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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

The Effects of Problem-Based Learning and Web-Based Learning on School Administrators' Decision-Making Styles and Competencies

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Abstract

In this study, the effects of problem-based learning and web-based learning on school administrators' decision-making styles and competencies were investigated. The mixed-method was performed in the study. In the qualitative dimension, a semi-structured interview technique was used. The quantitative dimension was conducted experimentally and Melbourne Decision-making Questionnaire II was used to collect data. The participants were determined by purposive sampling method. One experimental and one control group were identified in the study and 31 participants were included in each group. Findings indicated that the school administrator training program, in which web-based learning and problem-based learning are used together, had a significantly positive effect on the participants' decision-making styles. In addition, the training program also increased the decision-making competencies of the school administrators such as compromise with others, evaluation of the result of decisions, control and choice of decision, creative problem-solving, being consistent in decisions, effective and correct decision-making, and providing credibility in decision-making. At the end of the study, some suggestions were made to the researchers and educators.

Keywords: Problem-based learning, web-based learning, school administrator training, decision-making styles, decision-making competencies

Öz

Bu çalışmada probleme dayalı öğrenme ve web tabanlı öğrenmenin okul yöneticilerinin karar verme biçimleri ve yeterlilikleri üzerindeki etkileri araştırılmıştır. Araştırmada karma yöntem uygulanmıştır. Nitel boyutta yarı yapılandırılmış görüşme tekniği kullanılmıştır. Nicel boyut deneysel olarak yürütülmüştür ve veri toplamak için Melbourne Karar Verme Anketi II kullanılmıştır. Katılımcılar amaçlı örnekleme yöntemi ile belirlenmiştir. Çalışmada bir deney ve bir kontrol grubu kullanılmış ve her bir gruba 31 katılımcı dahil edilmiştir. Bulgular, web tabanlı öğrenme ile probleme dayalı öğrenmenin birlikte kullanıldığı okul yöneticisi eğitim programının, katılımcıların karar verme stilleri üzerine önemli ölçüde olumlu etkisi olduğunu göstermiştir. Ayrıca eğitim programı, okul yöneticilerinin başkalarıyla uzlaşma, kararların sonucunun

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değerlendirilmesi, kararın kontrolü ve seçimi, yaratıcı problem çözme, kararlarda tutarlı olma, etkili ve doğru karar verme gibi karar verme yeterliklerini de arttırmıştır. karar vermede güvenilirlik sağlamak. Çalışmanın sonunda araştırmacılara ve eğitimcilere bazı önerilerde bulunuldu.

Anahtar Kelimeler: Probleme dayalı öğrenme, web tabanlı öğrenme, okul yöneticisi eğitimi, karar verme stilleri, karar verme yeterlikleri

Geniş Özet

Giriş

Karar verme, yönetimin vazgeçilmez süreçlerinden biridir ve yönetimin temelinde yer alır. Karar verme sürecinde yöneticinin etkili olması arzu edilen bir durum değil, zorunluluktur. Çünkü yöneticinin başarısı verdiği kararların sonuçlarına göre değerlendirilir. Ancak, yönetsel kararlar genelde çok karmaşıktır. Bu nedenle, yöneticiler basit problemlerin çözümünde yeterli olabilseler de örgütsel problemlerin karmaşıklığı, yönetsel yeteneklerin ve akıl kapasitesinin sınırlılığı, okul yöneticilerinin bütün sorunların çözümünde yetersiz kalmalarına neden olabilmektedir. Bu sorun, ancak okul yöneticilerinin eğitimleri ile en aza indirgenebilir. Ancak eğitim programları hazırlanırken okul yöneticilerinin yetişkin olmaları göz önünde bulundurulmalı, etkili öğrenme yöntemlerinden faydalanılmalı ve programlara okul yöneticilerinin karar verme becerilerini, stillerini ve yeterliklerini geliştirecek içerikler dahil edilmelidir. Bu nedenle okul yöneticilerinin iş yükleri, zaman sorunları ve eğitim ihtiyaçları birlikte dikkate alındığında eğitimlerde kullanılacak yöntemlerden biri web tabanlı öğrenmedir (WTÖ). Okul yöneticilerinin karar verme becerilerinin geliştirilmesinde kullanılacak etkili yöntemlerden bir diğeri de problem temelli öğrenmedir (PTÖ). Çünkü PTÖ'nün sorunları çözme aşamaları ile karar verme sürecinin eylem döngüsü birbirleri ile oldukça uyumludur. Bu çalışmada da okul yöneticileri için web tabanlı bir ortamda problem temelli bir yetiştirme süreci gerçekleştirilmiş ve bu yetiştirme sürecinin okul yöneticilerinin karar verme stillerine ve karar verme yeterliklerine etkisi incelenmiştir.

Yöntem

Yapılan çalışmada web tabanlı ve problem temelli bir okul yöneticisi yetiştirme (WPT-OYY) programının katılımcıların karar verme stilleri ile yeterlilikleri üzerindeki etkilerini ortaya koymak için karma yöntem kullanılmıştır. Karma yöntemin nitel boyutunda yarı yapılandırılmış görüşme tekniğinden, nicel boyutunda ise gerçek deneysel desenden faydalanılmıştır.

