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Teachers' Communication Channels In The Innovation- Decision Process *

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Abstract

Nowadays, many innovations and technological advancement find a place in every area of individuals' daily lives, especially in the field of education. The fact that such innovations and technologies are available in physical educational environments is not enough for an effective technology integration process alone. In addition to bringing innovation and technologies to the teaching environment, teachers should also be developed with regards to the relevant competencies regarding how to use these innovations. In this context, pre-service and in-service trainings are organized in order to provide teachers with information regarding new technologies. However, it is seen that the information flow through these channels alone is not enough for teachers to adopt the newly emerging technologies. At this point, it is important to find out alternative communication channels that teachers can use in the innovation-decision process. The relevant literature needs new research to find out the communication channels that teachers use in obtaining knowledge, developing an attitude and making decisions about the innovation. Within the scope of this study, it is accepted that the Education Information Network (EBA), which was recently developed by the Ministry of Education and continued to update itself continuously in the process, has been recognized as an innovation for teachers. The aim of this study was to find out the stages of teachers' innovation-decision process regarding innovations and the communication channels that they used in this process. The participants of the study consisted of 489 teachers working at primary, secondary and high school levels in the city centre of Çanakkale province in the 2017-2018 academic year. Survey and correlational research models were used. The data were collected with the use of the data collection tool developed by the researchers. The data were analysed by using SPSS 21 package program and descriptive statistics (percentage

Keywords

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and frequency) and chi-square test for two variables were performed. As a result of the research, it was concluded that most of the teachers were at the implementation and confirmation stage in the innovation-decision process for EBA. However, at each stage of the innovation-decision process for EBA, it was found out that teachers used the interpersonal channels and interactive internet tools functionally. While obtaining knowledge, developing attitudes and making decisions towards EBA, participant teachers were found to use face-to-face meetings, EBA website and educational websites channels functionally at all stages of the innovation-decision process. In addition, it was concluded that the relationship between the teachers' usage rate of functional communication channels and the type of school in which teachers worked was different at some stages of the innovation-decision process. It is recommended that "interactive internet channels" (such as educational sites) be used more priority in reaching teachers in the process of diffusion of innovation.

Introduction

It is seen that many technologies and innovations have a place in the fields such as banking, health, shopping and education which are directly related to the daily lives of individuals. The introduction of technologies into these areas is interpreted as their contribution to the relevant field rather than being new or being a technological tool. In other words, the question "How should this technology be used? is important. The quality should be investigated with "How". High value-added results could be obtained by processing technologies. With a simple analogy, bringing technology into a relevant learning environment will not go beyond just allocating a certain financial budget. Characteristic steps of instructional design as design, planning, training, making sustainable plans, training qualified personnel and making decisions based on research data (Reiser & Dempsey, 2007), will enable this process to be regulated. This process can be likened to connecting many roads with a bridge. This process is expressed as integration.

In the process of integrating technology into teaching processes, Kopcha (2012) addresses access to technology, time, support activities, teachers' views, beliefs and professional development as variables of the process. From this point of view, it is not enough to bring technology to the teaching settings for the integration process to be effective alone. Teachers' decision to integrate technology into teaching processes may vary depending on the level of support they receive in the process, their belief in using technology and their ability to use the technology (Ertmer & Ottenbreit-Leftwich, 2010; Mueller, Wood, Willoughby, Ross, & Specht, 2008). Nowadays, although teachers are more familiar with using technology in their daily lives, this situation is not enough for teachers to integrate computer technologies into educational processes (Cuban, 2001; Mueller et al., 2008). The lack of knowledge and skills related technology, technology-supported pedagogy and technology is seen as an obstacle for the integration of technology in education (Hew & Brush, 2007). In other words, teachers with advanced vocational qualifications increase the probability of using new technologies in teaching environments (Göktaş, Yıldırım, & Yıldırım, 2009a; Pineida, 2011). Teachers could gain the competencies necessary to adopt new technologies intended to be integrated into the teaching process with the help of pre-service trainings (Çelikten, Şanal, & Yeni, 2005; Göktaş, Yıldırım, & Yıldırım, 2009b) and in-service trainings (Kayaduman, Sırakaya, & Seferoğlu, 2011; Kıncal, 2005; Şahin İzmirli, 2012; Çalışkan & Şahin İzmirli, 2017; Şahin İzmirli, Odabaşı, & Yurdakul, 2012). In this context, pre-service and in-service trainings are considered as communication channels that support teachers to acquire the knowledge, skills and attitudes regarding the new technology and to facilitate decision making on the innovation. However, it is not seen that the basic competencies that are provided to the teachers through pre-service trainings

are not enough to use the technology in the teaching processes, and the in-service trainings organized for the development of the previously acquired qualifications cannot be fully successful (Akbaba-Altun, 2006; Akıncı, Kurtoğlu, & Seferoğlu, 2012; Şahin İzmirli, 2012). In other words, in addition to the need for pre-service and in-service trainings for teachers to be successful in the technology integration process, the lack of these trainings to reach the results puts the process into a vicious cycle. The importance of professional development activities based on quality and standards is understood here.

What is questioned within the process is the channels used in delivering the trainings to teachers. As the knowledge, skills and attitudes required by the technological developments increase, it gets difficult to limit the pre-service and in-service trainings to a specific program and time (Can, 2004; Kıncal, 2005). In this framework, it is seen that the communication channels, which teachers employ for the purpose of acquiring knowledge, skills and attitude about innovation, will not be limited to the only face to face communication channels. At this point, it becomes necessary to address the channel(s) that adults demand in the knowledge, skills and attitude development processes in questioning the quality of professional development activities and the specially prepared contents of the channel. In this research, a case which could be "new" for teachers was studied. Innovation is the process of developing, adapting new products, technologies, methods or making improvements on existing products and methods (Matthews, 2003). In other words, a new product development can be defined as innovation, the development activities carried out on the existing product can be defined as innovation as well. In Turkey, scope of the Movement of Enhancing Opportunities and Improving Technology (Fatih) project, in 2012, the Education Information Network (EBA) online social education platform was developed to provide e-content to be used in educational activities. EBA can be considered a "new" situation in the field of education because of it is a recently developed product. In addition to being a newly developed product in the field of education, EBA's improvement and development activities on its existing versions have been continuing continuously since its first development (eg EBA version 1, EBA version 2) (EBA, 2019; Güvendi, 2014). When the definitions of the term of innovation are examined, it can be considered that EBA maintains its position as a "new" situation in the field of education because of EBA's continuing continuously improvement and development activities. In this context, the Education Information Network (EBA) platform is seen as an innovation for the teachers in the diffusion to the teaching activities. The aim of this study was to find out the stages of teachers' innovation-decision process regarding innovations and the communication channels that they used in the process of EBA integration to learning activities. The terms written as EBA after this phase of the research were accepted as "innovation" in the teaching process. The following research questions were sought for answers.

1. At which stages are the teachers in the innovation-decision process in the diffusion of EBA to teaching activities?
2. What is the level of functionality of the communication channels that teachers use in the process of the innovation-decision process in the diffusion of EBA to teaching activities?
3. Is there any relationship between the functional communication channels that teachers use at each stage of the innovation-decision process and the types of schools where teachers work?

Literature Review

In a community-based organization, interpersonal channels are important as they provide information mobility in the diffusion of innovations (Gainforth, Latimer-Cheung, Athanasopoulos, Moore, & Ginis, 2014). Consumers who do not yet adopt new technologies prefer to get information from these interpersonal channels based on the conversational channels rather than written channels (Lee, Lee, & Schumann, 2002). If individuals are familiar with the innovations such as computer or computer program, it is seen that they could access to knowledge and skills through their own efforts (Lichty, 2000), but they use interpersonal channels such as colleagues, managers and technical experts along the process (Lichty, 2000; Stuart, 2000; Weenig, 1999). This situation is true for the banking sector. Banks' customers perceive face-to-face communication with the employees and acquaintances as the

most reliable and convincing channels in obtaining information regarding mobile banking services (Tran & Corner, 2016). However, in the process of adopting technological innovations, there are some studies indicating that individuals benefit from mass media channels in the process of obtaining information (Esen, 2002). It is observed that the majority of the companies operating in the livestock sector often use mass media such as newspapers, television and radio in the process of adopting a new knowledge or skill. (Çiçek, Cevger, & Tandoğan, 2008; Sezgin, 2010). It is seen that pre-service teachers use printed books and magazines while they prefer to use online books and magazines on the internet (Yılmaz, 2013). A similar situation is true for individuals who want to buy a car. Individuals obtain information through the internet channels as well as interpersonal channels used in the decision-making processes in car purchasing (Köksal & Türedi, 2014). In the process of obtaining knowledge and skills, it is seen that people use multiple channels and they use electronic devices either as the main channel or supplementary channel. It is concluded that teachers find that the seminars which are organised in order to help teachers gain knowledge and awareness about EBA were found to be sufficient in general but that the organised seminars were not given by qualified experts (Kurtdede Fidan, Erbasan, & Kolsuz, 2016; İzci & Eroğlu, 2016). Besides, it was seen that teachers used the internet and official channels except for seminars while gaining knowledge and awareness about EBA (Kurtdede Fidan et al., 2016). Güvendi (2014) stated that the majority of teachers follow the news, magazines/books and publications on EBA's official website. In the same study, however, it was concluded that school administrators follow the publications regarding distance education and the news on EBA website more than other teachers. In addition, primary and secondary school teachers were found to use EBA more effectively than high school teachers.

