Evaluation of High School Students' New Trends in Education: Internet of Things

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Abstract—The purpose of this research is to evaluate high school students' perceptions of the Internet of Things in the evaluation of new trends in education. The research was designed in accordance with the qualitative research method. The study group of the research consists of 83 high school students studying in Almaty, Kazakhstan, in the 2021–2022 academic year. The study group was given a 4-week Internet of Things online awareness training. After the training, interviews were held with high school students. A Semi-Structured Interview Form prepared by the researchers was used as a data collection tool in the interviews. As a result of the research, the knowledge level of high school students on the concept of the Internet of Things was evaluated as very low before the online awareness training and as high after the online awareness training. High school students, on the Internet of Things online education, while they had an indecisive attitude before the training, these attitudes changed positively after the training. High school students participating in the research stated that they found the achievements of the Internet of Things awareness training to be high. In addition, with the IoT awareness training given to the students, the students stated that they had a positive opinion about the use of IoT applications in education. In order to ensure the integration of IoT applications into education, it is necessary to provide necessary for instructors, prepare school infrastructures and make curriculum arrangements.

Keywords—high school students, Internet of Things, new directions in education

1 Introduction

In the age of technology that we live in, school environments have turned into an institution that shapes society and directs social development, adding a new responsibility to transfer knowledge and skills to students. School environments have aimed to raise generations to be open to innovations, aiming to reveal competencies and skills

by going beyond the institutional structures in which fixed programmes are transferred to the students. In line with this goal, it has become inevitable to combine technology with education and adopt a holistic understanding. In addition to the use of Internet of Things technology, which is of such great importance and is one of the technologies that will shape the future, in various fields, its use in traditional face-to-face education environments and open and distance education systems has become the focus of innovative approaches in recent years.

1.1 Theoretical and conceptual framework

The Internet of Things is generally defined as the uniquely addressed objects (devices) detecting and communicating with each other using Internet technology [1]. The rapid spread of the Internet in recent years has led to the emergence of new paradigms, and in this context, the Internet of Things, one of the new paradigms, is one of the hottest and most curious subjects in information and communication technology [2]. Horizon Reports are known as reputable reports that examine the latest innovations in education and current developments in educational technology. In the 2017 Horizon Report, one of the technologies that is thought to provide adaptation within 2–3 years within the scope of important developments on educational technologies in higher education is the Internet of Things paradigm [3].

It is necessary to provide an opportunity to understand the concepts and principles of the Internet of things for students who will use IoT technologies in business life in the future and for employees who inevitably switch to this technology, and to provide a learning environment that will allow the transformation of theoretical knowledge in this field into practice [25]. In addition, the integration capabilities of the systems designed today have highlighted the need for interdisciplinary work [4]. On the other hand, with the educational materials created with the working logic of the Internet of Things, it is aimed to increase the student–content interaction and to make the educational environments more efficient [5].

1.2 Related research

The widespread use of the Internet, distance and online education in educational environments has led to the emergence of new trends in education. Opportunities provided by effective online learning to students [26], blended learning environments adding a different dimension to education [27], use of mobile devices in online virtual learning environments [28] and difficulties in distance education process [29] are among the topics that have been frequently researched by researchers in recent years.

When the studies on the integration of the Internet of Things in education are examined, it is seen that these studies are mostly carried out at the undergraduate level [6,7]. Kortuem et al. [8] developed a new course structure and aimed to implement the introductory computer science curriculum based on the Internet of Things. In the study they carried out with 2000 students, many activities were carried out with a collaborative approach. As a result of the research, it has been emphasised that the internet of things generation has emerged in the new age's education understanding and the necessity of benefiting from the internet of things technologies that can meet the educational needs

of this generation. Wallner and Wagner [9] also emphasised the importance of the need for the Internet of Things in learning environments as a part of the transformations, while addressing the applications of Education 4.0 in the field of education in their research.

Yang and Yu [10] drew attention to the importance of redesigning distance education classrooms with the internet of things technology in their study. Open and distance education systems using advanced technology set an example for the internet of things applications. As a result of the research, it has been claimed that the technology used increases the academic performance of students and the teaching abilities of teachers. Lamri et al. [24], on the other hand, ensured that learning–teaching activities carried out in face-to-face classrooms could be transferred to distance education environments through the internet of things technology.

