

Title: Cloud VR Space as a virtual informative university reception

Abstract: This paper explores the benefits of using a desktop VR as a virtual workspace which we believe can improve the way University shares information with students. 12 participants are included in the survey which supports this study. With a between-subjects design, we compared the use of different Virtual workspaces, with MAXWHERE as a 3D cloud VR space in the focus of our work, compared to the experience of using the regular internet browsing by finding the information on the already existing university websites, as well as we compare it to organizing the information links in the start.me application as our third options which in contrast to MAXWHERE is a 2D space. Our goal was to research if 3D cloud VR space is really more efficient solution to a more structured and effective informative space for general information provided by the University and compare that to the already existing regular informative websites, mailing lists that the University uses, as well as the start.me as a application which stands in between this two options. As an end product we are creating a 3D virtual space for our ELTE informatics reception for the new commers student, using MAXWHERE.

Keywords: desktop VR; MaxWhere; virtual workspace

Introduction

Nowadays, it is possible a simple user, to move into the world of computer graphics. This magic with a new reality often starts in computer gaming field and propagate to the most of others life's fields forever such as education, training, and research in higher education.

With the increasing demand for innovative in higher education for engineering, and with the advancement in the 3D visualisation technologies and computer's hardware capacities, a growing range of engineering teaching and training material can be utilised in virtual reality environments.

Moreover, Teaching innovation and adoption of technology are part of the institution's challenges based to the Horizon report of higher education. And using a virtual worlds in educational purposes can be widely exploited. [39]

The idea is to build a Virtual world environment for Faculty reception destined to the students and especially for the new comers in order to provide a descrete and clear information of the university, the steps and the needed document for subscriptions because in the current situations they need to search a lot in different websites pages and that cause confusion for most of them .

Today, We are going to analyse and compare the different kind of existing Virtual environment and to analyse the difference between it and the Web Browser, and we will finish by presenting our University virtual space which was made by the Virtual desktop environment which was chosen based on our Analyse.

I. Virtual Work spaces

In the last couple of years, most of people and especially students have a personal computers, the screen size has become insufficient. The users are manipulating and looking at more and more pieces of information, but these are fragmented in different windows and tabs. To solve this, users start to switch back and forth between activities that are part of the same project [13]. Card and Henderson compare it with the classic method of working with papers: on a large desk

every document is grouped and arranged meaningfully to enable an effective workflow. The visual availability of the papers helps organize the task, as they become memory cues. Besides the size of the screen, another benefit of the usage of papers is that there is no need to assign names or formal codes to the grouped documents. This is inevitable on computers to make an effort to add meaningful names to documents. To solve this problem and enlarge the user's screen, different techniques have arisen. The most common are alternating screen usage, distorted views, large virtual workspaces and multiple virtual workspaces [14]. Real-time, synchronous collaboration rely on tools such as video or audio conferencing and instant messaging. Integrate these session-centric and the document-centric collaboration tools in one system was an early objective in the design of virtual workspaces. [15]. With the advance of technology, media richness has augmented. This means that an audioconference could convey more cues (tone, pauses) than an e-mail, which reduces the possibility of misunderstanding [16]. Widely used workspace technologies are electronic whiteboard, collaborative document editors, instant messaging applications, calendar and common repository [17]. Beyond these tools, the knowledge sharing, and the coordination of tasks are essentials for adequate functioning of a collaborative virtual team. Situational awareness is the awareness of the here-and-now states of collaborating team members, which helps them in the planning of the subsequent task. The situational awareness can be facilitated through virtual co-presence, which means that individuals feel as if they are in the same room with the others. This shared context also helps the knowledge exchange [18]. Maintaining focus and keeping the user in the context of her reasoning process is a basic requirement of a good computer-based workstation. Direct interaction and manipulation help to stay in the cognitive zone of the task, which means that it does not interrupt the workflow thus, it remains one cognitive whole. Also, avoiding actions that take the user outside of the frame of the task, for example, menus especially the traditional pull-downs where users have to sort through.

Method

The survey was divided into two parts, first there was a task where participants were experiencing information browsing into the different environments, and the second part of the survey was their feedback.

The time, effectiveness, the difficulty and the environments from a technical aspect are the focus factors in the measurement process of this task.

