other

words, designer teacher profiles can inspire teachers to interpret the formal curriculum in a more student-centered way.

Comparisons among the profiles regarding using innovative teaching and learning methods provide similar results. The low designers fail to use them frequently in their classrooms. This is consistent with their profile; the implementation/enactment domain was below the group's average. One way to interpret this result is that designer profiles might be practical evidence of how frequently teachers use various and innovative instructional methods and strategies. It is mostly possible that a subject matter might be taught differently by two distinct teachers. Hence, every teacher has their own teaching style (Chen et al., 2021). Teaching styles may positively or negatively affect students' meaningful learning experiences (Zhang et al., 2019). Specifically, teaching styles influence the diversity and quality of instructional methods and strategies, how teachers prioritize certain teaching strategies, and student roles in the classroom (Aelterman et al., 2019). The study indicated that designer teacher profiles could give us an idea of teachers' teaching styles included planning various instructional methods and strategies.

Limitations and Future Research

The results could be limited by the participating teachers' school type (i.e., context). They were from private (small and large) and public schools (rural and urban). Some schools allow teachers to be flexible in developing lessons and curriculum, but others do not. Some teachers were traditionally trained and never attended a month-long PD program. Even though our sample was diverse, the context in which the teachers were working provided varying views on our data. Future research can take this into account by explicitly incorporating variables to statistically control the confounding effect.

Design is a dominant area in teachers' daily practice. We tried to conceptualize "more" of the design efforts teachers put into their profession. However, the last three domains we had might not capture all relevant efforts teachers are involved in, such as informal learning experiences or school-based learning opportunities. Examining certain types of typologies might need more comprehensive scales that capture more of teachers' design-related professional efforts. Future studies can develop or use scales with more items and/or dimensions. Other domains relevant to the designer teacher role include professional networking, financial gains or burdens, and psychological and academic support.

The profiles were examined only in terms of the difference in professional knowledge and practices of teachers, data of which were collected by self-reports. There are other areas worth studying, such as learning communities, self-efficacy, and motivation (expectancy of success, task value, and cost). If more variables are measured regarding the designer teacher profiles, typologies and how they change over other variables might be comprehended more effectively.

Implications for Practice

Cluster analysis results demonstrated that there could be multiple designer roles with varying intensity on different designer dimensions. This study showed that there are types of designer teachers. Not every teacher needs to excel in all design-related skills. Providing such evidence highlights that teachers can focus on several aspects of design and use design-related

skills to benefit others. Profiling teachers regarding their designer role might help teachers to become better aware of their professional identity and make these explicit. Profiling designer teachers also makes it easier for school leaders and mentors to recognize such roles and assist teachers in promoting them. Sharing their identified role or profile can make teachers aware that they can professionally grow toward their emphasized skills.

In addition, teacher designer profiles might be helpful to means to encourage self-reflection, especially when teachers make them their labels or badges. A particular association of this kind helps them position themselves in a school environment visible to the school community. In a reflection session, they should be encouraged to discuss their designer role with their peers. If teachers are grouped based on their designer profiles, their job description, their workload, and their professional tasks can be adjusted for their and schools' needs.

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TÜRKÇE GENİŞ ÖZET

Tasarımcı Öğretmen Rolünün Küme Analiziyle İncelenmesi: Farklı Odakları Olan Üç Tasarım Profili Örneği

Giriş

Son otuz yıldır, öğretmenler öğretim tasarımcıları olarak çeşitli yönlerle vurgulanan şekilde tanımlanmışlardır (Carlgren, 1999; Koehler & Mishra, 2005; McKenney et al., 2015; Penuel & Gallagher, 2009; Voogt et al., 2015). Öğretmenlerin tasarım ile ilişkili bu tartışması geniş kapsamlı olmasına rağmen, halen belirgin değil ve kavramsal açıklığa ve netliğe ihtiyaç duymaktadır (Warr & Mishra, 2021). Genel olarak, araştırmacılar öğretmenleri tasarımcılar olarak tanımlarken, "belirsiz tanımlamalar" ve "çoklu yorumlamalar" (Persico et al., 2018, s. 232) bulunmaktadır.

