

DOI: 10.5281/zenodo.19862399

INFORMATION TECHNOLOGY TEACHERS' VIEWS ON ONLINE EDUCATION: A CASE STUDY OF UŞAK PROVINCE

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Received: 15/02/2026
Accepted: 18/03/2026

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ABSTRACT

During pandemic period, online education came into prominence. Information Technology Teachers hold responsible for issues and took the guidance responsibility in Türkiye. The aim of this study is to determine the views of Information Technologies teachers regarding online education practices. This qualitative study employed a case study design. All Information Technologies teachers working in the city of Uşak were invited to participate in the study and 17 Computer and Information Technologies teachers took part. The semi-structured interview questions were developed by the researcher. After completing content analysis phase, 3 themes were emerged; namely, 1. Information Technologies and Software Course Curriculum, 2. Online Education, 3. Teacher efficacy on technology. The findings illustrated that Information Technology Curriculum was an effective guide, hours allocated for the course were insufficient, insufficient infrastructure of schools did not let teachers cover the content with students and teacher training part for educational technology. One of the most important obstacles to implement online-education was students tried to enter courses via cell-phones because each family had only one computer and there was more than one student at home. The participants stated that their colleagues who were teaching various teaching field had limited computer knowledge and skills. In conclusion, hours in weekly schedule should be raised, software provided by schools to touch upon various applications, teachers in different teaching fields had prejudice towards technology and it could be solved by using more implementations.

KEYWORDS: Information Technology Course, Online Education, Teachers' Efficacy Towards Information Technology.

1. INTRODUCTION

Today, developments led by information Technologies have given rise to the concept of the "information society", in which knowledge is needed across all areas of society and assumes critical roles (Trust, 2018). In information societies, it is necessary to have the ability to access knowledge and to adapt it to existing or new situations through functional and rapid changes (Duman, 2012). Societies that can adapt to these new conditions make full use of the opportunities and conveniences offered by advancing technologies and resources, thereby developing both society and individuals and creating a society in which individuals can devote more time to their personal and social needs (Serefoglu-Henkoglu & Yildirim, 2012). The level of prosperity increases in societies that can adapt to developments in information and technology. In order not to fall behind informational and technological change and development and to improve living standards and increase welfare levels, societies are expected to follow technological developments, improve their infrastructures, or engage in production in different technological fields (Aytekin, 2019). Considering these reasons, information technology education is regarded as the most important step toward achieving these goals (Duman, 2012). Taking these reasons into account, research in our country on the knowledge-based society, communication tools, information and communication technologies, and how learning related to these issues can take place has gained momentum (Akinci & Seferoglu, 2010).

When the history of information technology courses in Türkiye is examined, it is evident that such courses began to be offered as formal subjects in schools affiliated with the Ministry of National Education in 1998, with the development of the internet and related technologies and the recognition that these changes would influence daily life. Since then, the Ministry has provided education aligned with the needs and interests of students and teachers in this field. Socially and economically developed information societies should function as developers and producers of information technologies rather than merely as consumers (Karabulut et al., 2019). However, despite advancements in information technologies, Türkiye continues to occupy a consumer position rather than a producer role in certain sectors. In order to become a producer and developer of information technologies and to keep pace with this transformation, the formal Information Technologies curriculum was revised in the 2016 programs (MONE, 2017; Gulbahar & Kalelioglu, 2018). During the pandemic period,

online education became an integral part of daily life, and following the Kahramanmaraş earthquake that affected 11 provinces in Türkiye, this process extended over an approximately four-year period (Aytekin, 2019).

With the curricular revisions implemented in 2018, the Information Technologies and Software course was reintroduced at certain grade levels as an elective, with its content updated. Curricula should be continuously improved and revised in line with newly generated knowledge as well as corrected and advanced information and technological developments (Bilen, 2002). These developments, discoveries, and technologies should be integrated into education to equip individuals with the competencies necessary to be better prepared for real-life contexts. Yuksel and Saglam (2012), assert that a curriculum's capacity to respond to contemporary needs plays a key role in technology education. The Information Technologies and Software Course is a compulsory subject for 5th and 6th grades and an elective subject for 7th and 8th grades.