A timer was set for each of the following task-questions that the participants had to complete. They repeated these questions for each of the 3 environments.

After the aim and procedure of the task is explained to you, wait until you are given a signal to start solving the tasks since we need to measure the start and end of the time the tasks take to be solved.

TASKS:

1. Find and download the document with the **MSc Computer Science Curriculum**
2. Check what is the last **post of the official fakebook page** for international students of ELTE:
Facebook page name: **Eötvös Loránd University International**.
Write down one sentence description of it and save it in Notepad++ text document.
3. Find and download this **document from Quaesture**: [Sample of Authorisation](#)
4. What are the steps for Stipendium Hungaricum Scholarship Transfer? Save them in a text document.
5. Find **most recommended places to visit in Budapest**. Write them down in a text document.

Figure3.9: Task-questions

Some of the participants could not complete the questions in more than 10 mins. In order to create the charts without having infinite values for the time, we considered these cases as the time of completing the question as 10min (600 seconds).

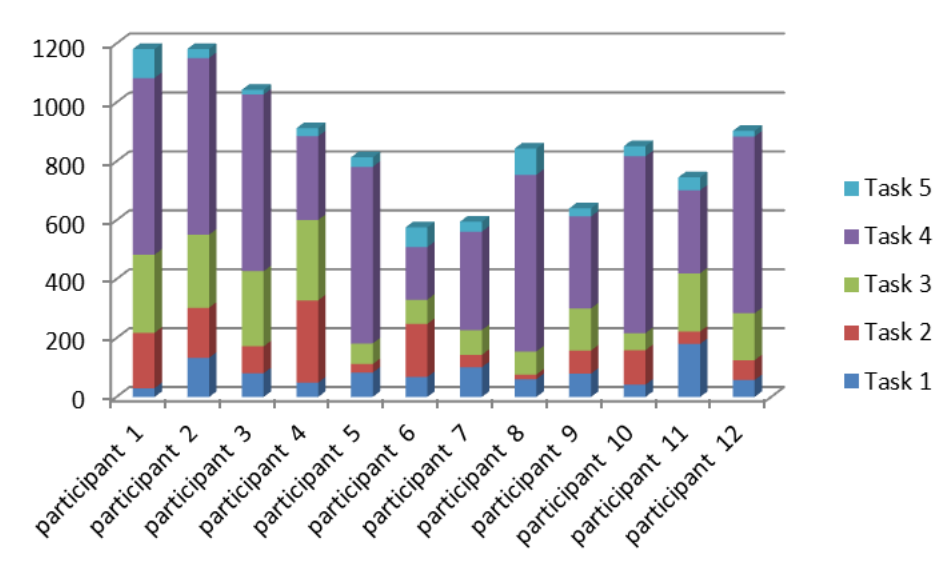


Figure3.10: Time for completing the task in Chrome

In Chrome solution, 7 participants could not finish the fourth question of the task in 10, the minimum time to finish the task in this solution is 575.71 seconds, meanwhile the longest time is 1181.47 seconds and an average of 857.19 seconds per participant

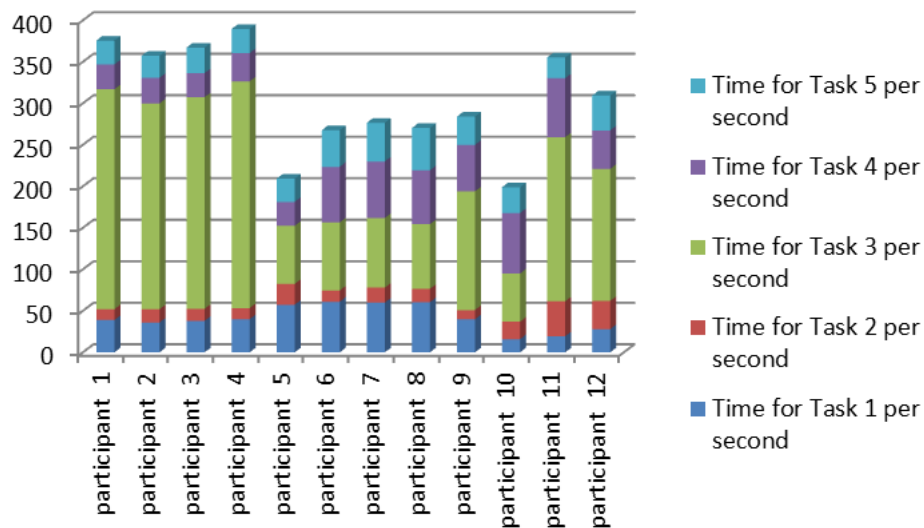


Figure3.11: Time for completing the task in Start.me

In the start.me solution the minimum time to finish the task for participants is 199.02 seconds and the maximum time to finish the task is 389.61 seconds and the average is 305.131 seconds per participant.

