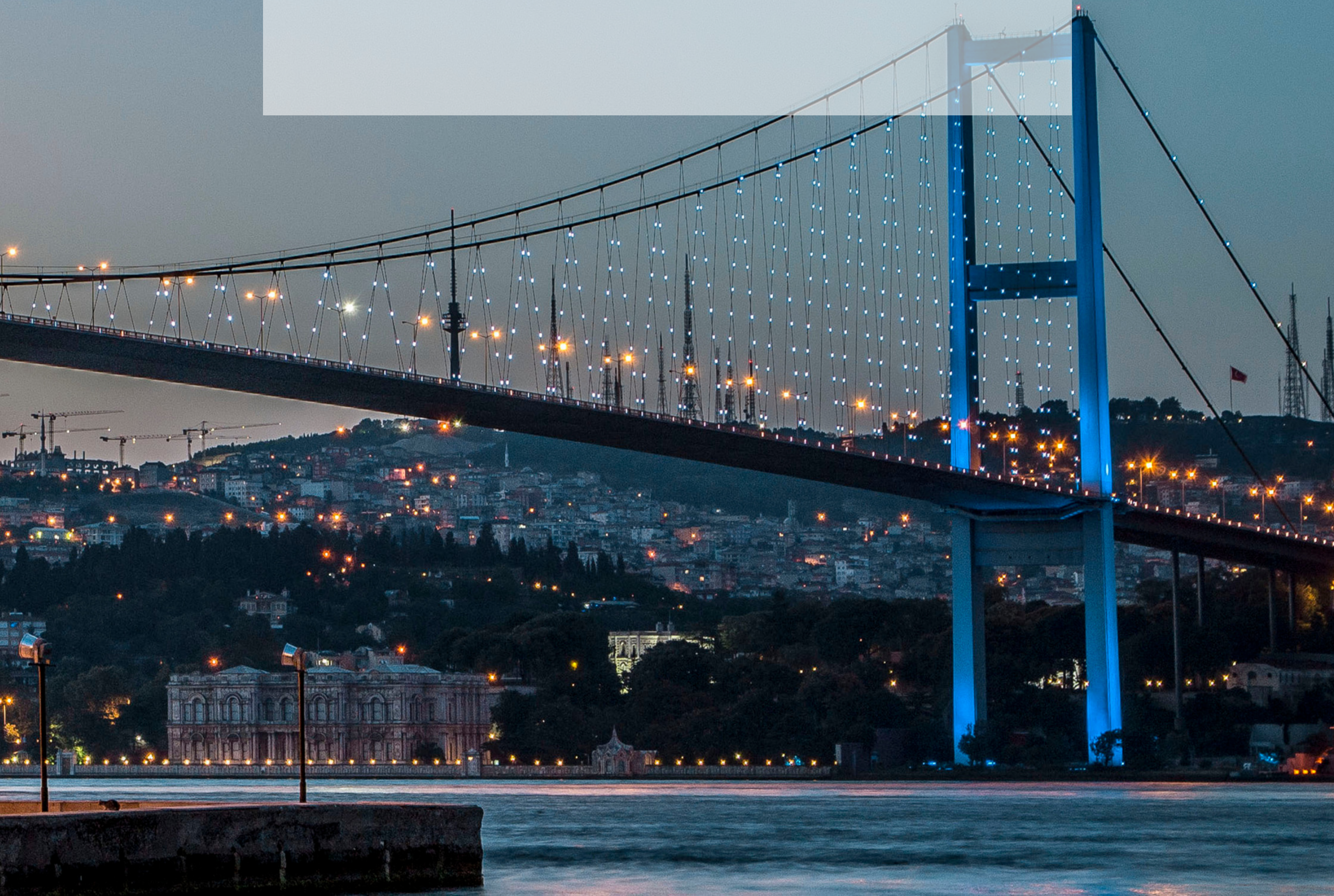


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INVESTIGATION OF STUDENT VIEWS ON DATA PRIVACY AND ETHICAL USE OF DATA IN SMART LEARNING ENVIRONMENTS

