Analysis 1 – Technical and didactic readiness of schools –

South Bohemia

Content

Introduction

A number of schools were approached in the specified period. The result of this process was a set of forty-four interviewed schools, which were further analyzed. The following are the results of this analysis.

Question #1: Are you familiar with the term "virtual reality?/augmented reality?"

A fundamental question focused on the main goals of the entire project. Before the interview, it was not clear which schools or school representatives were familiar with VR or AR technology.

The results show that the vast majority of respondents are familiar with this term, and upon further questioning, they all confirmed it with examples and experiences. One respondent had a very good idea of what VR technology was and pointed to a dedicated VR welding center.

Only one respondent did not know what VR or AR technology was and was unable to clarify even after giving examples.

Are you familiar with the term "virtual reality/augmented reality"?	
Virtual welding center from Fronius	1
Yes	42
No	1
In total	**44**

Question No. 2: Have you already had the opportunity to try it in practice?

The second question was focused on the respondents' practical experience. We wanted to find out how many of them had this technology in their hands and could practically try it out.

Have you already had the opportunity to try it in practice?	
No	20
Yes (AR)	1
Yes (VR and AR)	6
Yes (VR)	17
In total	**44**

The results show that roughly 54% had the opportunity to try VR or AR in practice. The remaining 45% percent have not yet had the opportunity to try VR or AR.

Question No. 3: Do you cooperate with any institution (school, company, etc.) that is equipped with AR/VR ?

The results of the third question were expected and the survey confirmed them. Only 18% of the schools that participated in the survey cooperate with another entity, whether it is a school, a company or another type of institution. It seems that this potentially opens up space for cooperation and the creation of a network of schools and companies based on the use of virtual reality.

Willingness to become part of such a network is described in other questions and results.

Do you cooperate with an institution (school, company, etc.) that is equipped with AR/VR?	
No	36
Yes	8
In total	**44**

Question No. 4: If you do not cooperate with any institution (school, company, etc.) that is currently equipped with AR/VR, would you be interested in such cooperation?

Before the survey, the attitude towards AR and VR technologies and the creation of networks based on this area was rather unclear.

The results are quite optimistic, as only 13.6% of respondents did not want to be part of the network of VR/AR organizations, usually due to different priorities.

The remaining 86.4% of respondents are interested in obtaining additional information, sharing experiences and establishing contacts. As one of the graphs below shows, there is a mix of schools that are and are not equipped with VR. Again, this seems to open up great possibilities for enriching schools without VR/AR technology with schools that already have experience and knowledge.

If you do not cooperate with any institution (school, company, etc.) that is currently equipped with AR/VR, would you be interested in such cooperation?	
No	6
Yes	38
In total	**44**

Question #1: Are VR-equipped schools interested in collaborating and connecting or not?

Are schools equipped with AR/VR interested in further cooperation?	
No	33
Yes (VR and AR)	2
Yes (VR)	3
In total	**38**

The graph above is a combination of the results of two queries. We specifically wanted to find out whether the 38 schools that are interested in further cooperation and networking are equipped with VR/AR or not.

The result shows both results, which means that both non-VR/AR equipped schools and VR/AR equipped schools are interested in becoming part of the wider network.

As mentioned above, this opens up a great opportunity for sharing and intermingling of both groups.

We consider this result to be very optimistic and consider it an important result of the survey.

Question #2: How do schools that already use VR/AR rate the use of this technology in the future?

AR/VR equipped schools: How often do you think AR/VR will be used in your school in the future?	
Less often	1
More often	5
In total	**6**

The chart above is also a combination of two questions. We specifically wanted to find out how 6 schools that are already equipped with VR/AR evaluate the future use of VR/AR in schools.

Most respondents said that these technologies will be used more often in the future than they are now.

Question #5: If you were interested in further cooperation and networking, what would you expect from such cooperation?

We present five examples of respondents' answers that reflect an overall view of the use of virtual reality in school curricula. It seems that most of the respondents who are interested in further cooperation have already passed the stage of the surprise effect and see the potential of VR technology. As they are all experienced teachers, most of them ask for examples of practical use, often help with ways to purchase VR, and many of them are also interested in sharing experiences with more experienced subjects than themselves.

