Exploring needs of ICT for Enhancing Inclusive Education in Turkey: Challenges of ICT Integration in education through the views of experts from business, government and university sectors

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Abstract

The purpose of the study is to determine the needs of using ICT in Turkey as part of international cooperation called "Smart Ecosystem for Learning and Inclusion (SELI)" which seeks to support inclusive education. Accordingly, the case study model, which is one of the qualitative research methods, was used in the analysis of the SELI Learning Platform within the framework of 'Information and Communication Technologies', 'Digital Storytelling' and 'Inclusive Education'. Case study, is one of the research methods used in the field of educational technologies. The most important feature of this research model is the situation in the research that is chosen by the characteristics of the individual or the community, handled within each counterpart context. Due to this feature; a case study is described as a qualitative research method such as ethnographic research, phenomenology and embedded theory research (Johnson & Christensen, 2004). Since the same research questions were answered in different situations, multiple case studies were used to determine the needs of the SELI Learning Platform. Multi-case study is a research model that provides strengthening and diversifying results by addressing a few similar situations. Within the scope of the research, the data obtained from the research questions created for three cases are an important source in determining the needs.

Introduction

The goals of societies in today's global competition; is that individuals have 21st century skills and use developing technologies effectively. The most important step towards this goal is that individuals receive an education to use information and communication technologies (ICT) correctly and effectively. Technology integration has become a necessity in education, which arises out of the need for education and technology to be intertwined, as well as traditional methods and techniques. As a result of this, investments for the use of technology in education are increasing day by day, educational institutions are equipped with these technologies and opportunities are provided for each student to have the opportunity to meet new technological equipment. Therefore, it is possible to say that learning environments using informatics technologies are rapidly expanding and studies towards this situation have gained speed in parallel. Various steps have been taken on how to use constantly developing technology more effectively in the teaching-learning process since 2004 in Turkey. In this context Mishra and Koehler's (2009) Technological Pedagogical Content Knowledge (TPACK) model which defines the relationship between Technology, Pedagogy, Content is used as a base for the integration of ICT in the educational process (Mumcu, Haşlaman & Koçak-Usluel, 2008). MoNE (Ministry of National Education), YÖK (Council of Higher Education), many private companies, experts, academics and teachers are constantly working and renewing themselves to overcome the obstacles that arise during the implementation of this model. As this research supports inclusive education with ICT, we discuss the results on views of three stakeholders in accordance with the relevant literature as part of need analysis of the SELI Learning Platform.

Research Group

The study group of the research was determined by criterion sampling as one of the purposeful sampling methods. According to criterion sampling, observation units in a research can be formed from individuals, events, objects or situations with certain qualifications (Büyüköztürk, Kılıç- Çakmak, Akgün, Karadeniz, & Demirel, 2014).

For the purpose of the research, the participants who were determined as a research group within the scope of three related cases. They consist of a faculty member working in the field of educational technologies more specifically on digital storytelling (P1), a CEO of private sector institution in the field of educational technologies (P2), and a public institution official working as an expert (P3) in the Ministry of National Education (MoNE). Information about the participants (occupation, field

of study and professional experience) of the study's working group are as follows:

P1: She is a graduate of Computer and Instructional Technologies. Currently, she is a lecturer at the Department of Computer Education and Instructional Technologies at Hacettepe University. Her field of study is the integration of technology in education, that is, the implementation of digital storytelling workshops, Web 2.0 tools in education and training. Her professional experience is 8 years.

P2: He is an electric and electronic graduate. He works in the field of information and communication technologies. He currently works as a CEO and CTO (Chief Technology Officer) at a company that develops online educational content for approximately 2750 private schools nationally and internationally. His professional experience is 12 years.

P3: He is a graduate of information technology teacher. He works as an expert at MoNE. He took part in the project called Movement of Enhancing Opportunities and Improving Technology (FATİH). He currently serves for teachers and prospective teachers within the Ministry of National Education as responsible of educations for the use of Microsoft Office, the use of the Education Information Network (EBA), the use of MEBSIS, the use of digital systems, the opening of robotics and coding courses. His professional experience is 12 years.

Data Collection Tool

The data collection tool of the research was created based on a conducted literature review by the researchers participating in the project from Latin America and Europe in order to determine the needs of the SELI Learning Platform. The necessary corrections were made by taking the opinions of the project partners. In this context, the data collection tool of the research includes open-ended questions about general information of the research group (such as profession, field of work and professional experience), implementation of the Information and Communication Technologies (ICT) in schools and other educational institutions, and feedback and analysis - support. These questions are given below:

General İnformation

1. Can you tell me a little bit about yourself?

- What do you teach/study/ administrative position?

- How long have you been in this position (e.g., teacher, administration and educator)?

- Can you tell me about your professional experience (background)?

- What has your experience been like in working with ICTs in education?

Implementation of ICT in schools and other educational institutions

1) What ICT-based solutions do trainers and teachers apply the most in their educational activities in our country? What worked the best and why?

2) What is the biggest barrier to the implementation of the modern ICT based solutions in our country?

3) How can we use the hardware and human potential of our country to further increase the effectiveness of ICT-supported learning?

4) How does the business sector support learning and inclusion with the use of ICT?

5) How are innovations used in schools?

Feedback and analytics – for groups requiring support

1) How should we support the development of ICT-related skills among the people who are responsible for learning and inclusion process (trainers and teachers)?

2) What methods and strategy should we adopt to develop open educational resources in our country?

3) How should we use open educational resources to collaborate with the disfavored group, e.g. immigrants, the unemployed, the disabled, seniors?

4) How do governmental agencies support the use of ICT in learning and inclusion?

Data Collection

The data were collected by an interview technique. The interview technique is one of the most widely used interview types in the field of education. One-to-one interviews are ideal interviews that allow participants to express their thoughts comfortably and clearly (Creswell, 2014).

The research was gathered between 05.02.2020-18.03.2020 in a place suitable for volunteer participants within the borders of Ankara Province, face to face and with the consent of the participants, by taking a voice record and notes. In addition, prior to the interview, consent was obtained by the researcher conducting the interview as a voice recording. Interviews took approximately 30 minutes on average.

Data Analysis

Content analysis was used to analyze the data obtained in the research. The purpose of this analysis is to reach the concepts and relationships within the scope of the research. Accordingly, it brings together similar data within the framework of certain concepts and themes and provides them to be interpreted by organizing them in a way that the reader can understand (Yıldırım and Şimşek, 2018). Content analysis was done using the analysis steps used by Thomas and Hardene (2008). These stages are described below:

Coding of Findings: At this stage, direct quotations from primary research or findings in the form of basic concepts are coded by reading line by line. After all the findings are coded, the second stage can be started.

Developing Descriptive Themes: The codes obtained at this stage are compared according to their similarities and differences and grouped to form a hierarchical tree structure. Each created group is called a theme. Each theme is created to cover the definitions and meanings of grouped codes.

Production of Analytical Themes: While this phase is close to the findings of primary studies in the development of themes, new interpretive structures and explanations are produced by going beyond primary studies in the process of producing analytical themes. Going beyond primary studies requires the use of descriptive themes derived from inductive analysis to answer research questions suspended for a while. For this purpose, more abstract analytical themes are created by comparing descriptive themes and discussing them with other researchers.

Reliability and Validity: The most important factor in accepting a research as a scientific study is its reliability and validity. In qualitative research techniques; A detailed examination of the collected data is among the important criteria of validity in explaining how the researcher achieved the results. (Yıldırım & Şimşek, 2018).

Themes were determined based on the relevant literature, codes were extracted, and a content analysis suitable for qualitative research was

made and findings were presented. The data obtained were analyzed by defining themes and sub-themes for the purposes of the study.

In this study, the data obtained and the opinions of two experts were consulted to ensure the reliability of the research. The reliability formula of Miles and Huberman (1994) was used. The formula is given below:

Reliability = Consensus / (Consensus + Disagreement) x 100

= 59 / (59 + 8) x100 = 59/67 x100 = 88

As a result of the reliability formula of Miles and Huberman (1994), it was 88%. According to Miles and Huberman (1994), they stated that the reliability of the research results that are 70% and above is high.

