



Development and Testing of an EPSS for Secondary School Teachers to Develop Contents and Material*

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Abstract

This study aims to develop an Electronic Performance Support System (EPSS) for secondary school teachers to develop contents and materials, and to determine the views of teachers. The study used a design-based research method and the data were collected through interview and observation technique. Before developing EPSS, a semi-structured interview was made with 11 teachers, out of various branch teachers working in secondary school, in order to determine the needs of teachers. After developing EPSS, a two-week process was determined for the teachers to use the platform and the teachers were monitored for whether they used this platform during this process and the technical support required for them to use the platform effectively was provided. The data collected were analyzed by Nvivo program and themes were created. According to the results; the teachers using the platform have stated that it is generally a practical system, that it provides motivation and self-confidence and makes them happy as it allows designing their own materials, and that the sources added to the platform are sufficient. Finally; it can be stated that the developed EPSS will allow performing experimental studies on teachers and that different scales can be used in future studies.

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INTRODUCTION

Technology integration is of great importance in order to adapt the information that develops and progresses over time to the needs and conditions of our age. However, different tools and software including mobile phones, computer, camera and web technologies can be exemplified as digital technology. It can be stated that digitalized technologies can actively and effectively play a role in designing the teaching environment, in student attitudes and in making regulations in education and training environments as they are present in all areas of life (Cabı, 2015).

The technologies that have developed and continue to develop create a learning environment for teachers, which complies with the needs, through online tools and software, and facilitate producing teaching materials, which may help the teaching process and is suitable for teachers and lesson process (Birişçi, Kul, Aksu, Akaslan & Çelik, 2018). In this direction, web 2.0 tools, which offer various web-based software to teachers and users (Anderson, 2007; D'Souza, 2006; O'Reilley, 2005), provide opportunities for needs such as ensuring user-oriented information production and sharing the interpersonal communication and the created content (Thompson, 2007).

The current improvements in information and communication technologies as well as the increase in the level of students and teachers to use devices included in the information technologies have led to emergence of new approaches in education (Georgiev, Georgieva & Smrikrov, 2004). One of these approaches is called as e-learning. E-learning is defined as the inclusion of information and communication technologies in education and training process (Sun, Tsai, Finger, Chen & Yeh, 2008). According to a more detailed definition, e-learning is the educational activities in which computer and communication technologies are used, the student and the teacher are located in different places and the students have right to make choices about education process (Altıparmak, Kurt & Kapıdere, 2011). E-learning has led to a change over time in the tools, materials and teaching methods, which are used while performing the teaching process (Yılmaz, 2013). Multimedia materials and options, which can meet the needs of the individual, are offered easily within e-learning approach (Gökdaş & Kayri, 2005). In order to provide an effective and active learning environment opportunity in digital learning environments, it is necessary to create digital teaching materials (assessment and evaluation tools, animations, games, presentation etc.) (Friesen, Fisher and Roberts, 2001). According to Kumar and Kumar -Kushwaha, (2010), digital materials and contents are essential components of learning.

In his study, Arslan (2011) defines the digital content concept as any kind of contents that can be produced and used in electronic environment. The digital content, one of the course materials and instruments in the teaching process of teachers, is the educational materials that can be transferred to or acquired from digital media (Bayrakçı & Demirbaş, 2013). Digital content is computer-based materials that comply with the teaching program, are supported by multimedia tools and support the scheduled courses in an asynchronous and synchronous way (MEB, 2011).

It is emphasized in the studies performed that it is effective to prepare contents and materials in education and teaching processes (Yelken, 2012). Anderson (2007) states that web 2.0 tools are composed of the expressions such as the user-specific products and the materials that users can produce, the ability to use the unity and power of community, being open source-coded etc. Web 2.0 tools include video-sharing sites (YouTube, google video etc.), RSS and instant messaging tools, the presentation program tools such as wiki, PowToon (Kavasoglu, 2020).

Teachers will show favorable reactions to educational activities and achieve the educational goals; however, it causes difficulties for them to apply their knowledge and skills in educational environments. Therefore, there is a need for switching from focused behavior to performance-oriented professional development approach. This approach requires a constant performance support for teachers (Önen, Mertoğlu, Saka & Gürdal, 2009). These supports firstly include the materials that will serve to the works which will help teachers apply what they have learned in their education in the

education environments. For example, the materials include the tutorials on how a particular strategy or a tool can be applied in a particular education environment. In addition, it is obviously known that peer learning is an effective intervention for performance improvement. In order to implement this intervention in support of teachers, there is an online forum that has the features of a performance community for sharing the good practices and finding solutions for frequently encountered problems. In order to go beyond the peer learning, the teachers will have the access to the field experts they need (Pamuk, Çakır, Ergun, Yılmaz & Ayas, 2013).

The studies also show that the current educative/in-service training programs should be organized with new technologies in order to integrate technology with education and find solutions for the technology usage, planning process and acceptance issues (Dağhan et al, 2015; Katman & Tutkun, 2015; Miller et al., 2007; Paschall, 2004). There is a lack of practice to will enable the educators to access any information whenever they need. Studies in literature show that various tools and software such as consultancy systems, professional systems, information management systems and artificial intelligence applications are used for this purpose (Akin & Usluel, 2020; Barker, Van Schaik & Famakinwa, 2007; Bayram, 2006; Chang, 2004; Çelik, 2010; Demirören, 2019; Kert, 2008; Miller, Fitzgerald, Koury, Mitchem & Hollingsead, 2007; Özyer, 2021; Park, Baek & An, 2001; Roh, Han & Yu, 2001; Van Schaik, Pearson & Barker, 2002).

Based on the statements above, the teachers play a critical role in integration of technology into education and in preparing the students to become the twenty-first century students at the most basic level. However, teachers fail to use the technologies in education environments sufficiently (Baş, Kubiato & Sünbül, 2016). It is thought that one of the approaches that can be used to meet the needs and expectations of teachers in the process of integrating technology into education can be Electronic Performance Support System (EPSS).

PURPOSE AND IMPORTANCE OF STUDY

The need of guidance in subjects such as the encounter of students with more complex and novel learning opportunities has become more important for teachers. For any need for learning, there is a need for both personal and effective guidance and the facilitation of teaching for students to achieve a higher chance of success (Hwang, 2014). The multiple studies also show that the current educative/in-service training programs should be organized with new technologies in order to integrate technology with education and find solutions for the technology usage, planning process and acceptance issues (Dağhan et al, 2015; Katman & Tutkun, 2015; Miller et al., 2007; Paschall, 2004; Seylen & Özyürek, 2015). There is a lack of practice to will enable the educators to access any information whenever they need. In addition to that, first of all, teachers need to be spiritually happy and adapted in order to perform a successful teaching (Girgin, 2010).