Some examples are:

1. *We are interested in further cooperation, especially in testing an environment that would be close to our subjects. Practical use of VR is important and we would like to see this type of use.*
2. *We would like to find out how to use VR in our lessons, how to improve work at school.*
3. *We would ask for more educational opportunities for teachers. The opportunity to visit the training center with the students and learn about procedures they are not familiar with. It would also be an opportunity to communicate within a cross-border network, to learn what is new and what are the trends. Alternatively, visit a school in Austria that is equipped with VR and see how the technology is used. Information on new software that can be used and how to get it on a reasonable budget.*
4. *It would be interesting to be in contact with, for example, two friendly schools, maybe we could buy different equipment and exchange it. It would also be motivating and competitive. If it was a collaboration with a university, we would expect someone who knows more than we do. We've only seen general and basic courses, but we'd like something more specialized.*
5. *Important information for correct use in classrooms. Also information on how to shop efficiently. What exactly to choose according to the ratio of performance and price. How to convince colleagues who are not completely interested.*
   1) Purchase advice.
   2) Training on usage.
   3) Sharing teaching experiences.

Conclusion

The responses seem to fall into three main groups.

Group 1: This group has a rather vague experience with AR/VR and is kind of at the beginning. This group then expects more general information for teachers and students, not necessarily focused on specific practical use, but generally showing new horizons and possibilities. Nevertheless, even this group expects examples focused more or less on their expertise.

Group 2: The second group mainly includes respondents who have experience with AR/VR, know its possibilities, but are not sure how to motivate other employees for whom they are responsible, especially teachers. Therefore, these respondents would welcome more motivational and practical examples to convince their colleagues to consider purchasing AR/VR equipment and incorporating it into the curriculum.

Group 3: The third group has more experience with AR/VR technology. Members of this group most need practical examples and meaningful ways to incorporate AR/VR into teaching. This group is motivated but not sure how and in what subjects to use AR/VR. This group can also be divided according to interest in specific subjects:

   a) Vocational subjects.
   b) General subjects.

There are exceptions to the above groups and there are opinions and demands that do not fit into any of these groups.

In general, most requirements can be met and most respondents are interested in learning more about AR/VR, albeit from different angles and approaches.

Comparison matrix between schools and companies in the Czech Republic and Austria.

This matrix consists of nine questions focused on multiple aspects of respondents' perception of AR/VR technology.

The results were analyzed based on the number and percentage of the entire sample.

	I definitely agree	I rather agree	I rather disagree	I definitely disagree	Not applicable
AR/VR opens up many new possibilities for the economy.	15	24	3	0	2
AR/VR opens up many new possibilities for education.	23	18	3	0	0
The use of VR/AR should be taught in schools.	12	27	4	0	1
The benefits of AR/VR outweigh the cost/effort.	9	10	5	0	20
AR/VR is too controversial for the health of its users.	0	3	20	10	11
AR/VR is relatively easy to use.	4	23	8	2	7
I have a general interest in VR/AR.	23	19	2	0	0
The main purpose of AR/VR is entertainment/gaming.	3	10	19	12	0
In the next three years, I will probably be using VR/AR in my work.	12	25	6	0	1

	I definitely agree	I rather agree	I rather disagree	I definitely disagree	Not applicable
AR/VR opens up many new possibilities for the economy.	34.1%	54.5%	6.8%	0.0%	4.5%
AR/VR opens up many new possibilities for education.	52.3%	40.9%	6.8%	0.0%	0.0%
The use of VR/AR should be taught in schools.	27.3%	61.4%	9.1%	0.0%	2.3%
The benefits of AR/VR outweigh the cost/effort.	20.5%	22.7%	11.4%	0.0%	45.5%
AR/VR is too controversial for the health of its users.	0.0%	6.8%	45.5%	22.7%	25.0%
AR/VR is relatively easy to use.	9.1%	52.3%	18.2%	4.5%	15.9%
I have a general interest in VR/AR.	52.3%	43.2%	4.5%	0.0%	0.0%
The main purpose of AR/VR is entertainment/gaming.	6.8%	22.7%	43.2%	27.3%	0.0%
In the next three years, I will probably be using VR/AR in my work.	27.3%	56.8%	13.6%	0.0%	2.3%

Question #6: Is your school equipped with AR/VR technology?

