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VR Baby, a virtual reality learning environment - does it help medical students to learn about complex topics in obstetrics and gynaecology?

Submission date
30/11/2020

Recruitment status
No longer recruiting

Registration date
02/12/2020

Overall study status
Completed

Last Edited
01/12/2020

Condition category
Pregnancy and Childbirth

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
This study is investigating the use of virtual reality and how these techniques may help to enhance learning in medical education. Virtual reality (VR) can be defined as “real-time interactive graphics with 3D models”. Research has shown that virtual reality can help with the learning process. Virtual reality enables the students to discover and explore their own knowledge, learn by doing, develop creativity, aid visual learners, and increase understanding of invisible concepts. This is unique to topics found within the obstetrics and gynaecology curriculum. The main aim of this study is to investigate the effectiveness of a virtual reality learning environment (VRLE) compared with a traditional tutorial learning environment amongst medical students.

Who can participate?
Students studying medicine, undergraduate or graduate entry level medicine programmes at University College Dublin (UCD)

What does the study involve?
Participants are randomly allocated to the intervention or control group. The intervention group will undertake a 15-minute lesson in a virtual reality learning environment (VRLE) that was created on the topic of stages of development in pregnancy. The VRLE is carried out under the government-directed protocol and guidance in relation to COVID-19. Participants are given a short introduction on the use of the VR headset and controls. The participants then use the headset for 15 minutes. The control group will undertake a traditional tutorial, which will take place online due to COVID-19 restrictions. The tutorial will involve a face-to-face teaching session using a PowerPoint presentation in small group settings. The evaluation will consist of a test before and after the intervention, along with a questionnaire on the learning experience and design of the virtual reality learning environment, as the researchers would like to hear about the opinions and attitudes on the use of this technology for learning purposes.

What are the possible benefits and risks of participating?
The benefit of the study is that there is a learning opportunity for the participant to see the

stages of development in pregnancy in 3D, complementing the teaching given in modules at UCD. Participants' views and experiences are important to help the researchers develop new and innovative ways to provide medical education. There will be no impact on academic standing whether students choose to participate in the study or not. In terms of risks, there are no known potential risks or harm involved with the study, but a potential risk to participants is cybersickness which can be defined as a range of clinical symptoms related to exposure to virtual reality. This risk is minimised for the students by setting a time limit of a maximum of 15 minutes when they are using the virtual or augmented reality technology. If students have any medical problems such as epilepsy, pre-existing binocular vision disturbances or psychiatric disorders or suffer from a heart condition or other serious medical conditions, they will not be permitted to participate in the study as this is a safety precaution advised by the manufacturers. Before taking part in the study participants will be screened for any medical conditions mentioned above, and if participants have any of the conditions mentioned above they will not be permitted to participate in the study.

Where is the study run from?
UCD Perinatal Research Centre at the National Maternity Hospital (Ireland)

When is the study starting and how long is it expected to run from?
January 2020 to March 2021

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Prof. Fionnuala McAuliffe
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Contact information

Type(s)
Scientific

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Additional identifiers

Study information

Scientific Title
"VR Baby", a virtual reality learning environment for medical students - does it enhance the understanding and learning of invisible concepts? A randomized control trial

Study objectives
The educational landscape is becoming an increasingly dynamic environment in the 21st Century. Immersive technology enables the students to discover and explore their own knowledge, learn by doing, develop creativity, aid visual learners, and increase understanding of invisible concepts. It is hypothesized that immersive technology can enrich and enhance the learning experience, especially in relation to invisible concepts, which are unique to the curriculum in obstetrics and gynaecology. With this in mind, the aim is to investigate the use of virtual reality as an educational tool in obstetrics and gynaecology to teach medical students compared with a traditional face-to-face tutorial.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 26/5/2020, Human Research Ethics Committee at University College Dublin (Office of Research Ethics, Roebuck Castle, Belfield, Dublin 4, Ireland; +353 (0)1 716 8767; hrec@ucd.ie), ref: LS-20-09-McAuliffe

Primary study design
Interventional

Study design
Single-centre randomized control trial

Study type(s)
Other

Health condition(s) or problem(s) studied
Effect of virtual reality in medical education (obstetrics and gynaecology)

Interventions
Recruitment is to take place on Brightspace, an eLearning University platform and through class announcements. Students are invited to take part and asked to provide written informed consent. Participants are then randomly assigned to the intervention or control group. The intervention group will undertake a 15-minute lesson in a virtual reality learning environment (VRLE) that was created on the topic of stages of development in pregnancy. The VRLE is carried out under the government-directed protocol and guidance in relation to COVID-19. Participants are given a short introduction on the use of the VR headset and controls. The participants then use the headset for 15 minutes. The control group will undertake a traditional tutorial, which will take place online due to COVID-19 restrictions. The tutorial will involve a face-to-face teaching session using a PowerPoint presentation in small group settings. Participants knowledge is assessed with a pre-test (MCQ1), and 2 post-test (MCQ2&3) 10-question MCQ. MCQ 1 will be

taken immediately prior to the learning experience (control vs intervention), MCQ 2 will be taken immediately after the intervention and MCQ 3 will be taken 1 week later, after the intervention. This is followed by a questionnaire (Likert-style scale) on the learning experience, which will assess attitudes and opinions on the VRLE and a questionnaire (Likert-style scale) on the design of the virtual reality learning environment.

Intervention Type
Other

Primary outcome(s)
Knowledge measured by differences in MCQ scores pre and post test

Key secondary outcome(s)
1. Attitudes and opinions on the learning experience measured by a validated scale, the student satisfaction in learning and self-confidence scale, a 5-point Likert scale completed immediately after the learning experience
2. Attitudes and opinions on the design of the virtual reality learning environment measured by a validated scale, the simulation design scale adapted for the VRLE, a 5-point Likert scale completed immediately after the learning experience
3. Side effect profile to help assess the usability, measured using a questionnaire immediately after the learning experience

Completion date
31/03/2021

Eligibility

Key inclusion criteria
All students studying medicine, undergraduate or graduate entry level programmes at University College Dublin

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
56

Key exclusion criteria

1. Non-English speaker
2. Aged under 18 years
3. Medical conditions: epilepsy, pre-existing binocular vision disturbances, psychiatric disorders, heart conditions, or other serious medical conditions

Date of first enrolment
01/07/2020

Date of final enrolment
31/10/2020

Locations

Countries of recruitment
Ireland

Study participating centre
UCD Perinatal Research Centre
Obstetrics and Gynaecology
School of Medicine
University College Dublin
65/66 Lower Mount Street (3rd Floor)
Dublin
Ireland
D2

Sponsor information

Organisation
University College Dublin

Funder(s)

Funder type
Not defined

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Prof. Fionnuala McAuliffe (fionnuala.mcauliffe@ucd.ie).

IPD sharing plan summary
Available on request