Technology demonstrates developments that can be measured not in years but in hours (Basar & Ozdemir, 2021). As a course centered on technology, the Information Technologies and Software course should place emphasis on continuous development, change, and renewal of its curriculum. The instructional tools and materials of the technology-oriented and software-oriented Information Technologies and Software course are expected to be consistently aligned with contemporary and continuously evolving tools and software (Gunduz & Kuzu, 2020). Within the prepared units and the teacher's guidebook, there are also examples of in-class activities that can be conducted without the use of information and communication technologies.

With the onset of the pandemic in 2020, the concepts of distance learning, online education, remote education, internet-based learning, e-education, and e-learning gained prominence due to the need to provide rapid, economical, and low-cost education to individuals in geographically dispersed locations (Karakaya & Aksoy, 2005). Distance education has been described as an educational practice that involves the use of various technological tools and enables the simultaneous instruction of many learners despite their physical separation (Moore & Kearsley, 2005).

In the Special Objectives of the Information Technologies and Software Course, which was finalized with the 2018 curricular revision, the Ministry of National Education defined the

standards that the course curricula are intended to help individuals achieve. These standards focus on educating individuals who can use information technologies effectively and for their intended purposes; who possess digital citizenship awareness; who can accurately carry out processes of problem solving, reasoning, questioning, interpreting, and structuring information; who can transfer acquired knowledge and skills to real-life contexts; and who adopt lifelong learning as a guiding principle. In accordance with these objectives, the learning outcomes and standards that students are expected to attain by the end of the course were specified (MONE, 2018).

Given the widespread implementation of online education, examining how these curricular goals are perceived and implemented by teachers in digital learning environments is critical. Thus, the aim of this study is to determine the views of Information Technologies teachers regarding online education practices.

2. METHODS

This qualitative study employed a case study design. All Information Technologies teachers working in the city of Uşak were invited to participate in the study. A total of 17 Computer and Information Technologies teachers took part. To obtain in-depth data, the interview technique was used. The semi-structured interview questions were developed by the researcher, and a pilot study was conducted with a Computer and Instructional Technologies teacher who had eight years of professional experience.

The following research questions were addressed in the study:

1. What are your views on the Computer and Information Technologies curriculum in terms of addressing the needs of online education?
 - 1.1. Which aspects of the curriculum could be revised to improve the teaching-learning process?
2. What are your views on online education?
 - 2.1. What are your views on the infrastructural needs of schools for effective online education?
3. What are your views on teachers' competencies in delivering effective online education?
 - 3.1. How can teachers be further developed to enhance the effectiveness of online education?
4. What types of limitations have you encountered in relation to online education?
 - 4.1. What types of limitations did other teachers (regardless of their subject area) encounter

during the pandemic period or after the 6 February earthquake in the online education process?

2.1. Population And Sample

In the city of Uşak, there were 30 Computer and Information Technologies teachers, all of whom were invited to participate in the study. Of these, 17 teachers responded to the invitation e-mail and volunteered to take part. In total, the participants consisted of 13 male and 4 female teachers, all of whom participated voluntarily.

2.2. Validity And Reliability

To enhance the trustworthiness of the study, credibility, transferability, dependability, and confirmability criteria were taken into consideration (Lincoln & Guba, 1985). Credibility was strengthened through the use of semi-structured interviews and by conducting a pilot study with an experienced Information Technologies teacher to refine the interview questions. Transferability was supported by clearly describing the research design, participant characteristics, and study context. Dependability was ensured by systematically documenting the data collection and analysis processes. Confirmability was addressed by grounding the findings in direct participant quotations and presenting the analysis transparently.

