Accelerating Western Balkans University Modernization by Incorporating Virtual Technologies

VTech@WBUni

WP1 - Deliverable D1.3

REGIONAL RESULTS/FINDINGS ON THE USE OF VIRTUAL TECHNOLOGIES IN TEACHING METHODOLOGIES IN KOSOVO

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1. Introduction

Possessing specific ICT skills to affect economic competitiveness, especially in a small country such as WB countries (Albania, FYROM, Kosovo), with high unemployment rates whereas one of the solutions to survive is active participation in a lifelong learning process (European Commission, 2011), by upgrading current competences and obtaining new competences, needed in the local, regional, European and global labour market.

Virtual Technologies are considered tools to transform and modernize Higher Education. Students today are already familiar with various technologies, which is why computerized tools and apps make sense in a classroom setting. In WB countries the rate of possession of smartphones and other smart equipment is comparable with the rate presented for European countries.

The project's general aim is to introduce for the first time at Western Balkan universities the concept of virtual technologies as a tool for accelerating university modernization while contributing to developing a knowledge-driven society.

By incorporating Virtual Technologies in the academic culture of universities we aim to increase the quality and level of efficiency in teaching and knowledge retention through interactive learning methods, thus contributing to skills enhancement and further building of a digital society in WB countries.

In the mid and long term, the project will enhance the effectiveness of the higher education system in knowledge retention and application. The project's direct beneficiaries are universities, schools, teachers, students, regional industries, and businesses.

Some of the specific objectives of the project are:
- Capacity building of academic staff to incorporate Virtual Technologies in Teaching
- Develop teaching methodologies availing of technology and/or ICT tools
- Increase the level of understanding and reduce the grasping time and the effort that students need to learn information by using 3D concepts instead of 2D ones
- Offer a better delivery of basic knowledge even for complex issues, higher learning efficiency, and better learning experience by AR/VR techniques.

The project brings together 11 partners with the University "Aleksander Moisiu" of Durres as the lead partner.

- Aleksandër Moisiu University of Durrës
- European University of Tirana
- Polis University
- Epoka University
- University of Prishtina
- University for Business and Technology
- South East European University
- Mother Teresa University
- University of Ljubljana
- University of Tartu
- Lodz University of Technology

This Report is prepared as an activity and deliverable within Vtech Erasmus + project.

The compilation of the Report is based on student and teaching staff evaluations collected from 1289 students and 275 teachers' responses in respective questionnaires.

The European Commission's support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors and project consortium, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

2. Objectives, methodology, and scope of the survey

The objective of the survey is to measure the level of implementation of interactive learning methods, with a focus on VR/AR Technologies, within the study program in universities in Kosovo. The survey also aims to enhance the skills for further building the digital society in Kosovo.

The survey collects data for gaining information regarding the researchers' (teachers) knowledge about virtual/digital technologies including the use and impact of virtual technologies in relevant study fields. In addition, this survey also gathers information regarding the frequency of laboratory usage in specific universities. There is also a field where the survey participant can give their suggestion about the type of virtual technologies that they desire to be implemented in the respective classes.

The student's knowledge of virtual/digital technologies is also evaluated through this survey. The students gave their feedback about the level of the implementation of virtual technologies in their specific study field. They also evaluated the impact of these

technologies in their specific field of study. Furthermore, students gave their suggestions about the kind of technologies that they want to be implemented in their faculties.

The information gained through this survey represents the level of virtual technologies knowledge in Universities and Private Higher Education Institutions in Kosovo. The data collected is consistent in both education sectors.

The survey is conducted from Assoc. Dr. Sabrije Osmanaj, Prof. Ass. Dr. Hana Maloku and Ass. MSc. Jeta Dobruna, professors in the Faculty of Electrical and Computer Engineering (FECE) and was electronically delivered to researchers and students during November, December 2020, and January 2021.

3. Sample (questionnaire) design

Based on the purpose of the VTECH project and the respective objectives, the following data was obtained from relevant universities, for the purpose of updating the sampling framework, regarding the:

- Number of teachers
- Number of students
- Study fields
- Digital devices
- Virtual technologies
- Existing laboratories

The survey scope consists of teachers and students. Based on this information the relevant samples are formulated, for teachers and professors. Afterward, the samples are delivered to the University of Prishtina, the University of Peja, the University of Gjakova, the University of Prizren, and the two biggest Private Higher Education institutions: AAB and UBT.