When reviewing the relevant literature, it is seen that EPSSs are used to support the teaching process of teachers in their courses and provide necessary assistance during this process (Akin, 2019). In their studies, Park, Baek and An (2001) created an application software called STEPS on evaluation of usefulness of an EPSS developed for increasing the teachers' performances at schools. Teachers stated that the software contained a database support to a great extent, that it had an auxiliary tool feature at a rate of 80% and a teaching feature at a rate of 40%, and that it had a positive impact on increasing their performance at school. In their studies, Chen et al. (2009) designed a mobile EPSS tool for teachers in Taiwan. While the software helps the teachers to be able to manage the knowledge of the students, it also provided an information support. As the result of the study, it was found that EPSS was useful.

Materials and current approaches seem to be highly important in education and training processes (Metin, 2018). Considering that each teacher has the ability to develop material, an application to be developed to improve their performances will affect their motivations. Likewise, the use of materials that teachers developed will increase the interest and motivation of students. The

developed system helps to find solution to the problems of the teachers by providing consultancy service to them. It has been considered that teachers are not alone in their professional development and they will be aware of the fact that they can develop their own materials.

In parallel to that, the goals of this study are to facilitate the learning and to increase the content and material development success of teachers. In addition, continuous studies are carried out to demonstrate that EPSS can be integrated into educational activities in our country and abroad in an undeniable way and to increase its efficiency (Aydın, 1999; Bayram, 2006; Chang, 2004; Çelik, 2010; Demirören, 2019; Kert, 2008; Kert & Kurt, 2012; Miller, Fitzgerald, Koury, Mitchem & Hollingsead, 2007; Mitchem, Fitzgerald, Miller & Hollingsead, 2013; Park, Baek & An, 2001; Van Schaik, Pearson & Barker, 2002) While there are studies on EPSSs in international context, it is noteworthy that few EPSS studies have been carried out in our country and the educational aspects of these practices are less and the most of the studies are generally at the information level. This study is believed to contribute to the literature in the context of the efficiency of EPSS in learning and teaching process.

It is anticipated that the EPSS developed within the scope of this study will be productive in the teaching and learning processes in the secondary school classes and that it will increase their motivation for education and training processes of teachers. In addition, it is assumed that it will be a leading study for teachers to manage their own content and material development processes and to use the contents and materials they have developed in their classes. This study was carried out to fill this gap in the literature. In this context following research questions were answered;

1. What are the main features of EPSS that is developed to enable the secondary school teachers to develop materials?

2. What are the opinions of the secondary school teachers regarding the EPSS that is developed to enable them to develop materials?

EPSS

Considering EPSSs in terms of the features they should have; Schaik, Pearson & Barker, (2002) are of the opinion that EPSSs in education and teaching environments are for the following purposes:

- EPSSs can be used as a tool to determine the subjects that are existing within the application and the individuals are performing poorly can be determined and to improve these fields.
- They can be used as a tool to improve skills and knowledge as it has the feature of supporting whenever they are needed.
- They can be used as an auxiliary tool to enable the individuals in the system to improve their performance or natural skills in any field.

In the literature, the use of EPSSs in education and training environments gradually increases. EPSSs developed by Moore, Orey and Hardy (2000) in order to assist teachers in planning subjects to help them perform their tasks more efficiently among the examples of their use in the field of education. TREE system, which has been developed in the public schools in Florida state to assist the teachers taking care of students who have difficulty in learning, are physically disabled or have mental disorders, is another example that shows the use of EPSSs in education (Miller, Fitzgerald, Koury, Mitchem & Hollingsead, 2007).

EPSS developed by Laffey and Musser (1996) in order to facilitate learning and teaching is a system that intends to teach the students by practice and experience in the out-of-class process. This EPSS can provide instant feedback on the task that the students work on to increase their performances and guidance service is provided. Despite of the fact that the use of EPSS has not reached the desired level in the education field yet, there are studies that put forward its positive effects resulting from its use for educational purposes (Clem, 2007; Davis, 1995; Juang, Liu & Chan, 2005; Hung

& Chao, 2007; Ma & Stephen, 2006; Laffey & Musser, 1996; Sheu, 2000). Let's describe some of the most recent ones with a couple of sentences.

Mitchell (2014) studied the effect of EPDS, education and the use of EPDS with education on the performance and task duration. 66 university students in total were enrolled in the study. The result of the study showed that the group receiving EPDS and education together had higher performances and shorter task durations, compared to the other groups. The study determined that the use of EPDS with education had positive effects on the task duration and task performance. In his study, Erdoğan (2015) designed and developed an EPDS specific to inexperienced instructional designers in order to support the instructional design process. The sampling of the study is consisted of 23 inexperienced instructional designers. As the result of the study, the tools, database, educations, sources, examples, interface, wizard and help are listed as the elements of an EPDS for inexperienced instructional designers. The developed EPDS had a positive effect on the performance of instructional designers. In his study entitled as A Decision Support System Suggestion in Academic Personnel Performance Evaluation, Aydemir (2019) studied the current assignment and improvement directives of universities, determined all criteria and presented the decision support system (DSS) suggestion created to evaluate these criteria. Each university will be able to enter their own parameter values according to their own criterion system via DSS, to view the scoring, and to sort on university, faculty or department basis. Moreover, each academic personnel will be able to analyze his or her score in each field and his or her status according to other section or people. In his study, Demirören (2019) developed an EPDS for research planning in educational technology. This study examined the problems that postgraduate students in the field of Computer and Instructional Technologies Education suffered in the process of preparing a thesis suggestion as well as their support requirements. The designed EPDS was called as Research Planning Support System (RPSS). According to the outcome of the study, it was found that the system was considered as usable at a rate of 74%. In their studies, Akin and Usluel (2020) shared the usability testing using paper prototypes, which is the first one of the usability studies of EPDS Designed for Kids With Special Needs, with its process and outcomes. As the result of the study, the system components (advisor/expert system, instructional system and customized tools) were identified. This study formed the basis for the design stage of the system intended to be developed about the early intervention for the early childhood special education. In their studies, Kurt and Ayvaz (2021) made the information technologies personnel performance evaluation decision support system design. For this study, a hybrid structure was created for the performance measurement of the work analysts working in the field of information technologies. As the result of the study, it was found that it provided convenience to the business processes of the executives and was usable when needed. In his study, Özyer (2021) designed an electronic performance support system for quantitative data analysis. As the result of the study, it was found that it provided support to the educational researchers who had difficulty while performing quantitative analysis, and that it was usable when needed in this regard.