3. FINDINGS

To enhance the trustworthiness of the study, credibility, transferability, dependability, and confirmability criteria were taken into consideration (Lincoln & Guba, 1985). Credibility was strengthened through the use of semi-structured interviews and by conducting a pilot study with an experienced Information Technologies teacher to refine the interview questions. Transferability was supported by clearly describing the research design, participant characteristics, and study context. Dependability was ensured by systematically documenting the data collection and analysis processes. Confirmability was addressed by grounding the findings in direct participant quotations and presenting the analysis transparently.

3.1. Information Technologies and Software Course Curriculum

Participants who were asked about their views on the Information Technologies and Software Curriculum stated that the content was effective and adequate, and that the topics aimed at developing fundamental skills could be addressed effectively;

however, they emphasized that the allocated course hours were insufficient. It was highlighted that the course should be offered for at least two hours per week rather than one. Participants who engaged in self-criticism noted that individual differences could not be sufficiently taken into account, attributing this limitation primarily to the one-hour-per-week course duration.

All participants (N=17) indicated that the curriculum content was sufficient to address the necessary fundamental knowledge, and they considered the guiding role of the formal curriculum to be satisfactory for Information Technologies teachers. There was a strong consensus regarding the limited number of weekly instructional hours allocated to the Information Technologies and Software course, which is currently scheduled for only one hour per week. Almost all participants (n=13) emphasized that the software provided in schools was insufficient. They also reported that individual differences could not be adequately addressed due to

crowded classrooms and inadequate software resources. The technological infrastructure of schools was perceived as limited, particularly in terms of available applications. Theoretical instruction was evaluated as ineffective for this course, as hands-on practice was identified as a key factor in an effective learning process. However, inadequate technological infrastructure constrained teachers' ability to implement application-based instruction. Insufficient internet connectivity and the lack of properly equipped laboratories were identified as additional barriers to effectively covering the curriculum content. Measurement and evaluation practices conducted through EIN (EBA) were also considered problematic by some participants, particularly due to students' interactions during examinations.

Table 1 presents the coding of teachers' views on the Information Technologies and Software Course curriculum.

Table 1: Views On Information Technologies and Software Course Curriculum.

Codes	f
Effective guidance for teachers	17
Insufficient hours in the weekly schedule	17
Insufficient school infrastructure in terms of technology and software	16
Insufficient students' prerequisite knowledge	15
Clear and understandable learning outcomes	15
Lack of time to take individual differences into account	10
Lack of laboratories equipped with current technology	6
Problems in measurement and evaluation through EIN (EIN means EBA in Turkish)	3

Participants also emphasized the difficulty of obtaining information about students' prerequisite knowledge in distance education. Although deficiencies in prerequisite learning are evident, attempts to assess these deficiencies are perceived as time-consuming within the context of distance education. It was noted that the challenges of distance education are further intensified in classes where teachers have had no prior opportunity to become acquainted with students and where no background information is available, such as with students who have recently entered high school (e.g., 9th graders)

Additionally, the inability of computer laboratories to support current technologies, the failure to procure necessary software due to financial constraints despite the rapid pace of technological advancement, and the high costs associated with establishing laboratories in schools lacking such

facilities were identified as factors that negatively affect the teaching-learning process and hinder the achievement of intended learning outcomes.

3.2. Online Education

For some students, online education became a part of daily life during their years of schooling. The Education Information Network (EIN/EBA) is a software platform used by all teachers working in public schools. In-service teacher training programs, which teachers are required to follow and respond to questions at the end of training videos, are also delivered through EIN (EBA). In addition, Information Technologies teachers are responsible for training other teachers in computer and software applications related to their courses. In this study, Information Technologies teachers were asked to share their views on online education.

Table 2: Online Education.