The purpose of this survey is to provide information about the knowledge and frequency of usage of digital/virtual technologies from teachers/researchers and students. Relevant data were collected and processed based on selected samples. Based on the survey results, recommendations will be derived regarding the need for training for different types of virtual technologies.

The data is gathered electronically, through the online survey, under the supervision of the above-mentioned team, selected from VTECH project coordinators.

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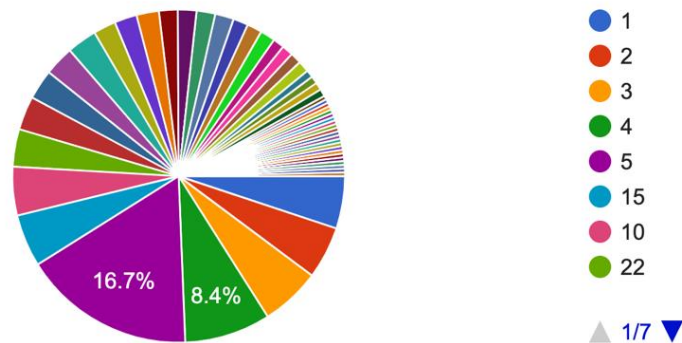@western balkan universities

4. Results

The survey data are collected through two questionnaires and the results are presented below:

4.1. Results of teachers' questionnaires

Teachers' questionnaires consist of eleven questions and graphs for each question are presented below:
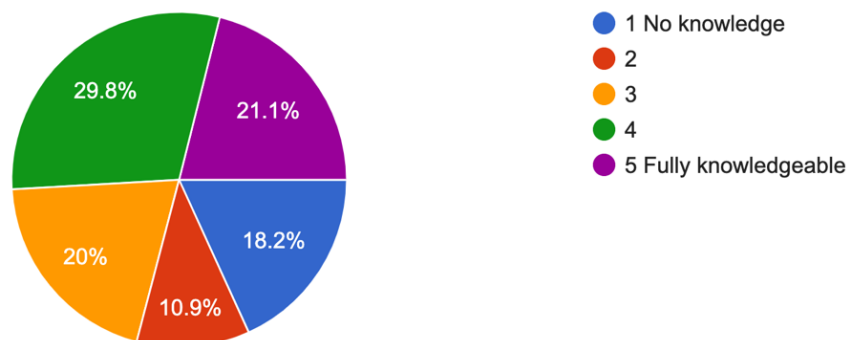
1. How many years have you been teaching?
275 responses

This question consists of data regarding the teachers' experience in teaching. It should be noted that the survey participant were teachers with different teaching experiences.

The above graph presents the percentage of participants in terms of their teaching experience. 41.1% of the respondents have up to five years of experience in teaching, while the others have more than five years of experience in teaching.

2. Which is your actual knowledge regarding virtual/digital technologies?
275 responses

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The second question reflects the knowledge of teachers regarding virtual technologies. As presented in the graph above, teachers are not very familiar with virtual technologies. 18.2% have no knowledge of these techniques, while 21.2% stated that are fully knowledgeable about virtual technologies.

3. How much have you tested the use of virtual reality or augmented reality in order to supplement current classroom teaching?
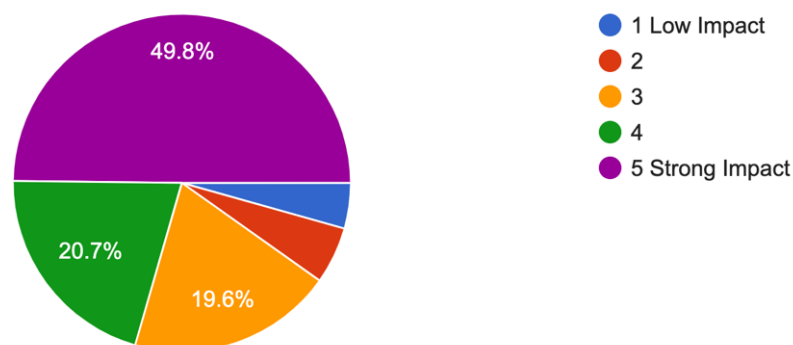275 responses