These studies demonstrate that EPSS will be used commonly in the future, integrating the other teaching tools and models into its body. This study aims to develop and test an EPSS for secondary school teachers to develop contents and materials.

METHOD

This study used "design-based research method" (TTA) to develop EPSS. TTA is a systematic and flexible research method to improve design, development, implementation and evaluation processes in educational practices in cooperation with researchers and participants and in their authentic environment (Wang & Hannafin, 2005). This study used ADDIE research model, framework of which was set by analysis, design, development, implementation and evaluation steps, to develop EPSS. This research model was named after the English initials of the steps stated below.

- Analysis, Design, Development, Implementation, Evaluation

At the Analysis stage;

Environment Analysis consists of the step of determining the needs of the environment in which the system will be used, and its current status.

Content Analysis consists of the step of determining the components and materials to be used in the system; of analyzing the documents informing about the system; of determining Web 2.0 tools; of determining the evaluation tools; and of preparing the system draft.

Learner Analysis consists of the steps of determining the needs of target audience and teachers to be used in the system; and lastly, of determining the current status of teachers.

At the Design stage; the steps of deciding on the components to be used for the design of the system; of determining the content of each component and menu; of preparing the infrastructure on which the system will work; of determining the design principles to be taken as reference in design process; of preparing the contents of components and menus; and of designing the system were carried out.

At the development, implementation and evaluation stages; the steps of testing the designed system; of taking the views of the users regarding the designed system; of examining the usability of the designed system; and of implementing the improvements were carried out.

At the reporting stage; the step of reporting in detail what was performed during the process was carried out (Akin, 2019).

SAMPLING

Study group of the research is consisted of 11 secondary school teachers, including 3 Computer and Instructional Technologies teachers, 3 foreign language teachers, 2 science teachers, 2 mathematic teachers and 1 Turkish language teacher. While determining sampling, it was thought that secondary school teachers would be more eligible for the study to reach the teachers working in different branches in line with expert opinions in the first place. At the beginning of the study, the teachers were interviewed via semi-structured interview form. As the result of these interviews, teachers who wanted to participate were selected and registered in the system.

Table 1. Distributions of teachers by their branches and genders are summarized

Branch	Female	Male	Total
Computer and Instructional Technologies Education	2	1	3
Foreign Language	2	1	3
Science	1	1	2
Mathematics	1	1	2
Turkish Language	1	0	1
Total	7	4	11

DATA COLLECTION TOOLS

SEMI-STRUCTURED INTERVIEW FORM 1: 11 volunteered teachers were interviewed individually in order to examine in detail the opinions and suggestions of secondary teachers regarding development of an EPSS for them to be able to use material in the class; to carry out a needs analysis; and to evaluate the implementation processes. A semi-structured interview form was used for the interviews that take about 30 minutes. Yıldırım and Şimşek (2016) states that the semi-structured interviewed are mostly preferred by the researchers as they are standards to a certain extent and are flexible. The interview form drawn up by receiving the expert opinions consists of 11 questions.

SEMI-STRUCTURED INTERVIEW FORM 2: Following the interviews carried out for needs analysis process, 11 volunteered teachers were interviewed individually in order to examine the opinions and

suggestions of secondary school teachers regarding EPSS designed for developing contents and materials. While creating interview forms, opinions of 4 subject matter experts working in the fields of teaching technologies, qualitative studies, computer engineering and program development were received at every stage and were applied on teachers. EPSS was used to receive opinions and suggestions after designing.

OBSERVATION FORM: It was designed to make observations during the use of EPSS designed for secondary school teachers to develop contents and materials. 11 teachers were observed. According to Yıldırım and Şimşek (2016), the qualitative research is defined as “the research in which qualitative data collection methods such as observation, interview and document analysis are used and a qualitative process is followed to put forward the perceptions and events in the natural environment in a realistic and holistic way”. During the observation that takes about 1 hour, the created observation form was used. While creating the observation form, expert opinion was received at every stage. In the observation form consisting of 9 steps, teachers are expected to become a member of EPSS, to access the user screen, to access the material analysis section, to select the possibilities of the environment in which they will use the material, to select the acquisition level that they will create material, to determine the type of material they want to create, to select the software and access the documents, videos and sample materials, to create a new material, to complete the evaluation test and receive feedbacks.

DATA COLLECTION PROCESS

The secondary school teachers were accessed through teachers working at secondary schools. Data collection took about two weeks for the first application. For second and third application, it took three weeks.

DATA ANALYSIS

The qualitative data obtained by interviews and observations were analyzed and interpreted firstly by descriptive analysis and then content analysis methods. Descriptive analysis is a qualitative data analysis type that includes summarization and interpretation of the data obtained via various data collection techniques according to the pre-determined themes (Yıldırım & Şimşek, 2016). The main purpose of the content analysis is to reach the concepts and relationships that can explain the data collected. The data summarized and interpreted in descriptive analysis are further processed in the content analysis and the concepts and themes that cannot be recognized in a descriptive approach can be discovered as the result of this analysis. To this end, the data collected should be conceptualized in the first place, and then they should be organized in a logical way according to the resulting concepts, and the themes explaining the data should be identified accordingly (Yıldırım & Şimşek, 2016). The collected data were analyzed via Nvivo program. Particular themes were created and analysis results were obtained.

FINDINGS

In this section, the findings of the research were presented in accordance with the order of research problems.

CYCLE I (ANALYSIS)

Before creating the 1st EPSS, the secondary school teachers identified for cycle 1 were interviewed for analysis process of the study (needs analysis, learner analysis, environment analysis and content analysis). During the interview, they were asked how important to use materials, what kind of materials they use in their classes, what they care for while selecting or preparing the materials, whether or not they develop new materials, what content and materials they feel competent to develop, in what ways they need support or assistance while developing materials, what features they would want if there were a platform to develop materials by using web 2.0 tools. After the completion

of interviews, a document specific to each teacher was created, and analyses were carried out and themes were created through Nvivo program. While creating themes, literature search was performed and expert opinions were received. The created themes, categories and codes were presented in Table 2.