Theoretical Background: Rogers' Theory of Diffusion of Innovation

Rogers (2003) defines innovation as ideas, objects or applications that are perceived as new by individuals or society. Bledow, Frese, Anderson, and Far (2009) define the term of innovation as the development and presentation of new and useful ideas by the individual or society. Rogers (2003) describes diffusion as the spread of a novelty among the members of the social system over time through certain channels. As Rogers (2003) emphasizes in its definition of diffusion, the diffusion model of innovation is explained with four basic elements, which are (1) innovation, (2) communication channels, (3) time and (4) social system. Innovation is the idea, object or practice that is perceived as new by the individual or society (Rogers, 2003). With this feature, it could be said that it carries the basic characteristic of the theory. Diffusion is a special type of communication that includes messages about innovation. Diffusion is the transmission of information about innovation by those who have knowledge about the innovation through communication channels to the individuals who do not have the relevant information. Communication channels in the model of diffusion of innovations can be classified into two categories as cosmopolite and local. Cosmopolite communication channels are generally defined as the channels that social system members use when communicating with other individuals or resources out of their own systems. Local communication channels are the channels that social system members use to communicate with individuals or resources with the same socio-economic characteristics (Rogers, 2003). In this diffusion process, the time element is examined as (a) innovation-decision process, (b) adopting categories and (c) adoption speed. The diffusion of innovations is a process that involves certain behaviours and decisions over time (Kılıçer, 2011). The innovation-decision process consists of (1) knowledge, (2) persuasion, (3) decision, (4) implementation and (5) confirmation. Rogers' (2003) innovation-decision process is given in Figure 1.

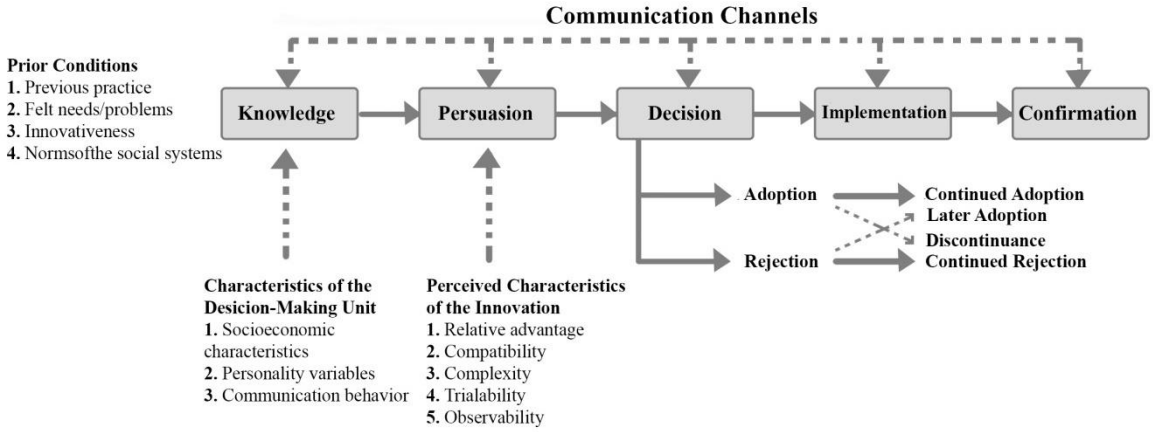

Figure 1. Innovation-Decision Process (Rogers 2003, p.209)

At the knowledge stage, the first awareness of individuals about the innovation is formed and individuals get information about this innovation for the first time (Rogers, 2003). At the persuasion stage, a positive or negative attitude is formed in the light of the knowledge gained about the innovation at the knowledge stage. At the decision stage, the decision to adopt or reject the innovation is created according to the attitude they develop at the persuasion stage. At the implementation stage, individuals put innovations into practice following the decision to adopt at the decision stage. At the confirmation stage, individuals form the final decision of adoption or rejection regarding the innovation (Rogers, 2003). Rogers (2003) emphasized that the level of adoption of innovations among social system members may differ in the model of diffusion of innovations and categorised them. Social systems are the structures that are formed by the interrelated units that try to solve the problems together (Rogers, 2003). As the diffusion of innovations takes place in social systems, the diffusion is affected by the structure of the social structure. This effect can be caused by social norms, opinion leaders, agents of change, results of the innovation and type of innovation-decision. In other words, social norms such as cultural and religious characteristics of individuals or societies can slow down the diffusion of innovation and in some cases, the diffusion can be slowed (Kılıçer, 2011).

The relationship between Innovation-Decision Stages and Communication Channels

Rogers (2003) stated that mass media communication tools are more functional than interpersonal channels at the knowledge stage where individuals acquire the first knowledge and raise awareness regarding the innovation in the model of diffusion of innovations. Interpersonal channels at the local level, such as communication with opinion leaders, exchange agents and peers, are more functional than mass media channels in providing technical support for individuals to develop attitudes, develop decisions and solve problems in the implementation process (Rogers, 2003). However, the level of accessibility to mass media in the developed countries is higher than in the developing countries (Rogers, 2003). Therefore, individuals in developing countries can use cosmopolite interpersonal channels as they gain knowledge and awareness about innovation because they have limited access to mass media channels (Rogers, 2003). In other words, the cosmopolite communication channels are more functional at the knowledge stage than the local communication channels. In addition, the cosmopolite interpersonal channels which provide the opportunity to react in the developing countries and in the cases where mass media channels are jointly used in cosmopolite ways, the effectiveness of these channels in the knowledge and persuasion stage was found to be higher compared with the developed countries (Rogers, 2003).

Considering that Turkey is within the category of the developing countries (ISI, 2019), Turkey could be given as an example for what Rogers (2003) claims. Eurostat (2017a) has determined the distribution of resources to seek information on learning possibilities. The distribution of the resources that are used to search for information in Turkey in 2011 is given in Figure 2.

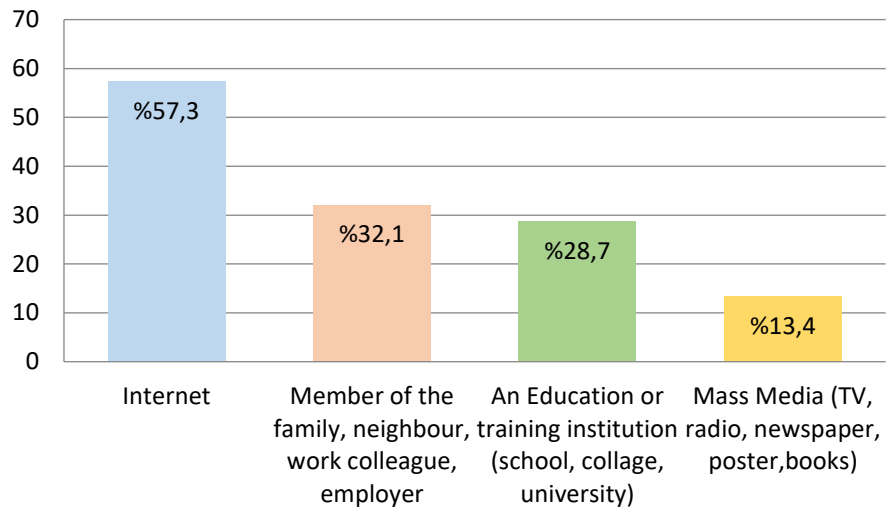

Figure 2. The Resources That Those Living in Eurostat-Turkey Use to Search for Information

As seen in Figure 2, 57,3% of individuals in Turkey obtain knowledge through the internet, 32,1% of them use their immediate environment, 28,7% of them use educational institutions and 13,4% of them use mass media communication tools. The fact that Turkey has low rates of access to mass media channels for individuals to obtain information, that individuals use internet tools and information acquisition channels such as interpersonal channels confirm the percentage given in Figure 2. The results of the research namely "Media use of individuals about policies and institutions" which was conducted by Eurostat (2017b) on European counties and Turkey are given in Figure 3.