Results

In this part of the research, the findings obtained from the data collection tool directed to the participants forming the research group are shared.

Participants, views on trainers and teachers' use of ICT-based solutions are most frequently used in educational activities in Turkey are given in Table 1.

Table 1. Participants' Perspectives on mostly used ICT-Based Educational Solutions by teachers and trainers in Turkey

		Frequency (f)
Mostly used ICT-Based Solutions by trainers and Teachers for educational Activities in Turkey	Encouraging the use of smart boards, EBA and internet infrastructure of not only young teachers but all teachers	1
	Some applications for coding	1
	Applications / systems to alleviate the workload of teachers and trainers	1
	Trainers and teachers completing their deficiencies by getting basic information literacy training	1
	Training of computer and instructional technology teachers to learn new technology applications	1
Total		5

Participants' opinions which support Results in Table 1. on mostly used ICT-based solutions by trainers and Teachers for educational Activities in Turkey are listed below:

"In fact, the state is trying to offer teachers a lot of technology... like smart boards... internet infrastructure. Tablets were also distributed once ... But I think teachers do not use smart boards much. I think that this is also results of the researches those who use them are a bit younger generation teachers or those who are interested in technology or information technology teachers. For teachers, we have something... EBA (Education Information Network). I don't think they are actively using it." (Encouraging the use of smart boards, EBA and internet infrastructure of not only young teachers but all teachers) (P1).

"For example, we now have various applications and software for programming such as Scratch. The teachers started using them very actively. There are similar web tools. They use them too. For example, now I have conducted school experience course last semester. I can give an example from observations of pre-service teachers, a teacher developed a web page. He had been shared his practices, presentations, and activities to be held week by week. The teachers followed her site. They were following the site of this information technology teacher. They also use these kinds of things." (Some applications for coding) (P1).

"The more educational technologies reduce the workload of teachers, the more successful they are. The more it brings the extra workload to him, the more it fails. Even if a system is very good and its super outputs are applied, even if we increase the success in education to 500% as a student and as a school system, it is not possible to apply if it brings an extra burden to the teacher. There are many unsuccessful and many successful examples, but I tried to underline the thing, why are the successful ones successful because they take the workload out of the teacher. The things that speed up the work that needs to be done in the form of repetition are successful, not with the intelligence that the teacher should do as a chore" (Applications / systems to alleviate the workload of teachers and trainers) (P2).

"Our teachers actually want to come to the course from every angle right now. They haven't made a full decision right now, about what to do. Because there are new trends and technologies. They want to use them. On the one hand, there are deficiencies in basic information literacy or, in fact, information literacy. Of course, this one is not for computer and instructional technology teachers, but other branch teachers... For example, we are opening office courses. For example, we took part in the training of prospective teachers, we provided them information for use of EBA, use of MEBSİS (Information Communication Systems of Ministry of National Education), use of digital systems. For example, we also consider different trainings. Drone production as part of lifelong training courses. In public Education, 3D production is more oriented towards hobby but it it is the systems that can be used at schools. Here it is without the need for outside." (Trainers and teachers completing their deficiencies by getting basic information literacy training; Training of computer and instructional technology teachers to learn new technology applications) (P3).

Participants' opinion about the biggest obstacles in the implementation of modern ICT-based solutions in Turkey are given in Table 2.

Table 2. Participants' opinion about the biggest obstacles in the implementation of modern ICT-based solutions

		Frequency (f)
Biggest obstacles in the implementation of modern ICT-based solutions	Lack of infrastructure and financial support in public schools	1
	Teachers feeling anxiety to complete education programs in public schools	1
	Hardware access barrier in public schools	1
	Regional hardware limitation in public schools	1
	Lesser obstacles in the implementation of ICT practices of private schools than public schools	1
	ICT applications that will cause teachers to spend extra time in private schools	1
	School principals do not want to send teachers' to courses opened within the Ministry of National Education(MoNE).	1
	School principals prevent teachers participation in courses because of the statement in the "Teacher Training Regulation" of MoNE, that mentions, teachers can participate in the courses opened within the MEB, in case teachers do not disrupt their lessons.	1
Total		8

Participants' opinions which support results in Table 2 about the biggest obstacles in the implementation of modern ICT-based solutions are listed below:

"When we compare private school and public private school, private schools have more opportunities… I worked in the doctorate process in different conditions. They said that we have everything in private and they can get everything we want in management. For example, get robotic coding… They could get robots management. But in a public school, they do not have any infrastructure or financial support. When they were in the coding program, they said they are doing computer-free coding training. They are doing more activities that can be done with wooden

and pencil. They used that kind of technology" (Lack of infrastructure and financial support in public schools) (P1).

"... There are concerns about completing the curriculum. They are dependent to a program. But those in private schools can teach more because they can get out of it" (Teachers feeling anxiety to complete education programs in public schools) (P1).

"So, actually, teachers want to use the internet in schools. But there are also limitations to their infrastructure. This can be. Whether it's the Internet or access barriers from their computers. Except for some sites, you know, others are banned from entering. So you know, they can't do it every time they want to, on the one hand, so I think the biggest obstacle is that it's restricted by other people. ..." (Hardware access barrier in public schools) (P1).

"In other words, teachers want to use different applications in schools over the internet. But they also have infrastructure limitations. There are barriers to access, whether on the Internet or on their computers. Except for some sites, others are banned from entering. Then they cannot do whatever they want, on the other hand... I think it is the biggest obstacle to be limited by others..." (Hardware access barrier in public schools) (P1).

"We are in the private school market. So these are the ones we can reach. In our industry, everyone has access to technology and everyone is expected to use it to a certain level. I can say something over it" (Lesser obstacles in the implementation of ICT practices of private schools compared to public schools) (P2).

"In private schools, if the teacher will take the material prepared for him and reflect it on the screen it is done easily. She/he uses them effectively. Because it doesn't require to spend extra time. But if teachers asked to do things that require to spend additional time the teacher does not work because he has to do something extra even they are good such as asking for the printout at the end of each lesson, the surveys each student, the questionnaire in the system, sharing the survey results" (ICT applications that will cause teachers to spend extra time in private schools) (P2).

"So the obstacles are a bit complicated (laughs)... So our managers may not warmly welcome. The biggest obstacle when opening the courses is the administrators... they do not want to send the teachers to the course." (School principals do not want to send teachers to courses opened within the Ministry of National Education (MoNE).) (P3).

"There is a situation like this. There is an article for training teachers. According to it, the teacher can take the course provided in case it does not disrupt his lessons. But this is not the case. The teacher may have to disrupt his lessons in any way. Because it happens in the morning, during the course or at noon. Here, part of the lesson coincides with the course or more. The manager may not want it" (School principals prevent teachers' participation in courses because of the statement in the "Teacher Training Regulation" of MoNE, which mentions, teachers can participate in the courses opened within the MEB, in case teachers do not disrupt their lessons.) (P3).

Participants views on the use of hardware and human potential in Turkey to further improve the effectiveness of ICT-supported learning is given in Table 3.

Table 3. Participants views on the use of hardware and human potential in Turkey to further improve the effectiveness of ICT-supported learning

		Frequency (f)
Use of hardware and human potential in Turkey to further improve the effectiveness of ICT-supported learning	Providing in-service training for the target group	1
	Emphasis on the use of technology as a tool within the scope of the trainings provided	1
	Need to change in the examination system	1
	Integrating examination system in which individual skills are measured with technology	1
	Paying attention to the education of the educator instead of hardware in ICT supported learning	1
	Providing trainings on the development of technology skills of the teacher in ICT supported learning	1
	Enabling educators to guide students in ICT-supported learning	1
	Enabling educators to use training materials suitable for individual differences, to get opinions from their colleagues and to make peer evaluations with the EBA software developed by MoNE.	1
Total		8

Participants' opinions which supports Results in Table 3 about the use of hardware and human potential in Turkey to further improve the effectiveness of ICT-supported learning are given below:

"First of all, I think that the people who will use it should be given training. We say technology integration is not a thing just like introducing a tool, technology that has come out and say let's try to take it and use it. It is important to consider how can we better integrate our lessons? In other words, what kind of process needs to be in order for effective learning to take place? Design? They also need to be trained so that they can be used in lessons... For example, in-service trainings can be given to teachers on these topics" (Providing in-service training for the target group) (P1).