- 1 Never
- 2
- 3
- 4
- 5 On daily basis
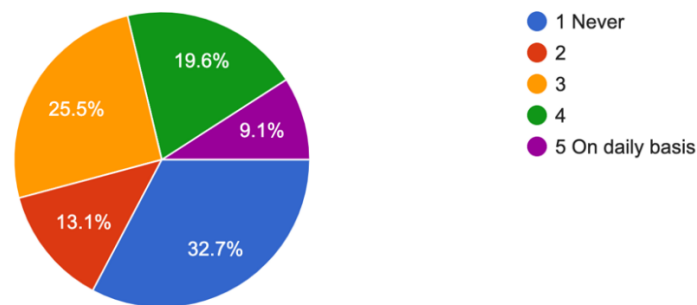
The third question provides information about the frequency of usage of virtual reality in the teaching process. From the presented graph we can see that there is a low level of implementation of virtual reality in the different teaching courses.

4. Rate the impact of virtual technologies in your specific field of education
275 responses
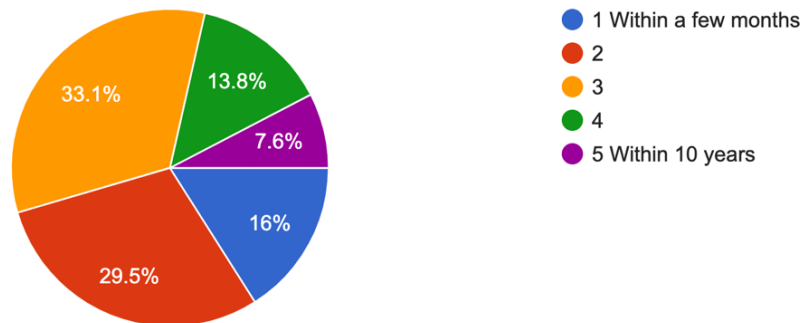

- 1 Low Impact
- 2
- 3
- 4
- 5 Strong Impact

This question evaluates the impact of virtual technologies in the relevant fields of education. Half of the participants evaluated that these technologies have a strong impact on their specific field. Some of the participants' teaching fields were: engineering, computer science, mathematics, environmental science, civil law, tourism, management, etc.

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5. Thinking about the adoption of this new technology into education, how soon do you see virtual reality making it into your school?

275 responses

Legend:
- 1 Within a few months
- 2
- 3
- 4
- 5 Within 10 years

Pie chart values: 33.1%, 13.8%, 7.6%, 16%, 29.5%

The fifth question reflects the teachers' opinion about the speed of the implementation of virtual technologies into the teaching process. From the graph, we can see that the teachers evaluated that the implementation of these technologies will take a couple of years.

6. Please rate the current level of the hardware present in your school/university.

275 responses

Legend:
- 1 No equipment
- 2
- 3
- 4
- 5 Fully equipped

Pie chart values: 27.3%, 10.9%, 7.6%, 22.2%, 32%
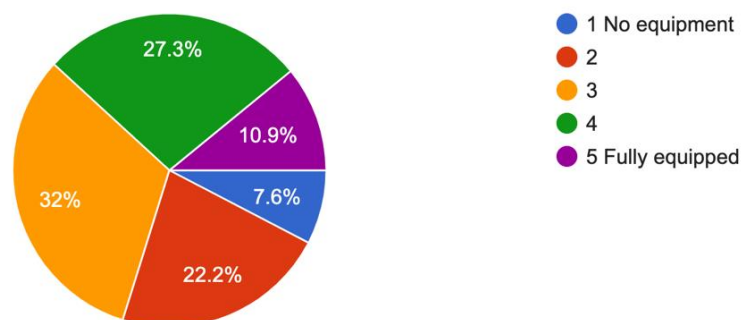
In the sixth question, a participant gave their feedback about the level of hardware present in their university. They indicated that there is not enough hardware in their schools, as it is shown in the graph.