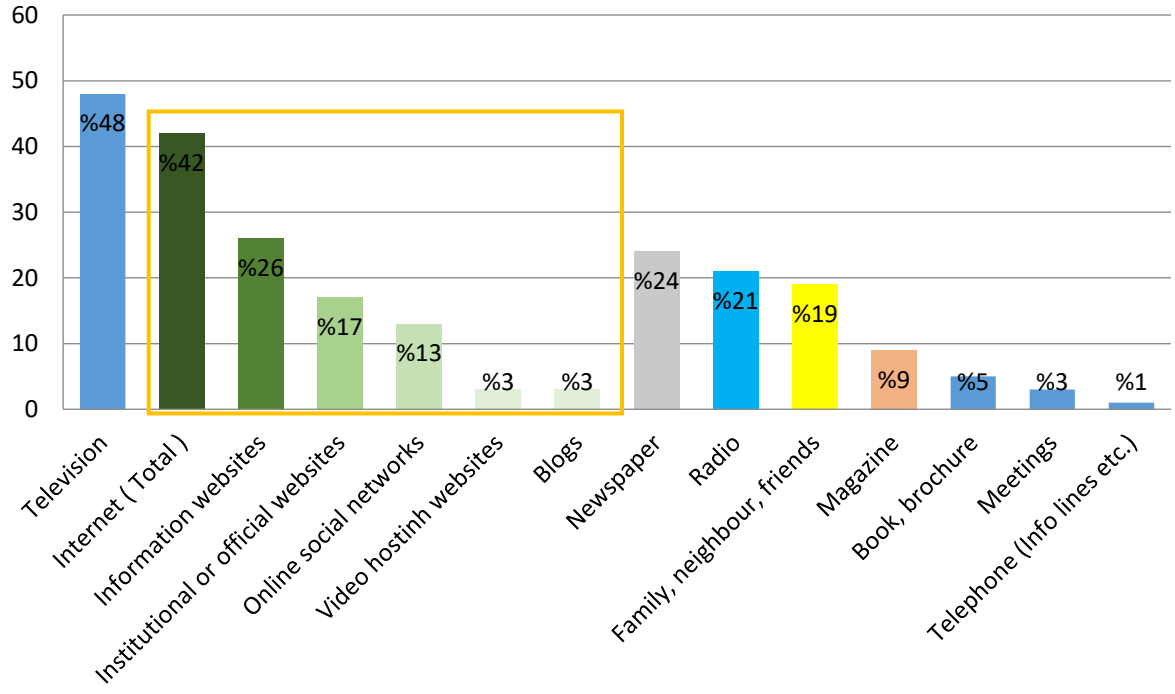

Figure 3. Eurostat Media Usage Report, Media Utilization Rates as a Source of Information

It was found that, in order to obtain information about individuals, policies and institutions, 48% of them were found to use television, 42% of them used the internet, 24% of them used newspapers, 21% of them used radio and 19% of them used their immediate environment (Figure 3). This situation can be interpreted as that it is easier for individuals in the developing countries to have access to the internet to obtain information than mass media (such as newspapers, radio, magazines, books and brochures).

Method

Research Design

This study was designed with survey and corelational research models. The survey model aims to reveal the specific characteristics (skill, attitude, opinion, belief, etc.) of a large group of participants (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2014; Can, 2014) without any intervention to the environment (Creswell, 2012; Erözkan, 2007; Fraenkel, Wallen, & Hyun, 2012). Survey model was used in the study to answer the first research question which aims to find out the stage of the innovation-decision process in the diffusion of EBA to the teaching activities and the second research question aiming to find out the functional communication channels used in these stages. Correlational research model was used to find the answer to the third research question, which aims to find out the relationship between the teachers' functional communication channels and the school type variable used at each stage of the innovation-decision process.

Participants

The population of the study consists of 1562 teachers working in public schools at the primary, secondary and high school levels in the city centre of Çanakkale province during the 2017-2018 academic year. As it was possible to reach the whole population within the scope of the research, no sampling was made and the whole population was studied in the study. In the data collection process, 505 teachers agreed to participate in the research and completed the data collection tools (32% of participants returned). When the collected questionnaires were examined, it was seen that 16 participants did not fill in the data collection tool in line with the given instruction. In this context, the data obtained from these 16 participants were excluded from the study. Demographic data of the participants are given in Table 1.

Table 1. Demographic Information for Participants of the Study

		N	%
Gender	Female	288	58,9
	Male	201	41,1
	Total	489	100,0
Type of school	Primary	118	24,1
	Secondary	205	42
	High School	166	33,9
	Total	489	100
Age	25 and below	8	1,6
	26-30	54	11,0
	31-35	72	14,7
	36-40	132	27,0
	41-46	121	24,7
	47 and above	102	20,9
	Total	489	100,0

In the study, the number of participants (n = 489) was thought to be enough to be able to respond to the research questions and to make generalizations to the whole research population (Cohen, Manion, & Morrison, 2000).

Data Collection Instruments

Within the scope of the research, the data collection tool namely "the Communication Channels Preferred by Teachers in the Decision Making for a Teaching Technology" was developed by the researcher. The developed data collection tool consists of two main parts. In the first part, there are questions related to the demographic information of the participant teachers such as gender, the type of school where they work. In the second part, there are questions related to the stages of teachers' innovation-decision process and the communication channels they prefer to use in these stages. The second part of the data collection tool consists of five sub-sections, namely knowledge, persuasion, decision, implementation and confirmation which are the stages of the innovation-decision process. In these five sub-sections, there are 28 separate communication channels, which are divided based on the instructions to be marked in accordance with the guidelines and the innovation-decision process related to the section.

Before the data collection tool was developed, a detailed literature review and document review were conducted. In the document review process, Turkish Statistical Institute (TSI), the Radio and Television Supreme Council (RTSC), Eurostat reports and Prime Minister's Communication Center (PMCC) for the EBA's promotional activities were examined obtained. The aim of the literature review and document review was to find out the characteristics of each stage in the innovation-decision stage and to determine the communication channels commonly used by individuals in order to obtain information in their daily lives. Within this framework, communication channels used by individuals to obtain information in their daily lives have been identified in three main categories as "Mass media channels", "interactive internet channels" and "interpersonal communication". Following the identification of these categories, a separate literature review and document review was conducted on each category and sub-communication channels commonly used under these channels were identified (eg Mass media channels: Television / News Programs, Interactive Internet tools: Social Media; Interpersonal channels: Education etc.).

In order to test the scope and face validity of the developed data collection tool, support was received from four instructors. The four faculty members giving support had an MA degree in Computer Education and Instructional Technology (CEIT). Two of them were found to have research in the field of "diffusion of innovation", one of them was found to have research in the field of "adopting technology in educational processes" and one of them was found to have research in the field of "e-learning". Necessary arrangements were made on the data collection tool by taking into account the feedback regarding the structural revisions (eg combining the communication channels categorised under two headings as "face-to-face" and "meetings and conferences". The data collection tool, which was finalized after the validity study, was piloted on 10 teachers teaching at the schools of the Ministry of National Education before being applied to the actual participants. Special attention was paid to that the teachers who were piloted were members of primary, middle and high schools.

Within the scope of piloting, the points that the piloted teachers had difficulty in understanding (eg, the background coloration of categories of communication channels and separation of the categories with thick borders) in the table, the missing points suggested by the teachers (eg adding "WhatsApp" as an example under the title of "social media", which is placed under the title of interactive internet tools) were gathered and revised in line with the collected feedback by the researcher. In the data collection tool, the channels that the teachers can use at the innovation-decision process for the use of teaching technologies are categorized as in Figure 4.

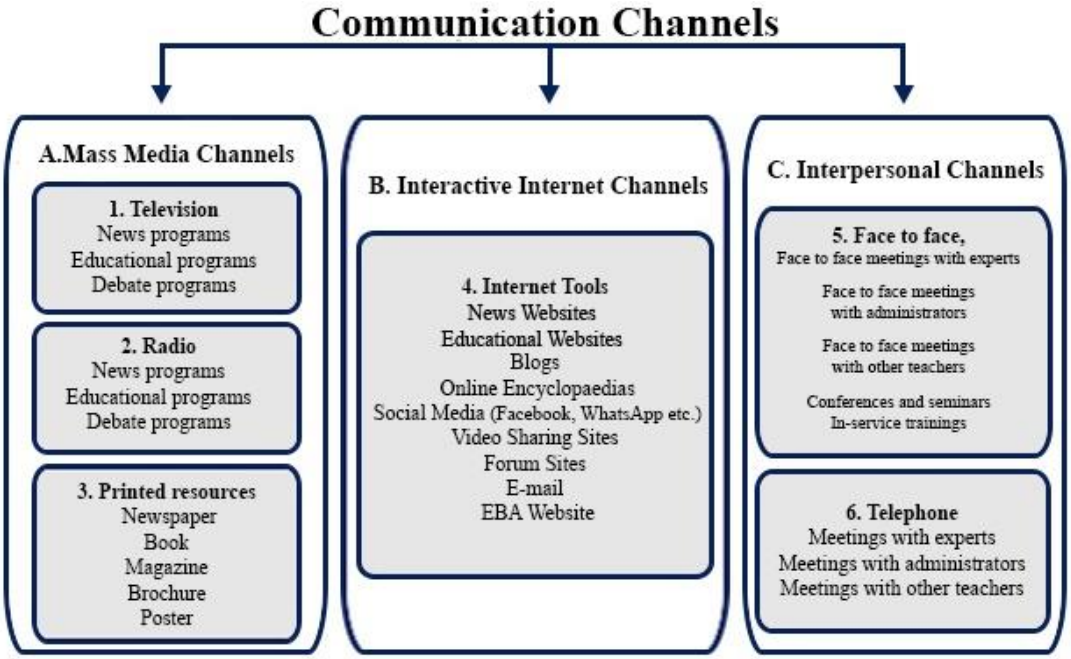

Figure 4. Channels and Categories Which Could Be Used at The Innovation-Decision Process for Instructional Technology

As seen in Figure 4, these categories are divided into three main channels: mass communication, interactive internet channels and interpersonal channels.

Data Collection

The data collection process was carried out by the researcher and three practitioners. In this context, after obtaining the necessary permissions for the data collection process, the researchers and practitioners started the data collection process at 41 public schools in the city centre of Çanakkale province. In the data collection stage, the process started by receiving verbal permission from the school administrators and the data were collected from the teachers of the visited schools. Data collection was performed during break times. At the beginning of the data collection, teachers were informed about the purpose and scope of the research. The data collection tool was distributed to the teachers who voluntarily accepted to participate in the research and they were requested to fill in the questionnaire.