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ABSTRACT

In this study, the views of university students using a smart learning environment on data privacy and ethical use of their data in the smart learning system were examined. The research was carried out on 30 university students. The data of the study were obtained through the semi-structured student opinions determination form developed by the researchers. Content analysis was performed in the analysis of the data. The research findings indicated that the majority of the students reported that the use of the smart learning system did not cause any ethical concerns or fears. However, some students stated that it would be appropriate to inform the students about how the data is protected and used, the privacy policy of the system, and who can access the data. Some students state that the smart learning system serving on a university server gives them a great deal of confidence. One of the reasons why students do not experience fear or anxiety about data privacy and ethics may be their low knowledge and awareness about cyber security. Students agree that it would be appropriate to view the learning analytics results on the dashboard of the smart learning system only by the course teacher, apart from the teacher, system administrator, classmates, etc. stating that people should not see this information. When asked whether the artificial intelligence system should obtain permission from students to use their data in order for the smart learning environment to analyze the learning analytics results on the dashboard page, 90% of the students stated that permission should be obtained from students. The vast majority of students consider teachers and system administrators responsible for the confidentiality and management of learning analytics results on the dashboard page of the smart learning environment. It is seen that the number of students who hold themselves responsible in terms of data security is quite low. In line with the findings obtained from the research, a discussion was made about what should be considered in smart learning environments in terms of data privacy and ethical use, and various suggestions were made. The vast majority of students consider teachers and system administrators responsible for the confidentiality and management of learning analytics results on the dashboard page of the smart learning environment.

Keywords: Smart learning environments, Smart MOOCs, Data Privacy, Ethical Use of Data

INTRODUCTION

With the effect of digital transformation in education, the use of learning environments enriched with technology in learning-teaching processes is increasing. Students actively use technology both in face-to-face classes and in out-of-class processes (eg doing homework at home) (Karaoglan Yilmaz & Yilmaz, 2022). As a result of the reflection of the developments in technology on education, the technologies used for educational purposes have started to become smarter. Smart learning environments support students' academic development with opportunities such as providing personalized tutoring opportunities, instant and detailed feedback, and providing personalized advice and guidance.

Smart learning environments store data about the learning behaviors of each student to reflect the above-mentioned advantages to the student, and this data is analyzed with data mining and machine learning techniques, so that the system recognizes the student. Personal data required for creating smart learning environments also brings risks of data privacy and ethical use. In this context, the use of data on learners requires consideration of privacy and ethical dimensions (Marshall et al., 2022). Although there have been various studies on data privacy and ethical use in recent years, a general standard and ethical norms have not yet been determined. However, there is a huge gap, with insufficient practical support or resources, between emerging research results on data privacy and ethical use and the world in which most practitioners of smart learning environments live and practice. For this reason, it is important to research experienced stakeholders using smart systems (Cetintav et al., 2022). At this point, it may be useful to examine the experiences and opinions of student stakeholders in smart learning environments. In addition, it is important to increase the number and diversity of publications in the field of educational sciences on data privacy and ethical use to establish a general consensus on this issue.

This research aims to examine the opinions of students who use the smart MOOC environment, which is created by combining artificial intelligence technologies, about data privacy and ethical use. The aforementioned smart MOOC is an integrated system created using adaptive learning, recommendation system, learning analytics, data mining and machine learning, intelligent tutoring system, adaptive mastery testing, dynamic assessment components (Tepgec et al., 2021a, 2021b). The smart MOOC system in question obtains student data from each component of its artificial intelligence technologies. These data are collected in line with the approval of the students registered in the system and used for personalized tutoring (Yilmaz et al., 2022). Based on the learning analytics results on the dashboard of the system, the data regarding the learning process and results of the students are presented visually (Karaoglan Yilmaz et al., 2021; Sahin et al., 2021). This research will guide future research on what can be done regarding data privacy and ethical use in smart MOOCs, where the trend in education is increasing.