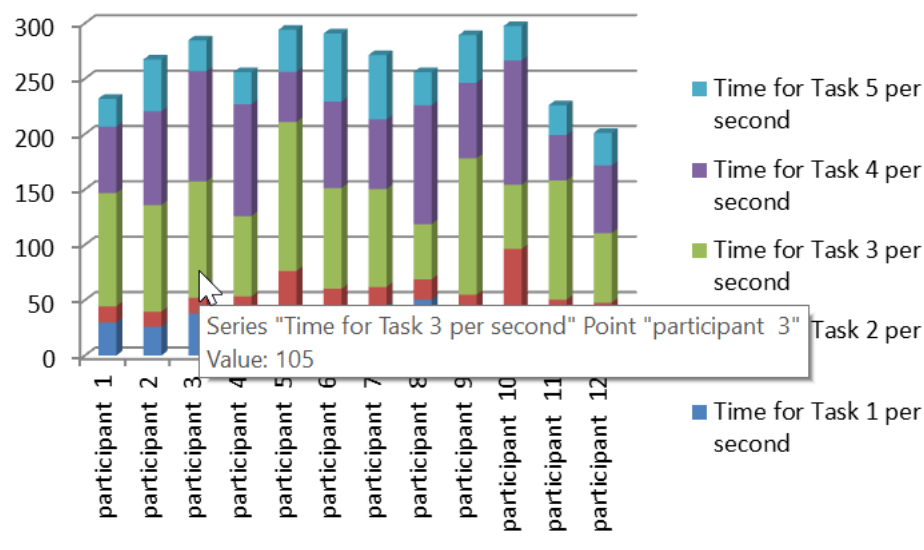


Figure3.12: Time for completing the task in MAXWHERE

In the MAXWHERE solution the minimum time to finish the task for participants is 201.19 seconds, the maximum time to finish the task is 297.64 second and the average is 263.90 seconds per participant.

Actually, MAXWHERE proved that it is the fastest solution to find the information for the new comers students regarding that the 12 participants finished the task in MAXWHERE faster than Chrome and Start.me.

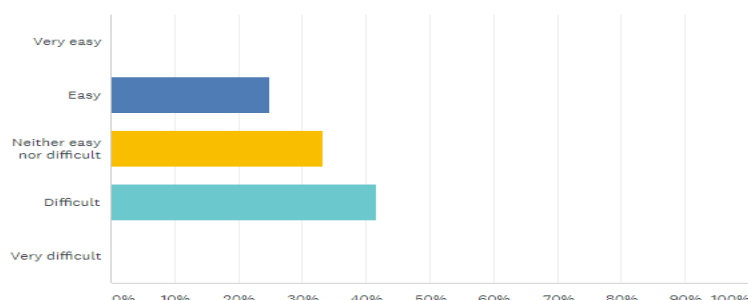
After completing the task and measuring the time, we created a survey and sent it to the participants in order to give feedbacks about the difficulties what they faced in searching the information in the solutions as well as the effectiveness and efficiency of every solution and the environments. Also, on their feedback they got the chance to choose the best solution based on the factors of the measurement and share their opinions about the MAXWHERE solution and how it can be improved.

3.4.1 Survey and results

The survey contained 8 questions to get the opinion of the participants about the experience and to let them evaluate the solutions and MAXWHERE as 3D space.

In your opinion, how do you rate the difficulty for new comers students to find the right source in order to seeks all the required information about the university, documents needed, schedules and the city ?