Data Analysis

The data collected within the scope of the research were analysed by using SPSS 21. Descriptive statistics (percentage, frequency) were used in order to determine the stage of the teachers regarding the innovation-decision process and the functional communication channels used by the teachers in the diffusion of EBA. In order to describe the variables, the data can be given as a percentage by using the frequency technique used to describe the data collected in the research based on the experimental and survey model (Büyüköztürk, 2016). In order to determine whether there is a relationship between the functional communication channels teachers choose to use in the innovation-decision process and the types of schools where the teachers are employed, Chi-square test for two variables was used. In the cases where a significant relationship was found between the variables as a result of the analysis, the strength of the relationship between the variables was examined by calculating the Contingency coefficient. Contingency coefficient is used in calculating the strength between variables when the degree of freedom is greater than 1 in the analysis results (Can, 2014). Contingency coefficient is between 0 and 1, and the value 0 means there is not any relationship between the variables when the value is 1 and close to one, it means that there is a strong relationship between the variables (Can, 2014; Cohen, 1988).

Results

Findings regarding the Stages of Innovation-Decision Process in Diffusion of EBA to teaching activities

The stages of teachers in the innovation-decision process in the diffusion of EBA to teaching activities were analysed with descriptive analysis (frequency, percentage). Analysis results are given in Table 2.

Table 2. The Stages of Teachers in the Innovation-Decision Process

Stages of Innovation-decision process	Frequency (*f*)	Percentage (%)
Knowledge	46	9.4
Persuasion	28	5.7
Decision	73	14.9
Implementation	33	6.7
Confirmation	306	62.6
None	3	0.6
Total	489	100

As seen in Table 2, 46 (9.4%) of the teachers were at the knowledge stage of the innovation-decision process in the diffusion of EBA to teaching activities, 28 (5.7%) were at the persuasion stage, 73 (14.9%) of them were at the decision stage, 33 (6.7%) were at the implementation stage and 306 (62.6%) were at the confirmation stage. It was found that 3 (0.6%) of the teachers had not yet reached the stage of the innovation-decision process in which they decide to adopt or reject EBA. In other words, 69.3% of the teachers (confirmation: 62.6% and implementation: 6.7%) have either used or continued to use EBA in the teaching process. However, 30.7% of teachers (knowledge: 9.4%, persuasion: 5.7%, Decision: 14.9% and None: 0.6%) have not yet used EBA in teaching processes. This situation can be interpreted that although the majority of teachers have integrated EBA into teaching processes, nearly one-third of them have not fully integrated EBA into teaching processes. Usluel and Aşkar (2003) stated in their study that the majority of the teachers made a positive decision about using the computer in managerial works and that they were in the implementation stage, and just some of them were in the implementation stage at the point of their use for teaching activities. The finding of this study shows that the majority of teachers have started to use computer technologies in their teaching activities. According to the findings of this research, it is understood that in innovation-decision processes, it is more important to decide which channels to use to reach teachers, especially in the final stages.

Findings on the functionality of the communication channels that teachers use in the process of an innovation-decision process in the diffusion of EBA to teaching activities

In the diffusion of EBA to teaching activities, the functional communication channels that teachers use during the innovation-decision process stages are analysed in three main categories: mass media channels, interactive internet channels and interpersonal channels for each stage. According to the results of the analysis, while the researcher was determining functional communication channels in the main categories, 70% usage rate was set as the lower limit, but while determining the functional communication channels in the sub-communication channels of the functionally, 30% utilization rate was set as the lower limit. Functional communication channels in the main categories was determinate as 70% usage rate as the lower limit because of the usage rates decreased significantly after 70% as can be seen in Tables 3, 6, 9, 12 and 15. Similarly, functional communication channels in the sub-communication channels was determinate as 30% usage rate as the lower limit because of the usage rates decreased significantly after 30% as can be seen in Tables 4, 5, 7, 8, 10, 11, 13, 14, 16 and 17.

Functional Communication Channels Used at the Knowledge Stage

Table 3 shows the categorical distribution of communication channels used by teachers at the knowledge stage, which is the first of the stages regarding the innovation-decision process during the diffusion of EBA to teaching activities.

Table 3. Categorical Distribution of Communication Channels Used by Teachers in Knowledge Stage

Communication channel	Number of teachers using		Number of teachers not using		Total	
	f	%	*f*	%	*f*	%
Interpersonal channels	420	86,4	66	13,6	486	100
Interactive internet channels	403	82,9	83	17,1	486	100
Mass media channels	234	48,1	252	51,9	486	100

Note. Participants could choose more than one choice

As seen in Table 3, it was seen that the teachers used interpersonal channels (86.4%), interactive internet channels (82.9%) and mass media channels (48.1%) respectively at the knowledge stage. Considering that the lower limit of use in the determination of functional channels is considered to be 70% by the researcher, the functional communication channels at which teachers raise awareness regarding EBA and learn about it were found to be interpersonal channels (86.4%) and the interactive internet channels (82.9%) respectively. Rogers (2003) stated that mass media channels are more functional at the knowledge stage, but this situation may vary in the developing countries. In other words, in the cases when access to mass media channels is limited in the developing countries, cosmopolite interpersonal channels could be more effective. In this context, it is seen that the research findings are similar to those of Rogers's (2003) when considered that the mass media channels containing information about the EBA are limited.

In addition, Rogers (2003) stated that communication channels with cosmopolite and mass media channels, which enable information to reach wide audiences in the developing countries, may be more functional at the knowledge stage. This can be considered as an example of the fact that interactive internet channels could be used both as a mass media and as a means of facilitating communication among cosmopolite individuals. In the study, the fact that interactive internet channels are functional at the knowledge stage supports Rogers (2003). When the literature is examined, it is observed that there are researches suggesting that individuals used more interpersonal channels in a more functional way while gaining knowledge and awareness about innovations (Gainforth et al., 2014; Lee et al., 2002; Lichty, 2000; Tran & Corner, 2016; Weenig, 1999). This research supported the literature. However, some studies in the literature concluded that individuals who had awareness and knowledge about innovation functionally for the first time could use mass media channels functionally (Çiçek et al., 2008; Esen, 2002; Sezgin, 2010). The results of this study are not similar to those in the literature. However, it is seen that individuals use the interpersonal channels as well as the internet effectively, which is similar to the results of this research (Kurtdede Fidan et al., 2016; Köksal & Türedi, 2014; Yılmaz, 2013).

Table 4 presents the rates of usage of the sub-communication channels of the category of interpersonal channels, which is the most functional channel used by teachers during the knowledge stage.

Table 4. Interpersonal channels Used at the Knowledge Stage

Interpersonal channels	Number of Teachers using		Total	
	f	%	*f*	%
Face to face				
Meetings with other teachers	260	53,5	486	100
In-service trainings	258	53,1	486	100
Meetings with administrators	160	32,9	486	100
Conferences and seminars	150	30,9	486	100
Meetings with experts	98	20,2	486	100
Telephone				
Meetings with other teachers	56	11,5	486	100
Meetings with administrators	29	6	486	100
Meetings with experts	21	4,3	486	100

Note: Participants could choose more than one choice

Considering that the lower limit for use was set as 30% in determining the functional sub-communication channels by the researcher, as seen in Table 4, the most functional sub-communication channels of the interpersonal channels which were used by teachers at the knowledge stage are the face to face meetings with other teachers (53,5%), in-service trainings (53,1%), face to face meetings with managers (32.9%) and conferences / seminars (30.9%). Rogers (2003) stated that cosmopolite communication channels could be functional in developing countries. In this context, as the channels of in-service trainings and conferences and seminars, which were used functionally at the knowledge stage, have facilitated teachers' communication with other individuals out of teachers' system, they could be considered as cosmopolite channels. Yılmaz (2013) stated that pre-service teachers use courses and seminars functionally when they learn about innovations. In this study, it was seen that teachers used the channel of conferences/seminars functionally at the knowledge stage as teacher candidates do. In addition, Stuart (2000) and Weenig (1999) stated that individuals used the communication channel with managers as they are learning about innovations.

In this study, it was seen that the teachers used the face to face metings with administrators channel in a functional way. Güvendi (2014) states that the EBA website is followed up more by the administrators. In this context, teachers' face-to-face meetings with the administrators to get information about EBA can be interpreted that they see them as opinion leaders. However, it is also stated that the trainings for EBA are useful but the trainers are insufficient due to being unqualified (Kurtdede Fidan et al., 2016; İzci & Eroğlu, 2016). Stuart (2000) found out that the university staff functionally used the meeting channel with the technical personnel/experts in obtaining information about innovations. In this study, it was determined that teachers did not functionally use the meeting channel with the experts at the knowledge stage. This can be interpreted as the fact that teachers do not choose to communicate with the experts in order to obtain information about EBA at the knowledge stage since they consider that experts do not have enough qualification. In this context, the research findings support the findings of Kurtdede Fidan et al. (2016), İzci and Eroğlu (2016), while they do not support those of Stuart's (2000). In addition, Rogers (2003) stated that, since the agents of changes are not in the same status as the members of the social system, some assistant elements with similar features with the social systems could be used in the process. In this case, experts who can provide technical support about EBA can be considered as assistants of exchange agents. When considered in this context, the findings may be interpreted that experts who are assistants of changes are not communicating with the teachers in the process adequately.