"I mean, our goal is not to use technology, but I think we should focus on how we can use technology as a tool" (Emphasis on the use of technology as a tool within the scope of the trainings provided.) (P1).

"Everything is examination-based in Turkey. Because the exams are a decisive factor in the lives of students, that is, if they take it well in those exams, if they succeed in these exams, their economic level has a chance to be much better in their future lives. Therefore, the country's reality is based on these exams in the whole educational organization, which need to change somehow" (Need to change in the examination system) (P2).

"If you do an information-intensive exam, they provide information to children. If you do a skill-based exam, they will teach skills to children... In other words, if an exam is measured in the university exam or high school entrance exam that measures internal skills, the whole education system adapts accordingly. If there is an exam system that requires more technology, people use more technology?" (Integrating examination system in which individual skills are measured with technology) (P2).

"We have always given priority to hardware until this time. In other words, it was one of our biggest mistakes in the FATİH Project. We first started by buying hardware. ... Yes, the hardware is important but the human resource is much more important than hardware. I mean if you cannot train your teacher, there is no benefit in getting that equipment. ... This equipment will not be even used after a certain period of time. Therefore, we are now in favor of giving priority to the teacher, teacher training, not to hardware. ... The teacher needs a lot of information if he will be a guide, that is to say, if he is going to be a leader in the classroom. So when you come to class, you can present those skills to your students or guide them on that subject. That's why we focused more on the personal development of teachers than on hardware. We said that materials

would be somehow taken care of. It can be done with cheaper systems; it can be done from internal resources. It can be taken care of from the school, or support can be obtained from parents if needed. But if you have a trained teacher, it doesn't matter. A study at school starts immediately, even without hardware. This work starts to be productive. That's why we headed there" (Paying attention to the education of the educator instead of hardware in ICT supported learning; providing trainings on the development of technology skills of the teacher in ICT supported learning; Enabling educators to guide students in ICT-supported learning) (P3).

"Now everyone is discussing EBA. ...such as content was enough, there was not any content in respected subject. Especially physical education and sports teachers for example always argue. They say there is not much content about their lesson or they cannot easily explain their lesson on EBA. Now we do not believe that very much. Actually our content is teacher. The more we manage to train the teacher, the more they will be able to create content. Because when he finds a solution in his class, he can publish and share that solution via EBA. There he can divide the class into groups. In fact, what we call EBA is process software. So, he can follow the process from start to finish. Here a class came to your hand, wants to work with that class. But in the classroom, there are students in different groups or different levels. Some go far ahead, much more successful, higher level of perception. The opposite of some does not have much attention. For example, the teacher can divide them into groups in EBA and can offer separate exercises, separate activities and examples for them. If he wants, he can give separate documents so that he can actually control an entire class at the same time. And it can provide additional material to a student whose success has been dropped, or they can get the opinion of their friends, make peer reviews. It can still be evaluated at certain times. And while doing all this, it doesn't have to be in the classroom. Lessons on EBA can be also carried at home. If he wants, he can manage lesson and students on a certain order" (Enabling educators to use training materials suitable for individual differences, to get opinions from their colleagues and to make peer evaluations with the EBA software developed by MoNE.) (K3).

Participants' views on business sector support for learning and inclusion with the use of ICT are given in Table 4.

Table 4. Participants' views on business sector support for learning and inclusion with the use of ICT

		Frequency (f)
Business sector support for learning and inclusion with the use of ICT	Determining the needs of the target audience by analyzing them	1
	Online environment design for the specified needs of the target audience	1
	EBA designed by MoNA does not support inclusive education	1
	No initiatives for inclusive education in the private sector	1
	Initiatives for a single disadvantaged group in the private sector	1
	Creating a pool of educational content for inclusive education and determining which disadvantaged groups are effective.	1
	Providing the state budget for the pool of educational content for inclusive education	1
	Teachers' willingness to use ICT	1
	MoNE's EBA allows teachers and students to use free of charge until a certain quota	1
Total		9

Participants' opinions which support Results in Table 4 about the opinions of the participants about business sector support for learning and inclusion with the use of ICT are given below:

"I mean, the target audience is important. An environment or something needs to be designed by analyzing the needs of learners" (Determining the needs of the target audience by analyzing them; Online environment design for the specified needs of the target audience) (P1).

"I think of the EBA, for example, if it is considered there? Is there an environment for different learners out there? No, I think you can have a subtitle when you need it or use a sign language. You get different options. I don't think so much in our country this is possible yet. I think

there is no environment, no tools to cover all the different individuals" (EBA designed by MoNA does not support inclusive education) (P1).

"Private sector ... Do I know? I don't think it is completely inclusive either. For example, my friend had done something for this. He had worked with them for the mentally disabled. I think there is a single target is chosen in this way. You know, it comes from one requirement, not more than one. I think it is being created. Could they provide an environment for all? I do not know. Really, designing an environment by analyzing it with different target audiences. After that, it is necessary to analyze that process and make improvements. I don't see it, frankly (Laughs)..." (No initiatives for inclusive education in the private sector; Initiatives for a single disadvantaged group in the private sector) (P1).

"The advantage of information technologies, that is, the biggest advantage of technology, is to do things that can be used repeatedly. You are making a software that software can be used repeatedly. You can try this in different groups. You can collect the results. Now you can prepare disabled or differentiated content on the same subject and apply a lot of them to large groups, and then you can understand which one is working better, which one works better in which type of person and which students are more inclined to learn. Therefore, the first thing to do is to create a pool and add as many materials and educational content as possible. Then tag them and find out which ones work best in which situations and which groups. After finding it, use it again and again. This is something to do, but it is costly to create such a large pool. It also increases the cost. Therefore, in order to bear this cost, either the demand must be high, or even if the demand is low, it must have high returns" (Creating a pool of educational content for inclusive education and determining which disadvantaged groups are effective) (P2).

"Unfortunately, there is less demand on this issue and those who have demand are not able to afford it. Therefore, it is difficult to be developed by the private sector. In such cases, the state supports it in some way as a social state. I mean either state applies for some exemptions related to this or directly allocates funds for such projects. It sounds like this would be more accurate if these two methods were developed" (Providing the state budget for the pool of educational content for inclusive education) (P2).

"The teacher needs to make an effort because, of course, there is FATİH infrastructure in our schools. So, at least we have the internet. Many, in our class... We do not have very few in our class, for example, not only in primary schools. We have smart boards, interactive boards.... So you have the chance to open it and make an event from there. He can always open EBA. Use of EBA was free up to 3GB, even some companies

were free to 6GB. So as long as the student uses EBA, internet is free..." (Teachers' willingness to use ICT; MoNE's EBA allows teachers and students to use free of charge until a certain quota) (P3).

Opinions of the participants about the innovations used in schools are given in Table 5.

Table 5. Opinions of the participants about the innovations used in schools

		Frequency (f)
Innovations Used in Schools	Events with 3D technology equipment	1
	Lack of necessary state support for the use of technological innovations in public schools	1
	Technological innovations in public schools need teachers to meet themselves or find sponsors	1
	Failure to use innovations in public schools due to teacher or school administration resisting technological developments	1
	The technological innovations spontaneously spread as a result of positive feedback.	1
	Cooperation of the private sector with MoNE in technological innovations used in the field of education	1
Total		6

Participants' opinions which supports Results in Table 5 about the Innovations Used in Schools are given below:

"3D pens, printers are out there. Private schools can buy and use those printers ... I can see that they use them. There is also a teacher at the public school.... For example, I follow. He also has some activities with these 3D pens" (Events with 3D technology equipment) (P1).