Codes	f
Applications could not be run on mobile phones.	16

Native (Turkish) applications are needed.	14
Face to face instruction is required for the Information Technologies and Software course.	12
Conducting all courses online resulted in teacher and student exhaustion.	8
An independent Coding course should be added to the curriculum.	5
Parents should also receive training.	4
Remedial courses should be face to face.	2

Participants stated that most software is in English and that both students and teachers have difficulty understanding the steps clearly. They emphasized the need for native applications developed in Turkish and compatible with mobile phones, as only one PC is typically available in an average household. This situation becomes particularly problematic for online education in households with more than one child. Another prominent finding was the necessity of face-to-face instruction for the Information Technologies and Software course. Participants reported that students often perceive their informatics knowledge as insufficient, which leads to panic when they make mistakes.

During the pandemic period, all courses were delivered online. According to the participants, this situation resulted in exhaustion among both students and teachers. Students tended to play online games, communicate with each other, or turn off their cameras and engage in activities unrelated to the lesson while appearing to attend online classes. Explaining procedural steps and the rationale behind these steps based on the lesson content was reported to be particularly difficult for Information Technologies and Software teachers.

Another finding of the study was the necessity of providing training for parents regarding online education. The importance of parents reviewing course content with students after lessons and engaging them in practice-based activities was emphasized. Notably, many parents believe that all responsibilities related to repetition and practice in learning belong solely to schools and teachers and do not consider themselves responsible for guiding students with homework, which further complicates the online education process. Therefore, it was suggested that parents should also receive training. However, participants indicated that even if such training was offered, participation would likely be very limited ($n = 4$). Parents' heavy work schedules were identified as the primary reason for their limited involvement in supporting students' learning processes. Representative quotations from the

interviews are presented below:

"Especially the Coding course cannot be conducted via mobile phones or tablets. When students have siblings, there is usually only one computer at home, and the alternatives, that is mobile phones or tablets, are not suitable for the requirements of the Coding course. All students try to implement the tasks at the same time. We encounter various problems simultaneously and cannot adequately explain how to correct or apply the steps. Maintaining focus on the subject while solving students' problems was extremely difficult" (A male teacher with 15 years of experience)

"The Information Technologies and Coding course delivered through EİN was frequently interrupted. There is no fiber internet connection in my neighborhood" (A female teacher with 17 years of experience)

3.3. Teacher Efficacy on Technology

During the later stages of the pandemic, when Information Technologies teachers were also responsible for providing training to other teachers, hybrid education models were implemented. While some schools preferred to divide classes into double shifts, other adopted arrangements in which attendance was organized by grade level on different days of the week. For example, 5th and 6th graders attended school on Wednesdays and Fridays, whereas 7th and 8th graders attended on other designated days. All participants emphasized that not all courses should be delivered online. According to teachers' views, courses that involve practical applications, particularly the Information Technologies and Software, should be conducted face to face. Participating teachers reported that students' motivation toward learning was very limited during the online education process. They also noted that older teachers tended to show resistance to computer and instructional technologies and experienced significant difficulties, largely due to their limited technological knowledge.

Table 3: Teacher Efficacy.

Codes	f
Limited computer knowledge	17

Resistance to learning technological applications	17
Anxiety toward technology	15
Fear of making mistakes	13
Inability to support student motivation in online education	2

An important finding emphasized by the Information Technologies and Software teachers was the anxiety experienced by teachers from other subject areas when using computers. Examples that made this anxiety visible included calling ITS teachers via mobile phone at the beginning of lessons to ask, step by step, what actions to take, and even asking how to turn cameras or microphones on or off, which are situations particularly common among older teachers. Participants also highlighted the stress teachers experienced when pressing an incorrect key, when the screen changed unexpectedly, or when they were unable to save their work.