The usage rates of the sub-communication channels of interactive internet channels which are the second most functional channel used by teachers at the knowledge stage are presented in Table 5.

Table 5. The Interactive Internet Channels Used at the Knowledge Stage

Interactive Internet Channels	Number of teachers using		Total	
	f	%	*f*	%
EBA Website	294	60,5	486	100
Educational Websites	242	49,8	486	100
News Websites	130	26,7	486	100
Social Media Tools	102	21	486	100
Forum Sites	68	14	486	100
Video Sharing sites	64	13,2	486	100
E-mail	38	7,8	486	100
Blogs	32	6,6	486	100
Online Encyclopaedia	17	3,5	486	100

Note. Participants could choose more than one choice.

It was seen that the most functional sub-communication channels of the category of interactive internet channels that the teachers used in a functional way at the knowledge stage were EBA website (60.5%) and educational websites (49.8%), respectively. Güvendi (2014) conducted a study and found that the vast majority of teachers followed the news, magazines, books on the EBA website and distance education facilities via the EBA website. At this point, it is seen that similar results were achieved with Güvendi (2014). However, Eurostat (2017b) stated that individuals are using information web pages effectively. This situation is similar to the teachers' functional usage of educational websites.

The Functional Communication Channels Used at the Persuasion Stage

Table 6 presents the categorical distribution of the communication channels that teachers use at the persuasion stage, which is the second stage of the innovation-decision process stages in the diffusion of EBA to teaching activities.

Table 6. Categorical Distribution of Communication Channels Used by Teachers in Persuasion Stage

Communication Channels	Number of Teachers Using		Number of Teachers not Using		Total	
	f	%	*f*	%	*f*	%
Interpersonal channels	373	84,8	67	15,2	440	100
Interactive Internet Channels	368	83,6	72	16,4	440	100
Mass media channels	140	31,8	300	68,2	440	100

Note. Participants could choose more than one choice.

As seen in Table 6, it was seen that teachers used interpersonal channels (84.8%), interactive internet channels (83.6%) and mass media channels (31.8%) at the persuasion stage respectively. The lower limit of the use of functional channels was accepted as 70% by the researcher. The functional communication channels used by the teachers at the persuasion stage in which they developed positive or negative attitudes towards EBA were seen as the interpersonal channels (84.8%) and interactive internet channels (83.6%). Rogers (2003) stated that interpersonal channels, such as communication with opinion leaders and peers, were more functional at the persuasion stage, which included attitudes towards innovation. Research findings are similar to those of Rogers' (2003). However, Weenig (1999) concluded that informal communication channels such as strong communication among the employees were more effective in shaping the employees' attitudes. Research findings are similar in this respect with those of Weenig's (1999).

In addition, Rogers (2003) stated that the use of cosmopolite and mass media channels together at the knowledge stage could be more functional in developing countries as they facilitate reaching vast masses. This can be considered as an example of the fact that interactive internet channels enable both cosmopolite interpersonal communication and can be used as a mass media. In the study, Rogers (2003) supports the fact that interactive internet tools are functional at the persuasion stage.

Table 7 presents the usage rates of the sub-communication channels of the category of interpersonal channels, which is the most functional channel used by teachers at the persuasion stage.

Table 7. Interpersonal channels at the Persuasion Stage

Interpersonal channels	Number of Teachers Using		Total	
	f	%	*f*	%
Face to face				
Meetings with other teachers	282	64,1	440	100
In-service trainings	165	37,5	440	100
Meetings with administrators	152	34,5	440	100
Conferences, seminars	109	24,8	440	100
Meetings with experts	95	21,6	440	100
Telephone				
Meetings with other teachers	58	13,2	440	100
Meetings with administrators	26	5,9	440	100
Meetings with experts	20	4,5	440	100

Note. Participants could choose more than one choice.

The lower limit of the use of functional communication sub-channels was accepted as 30% by the researcher. Within the category of interpersonal channels that teachers used functionally at the persuasion, stage is, as the most functional ones, face to face meetings with other teachers (64.1%), in-service training (37.5%) and face-to-face meetings with administrators (34.5%) respectively. Lichty (2000) conducted a study and concluded that university teachers had effective communication with their colleagues about technological innovations. In this context, the use of face-to-face meetings with other teachers at the persuasion stage is similar to the literature. The fact that teachers speak to their peers most commonly may be interpreted as that teachers give very much importance to their peers in adopting attitudes towards innovations. However, Rogers (2003) stated that cosmopolite interpersonal channels may be functional in developing countries.

In this context, since the in-service training channels, which are found to be functionally used at the persuasion stage, allow teachers to communicate with individuals outside their social systems, they could be considered to be cosmopolite channels. It was observed that the teachers used the channel of face to face meeting at the persuasion stage as well as the knowledge stage. Rogers (2003) stated that opinion leaders offered information and advice on innovation to other members of the social system. In this context, the fact that teachers had face-to-face meetings with their administrators to get information about the EBA could be interpreted as that administrators are seen as opinion leaders by teachers. This finding is similar to that of Stuart (2000) and Weenig's (1999) as in the knowledge stage. In addition, the persuasion stage, as in the knowledge stage, the change agents are not functionally contacted with the help of experts.

Table 8 presents the usage rates of the sub-channels of the interactive internet channels category, which is the second most functional channel used by the teachers at the persuasion stage.

Table 8. Interactive Internet Channels Used at the Persuasion Stage

Interactive Communication Channels	Number of Teachers Using		Total	
	f	%	*f*	%
EBA Website	262	59,5	440	100
Educational Websites	193	43,9	440	100
News Websites	92	20,9	440	100
Social Media Tools	72	16,4	440	100
Forum Sites	64	14,5	440	100
Video Sharing Sites	47	10,7	440	100
Blogs	28	6,4	440	100
E-mail	18	4,1	440	100
Online Encyclopaedia	13	3	440	100

Note. Participants could choose more than one choice

In the category of interactive internet channels that the teachers used functionally at the persuasion stage, the most functional sub-communication channels were EBA website (59.5%) and educational websites (43.9%), respectively. These findings are similar to those of Eurostat's (2017b) and Güvendi's (2014) as in the knowledge stage.

Functional Communication Channels Used at the Decision Stage

Table 9 shows the categorical distribution of communication channels used by the teachers at the decision stage, which is the third stage of the innovation-decision process in the diffusion of EBA to teaching activities.

Table 9. Categorical Distribution of Communication Channels Used by Teachers in Decision Stage

Communication Channel	Number of Teachers Using		Number of Teachers Not Using		Total	
	f	%	*f*	%	*f*	%
Interactive Internet Channels	355	86,2	57	13,8	412	100
Interpersonal channels	327	79,4	85	20,6	412	100
Mass media channels	99	24	313	76	412	100

Note. Participants could choose more than one choice.

As seen in Table 9, it was seen that the teachers used interactive internet channels (86.2%), interpersonal channels (79.4%) and mass media channels (24%) respectively at the decision stage. At the decision stage where teachers decided to adopt or reject EBA, the functional communication channels they used were interactive internet channels (86.2%) and interpersonal channels (79.4%). Rogers (2003) stated that communication channels that are used together as cosmopolite in the developing countries may be functional in persuasion and intention behaviours of individuals. Considering that the interactive internet channels meet these two conditions, it is seen that the study finding is similar to the literature. However, Rogers (2003) stated that interpersonal communication channels, such as communication with opinion leaders and peers, are more functional at the decision stage, which includes the decision to adopt or reject innovation. In this context, the research findings are similar to Rogers (2003). Additionally, Eurostat (2017a) issued a report stating that individuals in Turkey used the followings most commonly respectively as they are obtaining new information; the internet, family/colleague, educational organisations and mass media channels. This is similar to the findings of this study.

Table 10 presents the usage rates of sub-communication channels belonging to the category of interactive internet channels, which is the most functional channel used by teachers at the decision stage.

Table 10. Interactive Internet Channels Used in Decision Stage

Interactive Communication Channels	Number of Teachers Using		Total	
	f	%	*f*	%
EBA Web Sites	269	65,3	412	100
Educational Websites	149	36,2	412	100
Social Media Tools	68	16,5	412	100
News Websites	60	14,6	412	100
Forum Sites	52	12,6	412	100
Video sharing sites	41	10	412	100
Blogs	21	5,1	412	100
E-mail	18	4,4	412	100
Online Encyclopedia	17	4,1	412	100

Note. Participants could choose more than one choice

It was seen that the most functional sub-communication channels of the interactive internet channel category that the teachers used functionally at the decision stage were EBA website (65.3%) and educational websites (36.2%), respectively. These findings are similar to those of Eurostat's (2017b) and Güvendi's (2014) as well as in knowledge and persuasion stage.

Table 11 presents the rates of use of the sub-communication channels of the category of interpersonal channels, which is the second most functional channel used by teachers at the decision stage.