Tasarımcı teriminin karmaşık doğası göz önüne alındığında, öğretmenlerin tasarım işini daha detaylı bir şekilde anlamamız gerektiğine ve terimi öğretmenlik mesleğine genişleterek ötesine geçmemiz gerektiği bir gerçektir. Bu nedenle, bu çalışmadaki temel amaç, öğretmenleri farklı bir bakış açısı olan tasarımcı öğretmen olarak incelemek ve tasarım ile ilgili görevler üzerinde çalışırken öğretmenlerin diğer profillerini detaylandırmaktır. Tasarım odaklı bir mesleki gelişim programı uygulayarak, bu programın öğretmenlerin tasarımcı rolünü desteklemesi ve diğer öğretmenlerin faydasına olacak şekilde diğer becerileri kullanmalarını teşvik etmesi amaçlanmıştır. Bu çalışmada cevap aranan araştırma soruları şunlardır:

1. Tasarım odaklı bir mesleki gelişim programını tamamlayan öğretmenlerde hangi profiller ortaya çıkmıştır?
2. Öğretmen profilleri, program geliştirme bilgileri ve yenilikçi öğretim ve öğrenme yöntemlerini kullanma sıklığı açısından nasıl farklılık göstermektedir?

Yöntem

Türkiye'nin farklı bölgelerinden ve 20 farklı branştan toplamda 35 şehirden 150 öğretmen çalışmaya katılmaya davet edilmiştir. Ancak, bazı öğretmenler veri toplama işlemini tamamlamamıştır. Bu çalışmada bir ölçek ve iki anket kullanılmıştır. Tasarımcı Öğretmen Ölçeği, yazar(lar) tarafından öğretmenin bir tasarımcı öğretmen olarak ne sıklıkla davrandığı ve bunları uygulamalarında yansıttığı alanları ölçmek için geliştirilmiştir. *Program Geliştirme Anketi*, yazar(lar), 24 beşli Likert tipi maddenin yer aldığı bu anketi, Understanding by Design (UbD) çerçevesinden (Wiggins & McTighe, 2005) uyarlayarak oluşturmuştur. *Öğretim Yöntem ve Teknikleri Anketi*, bu anket, Yazar(lar) tarafından öğretmenlerin öğretirken farklı öğretim yöntemlerini ne ölçüde kullanıp uyguladığını ölçmek için hazırlanmıştır.

*Veri analizi için, k*üme/kümeleme analizi kullanarak yapılan veri analizlerinde amaç öğretmenlerin, tasarımcı öğretmen profillerini ortaya çıkarmaktır. Profil kıyaslamaları için tek yönlü ANOVA kullanılmış ve tüm analizler SPSS 24'te tamamlanmıştır.

Bulgular

Tasarımcı Öğretmen Profilleri

Yapılan analizler sonucunda tasarımcı öğretmenlerin üç ayrı profilde tanımlandığı ve bu profillerin, öğretmenlerin tasarımcı rollerini yansıtan belirli bir beceri setini ve bu becerilere atfedilen dereceleri gösterdiği belirlenmiştir.

Küme 1 (Mavi çizgi), tasarımı öğretmede düşük seviyede olan öğretmenleri içermektedir. Bu kümedeki (profildeki) öğretmenler, tüm tasarımcı öğretmen boyutlarında ortalama puanla karşılaştırıldığında daha az kullanıma sahiptir.

Küme 2 (Kırmızı çizgi), neredeyse tüm çalışma örnekleminin ortalamasına yakın olan öğretmenleri içermektedir. Bu kümedeki öğretmenlerin, tasarım/geliştirme ve rehberlik ve liderlik alanlarındaki seviyelerinin biraz ortalamanın altında olduğu görülmektedir. Uygulama/yürütme ve dijital yeterlilik alanlarındaki puanları ortalama ile benzerlik göstermektedir.

Küme 3 (Yeşil çizgi), tüm alanlarda ortalama puanın üzerinde bir seviyeye sahip olan öğretmenleri içermektedir. Tasarım/geliştirme alanı en yüksek ortalama değere sahiptir. Mesleki çabalar alanı, diğer alanlara kıyasla nispeten daha düşüktür.

Öğretmen Profillerinin Karşılaştırılması

İkinci araştırma sorusuna cevap vermek için, kümeler arasındaki farkları araştırmak için tek yönlü ANOVA testi kullanılmıştır. Öğretmenlerin tasarımcı profilleri, karşılaştırmalarda üç seviyeli bir faktör (bağımsız değişken) olarak ele alınmıştır. Sonuçlar, program geliştirme değişkeninde tasarımcı öğretmen profilleri arasında istatistiksel olarak anlamlı bir fark olduğunu göstermektedir ($F(5.473) = 0.005$, $p < 0.05$, Eta kare = 0.08). Tukey testleri, Küme 1 ve Küme 3 arasında anlamlı bir fark olduğunu ortaya koymaktadır ($p = 0.005$). Yüksek tasarımcılar, program geliştirme konusunda orta düzeyde tasarımcılardan ve düşük tasarımcılardan daha fazla bilgiye sahiptir.