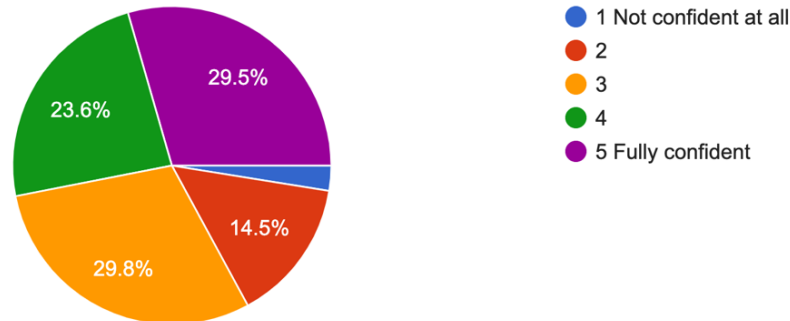7. *Which kind of digital technologies and tools would you like to learn more about?*

In the seventh question, the participant expresses their interest in the kinds of digital technologies that they want to learn. Most of the teachers stated that they are very interested to have a VR laboratory in their universities.

Some of the mentioned technologies were: VR technologies, IoT technologies, Artificial Intelligence technologies, etc.

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8. How confident do you feel when integrating digital technologies in your classroom?
275 responses

- 1 Not confident at all
- 2
- 3
- 4
- 5 Fully confident

The eighth question evaluates the level of teachers' confidence while implementing virtual technologies into their classes. From the graph, we can see that participants are not very confident in the implementation of these technologies in the teaching process, without training.

9. How often do you use the dedicated laboratories in your school/university?
275 responses

- 1 Never
- 2
- 3
- 4
- 5 On daily basis
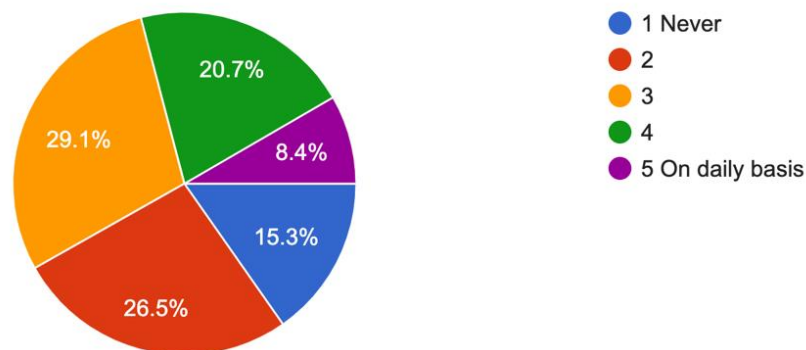
The frequency of usage of the dedicated laboratories in relevant universities is stated in the ninth question. From the graph above we can conclude that laboratories are not used very often by teachers in their teaching process.

> *10 Add any suggestion regarding which kind of technologies you would like to be implemented in your school and how.*

In the tenth question, teachers gave their suggestions for the technologies that they would like to implement in their school. Some of the suggested technologies were: VR technologies, networking technologies, LabVIEW Toolkit, simulations tools, math programs, etc.

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11 Give some examples of where, during your daily work, you would find the implementation of VR technologies useful (classes, topics, lab work, etc.).

Some of the examples where the implementation of VR technologies is useful are given in the eleventh question. Most of the participants in the survey stated that the implementation of virtual technologies in the teaching process, in different classes, would be very useful.

4.2. Results of student questionnaires

Student questionnaires consist of ten questions and graphs for each question are presented below:

1. Which is your actual knowledge regarding virtual/digital technologies?
1,289 responses
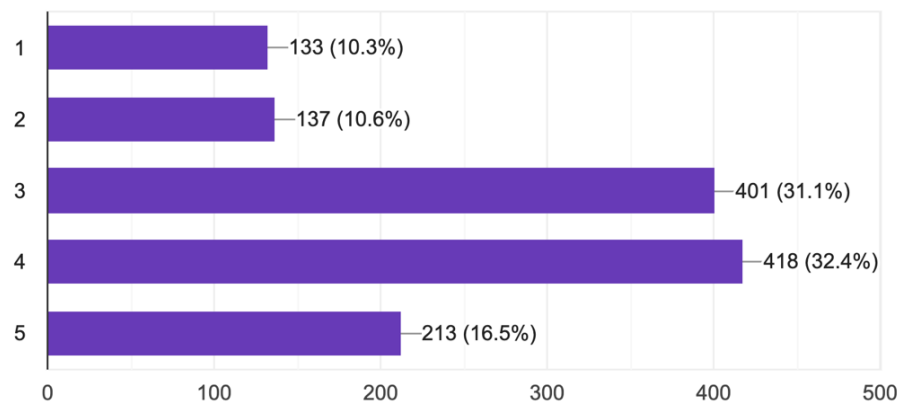
The first question of this questionnaire reflects the knowledge of students regarding virtual technologies. As presented in the graph above, students are not very familiar with virtual technologies.