METHOD

Within the scope of the research, the opinions of the students using the smart MOOC environment on data privacy and usage in the smart MOOC environment were examined in the context of data privacy and ethical use. For this purpose, the students' views were examined and analyzed in the research according to the qualitative research design.

Participants

The research participants are 30 university students using the smart MOOC environment. 70% of the students participating in the research are male and 30% are female. Within the scope of the research, the students used the smart MOOC system during an academic term within the scope of the statistical methods in education course.

Data Collection Tools and Analysis of Data

Within the scope of the research, a semi-structured student opinion determination form was developed by the researchers to determine university students' opinions about data collection and use in smart MOOC in the context of data privacy and ethical use. The questions in the form took their final form after the literature review and then the examination of 3 faculty members who are experts in the field of educational technology. The content analysis method was used in the analysis of the data. Student responses were analyzed separately by two different researchers. Then, the coding made to ensure the analysis's consistency was compared and a consensus was reached.

FINDINGS, DISCUSSION AND CONCLUSION

In the context of the first research question, the following question was asked to the students. The smart MOOC system based on artificial intelligence on the mooc.bartın.edu.tr site analyzes the data obtained from you and extracts your learning analytics. In this way, the system tries to recognize you. Do you think the system's use of your data in this way causes you any ethical concerns / fears? The results of the analysis on the students' views on the research question are given in Figure 1.

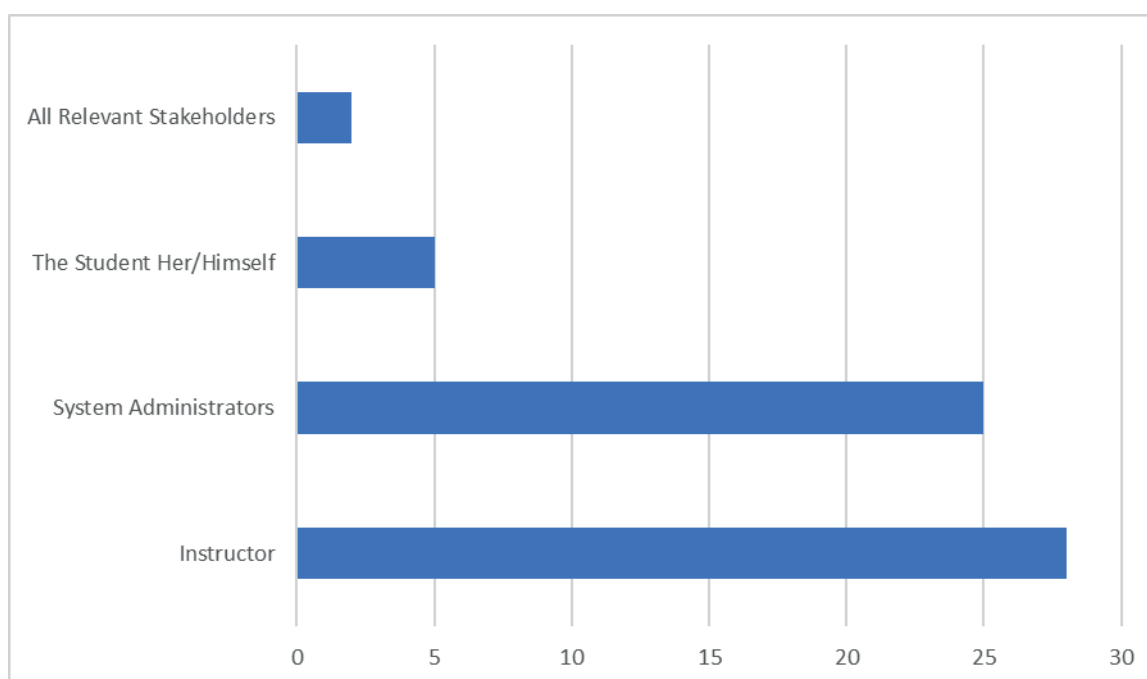


Figure 1. Ethical Concerns of Students in the Context of Data Privacy and Ethical Use

When Figure 1 is examined, it is seen that the majority of students collect student data and use this data by the smart MOOC system, which does not create ethical concerns for students. When the reasons why the students do not have ethical concerns are examined, it is understood that the students are confident because the smart MOOC system is serving on the university servers. Another reason why students do not have ethical concerns may be the low level of knowledge and awareness of students in the context of data privacy and ethical use. Some of the students opinions are as follows.