"Frankly, there are no such opportunities in the state. Teachers may want to use them, but I think they have no resources. They either need to find sponsors or reach something with their own efforts. I can say that such things are easier to access in the private sector. For example, teachers working in the east said that they had set up their own laboratories with their own efforts. They were asking from the MoNE... but they could reach such things either through the acquaintances or through the ministers" (Lack of necessary state support for the use of technological

innovations in public schools; Technological innovations in public schools need teachers to meet themselves or find sponsors) (P1).

"In other words, there is a group that insists on innovations and a group that opposes innovations that do not want to use it. There is also a group that continues to explain with their own classical methods. Obviously, when you look at an experienced mathematics teacher who has spent 30 years or so, he certainly did not want to use it. ... But novice teachers can be more interested in this kind of things or their skills may be better" (Failure to use innovations in public schools due to teacher or school administration resisting technological developments) (P1).

"Innovation is progressing in the form of diffusion. So if what you do is something that works very well, it diffuses very fast. If it is very visible, it still progresses fast. If what you're doing is obviously more beneficial from others, what you're doing is moving fast. ...In other words, if it works, it appears to be used by itself. It spreads itself" (The technological innovations spontaneously spread as a result of positive feedback) (P2).

"We actually work with many of them (Private Sector). Especially in education... Yes, they have financial resources and staff. ... Every developing technology reflects differently on education. Education is very different, so they are very supportive, that is, they support in terms of teaching. For example, when we are going to get support from outside, we rather get it from a teacher than an engineer. There's a reason. Yes, engineers are very knowledgeable. But what will my teacher need in the classroom, how will it be used? How will it become a more effective tool? Because he knows what his friend needs or what is used in classrooms. Therefore, a lot of collaboration can be done with private sector in the field of education" (Cooperation of the private sector with MoNE in technological innovations used in the field of education) (P3).

The opinions of the participants about their support for the development of ICT-related skills among the responsible persons (trainers and teachers) for the learning and inclusion process for disadvantaged groups are given in Table 6.

Table 6. The opinions of the participants about their support for the development of ICT-related skills among the responsible persons (trainers and teachers) for the learning and inclusion process for disadvantaged groups

		Frequency (f)
Support for the development of ICT-related skills among the responsible persons (trainers and teachers) for the learning and inclusion process for disadvantaged groups	Experiencing and testing the systems developed for disadvantaged groups by responsible persons	1
	Discussions on the development of ICT skills of disadvantaged groups of responsible people through digital storytelling workshops	1
	Easy to use ICT applications	1
	Presenting ICT application contents grouped according to different individual characteristics to responsible persons	1
	Providing in-service training to teachers who resist the use of technology and who have deficiencies in technology use	1
	Providing in-service training for the development of ICT-related skills of those responsible within the Ministry of National Education.	1
	Gamification of individuals' learning with the integration of technology in education	1
Total		7

Participants' opinions which supports Results in Table 6 about their support for the development of ICT-related skills among the responsible persons (trainers and teachers) for the learning and inclusion process for disadvantaged groups are given below:

"First of all, I think they have to use and experience that technology. In other words, I think that whatever we aim for the learners, what we aim to gain there, I think that teachers should have a workshop in that direction and go through the process and experience themselves" (Experiencing and testing the systems developed for disadvantaged groups by responsible persons) (P1).

"We can make it easier by implementing digital story workshops... I worked with teachers in different conditions. All of them share insights during story circle... They pour out their heart. They question the other side what they can do, they take each other's suggestions. They say the points they disagree with. In fact, the process of digitizing their stories continues in this story circle until the end of the group screening. In the sound recording ... In the process of preparing the visuals ... Although it seems a bit technical there, the teachers continue to speak in the background. And because they are warming and trusting each other more, they begin to pour, ask, and support each other. You know, in the in-group screenings, you can see their digital stories after watching them for the last time. They make comments through their stories again, and they speak out their suggestions for the future. In this way, I can say that there is a process of contributing in expressing and discussing such disadvantaged issues" (Discussions on the development of ICT skills of disadvantaged groups of responsible people through digital storytelling workshops) (P1).

"I don't have an educator background. So maybe I can just transfer my observations. Therefore, as an outsider, my observations... First of all, teachers should not be asked for anything extra. They are already Facebook users, I know Twitter users, WhatsApp users want to use products that can be used with the same logic. Otherwise, it should not be more difficult. This is a really important barrier" (Easy to use ICT applications) (P2).

"Materials that they can present in front of them must be grouped for the students who learn differently in their classes individually, In other words, without telling too much, the teacher tends to say to this group, let me give this to this group and distribute ready packages immediately. Otherwise, it is both difficult and not realistic to do anything from scratch and expect it from him" (Presenting ICT application contents grouped according to different individual characteristics to responsible persons) (P2).

"Here, in-house trainings are held. Older teachers put up more resistance in this regard. Younger teachers help them at work. They create such groups and complement teachers' technology deficiencies through in-house training. In other words, teachers continue their education in this way in schools. Students learn, on one hand, teachers learn on the other. This continues all the time" (Providing in-service training to teachers who resist the use of technology and who have deficiencies in technology use (P2).

"So we organize in-service training for them, whatever they need in different fields. Because these are Web 2.0 tools, new technologies, and

mobile uses. We explain how they adapt to them, what program they can find, how they can use this program in their class. ... There are in-class activities or classroom assessment tools such as possible to use online, they are very effective. You can gamify learning actually using digital skills" (Providing in-service training for the development of ICT-related skills of those responsible within the Ministry of National Education; gamification of individuals' learning with the integration of technology in education) (P3).

Participants' views on methods and strategies for developing open educational resources for disadvantaged groups in Turkey are given in Table 7.

Table 7. Participants' views on adopted methods and strategies for developing open educational resources for disadvantaged groups in Turkey

		Frequency (f)
Adopted methods and strategies for developing open educational resources for disadvantaged groups in Turkey	Determining the needs for disadvantaged groups	1
	Establishing infrastructures suitable for the determined needs of disadvantaged groups and making improvements according to incoming feedback	1
	Producing resources for disadvantaged groups, translating those in a foreign language to Turkish	1
	Indexing of resources prepared for disadvantaged groups for easy implementation of responsible persons	1
	Encouraging teachers to use open educational resources	1
	Publishing the content developed by teachers after editorial evaluations in EBA	1
	Designing and executing e-twinning projects by Teachers	1
	Using Web 2.0 application tools in teacher-student interaction	1
	Benefits of Teachers' use of public ICT systems for individuals to learn	1
Total		9

Participants' opinions which support Results in Table 7 on adopted methods and strategies for developing open educational resources for disadvantaged groups in Turkey are listed below:

"First of all, what kind of resources do disadvantaged groups need, these need to be determined. After it is determined, it is necessary to evaluate and improve it accordingly after providing the infrastructure" (Determining the needs for disadvantaged groups; establishing infrastructures suitable for the determined needs of disadvantaged groups and making improvements according to incoming feedback) (P1).

"There are a lot of materials, but most of them are in foreign languages. ...and there is a lot of information pollution. In other words, it is difficult for the teacher to find and select what is useful for him and pick them up. So if the indexes are prepared or something national ... Things that the Ministry of National Education or Civil Society Organizations may be preparing ... So, if this is the process, it is more efficient if catalogs are indexed to those who need to be presented to the students who have the specific problem. Because it is difficult for teachers to collect, find, try after that and see the result" (Producing resources for disadvantaged groups, translating those in a foreign language to Turkish; Indexing of resources prepared for disadvantaged groups for easy implementation of responsible persons) (P2).

"In other words, our job is to make use of these resources (by teachers). We encourage them. For example, we recommend our teachers to prepare lessons if they have different knowledge, if they have different areas of work. Here we even try to help with that. If you have such content, digitize it. We announce our platform, even if you want we publish it for you. This is the way EBA works. So, if it developed by a teacher this content can be shared over EBA. Of course, there's an editor. Editors evaluate. If appropriate, that content, for all of Turkey..." (Encouraging teachers to use open educational resources; Publishing the content developed by teachers after editorial evaluations in EBA) (P3).