In his research, Callaghan [11] developed an Internet of Things application kit for the development of science and engineering skills in undergraduate and pre-graduate programmes. This kit (Buzz-boarding) consists of an open system of about 30 pluggable hardware boards that can be connected to each other. As a result of the research, it was stated that this developed kit supports the practical teaching of the basic concepts of embedded systems and the internet of things.

In addition, when the literature is examined, it is seen that there are studies on the advantages of using the Internet of Things in education. In some studies, these advantages were expressed as an increase in the opportunity for students to access information from anywhere, regardless of time and place [12,13].

1.3 Purpose of the research

The purpose of this research is to evaluate high school students' perceptions of the Internet of Things in the evaluation of new trends in education. In this direction, the following sub-objectives have been determined:

1. What are the students' perceptions of the concept of the Internet of Things?
2. What are your views on the Internet of Things' online education?
3. What are the students' views on the use of the Internet of Things in education?

2 Method and materials

In this section, information about the research method, study group, process, data collection and data analysis is given.

2.1 Research method

In accordance with the structure of the research, high school students' perceptions of the Internet of Things were designed in a qualitative research technique in the evaluation of new trends in education. The first stages of qualitative research are the stages of recognising the problem and determining the details by analysing the problem. Then, the approach to problem-solving is chosen. After designing the study and collecting

data comes the classification and analysis of the data. The process is concluded with the stages of interpreting and reporting the data [14].

2.2 Participants

The study group of the research consisted of 83 high school students studying in Almaty, Kazakhstan, in the 2021–2022 academic year. The study group of the research was formed on a voluntary basis. After giving information about the content and research process of the research and explaining the ethical principles, 83 students who agreed to participate in the research formed the study group of this research. All of the students participating in the research are high school seniors, 34 of them were girls and 49 of them were boys.

2.3 Data collection tools

Research data were collected through a Semi-Structured Interview Form developed by the researchers. In the research, high school students' perceptions of the internet of things in the evaluation of new trends in education were carried out in two stages, as pre-education and post-education process evaluations, by giving a 4-week training. The Semi-Structured Interview Form, which was prepared to get the opinions of the students about the pre-process, process and post-process, was first presented to three experts. The questions in the form were prepared in a way that could be easily understood by the participants. By determining the details of the researched subject, care was taken to create the content of the questions in a way that would deepen the subject. It was aimed that the questions be multidimensional by avoiding ambiguous questions. During the interview, alternative questions were formed that could be directed to the participants in case the participants of the research deviated from the topic or did not provide sufficient information. The questions were arranged in a logical order in the Semi-Structured Interview Form. In line with expert opinions, the Semi-Structured Interview Form was reshaped by making certain corrections. The Semi-Structured Interview Form used in the research is shown in Appendix 1.

2.4 Data collection process

In the data collection process of the research, after the determination of the working group, a 4-week internet of things' online awareness training was given. After the training, interviews were held with high school students.

With the 4-week Internet of Things online awareness programme, it is aimed to improve the knowledge level of high school students about the Internet of Things, which is one of the new trends in education. The prepared training programme was designed for a total of 16 hours, to be implemented over 2 hours, for 2 days a week. While designing the Internet of Things education, it was taken as a basis that the gains should not exceed the student level. While determining student achievements, the learning, age and class levels of the students were taken into account, and it was aimed that the students' interest in the education process and their motivation would be high.

Week 1 outcomes: Having basic theoretical knowledge in the field of internet of things and to be able to make inquiries about the concept and content of the internet of things.

Week 2 outcomes: Comprehending the application areas of the internet of things and learning sample applications in internet of things applications.

Week 3 outcomes: Explaining privacy and security phenomena in the internet of things systems and to have knowledge about ethical principles in the internet of things applications

Week 4 outcomes: To comprehend the integration of internet of things applications into education and to be aware of the relationship between the Internet of Things and social benefit.

After the 4-week Internet of Things awareness programme was completed, face-to-face and one-on-one interviews were held with high school students. During the interviews, the questions in the Semi-Structured Interview Form prepared in advance were directed to the participants. During the interviews, a voice recorder was used with the permission of the students. It took approximately 7 weeks to complete the trainings and semi-structured interviews.