Çalışmanın katılımcıları amaçlı örnekleme yöntemi ile belirlenmiştir. Çalışmada bir deney ve bir kontrol grubu kullanılmış ve her bir gruba 31 katılımcı dahil edilmiştir. Deney grubu kendi arasında beş alt gruba ayrılmıştır. Katılımcıların belirlenmesi sırasında gönüllülük temel kriter olarak alınmıştır. Ayrıca, oluşturulan bütün alt gruplarda yöneticilik deneyime sahip katılımcıların olmasına dikkat edilmiştir.

Okul yöneticisi yetiştirme süreci, kontrol grubunda sınıf ortamında gerçekleştirilirken deney grubunda web tabanlı ortamda gerçekleştirilmiştir. Deney grubu için problem temelli eğitim programı kullanılırken kontrol grubu için kuramsal eğitim programı kullanılmıştır.

Katılımcıların karar verme stillerindeki değişimi ortaya koymak için yetiştirme süreci öncesinde ve sonrasında Melbourne Karar Verme Anketi II (MKVA II) uygulanmıştır. MKVA II, dikkatli karar verme, kaçıngan karar verme, erteleyici karar verme ve panik karar verme olmak üzere dört boyuttan meydana gelmiştir. Yetiştirme sürecinin karar verme yeterlilikleri üzerindeki etkisinin belirlenmesi ve nicel bulguların desteklenmesi için katılımcılarla yüz yüze görüşmeler yapılmıştır.

Demografik verilerin analizinde yüzde ve frekans teknikleri kullanılmıştır. Toplanan anket verileri ile ilgili analizlere geçilmeden önce verilerin normal dağılıp dağılmadığına bakılmıştır. Bunun için ise çarpıklık ve basıklık katsayıları hesaplanmıştır. Veriler normal dağıldığı için, karar verme stilleri arasındaki farkların istatistiksel analizleri için bağımlı gruplar t-testi ile bağımsız gruplar t-testi kullanılmıştır. Yapılan karşılaştırmalarda ortaya çıkan anlamlı farklılığın büyüklüğü hakkında yorum yapabilmek için de etki büyüklükleri hesaplanmıştır.

Nitel verilerin analizinde betimsel analiz yöntemi kullanılmıştır. Betimsel analizde toplanan veriler analiz birimlerine göre özetlenir ve yorumlanır. Bu nedenle ilk olarak katılımcı görüşleri, olumlu görüşler ve olumsuz görüşler olmak üzere iki ana temaya ayrılmıştır. Daha sonra olumlu görüşler teması altında *uzlaşma, sonucu değerlendirme, seçim, yaratıcı problem çözme, doğru seçim, kararlılık, anlama* ve *bağlanma* şeklinde adlandırılmış dokuz tane analiz biriminin yer alması uygun görülmüştür.

Bulgular

Nicel verilerden elde edilen bulgulara göre; yetiştirme süreci öncesinde deney ve kontrol gruplarındaki katılımcılar benzer karar verme stillerine sahipken, yetiştirme süreci sonunda deney grubu lehine orta düzeyde anlamlı farklılık meydana gelmiştir. Gruplardaki katılımcıların karar verme stillerinde herhangi bir değişimin meydana gelip gelmediğini belirlemek için yapılan analizler sonucunda kontrol grubundaki katılımcıların karar verme stillerinde anlamlı bir değişimin olmadığı görülmüştür. Ancak yetiştirme süreci, deney grubundaki katılımcıların dikkatli, erteleyici ve panik karar verme stillerinde son test lehine anlamlı bir farklılığa neden olurken kaçıngan karar verme stilinde olumlu fakat anlamsız bir farklılığa neden olmuştur.

Nitel verilerden elde edilen bulgulara göre ise katılımcıların en çok uzlaşma ile ilgili karar verme yeterliğinin geliştiğini, bu yeterliği sırası ile sonucu değerlendirme, seçim yapma, yaratıcı problem çözme, kararlılık, doğru seçim, anlama, bağlanma becerilerinin izlediği görülmüştür.

Tartışma

Çalışmanın sonunda WPT-OYY sürecinin okul yöneticilerinin karar verme stilleri üzerinde anlamlı ve olumlu etkiye sahip olduğu ortaya çıkmıştır. Ayrıca okul yöneticilerinin başkalarıyla uzlaşma, güvenilir, etkili ve doğru karar verme, kararların sonucunu değerlendirme, kararın kontrolü ve seçimi, yaratıcı problem çözme ve kararlarda tutarlı olma gibi karar verme yeterliklerini de arttırdığı görülmüştür. Alanyazında WTÖ ve PTÖ'nün birlikte kullanıldığı bir okul yöneticisi yetiştirme programının katılımcıların karar verme stillerine ve karar verme yeterliliklerine etkisini incelemeyi amaçlayan deneysel bir çalışmaya rastlanmamıştır. Ancak, Hallinger ve Bridge (2007) yaptıkları çalışmada PTÖ'nün yöneticilerin mesleki liderlik, tartışma ve karar verme gibi becerilerini geliştirdiğini ortaya koymuşlardır. Brownell ve Jameson (2004) PTÖ'nün mesleki yetiştirme programlarında ivme kazandığını ve çalışanların karar verme becerilerini, liderlik becerilerini ve uygulama deneyimlerini geliştirerek çeşitli mesleki bilgi ve becerilerin kazanılmasına yardımcı olduğunu belirtmişlerdir.