16.5% of students stated that are fully knowledgeable about virtual technologies, while 10.3% said that have no knowledge regarding virtual technologies.

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2. During your precedent years of study, have you ever been introduced or trained on VR/AI technologies?

1,289 responses
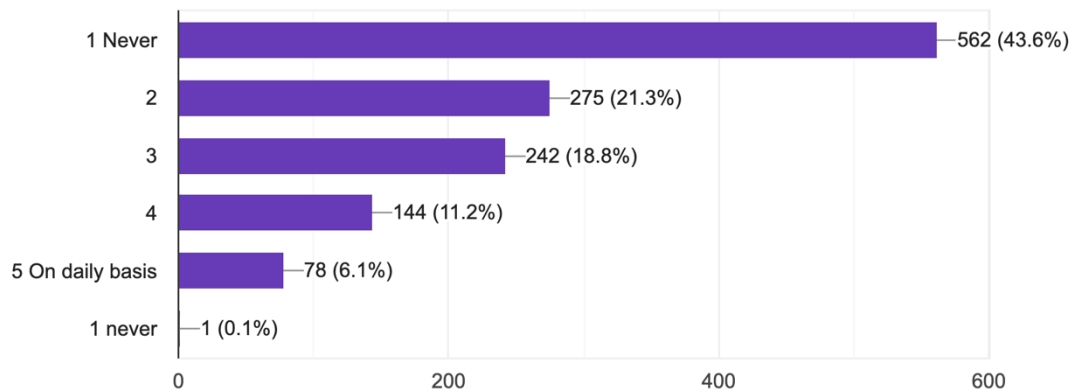
The second question indicates the students' experience regarding virtual technologies. From the graph, we can conclude that 43.6% of students have never received any training about virtual technologies, while only 6.1% of students stated that they have been introduced to virtual technologies.

3. How often do you engage in digital learning activities?

1,289 responses
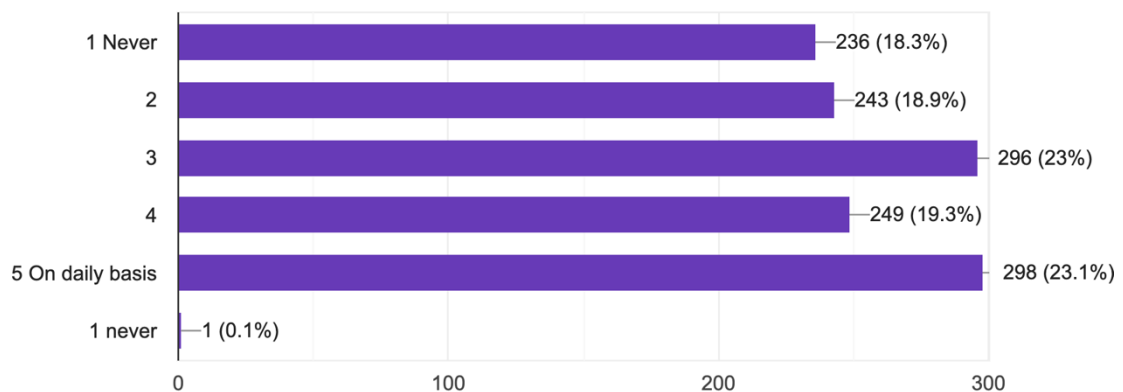
The third question expresses the frequency of engagement of students in digital learning activities. 18.3 % of students claimed that they have never been engaged in these activities, while 23.1% stated that they are engaged in digital learning on daily basis (reflecting the online learning due to the pandemic situation).

Some of the activities that students mentioned were: online learning, programming, coding, etc.