2.5 Data collection analysis

Content analysis technique, which is generally used in qualitative research, was used in the analysis of research data. In content analysis, data obtained through interviews, observations or documents are analysed in four stages: (1) coding the data; (2) finding the codes, categories and themes; (3) organising the codes, categories and themes; and (4) defining and interpreting the findings. These four stages were followed sequentially and the answers given by the high school students to the semi-structured interview form were converted into findings [15]. In the first stage, the answers given by the working group during the interview were transferred to semi-structured interview forms by listening to the audio recordings. In the second stage, while creating the semi-structured interview form, new codes, themes and categories were created in addition to the predetermined categories. The code, themes and categories created in the third stage were organised.

In the last stage, the tables were created in which frequency, percentage and weighted averages were taken, and they were converted into findings. Weighted averages were evaluated according to the categories of 'very high, strongly agree', 'high, agree', 'moderate, undecided', 'low, disagree' and 'very low, strongly disagree'. The answers of the students were defined as very high or strongly agree as they approached 5, and as very low or strongly disagree as they approached 1. The arithmetic mean score intervals were found to be 0.80. (The highest value − the lowest value) was calculated as (5 − 1) / 5 = 4 / 5 = 0.80 in the score range calculated as /5. It was evaluated as 5.00–4.20 = very high, 4.19–3.40 = high, 3.39–2.60 = moderate, 2.59–1.80 = low and 1.79–1.00 = very low.

3 Results

In line with the interviews with high school students, the answers to the questions in the Semi-Structured Interview Form are categorised and given in the findings section.

In Table 1, the knowledge level of the high school students participating in the research on the concept of the Internet of Things was evaluated in two dimensions, before and after the Internet of Things awareness training.

In Table 1, the knowledge level of the high school students participating in the research on the concept of the Internet of Things was evaluated in three categories: to dominate the concept of the internet of things; to dominate the internet of things applications; and to use the internet of things devices. Mastery of the concept of the Internet of Things was expressed by high school students as very low before mindfulness training and as high after mindfulness training. Mastery of IoT applications was rated very low before mindfulness training and moderate after mindfulness training by students. The tendency to use IoT devices was expressed by students as low before mindfulness training and high after mindfulness training. In general, the knowledge level of high school students on the concept of the internet of things was evaluated as very low before the online awareness training and as high after the online awareness training.

Table 1. Students' level of knowledge about the concept of the Internet of Things

Category	Before Internet of Things Online Awareness Training												
	Very High		High		Middle		Low		Very Low		Sum		Mean
	F	%	F	%	F	%	F	%	F	%	F	%	
Mastering the concept of the Internet of Things	–	–	4	4,8	6	7,2	28	33,7	45	54,2	83	100	1,62
Mastering Internet of Things applications	–	–	4	4,8	5	6	32	38,5	42	50,6	83	100	1,65
Tendency to use IoT devices	–	–	6	7,2	11	13,2	39	46,9	27	32,5	83	100	1,95
Overall Average													1,74
Category	**After the Internet of Things Online Awareness Training**												
	Very High		High		Middle		Low		Very Low		Sum		Mean
	F	%	F	%	F	%	F	%	F	%	F	%	
Mastering the concept of the Internet of Things	11	13,2	24	28,9	39	46,9	7	8,4	2	2,4	83	100	3,42
Mastering Internet of Things applications	5	6,0	21	25,3	41	49,3	6	7,2	10	12	83	100	3,06
Tendency to use IoT devices	16	19,2	49	59	8	9,6	6	7,2	4	4,8	83	100	3,80
Overall Average													3,42

The opinions of the high school students participating in the research on the concept of the internet of things were evaluated at five levels, before and after the online awareness training, and then the students' opinions on the subject were taken as follows:

Student 8: I had never heard of the concept of the Internet of Things before. I didn't know about IoT applications either. If I had been asked what I knew about IoT devices before taking this training, I could not answer. However, after the training, I gained a lot of knowledge. In fact, now I think that in the age of technology, every student should acquire at least the basics.

Student 39: I've heard of the concept of the Internet of Things before. But he is not fully informed. With this 4-week training we received, I both gained concept knowledge and increased my awareness. In addition, I currently have information about the areas and devices where internet of things applications are made.

Student 46: I am closely interested in technology and technological developments. Electronics is also among my interests. Therefore, before the training, I had knowledge about the Internet of Things. But I also learned a lot during the training.

In Table 2, the opinions of the high school students participating in the research on the internet of things online education were evaluated in two dimensions, before and after the internet of things awareness training.