Table 2. Themes, Categories and Codes as The Result of Analysis Process

1. Use of Materials	
a) Materials Used in Professional Life) Features of the Materials Used	
<ul style="list-style-type: none"> ● Slides ● Cartoon ● Puzzles ● Games ● Videos ● Worksheets 	<ul style="list-style-type: none"> ● Materials with High Visuality ● Interactive materials ● Three Dimensional materials ● Materials on which students are active
b) Importance of Using Materials	
<ul style="list-style-type: none"> ● Active and efficient lecturing ● Making the learning clear and understandable ● Making the course interesting ● Learning by practice and experience ● Making the learning permanent 	
2. Material Development Software	3. Expectations from Material Development Platforms
<ul style="list-style-type: none"> ● Exam and Interim assessment software ● Presentation creation software ● Game creation software ● Animation creation software ● Video creation software ● Survey creation software 	<ul style="list-style-type: none"> ● Usage convenience ● Suitability to student level ● Material development convenience ● Availability ● Upgradability ● Assistance

The data were transcribed and transferred to a Word file, then the interviewed people were asked to read some of these transcripts and their approval was obtained. As the result of the analysis carried out by Nvivo program, three main themes were created. They are the Use of Materials, the Material Development Software and the Expectations from Material Development Platforms.

1. USE OF MATERIALS

Materials used in professional life; Regarding the theme of ‘materials used in professional life’, teachers generally stated that they used videos, presentations, animations and worksheets in their courses and teaching process. They have stated that they are aware of Web 2.0 tools and they also used materials created with web 2.0 tools and stated that they wanted to create more different materials via web 2.0 tools.

Teachers working at village schools stated that there was a lack of materials, however they used smart boards and made use of materials such as videos and pictures for them to be efficient in their classes, that is, in the teaching process. In addition, teachers also stated that they wanted to use three-dimensional materials and augmented reality materials in the teaching process.

A teacher expresses his/her opinions as follows: “Since I work at a village school, we do not have much access to many materials. Therefore, I try to make up for the deficiency by having my students watch videos through smart board when I have a lack of material. Apart from that, I am making use of videos through smart board, as I said, as well as pictures, available tools to make experiments and available materials to enrich the lecture.”

Importance of Using Materials; Regarding the theme of ‘importance of using materials’; teachers have stated that the use of materials appeals to more than one sense organs to materialize the learning

and ensure the active participation in the course and that it makes the lecturing more efficient and ensures learning by practice and experience. Judging by these opinions, it can be said that teachers attach importance to the use of materials and are aware of the benefits of the use of materials in their classes.

In addition, the participants stated that the use of materials attracted the attention of the students and ensured the materialization of the concepts. They also expressed that it ensured the learning by practice and experience, which made the teaching process enjoyable. Judging by the opinions of teachers regarding the theme of 'importance of the use of materials', it was generally stated that the teachers used materials actively in their courses, and that the use of materials in the teaching process made the courses more efficient for students and had a positive effect on the learning process.

Features of the Materials Used

Regarding the features of the materials used, the opinions of teachers on what they care for in selection of materials were revealed. Teachers stated that they paid attention to whether the material contributes to the course, whether it is time-efficient, the level of student, the suitability of the course to the intended accomplishments, its usefulness and the currency of material while selecting the materials. In addition, they expressed that they developed materials, but they could not reach a sufficient level, and that they wanted to develop materials at a better level.

A teacher expressed his/her opinions as follows: *"I pay attention to its compliance with the subject, the currency of the material, its suitability to the group that is educated, the fact that it provides ease of use, and the fact that it appeals to more than one sense organ. In addition, I pay attention to whether it contributes to the course, and to the fact that it saves time"*.

2. MATERIAL DEVELOPMENT SOFTWARE

Regarding the material development software, teachers stated that they generally used video development software, presentation creation software, animation creation software and exam-interim assessment software.

Judging by the opinions of teachers regarding material development software, exam and interim assessment software, presentation creation software, game creation software, animation creation software, video creation software categories were created.

3. EXPECTATIONS FROM MATERIAL DEVELOPMENT PLATFORMS

Regarding their expectations from material development platforms, teachers were asked about what kind of features they wanted in material development platforms. Participants stated that they wanted a platform that guides them with sample drafts and contents, that is easy to use, that includes the acquisitions of the course and helps them prepare the material fast, that can create material absolutely by gamification to appeal to secondary school students, that attracts the interest visually, that can create augmented reality, that contains instructions for a beginner, and that is free of charge. They expressed that the platform should be fit for every branch, be accessed by everyone conveniently, be in a way that it can monitor new developments closely and immediately reflect to its content, be a platform that enables teachers to express their requests and opinions as this is a teacher-oriented platform and these opinions are taken into consideration. In addition, teachers expressed that they needed assistance while developing materials and this assistance should be available instantly while developing materials.

Judging by the opinions of participants, it can be said that they want the material development platform to be up-to-date; they want to be knowledgeable about current software and novelties and to reflect them to the platform; and they want a platform that allows designing materials with high visual richness and tracks the material development process of teachers and communicates with

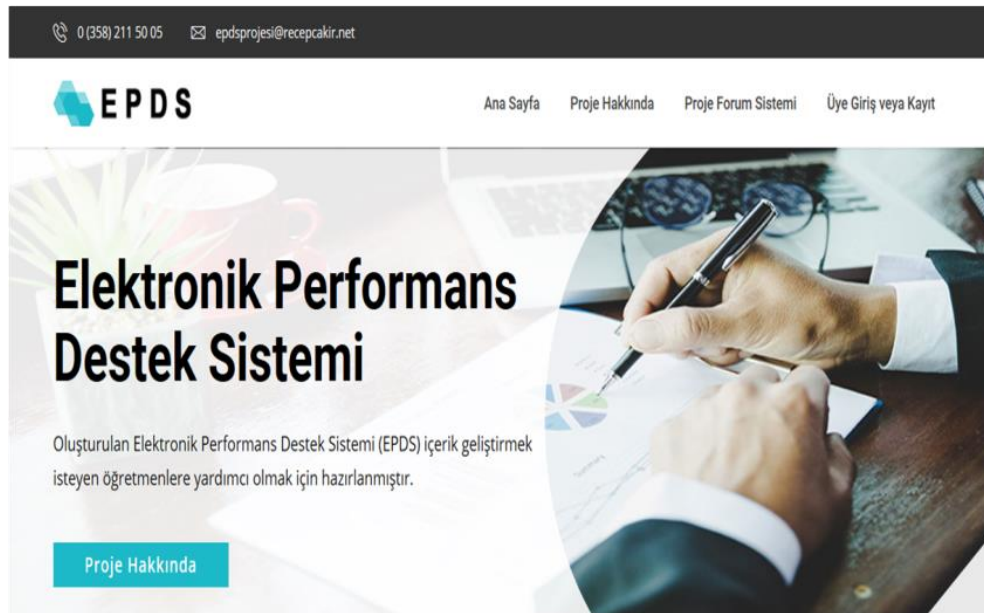
teachers about subjects they have difficulty in or need assistance, and that they can get more accurate and quick instructions. In addition, they defend the opinion that rich material development tools should be accessed and that platform should contain information on how to use them.