Table 11. Interpersonal channels at the Decision Stage

Interpersonal channels	Number of Teachers Using		Total	
	f	%	*f*	%
Face to face				
Meetings with other teachers	235	57	412	100
Meetings with administrators	145	35,2	412	100
In-service trainings	100	24,3	412	100
Conferences, Seminars	72	17,5	412	100
Meetings with experts	64	15,5	412	100
Telephone				
Meetings with other teachers	50	12,1	412	100
Meetings with administrators	24	5,8	412	100
Meetings with experts	15	3,6	412	100

Note. Participants could choose more than one choice.

It was observed that the most functional sub-communication channels of the category of interpersonal channels that the teachers used at the decision stage were face to face meetings with other teachers (57%) and face to face meetings with administrators (35.2%). Rogers (2003) stated that the peers who had previously adopted and applied an innovation could have an impact on other individuals at the decision stage. Rogers (2003) stated that local communication with peers is effective in deciding whether to adopt or reject innovation. In this study, the finding that the channel of face to face meetings with teachers was functionally used by the teachers is in line with the finding of Rogers (2003). This is also similar to Lichty (2000) and Weenig's (1999) findings in the literature. As in the knowledge and persuasion stage, it could be said that teachers continue to see administrators as their opinion leaders in decision-making. This is similar to Rogers' (2003) findings and also in line with those of Stuart's (2000) and Weenig's (1999). In addition, it was seen that the experts in the position of change agents were not used in this stage as in the knowledge and persuasion stage.

Functional Communication Channels Used at the Implementation Stage

The categorical distribution of the communication channels used by the teachers at the implementation stage, which is the fourth stage of the innovation-decision process in the diffusion of EBA to teaching activities is given in Table 12.

Table 12. Categorical Distribution of Communication Channels Used by Teachers at the Implementation Stage

Communication Channel	Number of Teachers Using		Number of Teachers Not Using		Total	
	f	%	*f*	%	*f*	%
Interactive Internet Channels	299	88,2	40	11,8	339	100
Interpersonal channels	256	75,5	83	24,5	339	100
Mass media channels	93	27,4	246	72,6	339	100

Note. Participants could choose more than one choice.

As seen in Table 12, it was observed that the teachers used interactive internet channels (88.2%), interpersonal channels (75.5%) and mass media channels (27.4%) respectively at the implementation stage. The functional communication channels used by the teachers at the implementation stage for EBA were interactive internet channels (88.2%) and interpersonal channels (75.5%). Rogers (2003) stated that cosmopolite communication channels in the developing countries could be functional in persuasion and intention behaviours of individuals. In this context, it could be said that cosmopolite channels have an effect on persuasion and intention behaviours of individuals in the diffusion process and they can also be used functionally in the acquisition of information at the implementation stage. Rogers (2003) stated that individuals used interpersonal channels more often to solve the uncertainties and problems they faced in the implementation of innovations. In this study, the finding that interpersonal channels emerged as functional channels at the implementation stage is in line with Rogers's (2003) findings. The findings of the study are also similar to those of Eurostat's (2017a) as at the decision stage.

The usage rate of the sub-channels of interactive internet channels, which is the most functional channel used by the teachers at the implementation stage is given in Table 13.

Table 13. Interactive Internet Channels Used at the Implementation Stage

Interactive Internet Channels	Number of Teachers Using		Total	
	f	%	*f*	%
EBA Website	234	69	339	100
Educational Websites	145	42,8	339	100
Social Media Tools	68	20,1	339	100
Forum Sites	66	19,5	339	100
Video sharing sites	63	18,6	339	100
News Websites	55	16,2	339	100
Blogs	29	8,6	339	100
E-mail	20	5,9	339	100
Online Encyclopaedia	13	3,8	339	100

Note. Participants could choose more than one choice.

It was seen that the most functional sub-communication channels of the category of interactive internet channels that the teachers used at the implementation stage were the EBA website (69%) and the educational websites (42,8%) respectively. These findings are similar to those of Eurostat's (2017b) and Güvendi's (2014), as in the previous three stages.

Table 14 presents the usage rates of the sub-communication channels of the category of the interpersonal channels, which is the second most functional channel used by the teachers at the implementation stage.

Table 14. Interpersonal channels Used at the Implementation Stage

Interpersonal channels	Number of Teachers Using		Total	
	f	%	*f*	%
Face to face				
Meetings with other teachers	200	59	339	100
Meetings with administrators	91	26,8	339	100
In-service trainings	87	25,7	339	100
Meetings with experts	64	18,9	339	100
Conferences, Seminars	63	18,6	339	100
Telephone				
Meetings with other teachers	52	15,3	339	100
Meetings with experts	22	6,5	339	100
Meetings with administrators	19	5,6	339	100

Note. Participants could choose more than one choice

It was observed that the most functional sub-communication channel of the category of interpersonal channels, which the teachers used at the implementation stage was a face-to-face meeting with other teachers (59%). In other words, as the teachers used more than one interpersonal channels in the first three stages, they could functionally use the channel of face to face meeting with other teachers at the implementation stage. This could be interpreted as that teachers gave more importance to getting help from their closest colleagues whom they thought may have encountered similar problems in seeking solutions to such uncertainties and problems. This finding supports Rogers's (2003) finding. However, Rogers (2003) stated that change agents and their assistants at the implementation stage provided technical support to solve the problems faced by individuals. In the study, it was found that the teachers did not use the channel of meeting with experts functionally at the implementation stage. This could be interpreted as that changing agents and assistants inadequately support teachers to solve their problems or that teachers consider experts to be unqualified. In other words, this finding of the research contradicts with that of Rogers's (2003). In this context, the findings support the findings of Kurtdede Fidan et al. (2016) and İzci and Eroğlu (2016).

Functional Communication Channels Used at the Confirmation Stage

Table 15 shows the categorical distribution of communication channels used by the teachers at the confirmation stage, which is the last stage of the innovation-decision process in the diffusion of EBA to teaching activities.

Table 15. Categorical Distribution of Communication Channels Used by Teachers in at Confirmation Stage

Communication Channel	**Number of Teachers Using**		**Number of Teachers not Using**		**Total**	
	f	%	*f*	%	*f*	%
Interactive Internet Channels	260	85	46	15	306	100
Interpersonal channels	246	80,4	60	19,6	306	100
Mass media channels	68	22,2	238	77,8	306	100

Note. Participants could choose more than one choice.

As seen in Table 15, it was found that teachers used interactive internet channels (85%), interpersonal channels (80.4%) and mass media channels (22.2%) at the confirmation stage respectively. The functional communication channels used by the teachers at the confirmation stage, which were the final decisions of EBA, were seen as interactive internet channels (85%) and interpersonal channels (80.4%). These findings are similar to those of Eurostat's (2017a) and Rogers's (2003), as in the decision and implementation stage.

Table 16 presents the usage rate of the sub-channels of the interactive internet channels category, which is the most functional channel used by the teachers at the confirmation stage.

Table 16. Interactive Internet Channels Used at the Confirmation Stage

Interactive Internet Channels	**Number of Teachers Using**		**Total**	
	f	%	*f*	%
EBA Website	202	66	306	100
Educational Websites	108	35,3	306	100
Forum Sites	56	18,3	306	100
Social Media Tools	54	17,6	306	100
Video Sharing Sites	46	15	306	100
News Websites	43	14,1	306	100
Blogs	17	5,6	306	100
Online Encyclopaedias	13	4,2	306	100
E-mail	13	4,2	306	100

Note. Participants could choose more than one choice.

It was seen that the most functional sub-communication channels of the category of interactive internet channels that the teachers used functionally at the confirmation stage were EBA web site (66%) and educational websites (35,3%) respectively. These findings are similar to those of Eurostat's (2017b) and Güvendi's (2014), as in the previous four stages.

The rates of usage of the sub-communication channels of the category of interpersonal channels, which is the second most functional channel used by the teachers at the confirmation stage, are given in Table 17.

Table 17. Interpersonal channels Used at the Confirmation Stage

Interpersonal channels	Number of Teachers Using		Total	
	f	%	*f*	%
Face to face				
Meetings with other teachers	196	64,1	306	100
Meetings with administrators	69	22,5	306	100
In-service trainings	65	21,2	306	100
Conferences, Seminars	45	14,7	306	100
Meetings with experts	43	14,1	306	100
Telephone				
Meetings with other teachers	61	19,9	306	100
Meetings with administrators	28	9,2	306	100
Meetings with experts	18	5,9	306	100

Note. Participants could choose more than one choice.

It was observed that the most functional sub-communication channel of the category of interpersonal channels that the teachers used functionally at the confirmation stage was meeting with other teachers (64%). At this stage, teachers used face-to-face meetings with other teachers as the most functional channel among the interpersonal channels as at the implementation stage. However, the usage rate of this channel, as in the persuasion stage, has increased to the highest usage level. This could be interpreted as that teachers give importance to face-to-face meetings with their peers while making their final decision on innovations or recommending innovations to the members of the social system as it happened when developing attitudes.

The Relationship Between the Sub-Functional Communication Channels of the Knowledge Stage and the Types of Schools where Teachers Work

The relationship between sub-category communication channels (EBA web site, educational websites, face-to-face meetings with other teachers, in-service training, face-to-face meetings with administrators, conferences and seminars) and the types of schools that the teachers work in are given below.