Table 2. Opinions of the students on the Internet of Things online education

Category	Before Internet of Things Online Awareness Training												
	Absolutely I Agree		I Agree		I'm Undecided		I Do Not Agree		I Strongly Disagree		Sum		Mean
	F	%	F	%	F	%	F	%	F	%	F	%	
Internet of Things training is beneficial	9	10,8	41	49,3	19	22,8	8	9,6	6	7,2	83	100	3,46
IoT education should be multifaceted (project development, collaborative learning)	7	8,4	25	30,1	36	43,3	11	13,2	4	4,8	83	100	3,24
Internet of Things training should be repeated	8	9,6	18	21,6	46	55,4	6	7,2	5	6	83	100	3,21
Overall Average													3,30
Category	**After the Internet of Things Online Awareness Training**												
	Absolutely I Agree		I Agree		I'm Undecided		I Do Not Agree		I Strongly Disagree		Sum		Mean
	F	%	F	%	F	%	F	%	F	%	F	%	
Internet of Things training is beneficial	51	61,4	23	27,7	2	2,4	4	4,8	3	3,6	83	100	4,38
IoT education should be multifaceted (project development, collaborative learning)	4	4,8	65	78,3	5	6	8	9,6	1	1,2	83	100	3,75
Internet of Things training should be repeated	7	8,4	52	62,6	13	15,6	9	10,8	2	2,4	83	100	3,63
Overall Average													3,92

In Table 2, the views of the students on the internet of things online education were evaluated in three categories before and after the online awareness training: IoT education is beneficial; IoT education should be applied in multiple ways; and IoT education should be repeated. Before the awareness training, high school students gave the answer 'I agree with the IoT training is useful', and after the awareness training, they gave the answer 'I definitely agree'. While the students were undecided before the awareness training about the multifaceted implementation of the IoT education and the repetition of the IoT education, they gave the answer 'I agree' after the education. The opinions of high school students about the internet of things online education in general were that they were undecided before the education, but they changed positively after the education.

The opinions of the high school students participating in the research on the internet of things online education were evaluated at five levels, before and after the online awareness training, and then the students' opinions on the subject were taken as follows:

Student 11: I had no idea whether IoT training would be a useful one. So I was undecided about what kind of application it would be. After receiving the training, my thinking has completely changed. Now I see this training as a training that needs to be repeated often.

Student 48: We received a useful training that allowed me to obtain detailed information in an area that I had partial knowledge of. I think that this education should be continuous. Also, in the second phase of this training, projects can be developed. Thus, we can find the opportunity to actively practice.

Student 69: Actually, I knew partially the applications of education of objects. But of course, I had detailed information. I found this training a bit insufficient to be fully knowledgeable in this field. I think it should be a more comprehensive training or it should be repeated in more than one step.

In Table 3, the views of the high school students participating in the research on the achievements of the education after receiving the Internet of Things online awareness training were evaluated.

Table 3. Students' evaluations on the achievements of the Internet of Things awareness training

Category	Internet of Things Online Awareness Training												Mean
	Very High		High		Middle		Low		Very Low		Sum		
	F	%	F	%	F	%	F	%	F	%	F	%	
To have theoretical knowledge in the field of internet of things	9	10,8	58	69,8	10	12	5	6	1	1,2	83	100	3,83
Mastering ethical issues in the field of the Internet of Things	52	62,6	12	14,4	13	15,6	4	4,8	2	2,4	83	100	4,30
To be aware of the relationship between the internet of things and social benefit	27	32,5	39	46,9	11	13,2	3	3,6	3	3,6	83	100	4,01
Overall Average													4,04

In Table 3, the opinions of the high school students participating in the research on the achievements of the education after receiving the Internet of Things online awareness training were evaluated in three categories: to have theoretical knowledge in the field of the internet of things; to have a command of ethical issues in the field of the internet of things; and to have an awareness of the relationship between the internet of things and social benefit. After the education they received, the students stated that they had a high degree of theoretical knowledge in the field of the Internet of Things and that they were aware of the relationship between the Internet of Things and social benefit. After the training, the students stated that they had a very high level of command on ethical issues in the field of the Internet of Things. When the general averages of the students' internet of things online awareness training are considered, it is possible to say that they are at a high level.

Opinions of high school students participating in the research on the internet of things online awareness training were taken as follows:

Student 23: It was an education where I learned a lot. Now I have a different field knowledge that I did not have before the education. We live in the age of technology, and I find such trainings very necessary to keep up with this age.