"Our teachers are very active in e-Twinning. Even now as we know that most e-twinning project applications are from Turkey. So, they came to that point, actually. There, at least among themselves, they can share resources among teachers. I mean, I prepared something like that, so you can use it in your class if you want..." (Designing and executing e-twinning projects by Teachers) (P3).

"Facebook is here, WhatsApp, Messenger are also used very effectively. But of course, these are closed systems... It is much more useful if there is actually a system that everyone can see" (Using Web 2.0 appli-

cation tools in teacher-student interaction; Benefits of Teachers' use of public ICT systems for individuals to learn) (K3).

The opinions of the participants about the use of open education resources to cooperate with disadvantaged individuals are given in Table 8.

Table 8. The opinions of the participants about the use of open education resources to cooperate with disadvantaged individuals

		Frequency (f)
Use of open education resources to cooperate with disadvantaged individuals	Determination of accessibility to technology by disadvantaged groups	1
	Designing systems suitable for technology and technology literacy skills of disadvantaged groups	1
	Providing technology literacy training for disadvantaged groups	1
	Guidelines for disadvantaged groups to gain awareness of efficient use of open education resources	1
	MoNE's General Directorate of Lifelong Education is in preparation of learning environment design for everyone including disadvantaged groups and this system will be published to EBA when it is ready.	1
Total		5

Participants' opinions which support results in Table 8 on use of open education resources to cooperate with disadvantaged individuals are listed below:

"At first, do they have access to a technology, ownership? In other words, this has to be looked at first. So unless it is, what you do can go to waste. ...this study can be done first. What is the state of having technology? ...what do they use more? Systems can be developed accordingly. You know, they only have a phone in their hands. If they don't have a computer, they won't be able to reach anything again. Do they use mobile, tablet or something? Do they have access to Internet infrastructures if they have computers? These have to be questioned first" (Determination of accessibility to technology by disadvantaged groups) (P1).

"First of all, it is a mobile, tablet, desktop, what kind of technology needs exists and system design for them... What kind of literacy skills they have when designing the system as well? These are important. They may have a low level of use, and then you designed it, you offered the technologies, but if they don't have the skills, they may be also trained" (Designing systems suitable for technology and technology literacy skills of disadvantaged groups; providing technology literacy training for disadvantaged groups) (P1).

"When it comes to disadvantaged groups, those groups must first know what will happen after they receive this training. Now are they aware of this? Awareness should be created so that they have the knowledge that if they reach an education like this, the result will make such a difference. That awareness is very low right now. Maybe not even. Only after this difference has occurred can one talk about its methods. How can be done more efficiently? Now, perhaps this awareness needs to be increased the most... Now, first of all, he should have path to go in front of him, and as a result of this path, he should say, see, and know that he should try to go through this path" (Guidelines for disadvantaged groups to gain awareness of efficient use of open education resources) (P2).

"The General Directorate of Lifelong Education has actually prepared a portal called open schools, open high school. In fact, it was still prepared, I do not know its final status at the moment, but they were preparing all the course content for those students. In other words, when we talk about lifelong learning, there are elderly people, young people, other disadvantaged groups, refugees, immigrants or people who need special education. All of these can be given as part of lifelong education. And as far as I know they are about to include them in EBA right now. They will share their lifelong content through EBA. It will be published over EBA from now on. Students can access EBA in any way. Including students in the private school" (MoNE's General Directorate of Lifelong Education is in preparation of learning environment design for everyone including disadvantaged groups and this system will be published to EBA when it is ready.) (P3).

The opinions of the participants about the state support for the use of ICT in the learning and inclusion of disadvantaged groups are given in Table 9.

Table 9. Opinions of the participants about the state support for the use of ICT in the learning and inclusion of disadvantaged groups

		Frequency (f)
State support for the use of ICT in the learning and inclusion of disadvantaged groups	Fatih Project carried out by the Ministry of National Education, it does not cause the desired targets to be achieved without training.	1
	Preparation and presentation of activities for the mother tongue of immigrants, one of the disadvantaged groups	1
	Planning and implementing inclusive education by taking advantage of the opportunities offered by technology	1
	Design of distance education system and exams for equal opportunity in education for disadvantaged groups	1
	Determination of interested teachers as leading teachers and leading teachers to improve their educational content by using ICTs and guide other teachers	1
	Development of educational content used by ICTs through design-skill workshops	1
	Realization of the Digital Wings Project with the cooperation of MoNE and private sector	1
	Collaboration between MoNE and universities to ensure that pre-service teachers receive trainings with improved technological skills	1
	Training pre-service teachers in accordance with 21st century skills	1
Total		9

Participants' opinions which support results in Table 9 on state support for the use of ICT in the learning and inclusion of disadvantaged groups are listed below:

"FATİH Project did not achieve much success, so it did not provide a full equality of opportunity anywhere in Turkey. Tablets were also distributed, but to what extent students could use them. .. They distributed the technologies to the classes, but they were not full. ... It would have been better if they were made available them first. How ready the teachers were for this? In fact, we can say that it was something that was implemented without preparation" (FATIH Project carried out by the Ministry of National Education, it does not cause the desired targets to be achieved without training) (P1).

"Either Syrians, so when we think about it, children have language problems. How do they understand, can they follow at the same level? How true is it that they are presented to our students in the same way as what is offered to them? I also think that events should be organized for them" (Preparation and presentation of activities for the mother tongue of immigrants, one of the disadvantaged groups) (P1).

"At that point, there are many opportunities that something different technology offers, but it is important that it is well managed, planned and implemented" (Planning and implementing inclusive education by taking advantage of the opportunities offered by technology) (P1).

"Normally, a person with a physical disability attending school every day is a process involving serious overtime and serious workload difficulties. This can be facilitated by distance education. The first thing is this distance education can be done. Secondly, exams such as exams are different for the visually impaired and the hearing-impaired are different. Differentiated exams are held in these kinds of things. It is wrong to wait for someone with a visual disability to make a question with shapes. Here comes something else. You make it feasible thanks to information technologies. In other words, you can prepare a fair exam system to be more equal" (Design of distance education system and exams for equal opportunity in education for disadvantaged groups) (P2).

"In the 2023 Vision Document, there is actually a concept that we call a leading teacher. Especially in the field of information technologies ... It says that teachers in schools should take teachers who are enthusiastic about this subject to leadership. There is a part to let them lead their colleagues and to ensure that these contents are used, expanded and multiplied. In fact, there were design-skill workshops in the Vision Plan. In fact, the Ministry has another project for the field of informatics, teaching or digital wings, and the Ministry is trying to carry them out. In other words, collaboration with universities should be done in this field. So what skills do we want? What skills do universities provide? Because you usually gain most of these skills in a school environment. You don't come here with the skill you got at the university. But should it be? In

particular, informatics should use it at that level, the engineer should use it at that level, and the teacher should use it at that level. But what is it, as much as it will adapt to your profession ... So maybe it is the only part we passed. But is there such a policy at universities? I do not know this. But it should be. Especially in the field of educational technologies, in every branch" (Determination of interested teachers as leading teachers and leading teachers to improve their educational content by using ICTs and guide other teachers; Development of educational content used by ICTs through design-skill workshops; Realization of the Digital Wings Project with the cooperation of MoNE and private sector; Collaboration between MoNE and universities to ensure that pre-service teachers receive trainings with improved technological skills) (P3).

"We do the cooperation between the University and the Ministry of National Education on the basis of projects. In fact, we are working with the university in a project that we wrote and we exchange views. But, of course, this should become a policy, that is, a strategy. Now people with skills are adapting what they call 21st century skills, deep learning at work, problem solving at work. In fact, individuals who have these skills should be trained in universities as well as in our schools" (Collaboration between MoNE and universities to ensure that pre-service teachers receive trainings with improved technological skills; Training pre-service teachers in accordance with 21st century skills) (P3).

Discussions

Results of the participants' perspectives on mostly used ICT-Based Educational Solutions by teachers and trainers in Turkey given below:

- Encouraging the use of smart boards, EBA and internet infrastructure of not only young teachers but all teachers,
- Some applications for coding,
- Applications / systems to alleviate the workload of teachers and trainers,
- Trainers and teachers completing their deficiencies by getting basic information literacy training,
- Training of computer and instructional technology teachers to learn new technology applications.