Venkatraman ve Krishnamurthy (2008) ve Akın (2010) tarafından yapılan çalışmalarda PTÖ'nün, yetişkinlerin analitik ve eleştirel düşünme becerilerini ve yaratıcılıklarını arttırdığı görülmüştür. Karabatak (2015) tarafından yapılan çalışmada katılımcılar, web tabanlı ve problem temelli öğrenmenin etkili ve doğru karar vermede önemli etkileri olduğunu belirtmişlerdir. Delaney, Pattinson, McCarthy ve Beechan'ın (2015) çalışmasında PTÖ ile hazırlanan bir programda katılımcıların problem çözme, karar verme ve hedef belirleme gibi bazı yönetsel beceri düzeylerinde genel bir iyileşme meydana geldiği ortaya çıkmıştır. Smith (2005) ve Bigelow'un (2004) çalışmalarında da yönetim eğitimi alanında PTÖ'yü kullanmanın katılımcıların etkili karar vermelerinde önemli katkılar sağladığı görülmüştür. Valaitis, Sword, Jones ve Hodges'un (2005) çalışmasındaki katılımcılar, yetiştirme sürecinin başında grup olarak ortak karar vermede zorluk yaşadıklarını, ancak daha sonra bu zorlukların üstesinden geldiklerini vurgulamışlardır. Gürsul ve Keser (2009), çevrimiçi PTÖ ortamındaki öğrencilerin karar verme sürecinde çeşitli engellerle karşılaştıklarını ifade etmişlerdir. Alanyazındaki çalışmalar, bu çalışmanın sonuçlarını destekler niteliktedir.

Introduction

Decision-making is one of the indispensable processes of management because decision-making is at the core of management and other processes depend on decision-making (Simon, 1951). Since especially management is a problem-solving process (Bedoyere, 1997), it is very important for the organization to make various decisions in this process (Akça & Yaman, 2009). The success of the manager is also evaluated according to the results of the decisions. Therefore, the effectiveness of the administrator in the decision-making process is not a desirable situation but an obligation (Çelikten, 2001). However, managerial decisions are often very complex. Therefore, although school principals may be sufficient to solve simple problems, the complexity of organizational problems and limitations of managerial abilities and capacity of the mind can cause school administrators to be inadequate in solving all problems. This problem can only be

minimized by the training of school administrators. For this reason, contents that will improve the decision-making skills, styles, and competencies of school administrators should be included in the courses while preparing training programs (Şengür, Turhan, & Karabatak, 2018).

Workloads, time problems and training needs of school administrators should be taken into consideration for the training programs to be organized. For this reason, it can be said that it may be more appropriate to organize school administrators' training in the context of adult education. Because the adult group has different learning needs and methods than children. For example, adults are more interested in learning the knowledge, skills, attitudes, and behaviors that will solve various problems and they choose what they learn more meticulously. They learn what they need to learn to produce better and more quality. In other words, the aim of adults in learning is to gain the knowledge, skill, and attitude required for production or service. Therefore, adult learning is more functional (Başaran, 2008).

To create a sense of self-confidence, adults need to solve complex and difficult problems, make effective decisions and gain self-directed learning skills (Akın, 2010). Therefore, knowledge should be more realistic for adults (Jarvis, 2004). *Learning to learn, self-directed learning*, *critical thinking,* and *experiential learning* are four main research areas for adult school administrators. Two of the powerful methods that can enable the training of school administrators in these areas are problem-based learning (PBL) and web-based learning (WBL) (Karabatak, 2015).

Web-based learning

Considering the capabilities and opportunities of the target group, technology which offers bold and new opportunities to provide rich learning experiences has been one of the most important forces shaping adult learning. WBL has also become one of the learning methods that particularly compatible can be coherent with adult education because it directly caters to adults' desire to be self-directed in their learning. In addition, if properly designed, technology-based instruction easily allows learners to tailor the learning to their real-world problems (Knowles, Holton, & Swanson, 2005).

In the WBL environment, not only synchronous, interactive, and rich content courses (video, audio or text-based) are presented, but also the content of the asynchronous course (text, presentation, audio, and video) can be shared. In this environment, individuals can also be contacted using e-mail, discussion rooms, and newsgroups. WBL has effective principles to develop different learning methods such as student-centered, problem-based, group-based, and cooperative learnings (Huang, 2002; Joliffe, Jonathan, & David, 2001; Prows et al., 2004) and supports lifelong independent learning (Crawford, 2011). There are many benefits of using WBL in executive training programs. For example, it offers flexible learning opportunities with its low cost of education, its availability, its independence from time and place. Other benefits of WBL include supporting an active and dynamic learning environment, requiring learners to interact with personally meaningful experiences, and providing a wide range of educational resources and documents (Al & Madran, 2004; Carswell & Venkatesh, 2002).

WBL is also frequently used in the professional training of working staff. However, being away from educational institutions and the increasing workload may limit the professional training efforts of school administrators (Kesim, 2009). WBL offers some solutions to these problems and perhaps the most important and best feature of the WBL (MacDonald, Stodel, Farres, Breithaupt, & Gabriel, 2001).