There was a significant relationship between the use of the EBA website and the types of schools where teachers worked ($X^2_{(sd=2)}$= 15,175, p<,05, C=,174). It was determined that the EBA website was used for obtaining information and raising awareness mostly by the teachers working in secondary schools and primary schools with the rates of 67.3% and 65.5%, respectively. At the knowledge stage, the teachers who used the EBA website least were found to be the teachers who worked in high schools with a rate of 48.5%. The teachers working in primary and secondary schools were found to follow the EBA website more often than the teachers working in high schools. (Güvendi, 2014). In this context, the findings of the study are similar to those of Güvendi's (2014). The fact that contingency coefficient value which shows the strength of the relationship between the teachers' usage of EBA website at the knowledge stage and the type of schools where participant teachers worked was, 174 indicates a low relationship.

It was seen that there was a significant relationship between the usage of educational websites and the types of schools where teachers worked ($X^2_{(sd=2)}$ = 11,033, p<,05, C=,149). It was found that the most commonly used educational websites by the teachers were 56.9% in primary schools and 54.1% in the secondary schools respectively. It was found that the teachers who used the educational websites at the knowledge stage the least were the teachers working in high schools with a rate of 39.4%. The fact that contingency coefficient value which shows the strength of the relationship between the teachers' usage of educational websites at the knowledge stage and the type of schools where participant teachers worked was, 149 indicates a low relationship.

It was seen that there was a significant relationship between the usage of face-to-face meetings with other teachers and the types of schools where teachers worked at the knowledge stage in learning about EBA and raising awareness about it ($X^2_{(sd=2)}$= 18.532, p<.05, C=.192). It was found that the teachers who had face-to-face meetings with other teachers while raising awareness or obtaining information about EBA were the teachers working in secondary schools with a rate of 63.9%. It was found that the teachers who had face to face meetings with other teachers were at least 39.7% of the teachers working in primary schools. The fact that the contingency coefficient value of the relationship between the usage of face-to-face meetings with other teachers and the types of schools with the other teachers at the knowledge stage was found to be .192 indicates that the relationship is low.

It was observed that there was a significant relationship between the usage of face-to-face meeting channel with the administrators in raising awareness about EBA and learning about it and the types of schools where teachers worked ($X^2_{(sd=2)}$= 9,428, p<,05, C=,138). While raising awareness or obtaining information about the EBA, it was found that the teachers had face to face meetings with teachers, who are working in secondary schools and high schools with 38% and 34.5% respectively. It was found that the teachers who had face-to-face meetings with administrators the least were the teachers working in primary schools with 21,6%. The fact that contingency coefficient value which shows the strength of the relationship between the teachers' usage of face to face meetings with administrators at the knowledge stage and the type of schools where participant teachers worked was, 138 indicates a low relationship.

At the knowledge stage, there was not any significant difference in raising awareness and learning about EBA between the teachers' usage of in-service training channel ($X^2_{(sd = 2)}$ = 1,516, p>, 05) and the use of the channels of conferences / seminars ($X^2_{(sd = 2)}$ = 1,268, p>, 05. In other words, teachers who work in primary, secondary and high school levels equally benefit from in-service trainings, conferences and seminars while raising and learning awareness about EBA.

The Relationship Between Sub-Functional Communication Channels of the Persuasion Stage and the Types of Schools where Teachers Work

The relationship between the functional sub-category communication channels that teachers used at the persuasion stage (EBA web site, educational websites, face-to-face meetings with other teachers, in-service training and face-to-face meetings with administrators) and the types of schools that teachers worked in is given below respectively.

At the persuasion stage, no significant relationship was found between the usage of EBA website and the types of schools where teachers worked ($X^2_{(sd = 2)}$ = 3,426, p>, 05). In other words, the teachers working at the primary, secondary and high school levels use EBA website equally in developing an attitude towards EBA. Güvendi (2014) concluded that the teachers working in primary and secondary schools follow the EBA website more frequently than the teachers working in high schools. In this context, the findings of the study regarding the persuasion stage do not indicate any similarity with those of Güvendi's (2014).

At the persuasion stage, it was observed that there was a significant relationship between the teachers' usage of the channel of face-to-face meeting with other teachers and the types of schools where teachers worked ($X^2_{(sd=2)}$= 20,486, p<,05, C=,211). While developing an attitude towards EBA, it was found that the teachers who conducted face-to-face meetings were the teachers working in secondary schools with a rate of 74.7%. It was found that the teachers who had face-to-face meetings with other teachers at the knowledge stage were the teachers who worked at primary schools with the rate of at least 48%. The fact that contingency coefficient value which shows the strength of the relationship between the teachers' usage of face to face meetings with other teachers at the knowledge stage and the type of schools where the participant teachers worked was, 211 indicates a low relationship.

There was not any significant difference between the teachers' usage of in-service training channel at the persuasion stage ($X^2_{(sd=2)}$= 5,747, p>,05), teachers' usage of face to face meetings channel with the administrators ($X^2_{(sd=2)}$= 2,004, p>,05), the usage rate of the educational web sites ($X^2_{(sd=2)}$= 3,767, p>,05) and the type of schools where teachers worked. In other words, while developing attitude towards EBA, in-service training channels, face-to-face meeting with administrators and the channel of educational websites are equally used by the teachers working in primary, secondary and high school levels.

The Relationship Between Sub-Functional Communication Channels of the Decision Stage and the Types of Schools where Teachers Worked

The relationship between the functional subcategory communication channels (EBA web site, educational websites, face-to-face meetings with other teachers and face-to-face meetings with administrators) and the types of schools that teachers worked in are given below.

There was no significant relationship between the teachers' usage of the EBA website and the types of schools where teachers worked ($X^2_{(sd=2)}$= 4,422, p>,05). In other words, the teachers working at primary, secondary and high schools use the EBA website equally in developing attitudes towards EBA. Güvendi (2014) conducted a study and concluded that the teachers working in primary and secondary schools follow the EBA website more frequently than the teachers working in high school. In this context, the findings of the study regarding the decision stage are not similar to Güvendi' (2014) findings.

There was not any significant difference between the teachers' usage of educational websites at the decision stage ($X^2_{(sd=2)}$= 5,939, p>,05), their usage of face-to-face meeting channel with other teachers ($X^2_{(sd=2)}$= 2,211 , p>,05), their usage of face-to-face meeting channel with administrators ($X^2_{(sd=2)}$= 1,065, p>,05) and the types of schools where teachers worked. In other words, when making a decision to use or not to EBA, the teachers working at primary, secondary and high schools equally benefit from educational websites, face to face meetings with other teachers and face to face meeting with administrators.

The Relationship Between Sub-Functional Communication Channels of the Implementation Stage and the Type of Schools Where Teachers Work

The relationship between the functional sub-category communication channels (EBA website, educational websites and face-to-face meetings with other teachers) and the types of schools in which teachers work are given below.

There was a significant relationship between teachers' usage of the EBA website and the types of schools where teachers worked ($X^2_{(sd=2)}$= 7,637, p<,05, C=,148). It was found that the teachers who used the EBA website most at the implementation of EBA were the teachers who worked in secondary schools with a rate of 77.1%. Güvendi (2014) concluded that the teachers working in primary and secondary schools followed the EBA website more frequently than the teachers working in high school. In this context, the findings of the study are not similar to those of Güvendi's (2014). The fact that contingency coefficient value which shows the strength of the relationship between the teachers' usage of EBA website at the implementation stage and the type of schools where the participant teachers worked was, 148 indicates a low relationship.

There was any significant difference between the teachers' usage of educational websites at the implementation stage ($X^2_{(sd=2)}$= ,145, p>,05), their usage of the face-to-face meetings channel with other teachers ($X^2_{(sd=2)}$= 4,473, p>.05) and the types of schools where teachers worked. In other words, the teachers who worked in primary, secondary and high school levels equally benefit from educational websites and face to face meetings with other teachers at the implementation of EBA.

The Relationship Between Functional Communication Channels of the Confirmation Stage and the Types of Schools where Teachers Worked

The relationship between the functional sub-category communication channels used by the teachers at the confirmation stage (EBA website, educational websites and face-to-face meetings with other teachers) and the types of schools where teachers work are given below.

It was seen that there was a significant relationship between the usage of EBA we site and the types of school where teachers worked ($X^2_{(sd=2)}$= 12,304, p<,05, C=,197). It was found that the teachers performing face-to-face meetings most while developing attitudes towards EBA were the teachers working in secondary schools with a rate of 76.2%. It was found that the teachers using EBA website at the confirmation stage were the teachers working at high schools with a rate of 54.1% in high schools. Güvendi (2014) conducted a study and concluded that the teachers working in primary and secondary schools followed the EBA website more frequently than the teachers working in high school. In this context, the findings of the study are similar to those of Güvendi's (2014). The fact that contingency coefficient value which shows the strength of the relationship between the teachers' usage of EBA website at the confirmation stage and the type of schools where the participant teachers worked was, 197 indicates a low relationship.

At the confirmation stage, it was seen that there was a significant relationship between the teachers' usage of face-to-face meetings with other teachers and the types of schools where teachers worked ($X^2_{(sd=2)}$= 22,168, p<,05, C=,260). While the final decision was made regarding EBA, it was found that the teachers who performed face-to-face meetings with other teachers were those working in high schools with a rate of 74.5%. At the confirmation stage, it was found that the teachers who had face-to-face meetings with other teachers were the teachers working in primary schools with a rate of 42.3%. The fact that contingency coefficient value which shows the strength of the relationship between the teachers' usage of face to face meetings with other teachers at the confirmation stage and the type of schools where the participant teachers worked was, 260 indicates a low relationship. However, there was no significant relationship between the teachers' usage of educational websites and the types of schools where teachers worked ($X^2_{(sd=2)}$ =, 889, p>,05). In other words, the teachers who work at primary, secondary and high school levels equally benefit from educational websites in a similar way when making a final decision regarding EBA.