S1: *"The use of data is not a concern for me. Because after all, this is the case in most applications that need to create a database."*

S2: *"It doesn't cause me any concerns, these data can be used for my education."*

S3: *"I have a concern about how the data is protected or processed. Information can be provided in terms of confidentiality."*

S4: *“It doesn’t cause me any anxiety either. The fact that it is an educational site may also be the reason for this.”*

In the context of the second research question, the following question was asked to the students. Who should be able to see the learning analytics results on the Dashboard page on the mooc.bartın.edu.tr website? The results of the analysis of the students’ views on the research question are given in Figure 2.

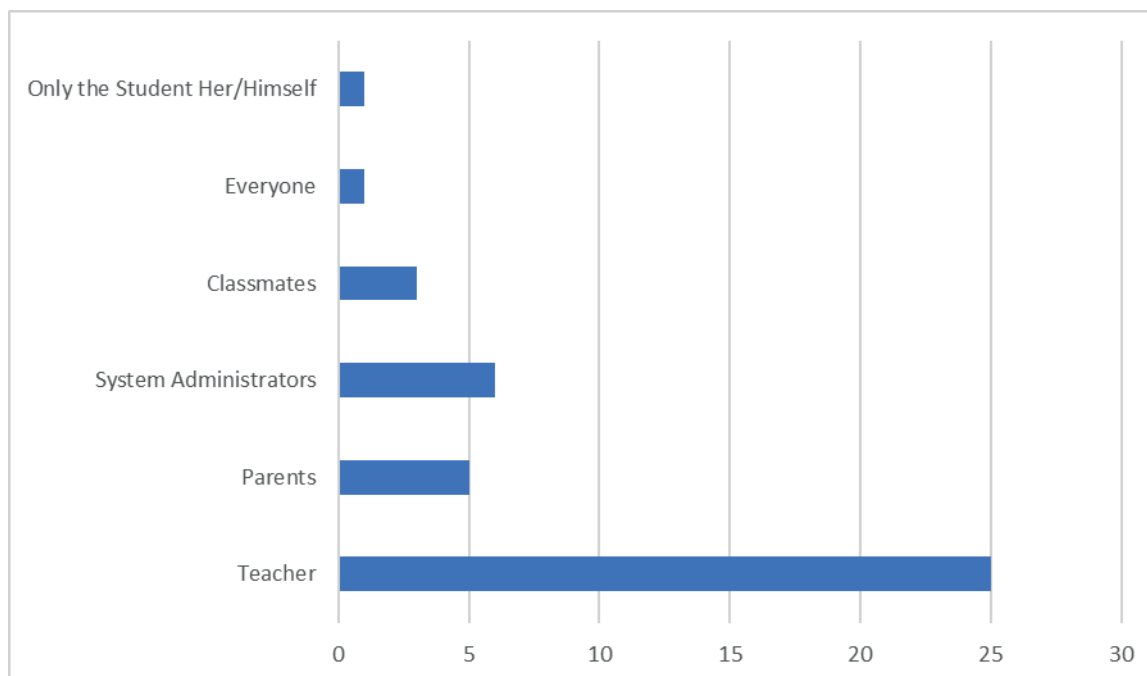


Figure 2. Student Views on Who Should See the Data

When Figure 2 is examined, the majority of the students state that the lesson teacher should be able to see their data. A small number of students stated that system administrators, parents and classmates can see this data. Again, a small number of students stated that this data could be accessible to everyone. These views of the students make us think that students’ knowledge and awareness of possible cyber security vulnerabilities and threats may be low in the context of data privacy and ethical use. Some of the student opinions are as follows.