"When I started introducing Zoom and similar distance education tools to my colleagues and moved into the implementation phase, I encountered numerous problems. Unfortunately, many teachers are closed to professional development. Some claimed that distance education was unnecessary, some did not have a personal computer at home and asked me to install school computers in their houses, and others suspected that Zoom would steal their personal information... the list goes on. From the students' perspective, they became bored very quickly with this mode of instruction, and families did not provide sufficient support." (A male ITS teacher with 22 years of experience)

"During the teacher training phase, I realized that teachers from all subject areas had very limited knowledge of online education materials, how to use them, and issues related to cybersecurity." (A male ITS teacher with 19 years of experience)

"Teachers continued to distance themselves from information technologies, even though they needed to use them during the pandemic to conduct their courses. Despite having limited knowledge, they were unwilling to learn about online education practices." (A female ITS teacher with 16 years of experience)

"They are genuinely afraid of making mistakes because they do not know how to correct them. When they become anxious about making errors, they are unable to implement instructional materials or connect them to the computer, which leads to chaos and panic." (A male ITS teacher with 22 years of experience)

4. DISCUSSION AND CONCLUSION

The first theme that emerged from the

participants' responses was the Information Technologies and Software Curriculum. Participants strongly criticized the allocation of only one hour per week for the Information Technologies course, noting that this limited duration prevents teachers from effectively covering both the theoretical and practical components of the curriculum. This finding is consistent with results reported in previous studies (Demir, 2025; Sarikoz & Bangir Alban, 2017). Participants expressed a need for more detailed instruction on Web 2.0 tools. For example, one participant referred to the use of Second Life software, while another mentioned a geography teacher's request for guidance on Arduino and Second Life applications for use in online courses. In addition, participants suggested that a Robotics and Coding course could be designed and incorporated into the curriculum as a separate subject. Such a course could support students in understanding technology more deeply and in producing creative technological outputs (Yilmaz, 2021). To ensure effective instruction in robotics and coding, additional hours could be allocated in the weekly schedule. Furthermore, although the existing topics and content include up-to-date information, they were considered insufficient under current conditions. Given the rapid daily advancements in information technologies and their associated costs, these findings align with those reported by Yilmaz (2021). Another common finding shared with Yilmaz's (2021) study is that while robotics and coding topics are mentioned within Information Technologies courses, they are not formally included in the curriculum. According to Demir (2025) robotics should be offered as a standalone course rather than as isolated topics within other subjects.

The participants in this study stated that the curriculum's learning outcomes were clearly and explicitly defined. However, although these outcomes were clear to teachers, they were perceived as being above students' levels and difficult to achieve when students' readiness levels were taken into consideration. A review of the literature indicates that this finding is consistent with the results reported by Sarikoz (2017) who similarly emphasized that clearly stated learning outcomes may remain unattainable due to insufficient student readiness. In addition, the inadequacy of allocating only one hour per week to the course has been widely highlighted in previous studies (Yilmaz, 2021;

Aytekin, 2019; Sarikoz & Bangir Alpan, 2017). When the learning outcomes were evaluated in relation to students' readiness levels, participants indicated a clear mismatch between the expected outcomes and students' preparedness. Overall, while the learning outcomes were found to be clearly articulated, studies by Sarikoz (2017) and Apsur (2025) further revealed that both insufficient instructional time and inadequate instructional tools and materials hinder the effective achievement of the intended learning outcomes.

Measurement and evaluation are integral components of every course and require new approaches with the transition to online education (Apsur, 2025). Students' interactions with one another cannot be effectively controlled during online examinations. According to the findings of this study, one of the most significant limitations of online education is the difficulty proctoring online exams. Similarly, Harmon and Lambrinos (2010) conducted a research study to examine cheating in online exams and found that cheating is likely to occur when exams are not proctored. This finding supports the participants' concerns in the present study regarding the prevalence of cheating in online assessment contexts.

In their study with Information Technologies and trainer teachers, Sahinkayasi and her friends (2011) reported that the majority of trainer teachers were dissatisfied with providing in-service training. In a similar vein, the findings of the present study indicate that compulsory participation in seminars, combined with inadequate technological infrastructure and insufficient software in schools, leads to decreased motivation among teachers. Even when teachers occasionally express a desire to learn about applications such as Web 2.0 tools or Arduino and demonstrate high motivation, the lack of adequate technological infrastructure within schools is perceived as a significant barrier to such learning.