As the result of the interviews made in this first cycle, a design was made starting from the idea that development of an EPSS would meet the needs of teachers. While designing EPSS, demands and opinions of teachers were taken into consideration at every stage, and the menus, categories, components and contents that EPSS should contain were planned in accordance with the opinions of 4 subject matter experts working in the fields of teaching technologies, qualitative studies, computer engineering and program development. As the result of the analysis of interviews and expert opinions, menus and components within the system were determined.

EPSS

The design file was put into its final form in accordance with the interviews with teachers and the expert opinions. Figure 1 below shows the home page of the finalized EPSS.

Figure 1. EPSS Home Page



A brief information letter related to the project can be accessed via “About Project” button. “Project Forum System” button is a button to push through which the users who want to become or have already become a member can access the support when they face a problem. In addition, they can also start a discussion on Web 2.0 tool and exchange ideas with each other in this area. The screen to be accessed by pressing “Member Login or Sign In” button is as follows:

Figure 2. Login Screen
Figure 3. Sign-In Screen

Once you have become a member of platform, another screen appears. This screen is as follows:

Figure 4. Member Home Screen **Figure 5. Material Analysis 1st Screen**

In this section, User has logged in his/her page. From this page, s/he can go back to home page, carry out user name and password procedures, switch to forum screen and view the software s/he has added to his/her favorites. In Material Analysis section, s/he will encounter particular questions before starting to develop his/her material. The questions here intend to determine the needs of teacher. Material Analysis screen ensures that after teacher designs his/her material, the possibilities of the environment in which this material will be used are determined. This way, teacher can design his/her material in compliance with possibilities and present it conveniently.

Figure 6. Material Analysis 2nd Screen

Figure 7. Material Analysis 3rd Screen

In this section, the teacher was asked for which acquisition step s/he wants to design a material and asked to select the category that material s/he wants to design falls within. As the result of the category s/he has selected here, the web 2.0 tools contained in that category and registered on the platform will appear.

Figure 8. Software List

4 - Yazılım Listesi

Uygulama Adı	Uygulama Açıklama	Öğren	Kullan	Değerlendir	Favorilere Al
Prezi	Web 2.0 Aracı	Video Yazılı Doküman Materyal	Kullan	Değerlendir	Favorilere Ekle
Powtoon	Web 2.0 Aracı	Video Yazılı Doküman Materyal	Kullan	Değerlendir	Favorilere Ekle
Google Slaytlar	Web 2.0 Aracı	Video Yazılı Doküman Materyal	Kullan	Değerlendir	Favorilere Ekle

Yönetici Paneli | PostaKutusu18

This section contains the sources on software that appears as the result of the category the teacher has selected and the materials containing associated statements. Learn section contains three different buttons. “Video” button will enable the user to find an instructive video on how to design a material through software. Clicking “Written Document” button, the user can download and review a written document on how to design a material through software. “Material” button is a section by which the users can access to the area designed by the researcher and containing the materials that can be sources. “Use” section directs the users, that is the teachers, to the web site of software. “Evaluate” section is a section by which teachers access to an evaluation test that they will perform after designing their materials. This evaluation test will enable teachers to evaluate the material development software, material development process and EPSS. As the result of this evaluation, teachers have received the necessary feedbacks in a practical manner and their motivation has been attempted to increase.

In Evaluation test;

Figure 9. Evaluation Test Screen

Anket

Anket Sorusu	(1) Çok Kötü	(2) Kötü	(3) İdare Eder	(4) İyi	(5) Çok İyi
Bu Web aracını kullanarak materyalimi oluşturabildim.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EPDS içinde bulunan araçların ve yönlendirmelerin yeterli olmadığını düşünüyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EPDS'de bulunan web araçlarının eğlenceli ve basit olduğunu düşünüyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EPDS'nin yetersiz bulduğunuz özellikleri nelerdir? Neler yapılabilir?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bu Web aracını kullanırken sorun yaşadım.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bu Web aracının materyalimi oluşturabileceğim uygun bir yazılım olduğunu düşünüyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bu Web aracının kullanışlı olduğunu düşünüyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bu Web aracının hedef kitleye uygun olduğunu düşünüyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oluşturduğum materyali kullandım ve öğrencilerimden olumlu dönütlər aldım.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bu Web aracının içinde bulunan araçlar materyalimi oluşturmamda yeterli değildi.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EPDS'de bulunan uygulama örnekleri ve dokümanların yeterli olduğunu düşünüyorum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EPDS'nin genel olarak kullanımı kolaydı.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In accordance with the purposes of study, EPSS, in which teachers can turn on the platform via their computers and mobile devices and which has been developed in a way to comply with their courses and in a supportive manner, has been introduced to teachers and second stage has been initiated.

CYCLE II

After being developed, EPSS application was made available to 11 secondary school teachers in active duty, including 3 Computer and Instructional Technologies teachers, 3 foreign language teachers, 2 science teachers, 2 mathematic teachers and 1 Turkish language teacher, and the first applications were performed. During the application, data were collected from the participant teachers via semi-structured interview form and observation form. As the result of the qualitative analyses, two main themes were found. They were called as EPSS features and EPSS evaluation. These themes and the categories and codes under each theme are given in Table 3.

Table 3. Theme, Category and Codes

1. EPSS Features	
a) Favorable Features of EPSS	b) Unfavorable Features of EPSS
<ul style="list-style-type: none"> ● Convenience in designing material ● Attracting attention of students ● Designing own material ● Assistance within the process ● Being practical 	<ul style="list-style-type: none"> ● Language of software ● Software deficiency
2. EPSS Evaluation	
<ul style="list-style-type: none"> ● Sources ● Software ● Feedbacks ● Design 	

EPSS FEATURES

FAVORABLE FEATURES OF EPSS:

Teachers have stated that EPSS they use is a practical system and that provides convenience in designing different kinds of materials and attracting attention of students. Besides, they expressed that it also assisted them with designing their own materials. They stated that determining which Web 2.0 tool they can use according to the choice of school facilities and level of acquisition shows that it is a need-oriented system. Judging by these answers, it can be said that teachers generally consider EPSS as favorable for both them and their students.