S1: *“Only teachers should be able to see outside of ourselves because outside of us and the teachers cannot know what we need or not.”*

S2: *“Teachers should be able to see because they can change their education style accordingly. I don’t find it right for students to see each other’s knowledge.”*

S3: *“Teachers and system administrators can see it, but it is not necessary for other students to see my mistakes or truths, my friends should not see it.”*

S4: *“The students should be able to see the people they allow or their common classmates.”*

In the context of the third research question, the following question was asked to the students. In order for the smart MOOC environment to analyze the learning analytics results on the dashboard page, do you think the artificial intelligence system should get permission from the students to use their data? The results of the analysis regarding the students’ views on the research question are given in Figure 3.

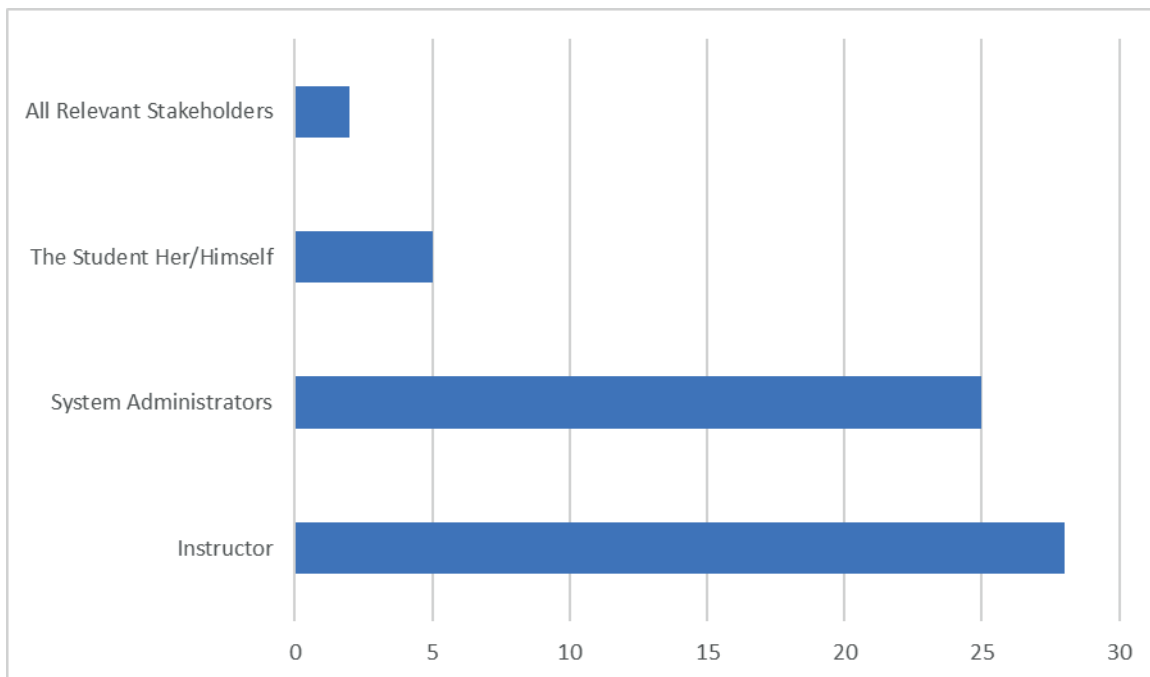


Figure 3. Student Opinions on Whether the Smart MOOC System Should Obtain Permission for Data Use

When Figure 3 is examined, the majority of the students state that permission should be obtained from the students in order to use the student data. On the other hand, some students stated that the system can use student data without permission.

In the context of the fourth research question, the following question was asked to the students. Who is responsible for the privacy, use and management of your data in the Smart MOOC environment? asked the question. The results of the analysis of the students' views on the research question are given in Figure 4.