There are several limitations and disadvantages in WBL. For example, teachers' insensitivity to the changes in their role, low quality in teaching, the uncertainty of document, resource, and material use and the technical inexperience are the main concerns. The problems experienced by adults in the WBL process include lack of technology usage and shortage of time (Karabatak & Turhan, 2017a; MacDonald et al., 2001). In addition, WBL does not increase success for people without a sense of responsibility, may negatively affect students' socialization, and students may face motivation problems (Cuez, 2006). But the effectiveness of educational activity is closely related to the social, psychological, and physiological characteristics of individuals (Yazar, 2012). So, it would be more beneficial to support WBL with novel approaches such as PBL to provide the school administrators with a more flexible, fun and autonomous environment, to reduce the above-mentioned problems and limitations, and to develop skills such as problem-solving and decision-making.

Problem-based learning and decision-making process

PBL is a student-centered method (Wilkerson & Gijselaers, 1996) that allows students to understand the issues, theories, and principles that underlie the problem (Akın, 2010; Spencer & Jordan, 1999), to think critically, and to turn their knowledge into practice (Crawford, 2011; Savery, 2006) while trying to solve problems. It has also been proven that PBL is an interventionist method in encouraging people to think high, and in collaborative and independent learning in the construction of knowledge (Tan, 2009).

According to Brownell and Jameson (2004), PBL is not only conceptual but also long-term learning that creates behavioral changes resulting in mastery. PBL benefits from synergies between cognitive, affective and behavioral learning. PBL focuses on real-world problems, so it provides students to look at different perspectives, recognize irrational elements in decision-making, and face ethical dilemmas. Affective and cognitive learning together form the basis of behavioral learning.

In the context of the school administrators' training process, PBL allows the school administrators or candidates to meet the problems they may face in the future. Therefore, PBL feeds administrators' decision-making skills by applying previously acquired information to these problems. A problem to be solved, a situation to be analyzed, knowledge to be applied, alternatives to be evaluated, decisions to be made, and consequences to be forecast are at the heart of the PBL process (Hallinger & Bridges, 2007).

Decision-making is the selection of the most appropriate way of solving a problem (Memisoglu, 2013). Therefore, decision-making is not a single step, but a gradual process with a series of successive actions. The cycle of decision-making is as follows (Hoy & Miskel, 2010):

1. Recognizing and identifying the problem or issue,
2. Analyzing the difficulties in the situation,
3. Establishing criteria for a satisfactory solution,
4. Identifying a movement strategy,
   a. Identifying possible alternatives,
   b. Considering probable consequences,
   c. Delibrating,
   d. Selecting a plan of action,
5. Initiating the plan of action,
6. Evaluating the outcomes.

PBL takes a problem as the start point of teaching and enables the individual to play an active role in solving the problem individually or cooperatively and find the answer in the problem (Karabatak & Turhan, 2017a, 2017b). The problem-solving stages with PBL are as follows (Tekedere, 2009):

1. The problem is presented without any lesson or subject being told.
2. Brainstorming is done about the problem in the teams. The problem is defined and various hypotheses are developed for the solution.
3. Students distinguish between what they know and what they need to know. They determine the issues/subjects they need to learn. They develop a plan for the solution of the problem and conduct detailed research.
4. They review hypotheses with learning and narrow the hypotheses if necessary.
5. They present their solutions to the team. Students discuss and agree on what should be the best solution.
6. The facilitator monitors the learning process, directs students to resources and directs the team by directing questions.

It can be said that the action cycle of the decision-making process and the problem-solving stages of PBL are quite compatible with each other. For this reason, PBL can be defined as one of the effective methods to improve individuals' decision-making and and also it can be an alternative tool for training school administrators when blended with WBL.

In previous studies, PBL blended with WBL was determined to be effective in developing learners' skills of looking from different perspectives (Brownell & Jameson, 2004), problem-solving (Sherwood, 2004; Bigelow, 2004; Smith, 2005; Dalby, 2005), critical thinking (Cooke & Moyle, 2002; Özdemir, 2005; Venkatraman & Krishnamurthy, 2008; Crawford, 2011), and

scientific communication and higher order thinking (Suwono & Dewi, 2019). Savin-Baden (2007) also states that an online PBL environment is built around team development principles and the software automatically records conversations and actions that can be effectively used, along with the facilitator's real-time observations, to evaluate both team and individual capabilities in critical areas such as problem-solving and decision-making. In addition to these studies, web-based and problem-based school administrators training programs had positive effects on participants' self-efficacy beliefs, attitudes towards the profession (Karabatak & Turhan, 2017a), and attitudes towards web-based learning (Karabatak & Turhan, 2017b).

In the study by Şengür (2018), the action learning process improved the decision-making skills of the school administrators, but the participants stated that they had difficulty in attending the courses. Therefore, in this study, a learning environment independent from time and space was formed to develop the decision-making styles and competencies of school administrators by using real-life managerial problems. It is hoped that this study will contribute to school administrators training literature.

The general aim of this study is to determine whether PBL has any effects on the decision-making styles and competencies of school administrators in a web-based environment. In light of the purpose, the following questions were tried to answer:

1: Are the decision-making styles of those participated in the web and problem-based school administrator training (WPB-SAPT) program and the decision-making styles of those participated in the class-based school administrator training (CB-SAPT) program different?

2: What are the effects of the PBL in the web-based environment on the decision-making competencies of school administrators?