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4. Rate the impact of virtual technologies in your specific field of education
1,289 responses

- 1 Low impact
- 2
- 3
- 4
- 5 High impact
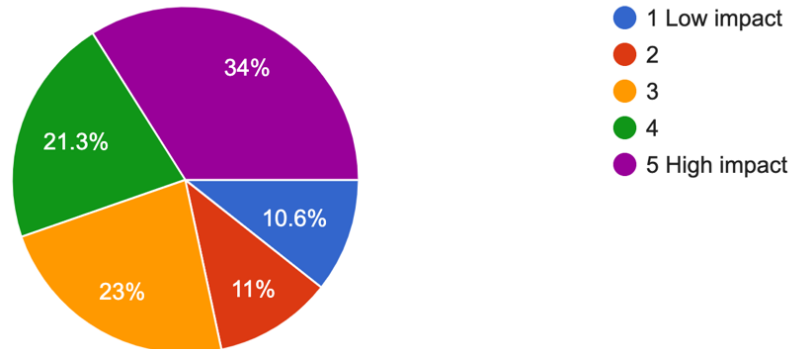
This question rates the impact of virtual technologies in specific study fields.
Most students think that virtual technology has a significant impact on their study field.
Only 10.6% stated that virtual technologies have a low impact on their learning process.
Some of the study fields that survey participants (students) are engaged in are:
Engineering, computer science, medicine, English language, preschool education,
Albanian language, nursing, etc.

5. How much is information regarding these technologies shared at school between students and professors?
1,289 responses

- 1 Unsatisfying
- 2
- 3
- 4
- 5 Satisfying
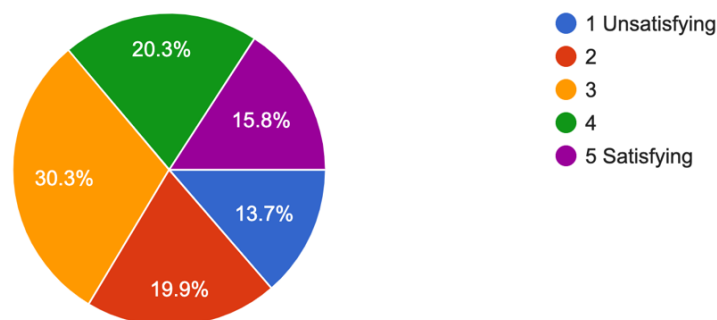
The fifth question evaluates the level of sharing information between professors and students, regarding virtual technologies. As we can see from the graph, there is not a satisfying level regarding this activity. Only 15.8% of students stated that the level of information sharing, regarding virtual technologies, is satisfying.

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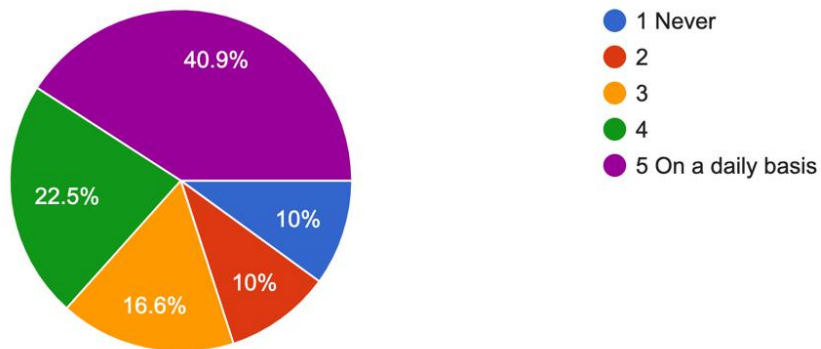## 6. Do you think you would implement such technologies in your learning process?
1,289 responses
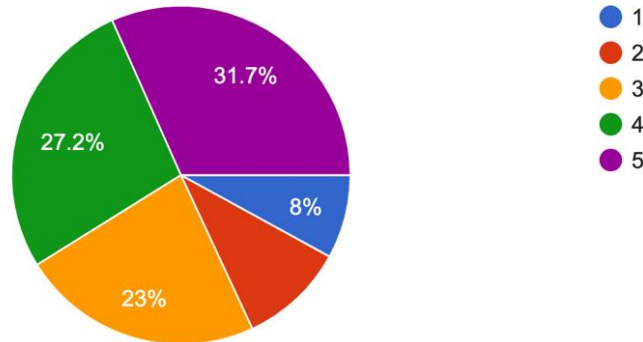
The sixth question takes the student's feedback about the implementation of virtual technologies in their learning process. 31.7% claimed that they would implement these technologies in their learning process, while only 8% stated that they would never use these technologies for learning activities.