In addition to that, teachers have stated that developing a new material provides motivation, that they become happy as they are developing materials, that producing makes a person happy, and that this is fun and exciting. Judging by these answers, it can be said that designing their own material makes teachers happy in general, that it is exciting for them to design a material in EPSS, and that they are having fun while designing a material.

A teacher expresses his/her opinion as follows: *“The sense of being able to design a material really made me feel happy. I used the materials of my design in my classes and this increased my self-confidence. In addition, the fact that it has assisted and instructed me from beginning to end of the process was a plus for me”*.

UNFAVORABLE FEATURES OF EPSS:

Regarding the unfavorable features of EPSS, teachers stated that the use of software in Turkish language could be more convenient, that the software could be increased, and that the feedbacks could be detailed. Judging by the answers, it can be said that Turkish Web 2.0 software options should be added and that software options should be increased.

EPSS EVALUATION

Regarding the theme of ‘EPSS evaluation’, teachers specified the sufficient and lacking aspects of EPSS developed. Teachers have stated that it aids in general, that it provides learning by discovering, and that the learning is more permanent thanks to the sources it contains. Judging by these answers, it can be said that teachers are satisfied with the documents, videos and sample materials contained in EPSS, and that it provides assistance with learning Web 2.0 tool.

In addition to that, all participants stated that they took the evaluation test. Many participants have stated that feedbacks are not sufficient and need to be improved. Judging by these answers, it can be said that, as the result of the test, data and feedbacks should be improved and developed, and that application should be made afterwards.

And according to general suggestions of teachers regarding EPSS are examined, teachers has stated that it is generally a practical system, and it provides self-confidence and makes them happy as it allows them to design their own materials. This can be put into words as follows: Turkish software can be added, the software options can be increased in general and the feedbacks can be detailed.

Observations were also carried out in addition to interviews for the 2nd cycle of the study. An observation form consisting of 9 steps was created for observation. The observation form consisting of 9 steps contains the features such as teachers’ becoming a member of EPSS, their selection of the environment to use the material, their determination of the material type in compliance with acquisitions, their creation and use of new materials.

The following findings were obtained as the result of observation;

All steps in the applied observation form were performed successfully by teachers.

Most of the teachers made use of written documents, videos and sample materials contained in EPSS during the design process. During the observation, it was observed that teachers had been provided assistance instantly for the design process thanks to the auxiliary documents and thus, the process had taken a shorter time. As they stated in the interviews, teachers were observed to be very happy and excited while designing a new material.

After completion of material design process, an evaluation test was applied to them to find out their opinions on both EPSS and the assistance they took in the design process. Most of teachers stated at the time of observation that the feedback they received was not sufficient as the result of evaluation test.

After completion of observation period, the design-related parts and the parts that need to be organized in general have been determined.

As the result of the interviews and observation performed in Cycle II and application process, evaluations were carried out with the subject matter experts and improvements were made. Improvements made are as follows:

- Web 2.0 software with Turkish language support was included in EPSS.
- Web 2.0 software was generally upgraded in EPSS.
- Feedbacks were detailed and improved.
- Regarding the design, additions such as button addition and button change as well as page addition were made, and the design was generally rendered practical and simple.

CYCLE III

As the result of updates, the improved and upgraded EPSS has been retested for 3 weeks with the participation of secondary school teachers. At this stage, data were collected via semi-structured interview form and observation form.

Once the data obtained as the result of the applications made were analyzed, 2 main themes were found. They were formed as EPSS features and EPSS evaluation. These themes and the categories and codes under each theme are given in Table 4.

Table 4. Theme, Category and Codes

<i>1. EPSS Features</i>	
a) Favorable Features of EPSS ●Convenience in designing material ● Attracting attention of students ●Designing own material ●Assistance within the process ●Being practical	b) Unfavorable Features of EPSS ● Lack of software 2. EPSS Evaluation ●Sources ●Software ●Feedbacks ●Design

EPSS FEATURES

FAVORABLE FEATURES OF EPSS:

Regarding the favorable features of EPSS designed, teachers have stated that it is a convenient and practical system, and that it facilitates designing different kinds of materials and attracting interest of students, as they have already stated in the 2nd application. Besides, they expressed that it also assisted them with designing their own materials. They stated that determining which Web 2.0 tool they can use according to the choice of school facilities and level of acquisition shows that it is a need-oriented system. Judging by these answers, it can be said that teachers generally consider EPSS as favorable for both them and their students.

A science teacher has made a statement as follows: *“It has facilitated designing different kinds of materials and attracting interest of students. I am of the opinion that the feature of providing a step-by-step instruction and allowing the selection of the school facilities and acquisition levels is also very useful. This is because the schools we will use the material do not always have every opportunity unfortunately.”*

UNFAVORABLE FEATURES OF EPSS:

Regarding the unfavorable features of EPSS, teachers have only stated in general that more software can be added to system.

EPSS EVALUATION

Regarding the EPSS evaluation, teachers have generally given similar opinions to the opinions in the 2nd application. Participants have stated that it provides assistance in general, that it provides learning by discovering, that it provides motivation and self-confidence, and that the learning is more permanent thanks to the sources it contains. Judging by these answers, it can be said that teachers are satisfied with the documents, videos and sample materials contained in EPSS, and that it provides assistance with learning Web 2.0 tool.

In addition, an evaluation test prepared by the subject matter experts and the researcher was applied on teachers following the application. Evaluation test is an evaluation test consisting of 12 items, in which teachers can make an evaluation after examining the system and completing the material design and by which they will receive feedbacks as the result of their evaluation. As the result of analyses and evaluations, the teachers using the platform have stated that it is generally a practical system, that it provides motivation and self-confidence and makes them happy as it allows designing their own materials, and that the sources added to the platform are sufficient. They have stated that developing a new material provides motivation, that they are happy, and that it is fun and exciting. They have also stated that giving a feedback after the evaluation test is a distinctive feature from other platforms.

Opinions of teachers on the evaluation test in the system and the feedbacks given as the result of evaluation test were also taken. Teachers stated that they performed the evaluation test. Many participants have stated that feedbacks are sufficient. Judging by these answers, it can be said that the feedbacks detailed and improved at the result of 2nd cycle are sufficient. Teachers have not expressed any unfavorable situation during and after the evaluation test in the observation period.