Method

Research model

In this study, mixed-method was used to reveal the effects of the training process on decision-making styles and competencies of school administrators. Qualitative and quantitative data collection and analysis processes are used together in the mixed studies (Creswell, 2012).

In the quantitative dimension of this study the true experimental design was used. The true experimental designs contain the most rigorous and strong experimental designs because of equating the groups through random assignment (Creswell, 2012). The *pre-test and post-test control group design,* commonly used in psychology, medicine and education, was used in the study. The appearance of the pre-test and post-test control group design is presented in Table 1.

Table 1

Pre-test and post-test control group design

Group	Pre-test	Program	Post-test
Experimental Group	*MDMQ-II Scale*	WPB-SAPT	*MDMQ-II Scale*
Control Group	*MDMQ-II Scale*	CB-SAPT	*MDMQ-II Scale*

As seen in Table 1 the experimental group participated in WPB-SAPT program, while the control group participated in CB-SAPT program. The participants' opinions were taken with MDMQ-II before and after the training program.

Participants

The participants of the study were determined by purposive (judgemental) sampling method. Purposive or judgemental sampling enables to use the judgement to select cases that will best enable to answer the research question(s) and to meet the objectives (Saunders, Lewis, & Thornhill, 2006, p. 230). More information can be obtained with purposive sampling in accordance with the purpose of the study. In this way, the most appropriate participants are worked with the purpose of the study (Balcı, 2011, p. 102). One experimental and one control group were identified in the study and 31 participants were included in each group by using purposive sampling. During the determination of the participants in both study groups volunteerism was taken as basis criterion. In addition, attention was paid to the fact that some of the participants in the teams have administrative experience.

Preparation of problem scenarios and training process

The program model used in the training process was prepared by Karabatak (2015). While preparing the problem scenarios, the opinions of the 27 participants who had the administrative experience were taken. Six actual and real problem scenarios were prepared by using the problems they experienced in their schools. Problem scenarios and learning resources such as educational videos, articles, course notes, presentations, and databases for solving problems in each scenario were placed under the relevant week on the Moodle portal as a learning management system.

Formation of the groups

Small group collaboration and the heterogeneous structure of the group are important elements to ensure the effectiveness of PBL, and richness team interaction. So the experimental group participants were divided into five subgroups (teams). The structures of the formed groups and teams are shown as in Table 2.

Table 2

The Structures of the Formed Groups and Teams

	Groups	Teacher	Administrator	Administrative experience	Previously participated in any training program
Experimental Group	Team 1	3	3	2	3
	Team 2	3	3	2	3
	Team 3	3	3	3	3
	Team 4	5	2	3	4
	Team 5	4	2	3	4
	Total	**21**	**10**	**13**	**17**
Control Group		**20**	**11**	**15**	**18**

In Table 2, 21 participants in the experimental group are teachers, and 10 of them are administrators. 20 participants in the control group are teachers, and 11 of them are administrators. 13 participants of the experimental group and 15 participants of the control group have administrative experiences.

While the participants in the control and experimental groups were provided to have similar characteristics (homogenous distribution), attention was paid to have the heterogeneous structure of the groups in itself. Because the fact that the teams have heterogeneous structure is very important in terms of social interaction. Because this structure enables members to increase their information source, knowledge and skills pools during learning and problem-solving (Scott, 2014).

Data collection and analysis

In the quantitative dimension of the study, Melbourne Decision-making Questionnaire II (MDMQ-II) developed by Mann et al. (1998) was used. The questionnaire was designed to assess how individuals approach decision situations. The adaptation of the scale to Turkish was done by Deniz (2004). The scale consists of 22 items and four sub-scale: vigilance decision-making (VDM), hypervigilance decision-making (HDM), procrastination decision-making (PDM), and buck-passing decision-making (BDM).

The items are answered on a three-point scale (0=not true for me; 1=sometimes true; 2=true for me) and the maximum score that can be taken from the scale is 12. The internal consistency coefficients of the scale were calculated as .80 for sub-scale of the vigilance as .87 for the sub-scale of buck-passing, as .81 for the sub-scale of procrastination and as .74 for the sub-scale of hypervigilance by Mann et al. (1998). In this study, the internal consistency coefficients were calculated as .90 for sub-scale of the vigilance as .88 for the sub-scale of buck-passing, as .84 for the sub-scale of procrastination and as .83 for the sub-scale of hypervigilance.

In the qualitative dimension of the study, interview technique was used to get the opinions of the participants about the impact of the WPB-SAPT program on the decision-making competencies of the school administrators, to confirm the survey data and to support the quantitative findings. Semi-structured interview technique was used. During the interviews, the

participants were asked to evaluate the effects of the training process on their decision-making competencies.

***Quantitative data analysis*:** Percentage and frequency techniques were used to analyze demographic data. Before revealing the statistical analysis of the differences between the decision-making styles of the participants in the experimental and control groups, firstly, it was examined whether the collected data were distributed normally or not. For this reason, skewness and kurtosis values were calculated. Data distribution analysis of sub-scales is shown in Table 3.