Although technology integration in education is shaped by taking students to the center, we can say that teachers have also an important role

in this process. Although teachers' perceptions, attitudes, knowledge, experience and skills towards technology are significantly influential in ICT use, results show that teachers appear to have some shortcomings at this point (Karaca, 2011; Chen, 2008). The ability and competence of the teacher to use technology is directly related to the technology integration process (Inan & Lowther, 2009; Gorder, 2008; Vannatta & Fordham, 2004). Technological experiences of teachers affect their perception and expectations of using technology in education as well as their successful technology integration (Krause, 2010). The positive experiences related to technology may lead to the development of a positive perception towards technology or the lack of experience of the technology leads to a negative attitude towards technology (Reynolds & Rucker, 2002). However, it can be said that teachers and students should use technology regularly in a successful technology integration. In addition, young teachers' perception of technology integration and use of technology is higher than older teachers (Gorder, 2008). It is stated that this result is related to the fact that new teachers are more close to technology culture and they have benefited from technology in their pre-service education. In his research, Hsu (2010) stated that teachers with a high level of technology use knowledge may have a high level of technology integration competencies. In the study carried out by Sang, Valcke, Van Braak & Tondeur (2010), it was found that although the constructivist approach was aimed in teacher education in Vietnam, the use of ICT applications was limited and mostly traditional teaching practices were used. As a reason, it was shown that educators had low ICT skills. In the research conducted by Hutchison and Reinking (2011) with literature teachers, it was found that the literature course remained low in the integration of the curriculum with technology and this situation prevented the integration of the content of the course with technology. It was determined by Bouhnik and Deshen (2014) that WhatsApp groups were used as a platform for teachers to communicate with students, to increase social interaction, to encourage sharing among students and to learn.

Participants' opinions about the biggest obstacles in the implementation of modern ICT-based solutions are given below:

- Lack of infrastructure and financial support in public schools,
- Teachers feeling anxiety to complete education programs in public schools,
- Hardware access barrier in public schools,
- Regional hardware limitation in public schools,

- Lesser obstacles in the implementation of ICT practices of private schools than public schools,

- ICT applications that will cause teachers to spend extra time in private schools,

- School principals do not want to send teachers to courses opened within the Ministry of National Education (MoNE).

- School principals prevent teachers' participation in courses because of the statement in the "Teacher Training Regulation" of MoNE, which mentions that teachers can participate in the courses opened within the MEB, in case teachers do not disrupt their lessons.

Access to technology, availability of technology or resources are another prerequisite for technology integration and important factors that prevent integration (Inan & Lowther, 2009; Chen, 2008; Hohlfeld, Ritzhaupt, Barron & Kemker, 2008; Vanatta & Fordam, 2004). Teachers want to know why they need to integrate technology into the teaching process and how to do it. It is seen that teachers have basic technology usage knowledge, but they do not know how to integrate them into the education process and they do not have sufficient knowledge and skills regarding technology integration (Eyyam, Meneviş & Doğruer, 2011; Chen, Lim & Tan, 2010; 96,97,98). Therefore, pedagogical knowledge and skills that teachers have to acquire are also within the scope of technology integration competence (Gorder, 2008). Teachers have trouble finding time for the acquisition of knowledge and skills, following new technologies and adapting to educational environments. The problem of time is seen an important factor in both obtaining (selecting and developing) material and the planning and designing of the integration process. However, even though teachers have the ability to use technology and have sufficient time, they may not be able to integrate technology into the education process (Bauer & Kenton, 2005). At this point, it is clear that "knowledge of how to integrate technology effectively into education" and the use of technology are two effective points.

Although teachers' taking in-service courses and seminars in the field of technology integration and enabling specialists in the field to provide seminars in schools should be among the important responsibilities of school administrators (Gülünç, 2017), this might not be the case in practice. One of the most important obstacles to the effective integration of technology into learning-teaching processes is that teachers, as practitioners, do not have a significant experience in how to use which tools to perform technology-based practices. In the research conducted by Akarawang, Kidrakran & Nuangchalerm (2015), it was found that it is necessary to integrate ICT into education in order for teachers to obtain

better learning experience and skills. Since the existing education system in schools does not allow the use of the system in which ICT is integrated, it is stated that it is necessary to develop an education program in which ICT is integrated with teachers, blended education models (traditional education approach and internet-based education).

Results of participants views on the use of hardware and human potential in Turkey to further improve the effectiveness of ICT-supported learning is given below:

- Providing in-service training for the target group
- Emphasis on the use of technology as a tool within the scope of the trainings provide,
- Need to change in the examination system,
- Integrating examination system in which individual skills are measured with technology,
- Paying attention to the education of the educator instead of hardware in ICT supported learning,
- Providing trainings on the development of technology skills of the teacher in ICT supported learning,
- Enabling educators to guide students in ICT-supported learning,
- Enabling educators to use training materials suitable for individual differences, to get opinions from their colleagues and to make peer evaluations with the EBA software developed by MoNE.

When technology integration is realized within the framework of meaningful activities in educational processes, it can be stated that they have significant benefits to learning processes and outcomes. Otherwise, it can be said that only equipment of educational environments with technology or the use of these technologies with focus on teacher or content will have limited contribution to learning-teaching processes. In summary, the most important determinant of the efficiency of technology integration in education depends on the level of learners' involvement in the learning process (Dexter, Anderson & Becker, 1999). In the study conducted by Wu, Pan, & Yuan (2017), it was determined that the integration of ICT tools in education is effective in student-student interaction, teachers 'guidance and students' profession in the future.

In the research conducted by Sargezi, Esmaeili, Mirgol, Moghaddam, Sargezi & Komak (2020), it was found that the use of information and communication technologies had a positive effect between the cognitive empowerment and the effectiveness of instructional performance.

Results for the Participants' views on business sector support for learning and inclusion with the use of ICT is given below:

- Determining the needs of the target audience by analyzing them,
- Online environment design for the specified needs of the target audience,
- EBA designed by MoNA does not support inclusive education,
- No initiatives for inclusive education in the private sector,
- Initiatives for a single disadvantaged group in the private sector,
- Creating a pool of educational content for inclusive education and determining which disadvantaged groups are effective,
- Providing the state budget for the pool of educational content for inclusive education,
- Teachers' willingness to use ICT,
- MoNE's EBA allows teachers and students to use free of charge until a certain quota.

Many students who need special education cannot fully benefit from a standard education program since they do not have the conditions to participate in a standard classroom environment. Therefore, computer-based technologies can play an important role in inclusive education for these students (Hasselbring & Glaser, 2000). Computer and internet technologies can be used effectively to ensure that students in need of special education achieve equal conditions with their normal peers in terms of access to information. In this context, the use of technology in special education covers a wide range of applications; examples of these applications are assistive technology, adaptive technologies and the basic use of computers for instruction (Stanford, Crowe & Flice, 2010). In the research conducted by Stone, Mills & Saggers (2019) within the scope of special education, online games were used in the education of students with autism spectrum disorders.

As a result of the research, it was determined that multi-player online games made important contributions in addressing students' interests in order to support their skills in initiating and maintaining social interaction in inclusive educational environments. In this context, technological tools and digital products can be used in the learning-teaching processes organized for students who need special education. In the related literature, Leung and Mak (2010) stated that teachers' basic and incomplete understanding was found in the study in which the competencies of the teachers were examined. However, they concluded that variables such as subject and age taught are not effective on teacher attitudes, and that the variable of experience in teaching positively affects the attitude of the teacher. In addition, as a result study reveals that teachers wanted to receive education about inclusive education however could not realize because of the high workload and the high level of procedural works in the study, of De Boera, Pijlb & Minnaerta (2011) in which the attitudes towards classroom teachers' practices of inclusive education were examined, it was found that teachers generally displayed neutral or negative attitudes. Forlin & Chambers (2011) conducted a research aiming at evaluation of pre-service teachers' perceptions regarding their preparedness for inclusion. The study found that increasing knowledge about legislation and policy related to inclusion, and improving levels of confidence in becoming inclusive teachers, did not likewise address their concerns, or perceived stress, about having students with disabilities in their classes.