Answered: 12 Skipped: 0



ANSWER CHOICES	RESPONSES
Very easy	0.00% 0
Easy	25.00% 3
Neither easy nor difficult	33.33% 4
Difficult	41.67% 5
Very difficult	0.00% 0
TOTAL	12

Figure3.13: Question 1

Only 25% from the participants's think that there are no difficulties for new comers international students to seek all the required information about the university, documents needed, schedules and the city. which reflect that most of the international students do not find these facts easily.

Do you think having 2D or 3D solution collecting the required Data for new comers students can help them to get the information in more efficient and effective way?

Answered: 12 Skipped: 0

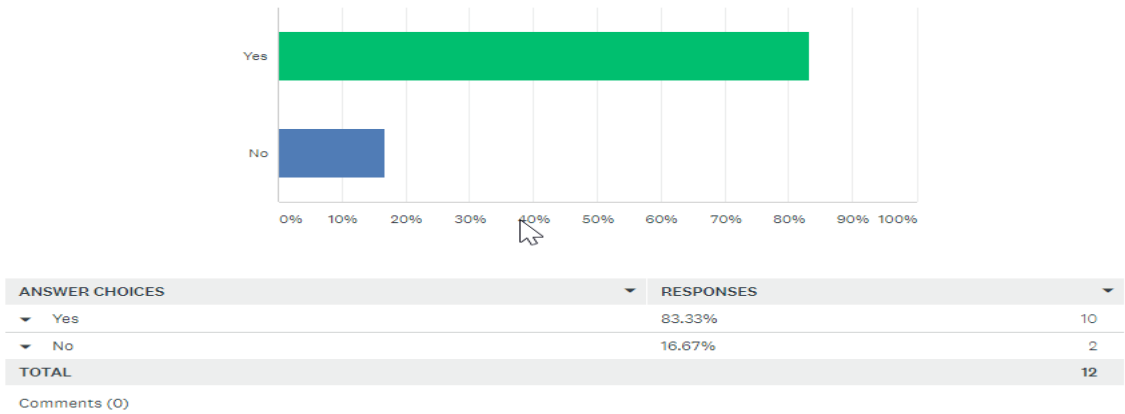


Figure3.14: Question 2

83.33% from the participants agreed that we need a solution for collecting all the needed and required information for new comers students which prove that the ELTE reception project is adding a value for the engineering education.

Rate how efficient and effective is the browser solution based on the experience of searching the information in task what you did.

Answered: 12 Skipped: 0

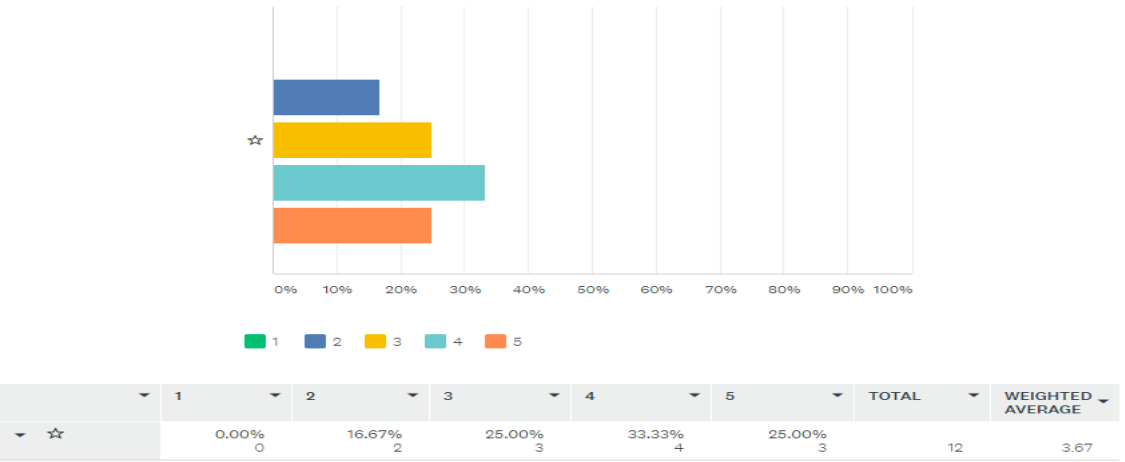


Figure3.15: Question 3

As the students used to the classic browser, the answers of participants about Chrome solution was mostly good, varied between 2, 3, 4 and 5 and the number of participants was almost the same in every answer.