Table 3
Data Distribution of Sub-scales

Test	Sub-scale	Skewness	Kurtosis	Test	Sub-scale	Skewness	Kurtosis
Pre-test	VDM	-1.633	1.454	Post-test	VDM	-1.395	.751
	BDM	1.062	-.103		PDM	.946	.067
	PDM	.842	-.290		BDM	1.160	.610
	HDM	.654	-.795		HDM	1.001	.362

According to the skewness and kurtosis values in Table 3, the data are normally distributed. Because according to George and Mallery (2010) these values range from +2.0 to – 2.0. For this reason, dependent and independent groups t-test were used in comparative analysis. After the dependent and independent groups t-tests, the effect sizes were also calculated for those who had significant differences between the scores to provide information about the magnitude of the difference. Effect size (d) describes how strong the relationship between two or more sets of data is. The meaning of effect size varies by context, but the standard interpretation offered by Cohen is as "very large effect if it is greater than 1, as the large effect if it is 0.8, as the medium effect if it is 0.5, and as the small effect, if it is 0.2" (Cohen, 1992).

Qalitative data analysis: The descriptive analysis method was performed to analyze qualitative data. In this analysis method, the data is transmitted as quotations without being changed as obtained from the interviews. According to Yıldırım and Şimşek (2011), the collected data is summarized and interpreted in accordance with the analysis units (themes) in descriptive analysis. The descriptive analysis has four stages. In the first stage, a framework is created for descriptive analysis and according to this framework which data will be organized and presented under the analysis units (or themes) is determined. In the second stage, the data is processed and organized according to the analysis units. In the third stage, organized data is defined and supported by direct quotations where necessary. In the final stage, the findings are interpreted. That is, the findings are described, associated, and interpreted (Yıldırım & Şimşek, 2011).

The interviews were transformed into electronic forms and analyzed. But before the analysis, the participants were coded. The first letters of participants' names and surnames were used for coding. In the analysis phase of this study, first of all, opinions were divided into two as *positive*

and *negative*. Then the nine indicators of decision-making competencies identified by Mann, Harmoni, and Power (1989) are determined as analysis units:

1. **Choice:** Control of decisions
2. **Comprehension:** Points to understanding decision-making effectiveness as a cognitive process.
3. **Creativity:** Identifying the problem, revealing the alternatives to be chosen, the creative composition of the selection alternatives to produce new alternatives, and understanding the necessary steps to achieve the objectives.
4. **Compromise:** Agree with others in an acceptable solution
5. **Consequentiality:** Thinking about the results of selected actions for himself/herself and others.
6. **Correctness:** Choosing the right and strategic decision.
7. **Credibility:** Ability to evaluate the reliability of the information in the selection of alternatives.
8. **Consistency:** Stability in selections.
9. **Commitment:** High qualification in decision-making over time.

Validity and reliability: To ensure the validity and reliability of the study, its internal validity/credibility, external validity/transferability, internal reliability/consistency, and external reliability/confirmability were examined (Yıldırım & Şimşek, 2011). To ensure the internal and external reliability of the qualitative data, two more experts were included in the process of preparing interview questions, obtaining opinions, analyzing the data, and reaching the conclusion. After prejudices, unreal, and irrelevant data were eliminated before analysis. After this process, compliance and conflict points of the analyzes with one of the experts were determined. Within the framework of the aim of the study and in accordance with expert suggestions, analysis of research data according to the analysis units was completed. Then the other expert was asked to compare the data obtained with the results of the study and to re-examine the whole study. As a result of the expert reviews, it has been determined that the research as a whole has a consistent structure and can be confirmed.

To ensure the external validity of the study, the participants were determined by purposive sampling method and to increase the internal validity of the study, both qualitative and quantitative data collection processes were used together. For this, both the questionnaire and the interview techniques were used together with the participants' opinions about the effects of the training program process they participated in decision-making competencies. In addition, the voice recording device was used in the interviews and the participants were asked to confirm their opinions after they were transferred to electronic forms. The internal validity of the study was tried to be provided by this participant confirmation method.

Findings

Within the scope of the first research question, independent groups t-test was performed to the pre-test and post-test scores of the groups participating in the training programs. The results of the comparisons are as shown in Table 4.

Table 4

Comparison of Pre-test and Post-test of Decision-Making Styles of the Groups

Test	Sub-scale	Group	N	$\overline{X}$	sd	t	df	p	d
Pre-test	VDM	Control Group	31	9.71	3.164	-.256	60	.799	-
		Experimental Group	31	9.94	3.759				
	BDM	Control Group	31	4.03	3.851	.805	60	.424	-
		Experimental Group	31	3.26	3.724				
	PDM	Control Group	31	3.65	3.028	.310	60	.757	-
		Experimental Group	31	3.39	3.499				
	HDM	Control Group	31	3.42	2.975	.081	60	.936	-
		Experimental Group	31	3.35	3.272				
Post-test	VDM	Control Group	31	9.35	2.961	-3.367*	60	.002	.4
		Experimental Group	31	11.35	1.473				
	PDM	Control Group	31	4.03	2.834	2.682*	60	.009	.3
		Experimental Group	31	2.13	2.754				
	BDM	Control Group	31	4.39	3.565	2.892*	60	.005	.4
		Experimental Group	31	2.13	2.487				
	HDM	Control Group	31	3.68	2.535	3.520*	60	.001	.5
		Experimental Group	31	1.52	2.293				

* $p<.05$

As a result of the analysis, there was no significant difference ($p>.05$) in any sub-scales of decision-making styles before the training program, but significant differences ($p<.05$) were observed between the control and experimental groups in all sub-scales [$t_{VDM}(60)=-3.367$, $t_{BDM}(60)=2.892$, $t_{PDM}(60)=2.682$, $t_{HDM}(60)=3.8520$] after the training program. This finding shows that there is a similarity in the decision-making styles of the participants in both control and experimental groups before the training program and that there is a significant difference in the decision-making styles of the groups in favor of the experimental group. The effect sizes were calculated for all sub-scales to determine the magnitude of these differences. The calculated values ($d_{VDM}=.4$, $d_{PDM}=.3$, $d_{BDM}=.4$, and $d_{HDM}=.5$) show that the effect sizes are at medium levels in all sub-scales.