Student 74: I learned the most ethical issues related to the Internet of Things. The devices used in this area, the areas in which these applications are made and the benefits to society are among the information I learned. It is a very useful training in terms of theoretical knowledge.

Student 81: I found this training moderately beneficial. If I have to evaluate its gains, I think it is moderate. The reason for this is that I think there is a need for practice in such trainings. We were a little disappointed that we could not practice due to time constraints. But I still learned a lot.

In Table 4, the views of high school students participating in the research on the use of the Internet of Things in education were evaluated in two dimensions, before and after the Internet of Things awareness training.

Table 4. Students' views on the use of the Internet of Things in education

Category	Before Internet of Things Online Awareness Training												Mean
	Very High		High		Middle		Low		Very Low		Sum		
	F	%	F	%	F	%	F	%	F	%	F	%	
Having an opinion on the benefits of the internet of things in education	1	1,2	4	4,8	7	8,4	49	59	22	26,5	83	100	1,95
Finding useful use of the internet of things in education	1	1,2	3	3,6	9	10,8	53	63,8	17	20,7	83	100	2,01
Finding the use of the internet of things in education beneficial for professional career	–	–	4	4,8	6	7,2	25	30,1	48	57,8	83	100	1,59
Overall Average													1,85

(Continued)

Table 4. Students' views on the use of the Internet of Things in education *(Continued)*

Category	After the Internet of Things Online Awareness Training												Mean
	Very High		High		Middle		Low		Very Low		Sum		
	F	%	F	%	F	%	F	%	F	%	F	%	
Having an opinion on the benefits of the internet of things in education	12	14,4	53	63,8	10	12	6	7,2	2	2,4	83	100	3,80
Finding useful use of the internet of things in education	8	9,6	56	67,4	11	13,2	5	6	3	3,6	83	100	3,73
Finding the use of the internet of things in education beneficial for professional career	4	4,8	13	15,6	44	53	19	22,8	3	3,6	83	100	2,95
Overall Average													3,49

In Table 4, the opinions of the students participating in the research on the use of the Internet of Things in education were evaluated in three categories: having an opinion on the benefits of the internet of things in education; finding the use of the internet of things in education useful; and finding the use of the internet of things in education useful in terms of professional career. The students stated that they had a low level of opinion before the training given in the category of having an opinion on the benefits of the internet of things in education, and a high level of opinion after the training. The students evaluated the use of the Internet of Things in education as low before the education and highly beneficial after the education. Finally, the students stated that they found the use of the Internet of Things in education to be very beneficial before the education and moderately after the education in terms of professional career. The general averages of high school students regarding the use of the Internet of Things in education were found to be low before the education and high after the education.

The opinions of the high school students participating in the research on the use of the internet of things in education were evaluated at five levels, before and after the online awareness training, and then the students' opinions on the subject were taken as follows:

Student 13: In fact, before taking this training, he did not have any knowledge about the use of the Internet of Things in education. I had no idea it could be useful. After this four-week training, my perspective has changed. I would like to add content related to the Internet of Things, which will be beneficial when we enter the business life in the future, to the education curriculum.

Student 29: Before I took the training, I had some knowledge about the Internet of Things. But after this training, I think it is definitely very useful and should be included in the training programmes we take in high schools.

Student 52: We received an education in a field that I don't know much about. Now I think that IoT devices and applications can be used in other courses as well. Depending on the choice of profession, it can be very useful in our future life.

4 Discussion

The knowledge level of the high school students participating in the research on the concept of the internet of things was evaluated as very low before the online awareness training and high after the online awareness training. High school students participating in the research, related to the internet of things online education, had an indecisive attitude before the training, but these attitudes changed positively after the training.

High school students participating in the research stated that they found the achievements of the internet of things awareness training to be high. In their study, Gkamas et al. [16] pointed out that proficiency in the field of IoT is low and the importance of training should be given to increase the skill gap. In their study, Torun and Cengiz [23] measured the Industry 4.0 perspective from the students' point of view with the technology acceptance model. In this research, which states that Industry 4.0 also includes internet of things technologies, it is stated that university students have a positive perception towards new trends in education.