All steps in the applied observation form were performed successfully by teachers. During the observation, it was found that sufficient amendments and additions were performed about the design and the parts that need to be arranged in general. Participants have not used any negative expressions in observation and application process. A teacher says: *“Yes, I think it is a well-prepared system. It was easy and understandable for me. The software can be increased over the time, but I have recognized that there are sufficient categories, materials and sources.”*

DISCUSSION AND CONCLUSION

This study aims to develop and test the EPSS for secondary school teachers to develop contents and materials. For this purpose, EPSS was developed through Design-Based research method consisting of 3 cycles. Needs analysis was performed in Cycle 1 and the following conclusions were reached in general: the participant teachers stated that they generally made use of videos, presentations, animations and worksheets in their classes and teaching process. Apart from that, they expressed that they were aware of Web 2.0 tools and used materials created via web 2.0 tools. Teachers working at village schools stated that there was a lack of materials, however they used smart boards and made use of materials such as videos and pictures for them to be efficient in their classes, that is, in the teaching process. Based on the opinions of teachers, it can be concluded that teachers

are knowledgeable about web 2.0 tools and use the materials created via web 2.0 tools in the teaching process. Besides, it has also been found that teachers working at village schools want to use materials in their classes, but their schools are lacking in materials. When the literature on the use of materials are examined, Özpınar and Sarpkaya (2010) have investigated in their study the problems of form teachers working at villages. The most common problems encountered by the form teachers working at villages include having difficulty in accessing materials to make experiments and applications in teaching process and while doing research. Likewise, Özer and Albayrak Özer (2017) have found in their study that prospective teachers are partly aware of the features of web 2.0. They concluded that teachers wanted to use web 2.0 tools for education but they were not sufficiently knowledgeable about it.

The participant teachers have also stated that the use of material appeals to more than one sense organs to materialize the learning and ensure the active participation in the course and that it makes the lecturing more efficient and ensures learning by practice and experience. Judging by these opinions, it can be expressed that teachers attach importance to the use of materials and are aware of the benefits of the use of materials in their classes. In addition, the teachers stated that the use of materials attracted the attention of the students and ensured the materialization of the concepts. They also expressed that it ensured the learning by practice and experience, which made the teaching process enjoyable. In the study carried out by Çiftçi, Yıldız and Bozkurt (2015), in which they investigated what the materials and the use of materials in the classes meant for secondary school mathematic teachers, teachers defined the material as the objects that materialize the abstract concepts, that facilitates understanding, that ensures that student can reflect on mathematical concepts and that brings practicality and visuality to the teaching. In addition, based on the opinions of teachers, it has been concluded that the use of materials is important in terms of “materialization, association, providing motivation, increasing permanence and developing a positive attitude”.

Another finding that has been found in the needs analysis is that teachers have stated that they pay attention to whether the material contributes to the course, whether it is time-efficient, the level of student, the suitability of the course to the intended accomplishments, its usefulness and the currency of material while selecting the materials. In the study carried out by Çiftçi, Yıldız, Bozkurt (2015), it has been found that the material usage processes of teachers are affected by the factors of attendance level of students, exam anxiety, physical conditions, lack of time, teachers’ lack of knowledge and skills. Similarly, Çakıroğlu and Yıldız (2007) have reached the conclusion in their study that teachers are not aware of how to select suitable materials for their class and how to efficiently use the materials they have selected in their class.

Teachers stated that they wanted a platform that guides them with sample drafts and contents, that is easy to use, that includes the acquisitions of the course and helps them prepare the material fast, that can create material by using tools that students will find enjoyable such as games and gamification to appeal to secondary school students, that attracts the interests visually, that can create augmented reality, that contains instructions for a beginner, and that is free of charge. In addition, teachers expressed that they needed assistance while developing materials and this assistance should be available instantly while developing materials. It is also seen in the literature that there are studies supporting this. For example, Uzun (2013) emphasized in his study that the learning environment should have the following features: The learning environment should enable students to study whenever and wherever they want; The learning environment should contain rich multimedia materials; The content should be explained in-depth and in detail; The content should include many sample applications; The learning environment should allow the students to communicate with each other and their teachers and to study individually or with their classmates.

EPSS, which has been developed by taking the opinions of teachers into consideration, is computer-assisted in this study and the task can be accessed easily. After signing up and logging in the

EPSS, directions are made through instructions. The documents and sample materials that will appeal to different sense organs have been uploaded to the system. Within the system, a consultancy service is provided through forums and mail. And the artificial intelligence allows offering options according to the preference of teachers and providing a service for needs. It is seen in the study that the EPSS developed is supported by the features in the literature. In a study he carried out, for example, Kert (2008) determined 12 features that should be present in EPSS. These include being computer-assisted, ability to access the task instantly, ability to be available in the working environment, ability to control the users, reduction of the need for orientation training, being easy to update, accessing the information rapidly, excluding the redundant information, providing information at a different level, taking the different learning patterns into consideration, the integrated information, providing consultancy and learning experiences and artificial intelligence. In his study, Bayarçelik (2020) stated that the biggest difference that occurred in the systems, in which the digital education is provided, was that all data to be used for the need analysis could be collected digitally, simultaneously and in real time, that it could be renewed very fast according to changes, and that it could determine the current situation much more rationally. In addition, the users stated that they could identify their own education and that they were advantageous because they could spare time for their education when they desired.

In the light of findings obtained from the needs analysis and in accordance with the expert opinions, the developed EPSS was put into the use of teachers and the second cycle was started. As the result of the interviews and observations, Regarding the favorable aspects of EPSS, teachers have stated that it is a practical system and that provides convenience in designing different kinds of materials and attracting attention of students. Besides, they expressed that it also assisted them with designing their own materials. They stated that determining which Web 2.0 tool they can use according to the choice of school facilities and level of acquisition shows that it is a need-oriented system. Judging by these answers, it can be said that teachers generally consider EPSS as favorable for both themselves and their students. Özgür (2013) has stated in his study that EPSSs support skills and performance of the users to eliminate the problems encountered during the implementation, rather than teaching the information and subjects, as the systems controlled by the user and providing the performance support when desired. In the study of Akın (2019), EPSS was developed to assist the teachers in the process of monitoring and reporting the development of children within the scope of early childhood special education. It has been concluded that the users have a positive attitude for the developed EPSS and EPSS contributes to motivations and performances of users. Özyer (2021) designed an electronic performance support system for quantitative data analysis. As the result of the study, it was found that it provided support to the educational researchers who had difficulty while performing quantitative analysis, and that it was usable when needed in this regard. When the factors affecting the usability of the developed system were examined, the system properties (i.e. content, visual design, guidance, organization and help) and user properties (i.e. learning style, statistics perception and attitude toward computer) came to the forefront.