Conclusion

This study aimed to find out the functional communication channels teachers used as they were developing knowledge, skills and attitudes regarding EBA during the diffusion of EBA social education platform to teaching activities. In addition, the relationship of these preferred channels with the types of schools where teachers worked was also examined. The data were analysed using descriptive statistics (percentage and frequency) and two-variable chi-square test. As a result of the research, it was found that teachers respectively used interpersonal channels and interactive internet channel as the most functional communication channels at the knowledge stage where they gained knowledge about EBA and at the persuasion stage where they developed a positive or negative attitude towards EBA. However, it was found that teachers respectively used interactive internet channels and interpersonal channels as the most function communication channels at the decision stage in which teachers decided to adopt or reject EBA, at the implementation stage where teacher used EBA in their teaching process and at the confirmation stage where they made their final decisions regarding EBA.

It was seen that teachers functionally used the communication channel of "face-to-face meetings with other teachers", which is one of the interpersonal channels, at every stage of the innovation-decision process. It was seen that teachers functionally used the communication channel of meeting with administrators/face to face, which is one of the interpersonal channels, at the knowledge, persuasion and decision stages. In addition, while teachers functionally used the communication channel of "in-service trainings" at the knowledge and persuasion stage, it was found that they functionally used "conferences, seminars" channels only at the knowledge stage. It was found that the interpersonal channels except the ones mentioned above (phone call communication channels, face-to-face meetings with experts) were not functionally used by the teachers. As the interactive communication channels that the teachers could functionally use during the process, "EBA Website" and "Educational websites" communication channels were functionally used by the teachers at the innovation-decision stage. It was seen that the other sub-channels of interactive internet channels (social media tools, forum sites, etc.) were not functionally used by the teachers. The communication channels used by the teachers in the process of the innovation-decision process are shown in Figure 5.

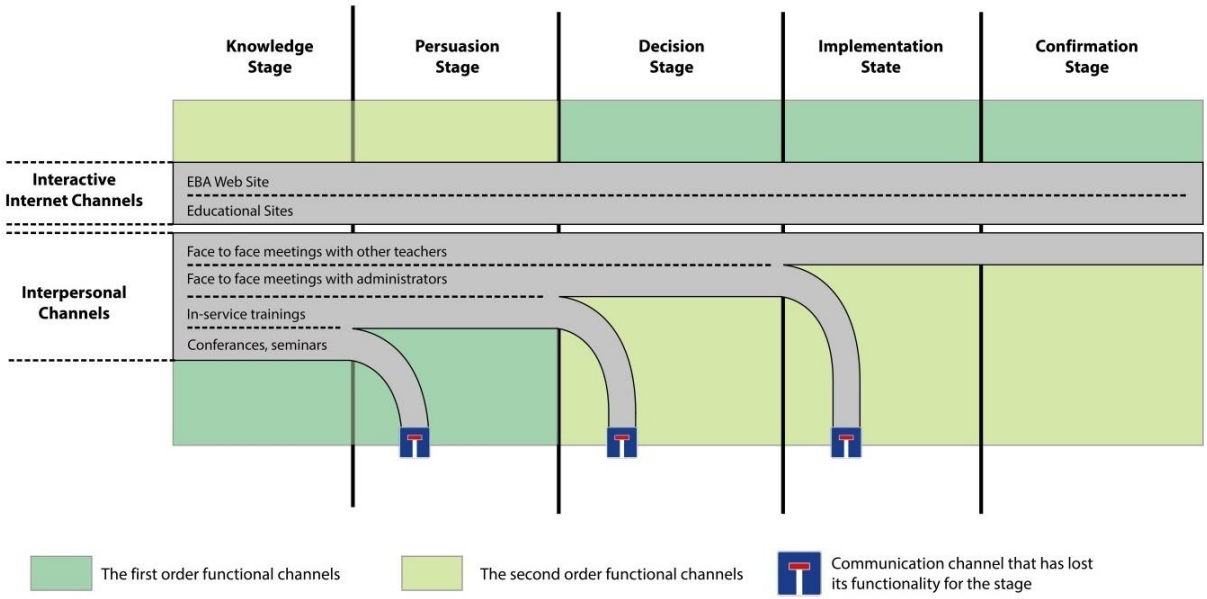

Figure 5. Functional Communication Channels Used by the Teachers in the Innovation-Decision Process in the Diffusion of EBA to Teaching Activities

As a result, it was found that "interpersonal channels" were found to be the first order functional channels at the knowledge and persuasion stage. At the decision, implementation and confirmation stages, "interactive internet channels" were the first order functional channels. The results of the communication channels used by the teachers in the innovation-decision process and the types of schools in which teachers work are as follows;

- The teachers' functional usage of the communication channels such as "in-service trainings" and "conferences, seminars" at the knowledge stage do not differ depending on the types of schools where teachers worked. However, the "EBA website" and "educational websites" were found to be used most by the teachers working at secondary and primary schools for information purposes. At the knowledge stage, it was found that the teachers who worked in secondary schools most used the channel of "face to face meetings with other teachers", but the teachers who worked at primary schools used the least. At the knowledge stage, the channel of "face-to-face meetings with administrators" was mostly used by the teachers working in secondary and high schools.

- The teachers' usage of the channels such as "in-service trainings", "face to face meetings with administrators", "EBA website" and "Educational websites" were found not to differ significantly based on the schools where the teachers worked at the persuasion stage. However, at the persuasion stage, it was found that the communication channel of "face-to-face meetings with other teachers" was found to be used most commonly by the teachers working at the secondary schools and least by the teachers working at the primary schools.
- The teachers' usage of the communication channels such as "EBA website", "educational websites", "face to face meetings with other teachers" and "face to face meetings with administrators" were found not to differ significantly depending on the school types where the participant teachers worked at the decision stage.
- At the implementation stage, the teachers' functional usage of communication channels such as "educational websites" and "face to face meetings with other teachers" were found not to differ significantly from the types of schools where the teachers worked. However, at the implementation stage, it was found that the communication channel of "EBA web sites" was found to be used most commonly by the teachers working at the secondary schools.
- At the confirmation stage, the teachers' functional usage of the communication channels of "educational websites" was found not to differ significantly from the types of schools where the teachers worked. However, at the confirmation stage, it was found that the EBA "web site" channel was most commonly used by the teachers working at secondary schools. The channel of "face to face meetings with the other teachers" was most functionally used by the teachers working at high schools.

Suggestion

Within the scope of the research, it was aimed to find out the channels through which the acquisition of knowledge, skills and attitudes in the innovation-decision processes of the teachers was possible. Thus, how existing channels, such as pre-service and in-service trainings work were also examined. This is important because this will give us insight into how the existing channel/channels and other communication channels are used in the process. This study provides policy practitioners and in-service training practitioners with some advice on which channels could be used to reach teachers to facilitate technology integration at schools. In addition, the research offers new ideas to policy practitioners regarding how to deliver educational applications to teachers and how to make decisions or training applications within the framework of large-scale educational projects such as the Fatih Project, which may be considered new in the educational community. In other words, the functional communication channels determined at the end of the research could be selected according to the innovation-decision stages of the teachers. Thus, this study is expected to be useful for policy practitioners. In addition, the research shows that teachers are mostly in the final stages (implementation and confirmation stages) in the use of computer technology (EBA) (69.3% implementation and Confirmation stage). In this framework, interactive Internet channels (training and introductory web sites) and interpersonal channels (face-to-face meetings with other teachers) could be used as the functional channels in order to reach the teachers at the implementation and confirmation stages of new technologies.

As a result of the research, it was seen that teachers used the mass media such as television, radio and printed sources at a lower level than other communication channels in adapting new decisions, information and attitudes regarding EBA. When this is considered, the number of publications in mass media for teachers to facilitate their knowledge, attitude and decision-making about the EBA could be increased. However, it was seen that teachers used the interactive internet tools at all stages of the innovation-decision process but some of the internet tools were used at a low level. Considering that teachers use social media, video sharing sites, e-mail sending and receiving channels very often in their daily life, these channels could be used more often to help them obtain relevant information. In addition, the reasons for the teachers' low-level usage of interactive internet channels

for information purpose, which are used intensively in their daily lives, can be investigated. In addition, it was seen that teachers did not communicate adequately with the field experts at all levels of innovation-decision processes in which they developed information, attitude and decision regarding EBA (eg use of face-to-face meetings with experts in the knowledge stage 20.2%). In this framework, the number and qualifications of the experts to be contacted by teachers in the process of teacher training could be increased. In addition, the kind of environments where teachers can interact with experts could be developed or the number of related meetings can be increased. Future research can be conducted to determine the reasons why teachers do not communicate with experts very often in the innovation-decision process of EBA. In addition, the relationship between the communication channels used by the teachers in the innovation-decision processes and the educational status of the teachers and the branch types could be examined.

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