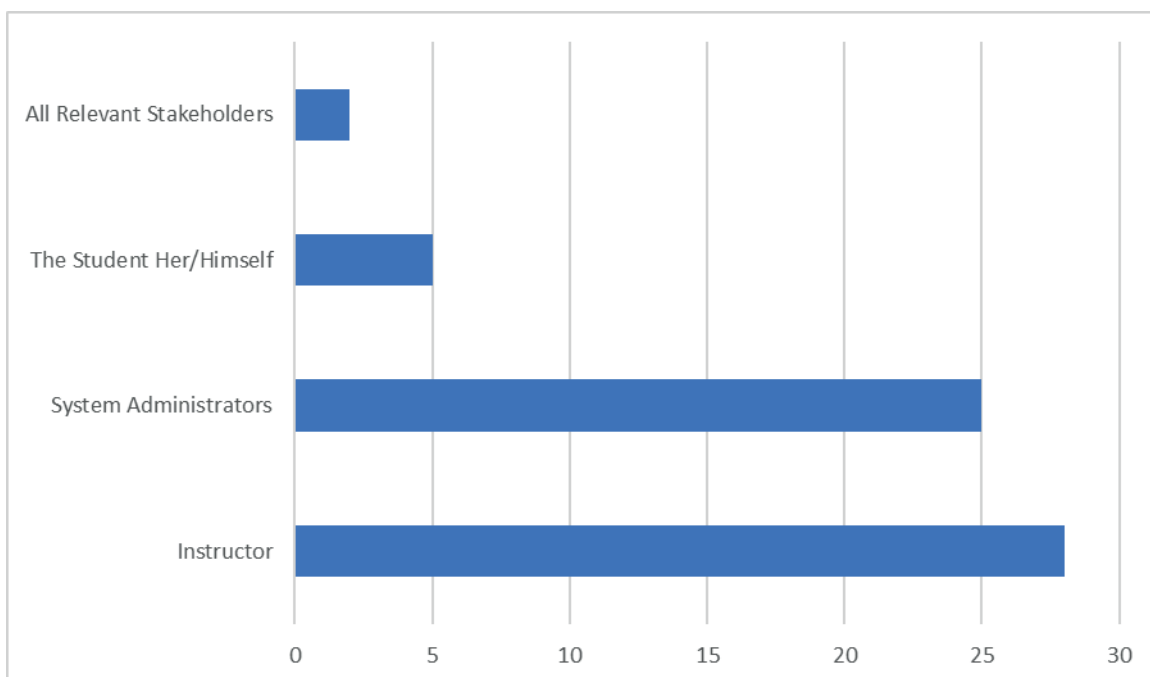


Figure 4. Student Views on Who is Responsible for the Privacy, Use and Management of Data in the Smart MOOC System

When Figure 4 is examined, it is understood that the majority of the students hold the course teacher and system administrators responsible for data privacy and management. It is understood that the majority of the students do not know that they are also responsible for the confidentiality and management of their own data. It is estimated that the knowledge and awareness of the students on this subject is low or they do not consider themselves consciously responsible for this issue. Some of the student views on data privacy and management are as follows.

S1: “First of all, it is necessary to ensure its security. Confidentiality data should not be stored or stored securely. Not to make unnecessary information mandatory or even not to ask at all, the less information, the less data is created.”

S2: “Personal rights and privacy should be given importance.”

S3: “Having a good host company, the database modeling is suitable for the corporate architecture, and the program used in the backend is suitable for the corporate architecture, because when we try to add a feature, it may break the system.”

S4: “Student data should not be shared with others. Students should be informed about the process and necessary permissions should be obtained.

When the research findings are evaluated in general, it is understood that students trust artificial intelligence systems created for educational purposes in the context of data privacy and ethical use. However, some students stated that it would be appropriate to inform the students about how the data is protected and used, the privacy policy of the system, and who can access the data. For this reason, it would be appropriate to inform students clearly about these issues during the registration process to the system. In addition, when the answers of the students are evaluated, it is thought that the knowledge and awareness of the students in the context of data privacy and ethical use may be low. It would be useful to conduct future research to examine students’ knowledge and awareness.

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