In addition to that, teachers have stated that developing a new material provides motivation, that they become happy as they are developing materials, that producing makes a person happy, and that this is fun and exciting. Also during the observation period, similar findings were observed in teachers in the material development process. In his study regarding the teachers' level of developing their professional skills in instructional technologies and material development course, Saka (2005) stated that teachers wanted to design their own materials according to the environmental conditions and available opportunities in the teaching process. In his study, Duman (2013) concluded that the teaching materials should be suitable to the attendance level of students, be in compliance with individual diversity, appeal to the senses of students and ensure multiple learning opportunities, be in a way to make the student become active, be designed according to the principle of learning by practice and experience and be easy to use.

Teachers stated as unfavorable aspects that the use of Turkish software in EPSS would be more convenient and that the software could be increased. Judging by these answers and observation results, it can be said that Turkish Web 2.0 software options should be added or auxiliary materials should be prepared accordingly, and that software options should be increased. It has been found in the process of developing EPSS that literature also contains similar studies. For example, Paschall (2004) stated in his study that some components that EPSS should contain were ignored in some studies. Schmid, Miodrag and Francesco (2008) stated in their study that the interface design is important. In Akin's (2019) study, the participants were asked to perform certain tasks. In order to perform these tasks, the auxiliary tools were added to EPSS in both written and video format. Most of the participants used the auxiliary tools to complete the tasks and stated that these tools made a great contribution in completion of the tasks. As a result, it took longer for some participants to complete the tasks.

Teachers have stated that EPSS created provides assistance in general, that it provides learning by discovering, and that the learning is more permanent thanks to the sources it contains. Judging by these answers, it can be said that teachers are satisfied with the documents, videos and sample materials contained in EPSS, and that it provides assistance with learning Web 2.0 tool. Mitchem, Kight, Fitzgerald, Koury and Boonseng (2007) investigated the availability and perceived efficiency of StrategyTools™ application, an electronic performance system designed to be used independently in the classroom and home environments of incompetent secondary school students. As the result of the research, students and teachers stated that the software is beneficial. Students stated that the use of software contributed them in academic, behavioral and transition areas.

Improvements determined at the end of Cycle II were made and Cycle III was started. Regarding the theme of 'favorable features of EPSS created' at the end of Cycle III, teachers have stated that it is a convenient and practical system, and that it facilitates designing different kinds of materials and attracting interest of students, as they have already stated in the 2nd application. Besides, they expressed that it also assisted them with designing their own materials. They stated that determining which Web 2.0 tool they can use according to the choice of school facilities and level of acquisition shows that it is a need-oriented system. Judging by these answers, it can be expressed that teachers generally consider EPSS as favorable for both themselves and their students. In their studies, Kert and Kurt (2012) studied the impact of EPSS on self-regulation skill. When the study results are examined, it has been found that there is no significant difference in terms of motivational beliefs, while there is a significant difference in favor of experimental group in terms of cognitive, metacognitive and source management strategies.

Kert (2008a) stated that a performance assistance system should have particular features to be qualified as EPSS. These features include being computer-assisted, accessing the task instantly, being present in the working environment, controlling the users, minimizing the need for orientation training, being easy to update, retrieving information quickly, excluding the redundant information, presenting information at different levels, taking different learning patterns into consideration, presenting integrated information, consultancy and learning experiences and hosting artificial intelligence. EPSS created within this study has the above-mentioned features. It is computer-assisted and also the task is accessed quickly. After signing in and logging in EPSS, teachers are directed by the step-by-step instructions and their tasks for them to fulfill are delivered in this way. Teachers can access EPSS whatever environment they need. Users are controlled by the expert system. There is no need for an extra training to be able to use the system. System contains helpful descriptions. Additions and updates to the system are easily performed. Redundant information is avoided and descriptions are made with a plain language. Documents and sample materials that appeal to different sense organs are added to system. Consultancy service is provided in the system via forum and mail. The artificial intelligence makes it possible to provide options according to the choices of teachers and a need-oriented service is provided. Teachers have detailed the presence of the above-mentioned features

and the parts that particular features contributed to as they are giving their opinions on features of EPSS. Judging by the opinions of teachers, it can be expressed that they share the same opinion.

Regarding the EPSS evaluation, teachers have generally given similar opinions to the opinions in the 2nd cycle. Participants have stated that it provides assistance in general, that it provides learning by discovering, that it provides motivation and self-confidence, and that the learning is more permanent thanks to the sources it contains. In Akin's (2019) study, the participants were asked to perform particular tasks. In order to perform these tasks, the auxiliary tools were added to EDPS in both written and video format. Most of the participants used the auxiliary tools to complete the tasks and stated that these tools made a great contribution in completion of the task.

It was observed that all steps in the applied observation form were performed successfully by teachers. During the observation, it was found that sufficient amendments and additions were performed about the design and the parts that need to be arranged in general.

The teachers using the platform have stated that it is generally a practical system, that it provides motivation and self-confidence and makes them happy as it allows designing their own materials, and that the sources added to the platform are sufficient. They have stated that it is motivative to develop a new material, that they are happy, that it is fun and exciting, and that giving a feedback after the evaluation test is a distinctive feature from other platforms. Yelken's (2012) stated that the prospective teachers enjoyed the resulting product so much as it is totally the result of their own efforts and they find it comprehensive and multi-purpose. Kurt and Ayvaz (2021) designed the information technologies personnel performance evaluation decision support system. In this study, it was found that it provided convenience for business processes to the executives using the system, that it was usable when needed, and that it provided support in the management of the process.

Suggestions for future studies;

- This study used semi-structured interview form and observation form created by the researcher. For future studies, experimental studies can be carried out and different scales related to the effectiveness of EPSS and web 2.0 tools can be used.
- Sampling group of this study is consisted of teachers working within the body of National Education. The same study can be repeated with prospective teachers or teachers of different categories.
- The duration of this study was determined as three cycles within the limitations of the researcher. The study can be repeated by extending the application process.

AUTHOR CONTRIBUTIONS

This study was produced from the master thesis that has been conducted by the 1st author in company with 2nd author's academic advisor.

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