16.67% rated bad, 25% rated neither good nor bad, 33.33% rated good and 25% of the participants rated is good.

Rate how efficient and effective is the "2D solution" Star.me based on the experience of searching the information in task what you did.

Answered: 12 Skipped: 0

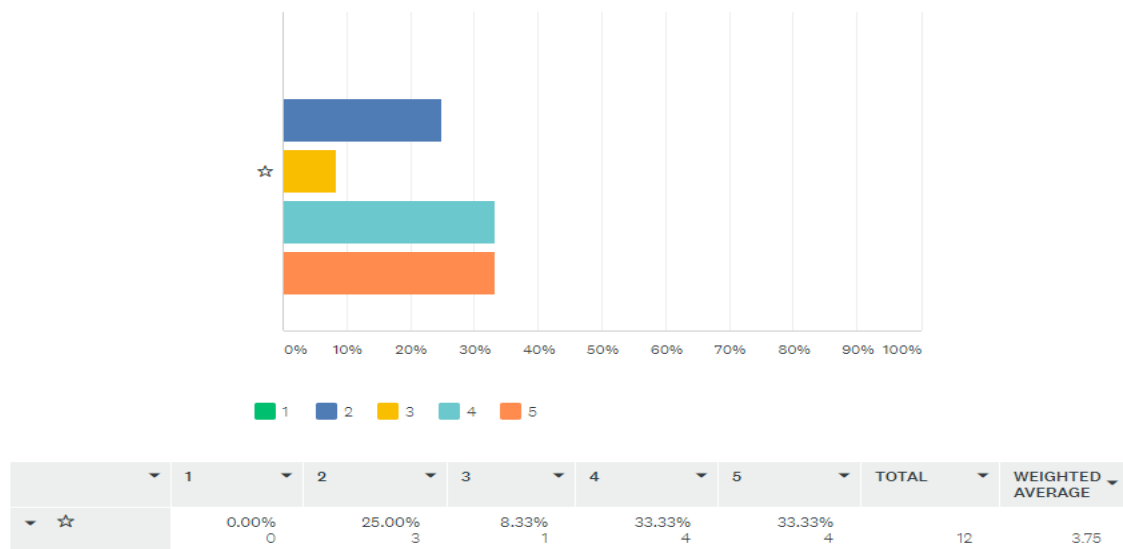


Figure3.16: Question 4

The participants's answers about the efficiency and effectiveness of Start.me was between 2, 3, 4 and 5.

25% rated bad, 8.33 rated neither good nor bad, 33.33% rated excellent and the same percentage rated good which means start.me solution is a little bit better than chrome solutions based on the feedback of the participants.

Rate how efficient and effective is "3D solution" MAXWHERE based on the experience of searching the information in task what you did.