High school students stated that they supported the use of the Internet of Things in education at a low level when they evaluated their views before the education they received. After the Internet of Things awareness training, the students stated that they highly supported the use of the Internet of Things in education. Ur Rahman et al. [17] stated that the integration of social media applications, information communication technologies and the internet of things in universities offer new opportunities to create smart educational environments for educators, students and the business world. Gul et al. [18] stated, in their study, that the Internet of Things can be an important educational tool that can be used to learn programming better. Heinemann and Uskov [19], on the other hand, stated that the Internet of Things makes an important contribution in terms of enabling students to access educational environments remotely. Silva et al. [20] also revealed that the Internet of Things benefits education as a support tool in the education administration decision-making process.

In addition, when the literature is reviewed, it is seen that there are studies on the importance and benefits of using the Internet of Things in different fields in education. Lenz et al. [21] demonstrated the benefits of using the Internet of Things in the education of students with learning disabilities. Pruet et al. [22] evaluated the process of purchasing and using the devices by considering the problems that may arise in the use of the internet of things in education from a financial point of view.

5 Conclusion

Technology integration into education emerges as an important requirement of the digital age we live in. It is possible to find traces of technology in every step of the change in education. One of the new trends in education and training applications is the internet of things. For this reason, in this study, the evaluations of high school students regarding the Internet of Things, which is one of the new trends in education, are discussed. As a result of the research, the knowledge level of high school students on the concept of the Internet of Things was evaluated as very low before the online awareness training and as high after the online awareness training. While high school

students, on the internet of things online education, had an indecisive attitude before the training, these attitudes changed positively after the training. High school students participating in the research stated that they found the achievements of the internet of things awareness training to be high. In addition, with the IoT awareness training given to the students, the students stated that they had a positive opinion about the use of IoT applications in education.

6 Recommendations

After the 4-week Internet of Things awareness training given to high school students, when the students were asked about their perceptions of the Internet of Things, it was observed that the education positively affected the students' perceptions. In this direction, the following recommendations have been developed:

1. IoT education should be applied regularly in different fields, such as cooperative learning and project development, so that high school students can have more comprehensive knowledge and practice in this field.
2. Internet of Things education should be enriched with both conceptual and practical content and designed to be applied at all levels of education.
3. In order to ensure the integration of IoT applications into education, it is necessary to provide training for trainers, prepare school infrastructures and make curriculum arrangements.

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8 Appendix 1 Semi-Structured Interview Form

Dear Students,

In this form, your perception level of IoT applications will be evaluated before and after the Internet of Things online awareness training. Your answers to the questions in the form will be used for scientific purposes only, and your personal information will be kept confidential. Thank you in advance.

1. Evaluate your level of knowledge on the concept of the Internet of Things in one of the five stages listed below.

Category	Before Internet of Things Online Awareness Training					After the Internet of Things Online Awareness Training				
	Very High	High	Middle	Low	Very Low	Very High	High	Middle	Low	Very Low
Mastering the concept of the Internet of Things										
Mastering Internet of Things applications										
Inclination to use IoT devices										

Your opinion:……..…….

…….

2. What are your views on Internet of Things online education? Evaluate in one of the five stages listed below.

Category	Before Internet of Things Online Awareness Training					After the Internet of Things Online Awareness Training				
	Absolutely I Agree	I Agree	I'm Undecided	I Do Not Agree	I Strongly Disagree	Absolutely I Agree	I Agree	I'm Undecided	I Do Not Agree	I Strongly Disagree
Internet of Things training is beneficial										
IoT education should be multifaceted (project development, collaborative learning)										
Internet of Things training should be repeated										

Your opinion:……..…….

…….

Post-training process evaluation

3. Evaluate the Internet of Things training you have received in five stages in terms of the following achievements.

Category	Very High	High	Middle	Low	Very Low
To have theoretical knowledge in the field of Internet of Things					
Mastering ethical issues in the field of the Internet of Things					
To be aware of the relationship between the Internet of Things and social benefit					

Your opinion:……..…….

…….

4. What are the students' views on the use of the Internet of Things in education? Evaluate in one of the five stages listed below.

Category	Before Internet of Things Online Awareness Training					After the Internet of Things Online Awareness Training				
	Very High	High	Middle	Low	Very Low	Çok yüksek	Yüksek	Middle	Low	Very Low
Having an opinion on the benefits of the Internet of Things in education										
Finding useful use of the Internet of Things in education										
Finding the use of the Internet of Things in education beneficial for professional career										

Your opinion:……..…….

…….

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