To determine whether a significant change occurred in the decision-making style of the participants in the groups before and after training programs, the dependent groups' t-test was performed and the findings are shown in Table 5.

Table 5

Comparison of the Pre-test and Post-test of Decision-Making Styles

Group	Sub-scale	$\overline{X}$	N	sd	t	df	p	d
Control Group	VDM Pre-test	9.71	31	3.164	1.076	30	.290	-
	VDM Post-test	9.35	31	2.961				
	BDM Pre-test	4.03	31	3.851	-1.321	30	.196	-
	BDM Post-test	4.39	31	3.565				
	PDM Pre-test	3.65	31	3.028	-1.647	30	.110	-
	PDM Post-test	4.03	31	2.834				
	HDM Pre-test	3.42	31	2.975	-1.034	30	.309	-
	HDM Post-test	3.68	31	2.535				
Experimental Group	VDM Pre-test	9.94	31	3.759	-2.108*	30	.043	.3
	VDM Post-test	11.35	31	1.473				
	BDM Pre-test	3.26	31	3.724	1.806	30	.081	-
	BDM Post-test	2.13	31	2.487				
	PDM Pre-test	3.39	31	3.499	2.892*	30	.007	.4
	PDM Post-test	2.13	31	2.754				
	HDM Pre-test	3.35	31	3.272	3.114*	30	.004*	.4
	HDM Post-test	1.52	31	2.293				

*p<.05

According to the findings seen in Table 5, for the participants in the control group the vigilance decision-making level [t(30)= 1.076] was $\overline{X}$=9.71 before the training program, it was $\overline{X}$ =9.35 after the training program; buck-passing decision-making level [t(30)=-1.321] was $\overline{X}$=4.03 before the training program, it was $\overline{X}$=4.39 after the training program; procrastination decision-making level [t(30)= – 1.647] was $\overline{X}$=3.65 before the training program, it was $\overline{X}$=4.03 after the training program, and hypervigilance decision-making level [t(30)= – 1.034] was $\overline{X}$=3.42 before the training program, it was $\overline{X}$=3.68 after the training program. However, these changes are not statistically significant (p>.05).

While the vigilance decision-making level of the participants in the experimental group was $\overline{X}$=9.94 before the training program, it increased to $\overline{X}$=11.35 after the training program,

and this change was determined to be significant (t(30)=-2.108; p<.05). The buck-passing decision-making level was $\bar{X}$=3.26 before the training program, it decreased to $\bar{X}$=2.13 after the training program, and this change was not determined to be significant (t(30)=1.806; p>.05). The procrastination decision-making level was $\bar{X}$=3.39 before the training program, it decreased to $\bar{X}$=2.13 after the training program, and this change was determined to be significant (t(30)=2.892; p<.05). The hypervigilance decision-making level was $\bar{X}$=3.35 before the training program, it decreased to $\bar{X}$=1.52 after the training program, and this change was determined to be significant (t(30)=3.114; p<.05). The calculated values ($d_{(VDM)}$ = .3; $d_{(PDM)}$ =.4, $d_{(HDM)}$=. 4) show that the effect sizes are at medium levels in three sub-scales. These findings indicated that the WPB-SAD program had a significant and positive effect on the participants' decision-making styles. Participants' opinions were taken to explain quantitative findings. The findings related to the themes and analysis units obtained from the analysis of the collected opinions are as shown in Table 6.

Table 6

The Impact of WPB-SAD on the Decision-Making Competencies of School Administrators

Themes		F	Codes / Participants
Positive Opinions		57	
Analysis units (AU)	Compromise	11	YK, UB, ZH, GC, İS, KY, AB, AG, EÖ, HD, PZ
	Consequentiality	10	LN, ZH, KY, MB, AG, CA, HD, Cİ, EÖ
	Choice	7	LN, KY, ME, MY, AG, NK, HD,
	Creativity	7	AKA, GC, HT, LS, MB, CA, DR
	Consistency	7	YK, CI, BO, LN, HD, CA
	Correctness	6	YK, ART, IA, TY, HD, KY, YB
	Comprehension	5	YK, CA, HD, ZH, CI
	Credibility	2	IA, LN
	Commitment	2	HD, YB
Negative Opinions		1	
AU	Ineffectiveness	1	AT

As seen in Table 6, the opinions about the effects of education on decision-making competencies of school administrators were analyzed and two main themes were formed as *positive opinions* and *negative opinions*. There are nine analysis units under the theme of positive opinions: choice, comprehension, creativity, compromise, consequentiality, correctness, credibility, consistency, and commitment. The compromise (f=11) is the most developed decision-making competence of the participants, and this competence is followed by consequentiality (f=10), choice (f=7), creativity (f=7), consistency (f=7), correctness (f=6), comprehension (f=5), credibility (f=2), and commitment (f=2).