Answered: 12 Skipped: 0

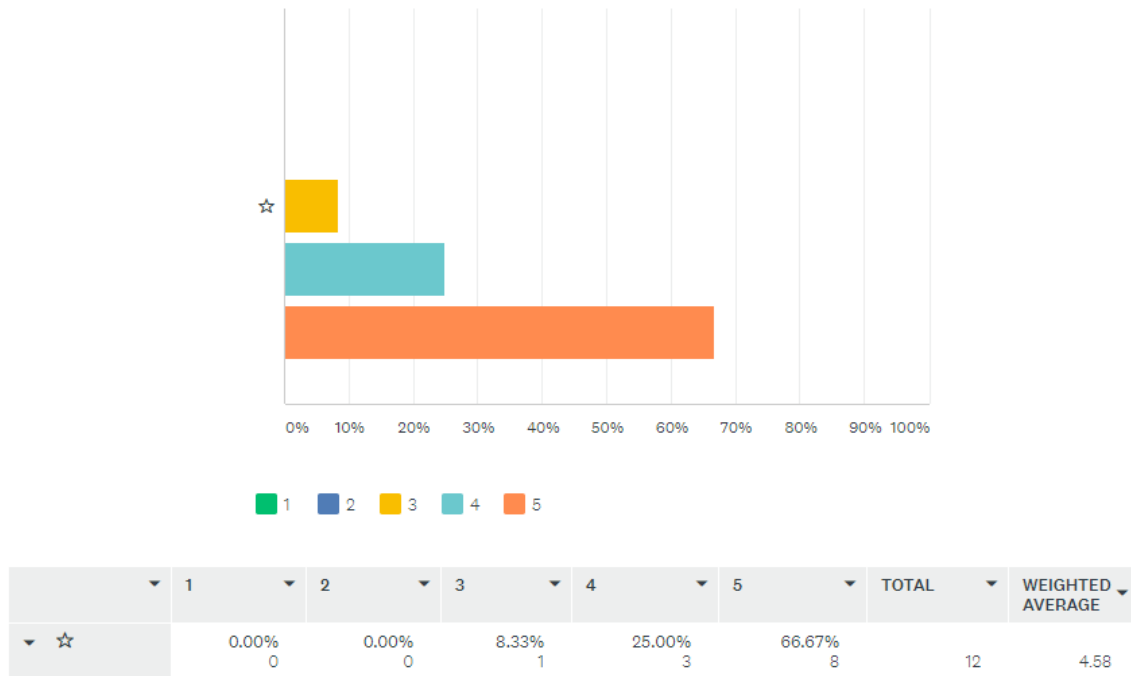


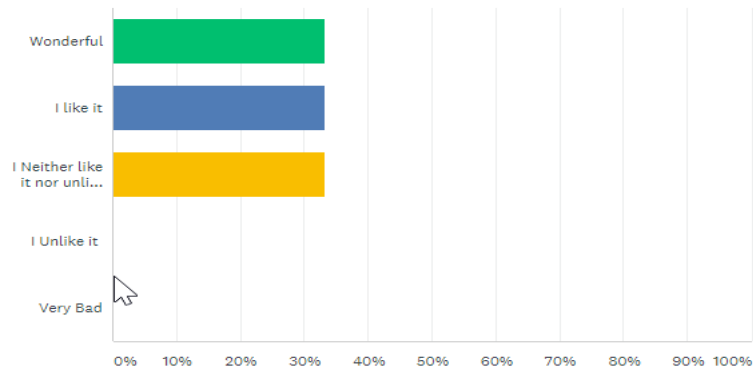
Figure3.17: Question 5

To know about the efficiency and effectiveness of MAXWHERE, the result was impressively great. All students grade it between 3 to 5. morethan 66.67% students thinks that MAXWHERE is excellent in term of effectiveness and efficiency and 25 % of them think that it is good and only 8.33 from the participants think that it is neither good nor bad.

Based on their feedback MAXWHERE is the most effective and efficient solution for new comers students and it is better the 2D solutions in term of effectiveness and efficiency.

How Do you like the experience of using a 3D environment in in order to improve the way how the university share information with students

Answered: 12 Skipped: 0



ANSWER CHOICES	RESPONSES	
Wonderful	33.33%	4
I like it	33.33%	4
I Neither like it nor unlike it	33.33%	4
I Unlike it	0.00%	0
Very Bad	0.00%	0
TOTAL		12

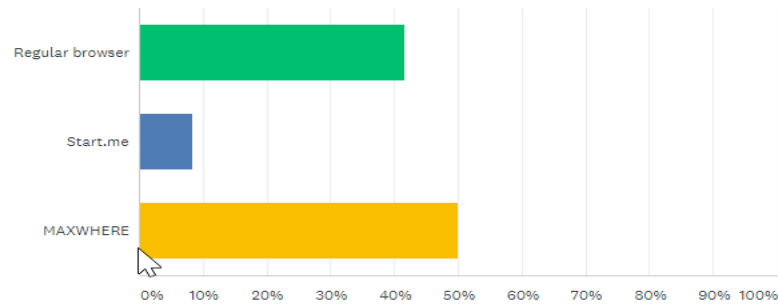
Figure3.18: Question 6

The participants mostly found that the experience of using MAXWHERE in searching information on the ELTE infomatics reception space is wonderful, they also like it and they think that this 3D environment (MAXWHERE) improve the way how the university share the information with the students .

33.33% found it wonderfull, 33.33% like it and the rest 33.33% neither like it nor unlike it. which is a great feedback despite they used MAXWHERE first time.

Which solution For finding the given information to that task was the most appealing to you?