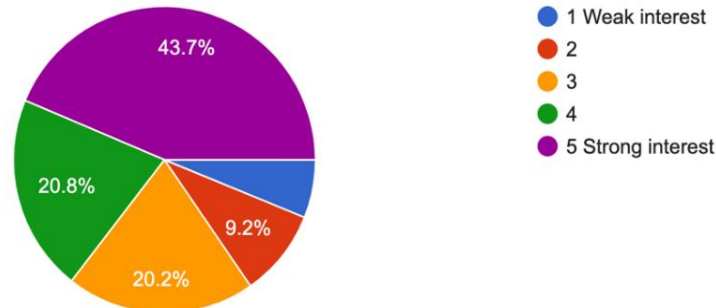## 7. Do you use digital technologies during your free time?
1,289 responses

This question measures the frequency of usage of digital technologies by students in their free time. Almost half of the students claimed that they use these technologies in their free time (gaming), indicating that there is a high interest from students regarding these technologies. Only 10% stated that they never used virtual technologies in their daily activities.

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8. Which is your actual interest of receiving specific training of digital technologies and tools?
1,289 responses

- 1 Weak interest
- 2
- 3
- 4
- 5 Strong interest

This question evaluates the interest of the students in receiving training in the field of virtual technologies. From the graph, we can conclude that there is a high interest from the students' side in learning about virtual technologies. Almost half of the students declared that have a strong interest in receiving training regarding virtual technologies. Only 6.1% of students showed weak interest in these technologies.

9. How often do you use the dedicated laboratories in your school/university?
1,289 responses

- 1 Never
- 2
- 3
- 4
- 5 On a daily basis
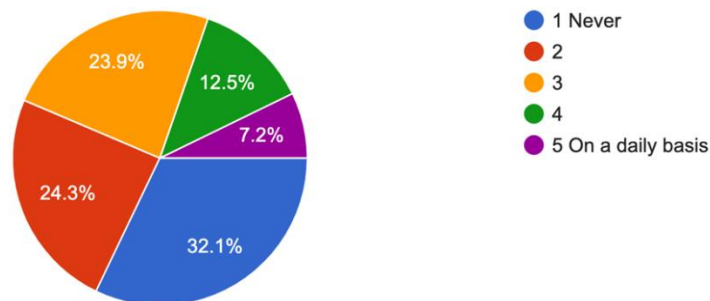
The ninth question measures the frequency of usage of dedicated laboratories in universities. From the above graph, we can see that laboratories are not frequently used in universities. 32.1% of students claimed that they have never been in their university laboratories.

> 10 Add any suggestion regarding which kind of technologies you would like to be implemented in your school and how

In the tenth question, students gave their opinion about the kind of technologies that they want to be implemented in their universities. Most of the students stated that they would like to have a laboratory with all the necessary equipment for implementing VR in their learning process.

5. Conclusion

This survey is conducted to measure the knowledge of students and teachers regarding virtual technologies in HEIs in Kosovo.

The samples were delivered electronically to students and teachers or researchers, in different universities countrywide. The results were derived from 1289 student responses and 275 teachers.

According to the results taken from the teachers' survey, we can conclude that teachers do not have a background in virtual technologies and they do not use these technologies in their teaching process. They think that these technologies have a strong impact on their specific fields and are very interested to learn more about these technologies. They stated that it is very important to integrate virtual technologies into the teaching process.

According to survey results, HEIs in Kosovo are not well equipped with hardware and it is highly recommended to have a VR laboratory for integrating VR technologies into different classes.

Students do not have knowledge of VR technologies too. They are not satisfied with the level of information shared between them and professors regarding VR technologies.

Students claimed that are very interested to receive any training regarding digital technologies because they think that these technologies have a high impact on their specific study field.

Students declared that they use virtual technologies in their free time and they think that these technologies will enhance their learning process.

In the end, we can conclude that both students and teachers have no background in VR technologies but they are willing to receive training in these technologies in order to integrate them into their learning and teaching process. Vtech-supported courses will be offered at each HEIs project partner.

Remark: we plan on publishing the results from this survey in a conference or journal paper.