There is only one participant's opinion (code) under the theme of negative opinions. Other participants expressed that little or significant changes occurred in their decision-making skills. Some of the opinions and units/participants specifying these views are as follows: Some of the opinions about the analysis units are as follows:

> "It allowed me to control my decisions and to identify solutions (Choice). When I made my decisions, I learned that I had to follow a scientific path, I had to do research, I had to make the right choice in light of the information obtained (Credibility), I should be decisive, clear and precise in my decision-making (Consistency), I should not take hasty decisions and consider all aspects of the matter and consider the implications for the future. I also learned that my decisions should be scientific (Consequentiality-LN)."
>
> "It made me decide faster and more effectively (Correctness). I learned that I should build empathy, get the opinions of the people who will be affected by the decision, think in detail, consult with my superiors (Compromise). I realized that I had to investigate the alternatives for the problem, to do the necessary research for the best solution, and to get information (Consistency). At the stage of providing ideas and solutions, I was of the opinion that I should not make a decision without team work and academic research (Comprehension-YK)."
>
> "We evaluated the solution alternatives in the PBL process. Finally, we tried to find the best solution… some case studies have made me feel that I need to be more careful, that I have to deal with all aspects of the problems, and that I need to evaluate all solution alternatives. (Creativity-DR)."
>
> "I realized that my decision-making competencies improved a little bit more. It would have had more effect if I could participate in more case studies (Commitment-HD)."
>
> "No, it didn't. Because I am sufficient in decision-making (Ineffectiveness-AT)."

The views on the effects of the training process on decision-making competencies of the school administrators support and explain the quantitative findings of the study.

Conclusion and Discussion

For effective school management and to solve the problems experienced in schools, the school administrators should make effective, right and rational decisions. The right and rational decision-making are closely related to the values, knowledge, and skills of the school administrators and also school administrators need to be well trained to make effective decisions. However, workloads, time problems and training needs of school administrators should be taken into consideration in the training programs to be organized. Therefore, in this study, a learning environment independent from time and space was formed to develop the decision-making styles

and competencies of school administrators by using real-life managerial problems. Then, the effects of the learning environment, used WBL and PBL together, on the school administrators' decision-making styles and competencies were examined.

According to the results of the quantitative data, there was a similarity in the decision-making styles of the school administrators in both control and experimental groups before the training and that there was a medium level and significant difference in the decision-making styles of the groups in favor of the experimental group. Also, there was a significant and medium level difference in the decision-making styles of the groups in favor of the experimental group. It is concluded that while there was no significant difference between the pre-test and post-test in decision-making styles of school administrators in the control group, there was a significant difference in the decision-making styles of the school administrators in the experimental group in favor of the post-test.

According to the results obtained from the findings of qualitative data, only one of the school administrators in the experimental group stated that there was no effect on the decision-making styles of the training process. Others stated that there were few or significant changes in their decision-making competencies. It was concluded that the training program, in which WBL and PBL are used together, increased the decision-making competencies of the school administrators such as compromise with others, evaluation of the result of decisions, control and choice of decision, creative problem-solving, being consistent in decisions, effective and correct decision-making, providing credibility in decision-making.

At the end of the study, findings indicated that the PBL and WBL had a significant and positive effect on the school administrators' decision-making styles. When the studies in the literature are examined, no study has been found which uses the WBL and PBL together and directly examines the effects on school administrators' decision-making competencies. But, according to Boettcher and Conrad (1999) define an online learning community as a community that consists of learners who support and assist each other, make decisions synergistically, and communicate with peers on a variety of topics beyond those assigned. Hallinger and Bridges (2007) state that PBL improves the skills of administrators such as professional leadership, discussion and decision-making. Brownell and Jameson (2004) stated that PBL has gained momentum in professional training programs as a way for business professionals to gain skill and knowledge in decision-making skills, leadership skills, and practical experience in applying critical thinking skills to real-world business scenarios.

In Venkatraman and Krishnamurthy's (2008) and Akın's (2010) studies, PBL increased the analytical and critical thinking skills and creativity of adults. In Delaney, Pattinson, McCarthy, and Beechan's (2015) study there was a general improvement in managerial skill levels such as problem-solving, decision-making and goal setting in a program prepared with PBL. According to the findings of Smith (2005) and Bigelow (2004) studies, it was revealed that using PBL in the field of administration education made significant contributions to the effective decision-making of the participants. Valaitis, Sword, Jones, and Hodges (2005) emphasized that students had difficulty in joint decision-making as a group at the beginning of education, but then they

overcome these difficulties. Gursul and Keser (2009) stated that the students in the online PBL environment faced various obstacles in the decision-making process.

At the end of this study, the suggestions to researchers and educators are as follows: Effective learning methods such as PBL reduced the limitations and disadvantages of WBL. So educators should support WBL with different teaching methods rather than using it alone. In the studies, the training programs using WBL and PBL together had positive effects on school administrators' various attitudes, behaviors, skills, and beliefs. Therefore investigating which other attitudes, behaviors, skills, and competencies of the school administrators are developed in training programs using WBL and PBL will contribute to the literature.

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