Low levels of student motivation toward learning also emerged as a key finding of the study. Participants attributed this issue primarily to the absence of questions related to the Information Technologies and Software course in national centralized examinations. Consistent with this result, İs (2024) reported that the lack of a specified number of information technology-related questions in national examinations diminishes students' perceived need to learn informatics, thereby negatively affecting both student and teacher motivation.

Previous research has shown that the presence of information technologies laboratories in schools positively influences teachers' job satisfaction, self-

efficacy, and motivation (Dursun & Saracoglu, 2016; Temelli & Guvenc, 2014). However, in the present study, 34% of the participants (N=17) reported that their schools lacked an Information Technologies and Software laboratory. Participants stated that this deficiency constrained instructional practices and adversely affected teacher motivation. Similarly, Polat (2023) emphasized that the absence of laboratories limits the effective implementation of course-related activities.

Despite the distribution of tablets to students by schools, many students attended lessons via mobile phones and experienced difficulties in completing application-based tasks. With the shift to online education during the pandemic, access to computers became a significant challenge in households with more than one child, as siblings participated in online learning simultaneously. This finding aligns with the results of Cigili and Eryaman (2023). The present study further revealed that certain applications included in the course content posed limitations for students who accessed lessons through mobile phones. Internet connectivity problems, financial constraints, and the need to rely on mobile phones due to shared computer use among siblings were identified as major limitations of online education (Adak, 2022).

This study's findings show that despite increased access to digital tools, teachers lack sufficient skills in pedagogical integration affect information technologies teachers' educational endeavors (Altunisik & Akturk, 2021; Avci & Atik, 2020). Digital transformation necessitates changes in teachers' perceptions of educational needs throughout the instructional process, as well as shifts in the perspectives of teachers and policymakers toward informatics (Almaazmi, 2025). Studies conducted in Türkiye on the knowledge and usage levels of teachers regarding Web 2.0 technologies show that significant deficiencies still exist in this area. Indeed, various studies supported by the Ministry of National Education emphasize that despite increased access to digital tools, teachers lack sufficient skills in pedagogical integration (Altunisik & Akturk, 2021; Avci & Atik, 2020). Based on the observations of Information Technologies teachers who conducted seminars, older teachers were reported to exhibit considerable resistance to information technologies. While three participants noted that questions were raised regarding Web 2.0 tools and one mentioned inquiry about the Second Life application, Information Technologies teachers emphasized that compulsory seminar attendance, a lack of perceived need for learning, and the belief

that lecturing is the only effective instructional method contribute to reduced motivation for professional learning across disciplines. Similarly, Adak and Koc (2022) found that school administrators and teachers expressed a demand for information about Web 2.0 tools. It was also noted that older teachers, in particular, often did not perceive a need to acquire new knowledge during seminars.

Another notable finding of the study was the limited capacity to produce materials suitable for distance education, along with a lack of motivation to do so. It was particularly noteworthy that requests for practical guidance on the use of the Fatih Pen application during seminars were predominantly made by teachers from quantitative disciplines, such as science and mathematics. In line with this, Cetinkaya and Elalmis (2022) reported that primary school teachers preferred using a physical

whiteboard to demonstrate letter writing rather than employing technological materials designed for online education. Participants in their study explained that they positioned the computer camera to capture a whiteboard mounted on a tripod, allowing students to observe the instruction via video.

For future research, it is recommended to investigate which software teachers and preservice teachers perceive as necessary for their professional development, to examine the implementation of Arduino programming by teachers from different subject areas, and to explore the effectiveness of three-dimensional virtual environments, such as Second Life, across diverse instructional contexts. Additionally, comparative studies contrasting these approaches with traditional teaching methods may provide further insights.

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