Results of the opinions of the participants about the innovations used in schools are given below:

- Events with 3D technology equipment,

- Lack of necessary state support for the use of technological innovations in public schools,

- Technological innovations in public schools need teachers to meet themselves or find sponsors,

- Failure to use innovations in public schools due to teacher or school administration resisting technological developments,

- The technological innovations spontaneously spread as a result of positive feedback,

- Cooperation of the private sector with MoNE in technological innovations used in the field of education.

It is considered important to use teaching activities that will activate students' visual and intellectual structures, while presenting information that is abstract and difficult to design in mind. In this context, it is stated that three-dimensional teaching materials can be used (Kahraman & Demir, 2011). Three-dimensional teaching materials are also included in research on inclusive education.

For example, in a study by Jager (2017), in which they examined three-dimensional images of the heart, the result showed that 3D animations improved teacher student's understanding of concepts regardless of the learning barriers they encountered. They also agreed that their attention span improved, they were more interested in the topic, developed a deeper understanding of the content, were actively involved in the lesson and tended to ask more complex questions. From this point of view, it can be said that three-dimensional digital materials can be used as an effective tool in differentiating education according to the learning characteristics of the students in inclusive education and thus, all students may benefit most from the education given regardless of their differences.

Results of the opinions of the participants about their support for the development of ICT-related skills among the responsible persons (trainers and teachers) for the learning and inclusion process for disadvantaged groups are given below:

- Experiencing and testing the systems developed for disadvantaged groups by responsible persons,
- Discussions on the development of ICT skills of disadvantaged groups of responsible people through digital storytelling workshops,
- Easy to use ICT applications,
- Presenting ICT application contents grouped according to different individual characteristics to responsible persons,
- Providing in-service training to teachers who resist the use of technology and who have deficiencies in technology use,
- Providing in-service training for the development of ICT-related skills of those responsible within the Ministry of National Education,
- Gamification of individuals' learning with the integration of technology in education.

When digital storytelling is considered in terms of learner participation, it enables learners to take an active role in terms of planning, managing and executing their own learning process, enabling them to have rich experiences. It can be stated that these learning experiences are effective in making the attendance easier and more effective (Olokunde & Lawson, 2016; Wang & Zhan, 2010). At this point, digital storytelling can be described as an important example of significant technology integration, both in terms of its learner-centered structure and creating significant opportunities for teachers to use technology more effectively in their classrooms. The use of gamification in education is important to internalize learning and teaching processes, to achieve meaningful and deep learning, and to provide motivation and dedication (Sezgin, Bozkurt, Yılmaz, & Linden, 2018). Gamification is a powerful tool in terms of attracting students' attention, actively participating in activities, creating behavior change. Gamification is considered as a powerful tool to attract students' attention and ensure their active participation in activities (Kim, 2015).

Results of the Participants' views on adopted methods and strategies for developing open educational resources for disadvantaged groups in Turkey are given below:

- Determining the needs for disadvantaged groups
- Establishing infrastructures suitable for the determined needs of disadvantaged groups and making improvements according to incoming feedback
- Producing resources for disadvantaged groups, translating those in a foreign language to Turkish
- Indexing of resources prepared for disadvantaged groups for easy implementation of responsible persons
- Encouraging teachers to use open educational resources
- Publishing the content developed by teachers after editorial evaluations in EBA
- Designing and executing e-twinning projects by Teachers
- Using Web 2.0 application tools in teacher-student interaction
- Benefits of Teachers' use of public ICT systems for individuals to learn.

Ministry of National Education (2013) declared the vision for information technology in the education system as

"To integrate the education system with advanced technologies, to support with innovations, to continuously develop by measuring and evaluating, to provide student-centered and project-based education by using information technologies".

When the vision for ICT in education in Turkey carefully examined it is clear that how much importance given to the teachers. In the Ministry of National Education (2018) curriculum, teacher candidates were expected to be able to use technology effectively as part of the competence field named "digital competence".

Accordingly, digital competence, covers the safe and critical use of information and communication technologies for work life, daily life and communication. This competence is supported through basic skills such as access to information and the use of computers for the evaluation, storage, production, presentation and exchange of information, as well as participation in common networks and communication through the Internet. In this context, it is seen that MONE explicitly strives for educators to use technology effectively. It can be said that teachers who use information technologies in classroom applications should be a role model for their students, especially since teachers are an important stakeholder in terms of being the practitioners of technology integration in classroom learning and teaching activities.

Results of the opinions of the participants about the use of open education resources to cooperate with disadvantaged individuals are given below:

- Determination of accessibility to technology by disadvantaged groups,
- Designing systems suitable for technology and technology literacy skills of disadvantaged groups,
- Providing technology literacy training for disadvantaged groups,
- Guidelines for disadvantaged groups to gain awareness of efficient use of open education resources,
- MoNE's General Directorate of Lifelong Education is in preparation of learning environment design for everyone including disadvantaged groups and this system will be published to EBA when it is ready.

It can be said, in today's conditions, that teachers' job is quite challenging, considering that students, who are called digital generations, are familiar with technology and eager to use technology effectively. The first thing that comes to mind when it comes to enriching teaching and using tools and equipment is the integration of technology into education and the effective use of information technologies in lessons. However, technology cannot be integrated into teaching with just simply adding new tools and materials in teaching. It is very important for educators to use pedagogy and content knowledge together for technology integration.

Results of opinions of the participants about the state support for the use of ICT in the learning and inclusion of disadvantaged groups are given below:

- Fatih Project carried out by the Ministry of National Education, it does not cause the desired targets to be achieved without training,

- Preparation and presentation of activities for the mother tongue of immigrants, one of the disadvantaged groups,

- Planning and implementing inclusive education by taking advantage of the opportunities offered by technology,

- Design of distance education system and exams for equal opportunity in education for disadvantaged groups,

- Determination of interested teachers as leading teachers and leading teachers to improve their educational content by using ICTs and guide other teachers,

- Development of educational content used by ICTs through design-skill workshops,

- Realization of the Digital Wings Project with the cooperation of MoNE and private sector,

- Collaboration between MoNE and universities to ensure that pre-service teachers receive trainings with improved technological skills,

- Training pre-service teachers in accordance with 21st century skills.

Undoubtedly, the process of technology integration is new in our country, as in many societies of the world. In this context, an effective collaboration should be established between education faculties and primary, secondary and high school levels. It can be said that it is important

for pre-service teachers to graduate from education faculties with "technology integration skill and competence" For this, it may be suggested to open related elective or compulsory courses so that pre-service teachers can obtain the theoretical and practical competence regarding technology integration within the scope of these related courses. Inclusion of technology into every area of our lives has made a transformation in education system. The ability to establish the bridge between educational levels depends on the adaptation of the society to this transformation process as much as possible. Therefore, it can be said that it is important to support teachers with in-service trainings during this adaptation process (Gülünç, 2017). However, in-service training alone is temporary and may not be an effective solution, and the competence regarding technology integration should be gained especially in the pre-service period.

Another stakeholder that school administrators need to collaborate and interact with is information technology teachers. Information technology teachers are seen as technology leaders just like school administrators. Information technology teachers have a mission to support and guide other branch teachers, especially teachers in integrating technology into their fields (Gülünç, 2017). However, in order to fulfill this mission successfully, it is very important for provide a good education in their pre-service education. Cooperation with stakeholders and scientific processes should be taken into consideration while developing training policies regarding the technology integration process; because society is affected by education policies in both short and long term.

Education policies need to be regulated quickly and effectively, taking into account the integration process, implementing new paradigms suitable for technology integration, and reorganizing the curriculum in accordance with technology integration. Education politicians have important duties in technology integration, especially in the meticulous execution of the "technology planning" process. Information activities should be carried out to the relevant people and the society on many topics related to technology such as the contributions of technology in educational environments, true and safe use of technology, scope and limits of technology use.