Is your school equipped with AR/VR technology?	
No	38
Yes (VR and AR)	3
Yes (VR)	3
In total	**44**

The results of this question were more or less expected and the survey confirmed them. Although many schools are interested in VR and want to know more about it, the actual number of schools equipped with this technology is quite small.

Out of the entire sample, only 13.6% of schools are equipped with VR or both AR and VR technology.

Question #7: What AR/VR equipment do you currently have?

The list of headsets based on the survey is quite broad in terms of the types of headsets schools are equipped with. We believe this also points to the early adoption of AR/VR and to some extent the lack of standards.

Equipment type	Number of kits	Dedicated PC
Class VR	15	No
Oculus Quest	16	No
Vive Pro	3	Yes
HP Reverb	1	Yes
Class VR	25	No
Class VR	12	No
Oculus Rift	1	Yes
Oculus Quest	2	No
HTC Vive PRO	1	Yes
Oculus 1	2	No
Oculus 2	13	No
Hololens 2	1	Yes
iPad Pro, LIDAR scanner	1	No

Question #8: Are you satisfied with the equipment you are using? Is its performance enough for you? Is the number enough for you? Is there any room for improvement?

1. *Glasses are under central administration. The teacher sees what the students are doing. The teacher can send content before the lesson, playlists can also be created . There are enough teaching materials. Natural sciences, mathematics, geography. It meets the requirements for ease of use and is probably the closest to what teaching needs.*
2. *We are more than satisfied, we plan to buy more.*
3. *Hardware is good, software is the problem. Something can be found, but we would expect it to be part of the math and science libraries. Not much to use.*
4. *We are happy to have the equipment, but we would need more glasses so that at least a quarter or half of the class could have them. Ideally one set for two students. For now, this is more of a demonstration.*
5. *More or less satisfied, so far the device is enough for our needs.*
6. *Yes.*

The answers are mostly positive. The only exception is the lack of software currently available. However, it is questionable whether the dissatisfaction is really due to a lack of software on the market, or whether it is simply a lack of information about the options and the software offering.

Question #9: How much money did your school spend on AR/VR equipment and how did your school secure the necessary budget? Has there been any financial support for the purchase of AR/VR equipment?

Around 3700 euros.	The funds were obtained as part of a support project, the school did not have to cover them from its budget.
Around 370,000 euros.	This is the total amount; the purchase was financed by public authorities and some equipment was purchased under various projects.
Does not apply (respondent did not know)	The equipment was purchased as part of the project.
Around 3100 euros.	The school funded the purchase from its "regular" budget and the purchase was partially funded by a sponsor.
Around 2200 euro including computer.	The school financed the purchase from its regular budget.
Around 22,300 euros.	The equipment was purchased as part of the project, the school partially financed the purchase from its regular budget and part of the amount was financed by public authorities.

Here, too, the results vary. It depends on the schools how they get the necessary funds to buy the equipment, on the other hand, we have not noticed any systematic support of this type of technology from the official authorities.

Question #2: Correlation between schools interested in more information (establishing a network of contacts) and their intention to purchase AR/VR devices in the near future.

In this question, we wanted to find out whether the lack of information about AR/VR technology is related to the intention to purchase this technology.

Based on the results, it seems that these factors may be correlated, as almost 67% of respondents who are interested in more information are not considering purchasing any AR/VR device.

We would like to believe that with more information, practical examples and experience sharing, the percentage of schools considering a purchase can increase.

Are schools currently interested in further cooperation also considering the purchase of AR/VR equipment?	
Yes	9
They don't know the budget yet, but they will consider it if it becomes available	1
Rather yes, but there are many unknowns at the moment (budget, usage, interest of teachers)	1
No	22
In total	**33**