Computing Science Research in [X]

Student ID: <2768146M>

Please describe here any external support or resources you used in preparing your assignment (if any):

https://www.ntt-review.jp/archive/ntttechnical.php?contents=ntr201803fa4.pdf&mode=show_pdf

https://www.researchgate.net/publication/281336331_A_Review_of_Research_on_Augmented_Reality_in_Education_Advantages_and_Applications

https://www.tandfonline.com/doi/full/10.2147/CIA.S25337

PAPER 1

The source of the paper (not the URL but its complete bibliographic reference):

The DOI of the paper, as a link that can be followed directly:

Summary (maximum 150 words, in your own words):

This paper introduces the facilitation and competition of virtual reality, and the influence of competition on the exercise situation of the elderly. That is to say, virtual reality technology has indirectly produced some positive social impacts to some extent. The author asked 14 elderly people to participate in some virtual technology research. Through a series of data, the game based on virtual technology not only makes the participants feel competitive, but also promotes their love for sports and maximizes their exercise intensity. Through the experimental data, it can be concluded that the virtual reality technology makes the elderly in front of the screen easy to arouse the desire for competition, but at the same time, we should pay attention to the objective law, that is, pay attention to the age of the elderly, should not overwork. [136 words]

What is the problem that the authors aim to address in this paper? (maximum 50 words, in your own words):

Does social presence influence exercise behavior? Specifically, will the increase of competitors based on virtual reality help increase exercise? Can the previous negative views on this aspect be changed through the research data and results? [35 words]

Why do you think this an important problem? If you do not think it is an important problem, why is this the case? (maximum 50 words, in your own words):

I think it's important because, with the development of technology and urbanization, people's attention to sports is decreasing, and the emergence of virtual technology provides people with the opportunity to study and combine the two to achieve high quality sports. [40 words]

What previous work is the basis for this research? (maximum 100 words, in your own words):

Much previous literature has shown that exercise not only improves physical fitness, but also improves cognitive and mental health in older adults. And previous studies, such as the CDC' s 2007 National Health Interview Survey, have shown that older people are less physically active. But on the basis of these, the author thinks that simple exercise is acceptable, some irresistible factors appear to limit the elderly' s exercise. In addition, the emergence of virtual reality technology has also helped. [79 words]

What makes this research different/better/worse than the previously published work? (maximum 50 words, in your own words):

The difficulty with this study is that the participants are older, and it's inevitable that some unexpected factors, such as physical strength, will come up when the study is conducted because the changes in vital signs may be less pronounced in younger people. [43 words]

What did the authors do in order to address the problem? (maximum 100 words, in your own words):

The author asked 14 elderly people to participate in the virtual bicycle experiment, and through the recording and observation of their vital signs, the variable relationship was used to discover the factor that affects the amount of exercise, namely competitiveness. Through the previous research and investigation, the competitiveness in virtual technology has a promoting effect on physical activity. At the same time, a series of measures were taken to eliminate some interference factors, which ensured the authenticity of the experiment to a greater extent. [84 words]

Do you think this was the correct way to address the problem? Why, or why not? (maximum 50 words, in your own words):

In my opinion, the author's behavior is the right way to solve the problem, because it provides a credible conclusion through concrete and feasible experimental data, and it is meticulous, excludes accidental factors, and uses scientific data to prove the conclusion. [41 words]

What conclusions do the authors draw from the results? (maximum 50 words, in your own words):

Competitiveness can regulate the social promotion effect. For the elderly with weak competitiveness, the increase in exercise intensity brought by virtual technology comes from the competitors on the screen. But at the same time, we should also pay attention to age and should not overdo exercise. [46 words]

Are these conclusions correct? Explain your answer to this question. (maximum 50 words, in your own words):

I think the conclusion of this paper is correct, because on the basis of previous studies, the author conducted scientific and feasible experiments and obtained data. After analysis, the characteristics of these variables were verified, that is, competitiveness promoted the increase of physical exercise. [44 words]