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References

Akarawang, C., Kidrakran, P., & Nuangchalerm, P. (2015). Enhancing ICT competency for teachers in the Thailand basic education system. *International Education Studies*, *8*(6), 1-8.

Bauer, J. & Kenton, J. (2005). Toward technology integration in the schools: Why it isn't happening. *Journal of Technology and Teacher Education*, *13*(4), 519-546.

Bouhnik, D., Deshen, M., & Gan, R. (2014). WhatsApp goes to school: Mobile instant messaging between teachers and students. *Journal of Information Technology Education: Research*, *13*(1), 217-231.

Büyüköztürk, Ş., Kılıç- Çakmak, E., Akgün, Ö., E. Karadeniz, Ş., & Demirel, F. (2014). *Bilimsel araştırma yöntemleri*. Ankara: Pegem Akademi Yayıncılık.

Chen, C. H. (2008). Why do teachers not practice what they believe regarding technology integration? *Journal of Educational Research*, *102*(1), 65-75.

Chen, W., Lim, C., & Tan, A. (2010). Pre-service teachers' ICT experiences and competencies: New generation of teachers in digital age. Society, 58(3), 631- 638.

Creswell, J. W. (2014). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* England: Pearson Education Limited.

De Boera, A., Pijlb, S. J., & Minnaerta, A. (2011). Regular primary school teachers' attitudes towards inclusive education: A review of the literature. *International Journal of Inclusive Education*, *15*(3), 331-353.

De Jager, T. (2017). Perceived advantages of 3D lessons in constructive learning for South African student teachers encountering learning barriers. *International Journal of Inclusive Education*, *21*(1), p. 90-102.

Dexter, S. L, Anderson, R. E., & Becker, H. J. (1999). Teachers' views of computers as catalysts for changes in their teaching practice. *Journal of Research on Computing in Education*, *31*(3), 221-239.

Eyyam, R., Meneviş, İ., & Doğruer, N. (2011). Perceptions of teacher candidates towards Web 2.0 technologies. *Procedia Social and Behavioral Sciences*, *15*, 2663-2666.

Forlin, C., & Chambers, D. (2011). Teacher preparation for inclusive education: Increasing knowledge but raising concerns. *Asia-Pacific Journal of Teacher Education*, *39*(1), 17-32.

Gorder, L., M. (2008). A study of teacher perceptions of instructional technology integration in the classroom. *Delta Pi Epsilon Journal*, *50*(2), 63-76.

Gülünç, S. (2017). *Eğitimde teknoloji entegrasyonunun kuramsal temelleri*. Ankara: Anı Yayıncılık.

Hohlfeld, T. N., Ritzhaupt, A. D., Barron, A. E., & Kemker, K. (2008). Examining the digital divide in K-12 public schools: Four-year rrends for supporting ICT literacy in Florida. *Computers & Education*, *51*(4), 1648-1663.

Hsu, S. (2010). The Relationship between Teacher's technology integration ability and usage. *Journal of Educational Computing Research*, *43*(3), 309-325.

Hutchison, A., & Reinking, D. (2011). Teachers' perceptions of integrating information and communication technologies into literacy instruction: A national survey in the United States. *Reading Research Quarterly*, *46*(4), 312-333.

Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational technology research and development*, *58*(2), 137-154.

Johnson, B., & Christensen, L.B. (2004). *Educational research: Quantitative, qualitative, and mixed approaches*. Boston: Pearson Education, Inc.

Kahraman, S., & Demir, Y. (2011). Bilgisayar destekli 3D öğretim materyallerinin kavram yanılgıları üzerindeki etkisi: Atomun yapısı ve orbitaller. *Erzincan Eğitim Fakültesi Dergisi*, *13*(1), 173-188.

Karaca, F. (2011). Teacher and Student Perceptions about Technology Use in an Elementary School in Ankara. *Journal of Social Studies Education Research*, *2*(2), 43-59.

Kim, B. (2015). Gamification in education and libraries. *Library Technology Reports*, *57*(2), 20-28.

Koehler, M., J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60-70.

Krause, J., M. (2010). *The impact of physical education student teaching experiences on technology integration self-efficacy* (Unpublished PhD Thesis). The Faculty of the Curry School of Education, Virginia University, USA.

Leung, C., & Mak, K., (2010). Training, understanding, and the attitudes of primary school teachers regarding inclusive education in Hong Kong. *International Journal of Inclusive Education*, *14*(8), 829-842.

MEB (2017). Öğretmenlik Mesleği Genel Yeterlikleri. Retrieved March, 21, 2020, http://oygm.meb.gov.tr/meb_iys_dosyalar/2017_12/11115355_YYRETMENLYK_MESLEYY_GENEL_YETERLYKLER Y.pdf

Miles M., & Huberman M. (1994). *Data management and analysis methods*. Thousand Oaks, CA: Sage Publications.

Milli Eğilim B. (2013). *Ortaokul matematik dersi (5. 6. 7. ve 8. sınıflar) öğretim programı*. Ankara: Devlet Kitapları Müdürlüğü.

Milli Eğitim B. (2018). Öğretim Programlarını Izleme Ve Değerlendirme Sistemi, Öğ-Retim Programları. Retrieved March, 20, 2020, http://mufredat.meb.gov.tr/Programlar.aspx

Mumcu, F. K., Haşlaman, T., & Koçak- Usluel, Y. (2008). *Teknolojik pedagojik içerik bilgisi modeli çerçevesinde etkili teknoloji entegrasyonunun göstergeleri*. Anadolu Üniversitesi Uluslararası Eğitim Teknolojileri Konferansı, Eskişehir.

Ntemana, T. J., & Olatokun, W. (2012). Analyzing the influence of diffusion of innovation attributes on lecturers' attitude towards information and communication technologies. *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments*, 8(2), 179–197.

Olokunde, T., & Lawson, A. (2016). Enhancing self–expression among early childhood learners through the use of digital story-telling. I*n Society for information technology & teacher education international conference* (pp. 458-460). Association for the Advancement of Computing in Education (AACE).

Reynolds, S. & Rucker, J. (2002). *Technology, methodology, and business education*. NBEA Association Publishers: National Business Year Book.

Sang, G., Valcke, M., Van Braak, J., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, 54(1), 103-112.

Sargezi, N. M., Esmaeili, H., Mirgol, A., Moghaddam, S. S., Sargezi, F. D., & Komak, S. S. (2020). Investigating the relationship between the use of information and communication technology and cognitive empowerment and the efficiency of educators' teaching performance in Zahedan University of Medical Sciences. Journal of Advanced Pharmacy Education & Research, 10(81), 83-88.

Sezgin, S., Bozkurt, A., Yılmaz, E. A., & Van der Linden, N. (2018). Oyunlaştırma, eğitim ve kuramsal yaklaşımlar: öğrenme süreçlerinde motivasyon, adanmışlık ve sürdürebilirlik. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, (45), 169-189.

Stanford, R., Crowe, M. W. & Plice, H. (2010). Differentiating with technology. *Teaching Exceptional Children Plus*, 6(4), 1 -9.

Stone, B., G., Mills, K. & Saggers, B. (2019). Online multiplayer games for the social interactions of children with autism spectrum disorder: A resource for inclusive education. *International Journal of Inclusive Education*, 23(2), 209-228.

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 8(45), 1-10.

Vannatta, R. A. & Fordham, N. (2004). Teacher dispositions as predictors of classroom technology use. *Journal of Research on Technology in Education*, 36(3), 253-271.

Vannatta, R. A. & Fordham, N. (2004). Teacher dispositions as predictors of classroom technology use. *Journal of Research on Technology in Education*, 36(3), 253-271.

Wang, S., & Zhan, H. (2010). Enhancing teaching and learning with digital storytelling. *International Journal of Information and Communication Technology Education (IJICTE)*, 6(2), 76-87.

Wu, Y. C. J., Pan, C. I., & Yuan, C. H. (2017). Attitudes towards the use of information and communication technology in management education. *Behaviour & Information Technology*, *36*(3), 243-254.

Yıldırım, A., & Şimşek, H. (2018). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin Yayıncılık.