Tasarımcı öğretmen profillerinin farklı öğretim ve öğrenme yöntemlerini kullanma sıklığı açısından istatistiksel olarak anlamlı bir fark gösterip göstermediği incelenmiştir. Tek yönlü ANOVA testi sonuçları, öğretmenlerin öğretim ve öğrenme yöntemlerini kullanma sıklığının tasarımcı öğretmen profilleri arasında farklılık gösterdiğini ortaya koymuştur ($F(15.970) = 0.000$, $p < 0.01$, Eta kare = 0.201).

Tartışma

Kümeleme analizinin sonuçları, öğretmenlerin tasarım becerileri düzeyinin, diğer beceri setlerini ne ölçüde kullandığına dair bir gösterge olduğuna işaret etmektedir (Boschman vd., 2015). Öğretmenlerin tasarım becerileri keskinleştikçe, geri bildirim sağlama, mesleki öğrenme etkinlikleri düzenleme ve teknoloji tabanlı dersler geliştirme gibi becerilerinin daha belirgin hale geldiği görülmektedir. Araştırmalar, okullarda tasarımcı bir rolü benimsemenin, sınıfta etkili

öğretmenlere sahip olmanın bir yolu olduğunu (Bartlett, 2021; Kalantzis & Cope, 2010; Scott & Lock, 2021) ve öğrenci başarısını artırdığını göstermiştir (Kim, 2019). Bu nedenle, öğretmenleri daha yetkin hale getiren tasarım ve diğer profesyonel alanların gücünü birleştirmeye başlamaları için bu rolü okullarda kullanmak önem arz etmektedir.

Yüksek tasarımcılar, diğer öğretmenlerin mesleki öğrenmelerine katkıda bulunarak onları etkilemek için gerekli olan temel becerilere sahiptir. Tasarım, geliştirme, uygulama ve yürütme açılarından güçlüdürler, bu da öğrencilerin öğrenmelerini gerçek hayat durumlarına aktarabilmelerine yardımcı olacak anlama (understanding-based) temelli bir program tasarlayabilecekleri anlamına gelmektedir (McTighe & Wiggins, 2012; Wiggins & McTighe, 2005). Orta tasarımcılar, farklı yöntemlerle mesleki öğrenmelerini geliştirmeye istekli olan öğretmenlerdir. Bu profilde içerik bilgisini güncellemeye odaklanmaları en belirgin özellikleri gibi görünmektedir ve bu, kendi konularıyla ilgili son çalışmaları ve yayınları takip etmede güncel olmalarını göstermektedir (Macia & Garcia, 2016). Düşük tasarımcılar, tasarım çabaları sırasında diğer öğretmenlere rehberlik etme ve destek sağlama eğilimindedir. Ders/ünite planları üzerine geri bildirim vermek, kullandıkları mekanizmalardan biridir (Caena, 2011). Bu profildeki öğretmenler, diğer öğretmenlere yardım eder ve program geliştirme süreçlerini açıklarlar (Kalantzis & Cope, 2010).

Üç profilin tümünde tasarım/geliştirme ve uygulama/yürütme alanları güçlü olarak ortaya çıkmıştır. Ancak, program geliştirme bilgisinde belirgin bir fark da göze çarpmaktadır. Yüksek tasarımcılar, öğrenme hedefleri belirleme, özgün değerlendirme görevleri tasarlama ve öğrenme etkinlikleri planlama konusunda daha fazla bilgiye sahiptir. Tüm öğretmenler genellikle aynı (resmi) öğretim programından yönlendirilirken, kendi kişisel yorumları farklı olabilir (Shawer, 2017).

Sonuç ve Öneriler

Bu çalışmanın sonuçları, tasarımcı öğretmen rolünün alanlarının farklı kombinasyonlarını vurgulayan üç profil tanımlamıştır. Tüm kümelerde (profillerde), tasarım/geliştirme kapasitesi önemli görünmektedir, bu da tasarım odaklı mesleki gelişim programına katıldıktan sonra oluşabilecek bir sonuç olabilir. Bu çalışma, farklı tasarımcı boyutlarında değişen yoğunlukta birden fazla tasarımcı rolü olabileceğini göstermektedir. Her öğretmenin tüm tasarım becerilerinde mükemmel olması gerekmez. Bu tür kanıtların sunulması, öğretmenlerin tasarımın çeşitli yönlerine odaklanabileceğini ve tasarım becerilerini diğerlerinin faydalanması için kullanabileceğini vurgulamaktadır.