If I had been doing research to address this problem, what would I have done differently? (maximum 50 words, in your own words):

First of all, I will increase the number of participants in the experimental variables, because more participants will make the results more universal. Secondly, I will separate the data from participants of different genders and conduct research to reduce the imbalance brought by gender, thus increasing the credibility of results. [51 words]

PAPER 2

The source of the paper (not the URL but its complete bibliographic reference):

Feature Articles: Research and Development in Sports Brain Science
Virtual Reality-based Sports Training System and Its Application to Baseball Dan Mikami, Kosuke Takahashi, Naoki Saijo, Mariko Isogawa, Toshitaka Kimura, and Hideaki Kimata
NTT Technical Review, Vol. 16, No. 3, Mar. 2018

The DOI of the paper, as a link that can be followed directly:

https://www.ntt-review.jp/archive/ntttechnical.php?contents=ntr201803fa4.pdf&mode=show_pdf
3, Mar. 2018

Summary (maximum 150 words, in your own words):

In the recent past, sports teams have started to increasingly rely on VR mechanisms to help train the athletes and develop strategies. Using VR helps the athletes better understand their opponents. This research mainly focuses on helping individual athletes improve in the domain of baseball. A VR based imagery system has been developed that enables the coaches to analyse the pitchers pitch and the strike. The Oculus rift head mounted device is used for this research. Few of the components necessary for this system are PC, HDMI cable, HMD, camera and a sensor. However, the authors believe that despite the efforts of VR, it is impossible to replicate the reality. (100 words)

What is the problem that the authors aim to address in this paper? (maximum 50 words, in your own words):
It takes time for the batter to get used to the pitcher's delivery, thus, the batter is only able to strike one in five pitches successfully. By using the VR based training system, the opponents pitch can be analysed and the batter takes less time to get accustomed to it. (49 words)

Why do you think this an important problem? If you do not think it is an important problem, why is this the case? (maximum 50 words, in your own words):

This is an important problem because this has a direct effect on the success of the team. If a batter keeps missing his shots, it's going to affect the team. Getting accustomed to the

deliveries is time consuming and in an official match, there are restrictions of limited time. (49 words)

What previous work is the basis for this research? (maximum 100 words, in your own words):

Research based on live 3D video in soccer stadiums and image completion via feature reduction forms the basis of this research. This helped the authors better develop their VR training model. (31 words)

What makes this research different/better/worse than the previously published work? (maximum 50 words, in your own words):

A unique factor about this research is that they have utilized an Oculus rift HMD model and the concept of the VR system has already been tried on real time players. [31 words]

What did the authors do in order to address the problem? (maximum 100 words, in your own words):

In order to address the issue of the time taken to adjust to the pitch, the authors have come up with their own VR training system and analysed it with a team. They have received positive results from the batters as this has helped them understand better the opponent's motion of a delivery. (50 words)

Do you think this was the correct way to address the problem? Why, or why not? (maximum 50 words, in your own words):

The problem has been addressed in an acceptable manner. The authors have developed a system to counter the problem too. They have focused on the 3D trajectory of the ball along with the field view to explain how one can better analyse the game and what the existing issues are. (50 words)

What conclusions do the authors draw from the results? (maximum 50 words, in your own words):

The authors have concluded that the VR system developed is of some help to the batters as they received a positive response from the Nippon Professional Baseball (NPB) organisation and the batter seem to better strike the deliveries after training with this system. However, there is still room for scope to help the bowlers and technical issues that persist. (50 words)

Are these conclusions correct? Explain your answer to this question. (maximum 50 words, in your own words):

The conclusions drawn by this research could hold true in real life circumstances. More often than not, it is possible that due to analytical training and regular practice with a VR system, a player can perform better in tight situations as they would have already trained for this. (48 words)

If I had been doing research to address this problem, what would I have done differently? (maximum 50 words, in your own words):