Answered: 12 Skipped: 0



ANSWER CHOICES	RESPONSES
Regular browser	41.67% 5
Start.me	8.33% 1
MAXWHERE	50.00% 6
TOTAL	12

[Comments \(2\)](#)

Figure3.19: Question 7

Many of students who took participated in survey believes that Maxwhere is the most appealing solution for finding information and the second part which is 41.67% thinks that chrome is the most appealing solution, meanwhile only 1 participant found Start.me is the appealing solution for finding information.

MAXWHERE won the challenge against the 2D solutions and this survey proved that the ELTE informatics reception by MAXWHERE is faster, More effective and more efficient than the 2D solutions.

In this question, 2 participants posted a comments as we see in the figure

Showing 2 responses

☐ Because for now the difference between Start.me and Regular browser is not so big. If you collect information and would like to filter it you give for student, first of all you should to name your references in the correct way and the first help for new users is readable and understandable names of topics and links.

5/16/2019 11:40 AM

[View respondent's answers](#) [Add tags](#) ▼

☐ Pretty fast, interactive, 3D feels

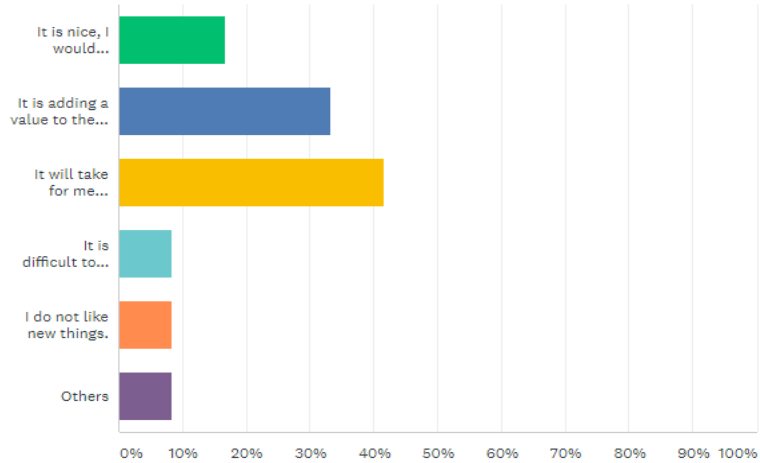
5/15/2019 2:25 PM

[View respondent's answers](#) [Add tags](#) ▼

Figure3.20: comments 1

Tell us your point of view regarding our ELTE reception in MAXwhere?

Answered: 12 Skipped: 0



ANSWER CHOICES	RESPONSES
It is nice, I would definitely use It	16.67% 2
It is adding a value to the new comers students as well as the university	33.33% 4
It will take for me sometimes to learn how to use It, But I still like It	41.67% 5
It is difficult to adapt, needs training	8.33% 1
I do not like new things.	8.33% 1
Others	8.33% 1
Total Respondents: 12	
Comments (1)	

Figure3.21: Question 8

Overall the Point of View of students are good regarding the ELTE informatics reception in MAXWHERE

All students believe that the Maxwhere space is adding a value of information for the new comers students and they would use it and some of them think that they need extra trainings for it.

1 participant liked the implementation and has got an idea in his comment to improve the space of ELTE reception by providing a tutorial about how to use the space.

Showing 1 response	
<input type="checkbox"/>	The implementation is okay. As for me, I would develop a quick tutorial - tour where the new user would automatically get the information in which he is demanded...
5/16/2019 11:40 AM	View respondent's answers Add tags

Figure3.22: comments 2

Conclusions

The 3D desktop VR workspace provided an advantage to its users by displaying extra information permanently and individuals could use this information in their subsequent performance estimation. Considering the cost and support, Everyone doesn't have high configured laptop in fact 7% computers still uses windows XP all around the world. In future, people will prefer buying high configured laptops and manufacturing companies will launch high configured gadget so all the computer will have high configuration and this technology will be adapt but now in current situation it is difficult to migrate from 2D applications to 3D desktop VR. It is proven that 3D Desktop VR is effective to use and very user interactive comparing to other 2D solutions. Hopefully, in near future people will adapt this new technology in there day to day life. Acknowledgement This work was supported by the ÚNKP-18-3 New National Excellence Program of the Ministry of Human Capacities and by the FIEK program (Center for cooperation between higher education and the industries at the Széchenyi István University, GINOP-2.3.4-15-2016-00003).

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