I would have carried out the research with the team for a longer period and maybe have a seasonal analysis of their performance before and after using the VR technology. (30 words)

PAPER 3

The source of the paper (not the URL but its complete bibliographic reference):

A Review of Research on Augmented Reality in Education:
Advantages and Applications
Nor Farhah Saidin1, Noor Dayana Abd Halim1 & Noraffandy Yahaya1
1 Faculty of Education, Universiti Teknologi Malaysia, Malaysia

The DOI of the paper, as a link that can be followed directly:

Summary (maximum 150 words, in your own words):

Augmented reality has enabled us to integrate the digital world with the virtual environment. This research paper focuses on the application of augmented reality in the field of education. The introduction of augmented reality has revolutionised the field of education. AR makes it easier for students to visualise and analyse scientific subjects. Furthermore, over covid we have realised the importance of digital learning and AR has been of great help in ensuring the success of the education system over the pandemic. The use of AR has received a positive response from the students as they find themselves more willing to attend classes and learn through interactive means. However, the concept of AR in education is still new and thus, there is still scope of improvement as there persist many technical issues. [131 words]

What is the problem that the authors aim to address in this paper? (maximum 50 words, in your own words):

The paper compares the advantages of AR with its limitations in the field of education. While on one hand, AR has been successful in engaging the students and helping them understand better through visual means, on the other hand, it also has its limitations such as increasing screen time and technical issues. [50 words]

Why do you think this an important problem? If you do not think it is an important problem, why is this the case? (maximum 50 words, in your own words):

I believe this is an important topic as the field of AR has great scope and it is important for us to analyse the issues it's facing now in its application in order for us to improve. This paves way for future research on the subject. [46 words]

What previous work is the basis for this research? (maximum 100 words, in your own words):

Previous research has suggested that AR creates a passive learning environment if it does not promote critical thinking. The advanced technology enables students to interact with virtual and real time applications and problems. The advantages and limitations the technology poses are vast. Previous research on secondary school students' perceptions of science and engineering is an example of the research used in this paper. Furthermore, researches conducted on the varieties of memory & consciousness have also been analysed for the purpose of this research. (83 words).

What makes this research different/better/worse than the previously published work? (maximum 50 words, in your own words):

The one aspect of this research that differentiates it from the rest is that it analyzes the application of AR in each subject that is being taught (maths, physics, medicine, chemistry etc) and not just classroom education as a whole. [42 words]

What did the authors do in order to address the problem? (maximum 100 words, in your own words):

The authors have conducted a meta analysis of research of applications of AR in various subjects. The authors have further discussed the limitations and suggested future areas of research. The authors have emphasised on the recent developments in the field such as mobile technologies and widespread wi-fi access.[48 words]

Do you think this was the correct way to address the problem? Why, or why not? (maximum 50 words, in your own words):

I believe that the authors have addressed the problem in the right manner as they have ensured that they analyse the application of AR in each subject and comment on the scope of further study accordingly. This provides a wider view of the picture not just limited to education as a general topic. [53 words]

What conclusions do the authors draw from the results? (maximum 50 words, in your own words):

The authors have concluded that there is still scope of further development in AR. As of today, AR has helped both the students and the teachers and it seems to have increased the willingness of students to learn. The technical challenges AR faces today can be further developed with increasing research. [50 words]

Are these conclusions correct? Explain your answer to this question. (maximum 50 words, in your own words):

The conclusions are in line with the data collected by the authors. Its true that AR faces technical issues and needs to improve. However, the authors have not provided a concrete conclusion as to how AR can improve and this question is to be answered with further research. [48 words]

If I had been doing research to address this problem, what would I have done differently? (maximum 50 words, in your own words):

Primarily, I would consider sending out closed-ended questionnaires asking students to rate their experience with AR in classrooms on a scale of one to five. I would have also considered comparing the grades of students learning through traditional chalk and board systems vs the ones using AR. (47 words)