

UNITZERO - A Proposal for UWTSD

Angel Garden Independent Study - PCET

This paper is an exploratory study/proposal for UWTSD to adopt a self-sustaining inclusion and diversity audit, in the form of UNITZERO, a common module, built and managed by the University.

Specific problems of lockdown, Covid, isolation, lack of kinaesthetic involvement or engagement, accessibility and mental health challenges have coincided with the introduction of Common Modules. These modules attempt to promote common understandings through somewhat interactive units, with communal follow-on activities. Modules address 'digital citizenship' and other 'wicked problems' facing humanity.

Received criticism of not being diverse and/or inclusive may reflect the homogeneity of the common modules development team, but equality cannot be retro-fitted so how can data collected by modules be digested and re-presented to drive a game and to deepen understanding, and promote vibrant learning?

Two primary research projects were conducted; a questionnaire and an autoethnographic account, and examination of seven relevant papers, featured here to build a picture of the feasibility of such a project.

This is followed by discussion of the research data and a conclusion.

Primary research

1. Questionnaire/Interviews

The questionnaire was both quantitative and qualitative. On reflection it was probably more like an informal interview due to the exploratory and open ended nature of some of the questions. It engaged ethics; the purposes and limitations of the questionnaire were made clear, including the small sample size, and anonymity was guaranteed. This also engaged the quality, sustainability and bench-marking element of my question due to the inclusion of comparative questions concerning Virtual Reality (VR) and wired/connected Serious Games (SG).

Eight questionnaires were distributed to acquaintances who were known to have an interest in games. Eight questionnaires were returned. The questions were broadly assessing knowledge of serious games, language about them, with questions designed to elicit answers that might be relevant to both gaming and education. There were also questions comparing wired serious games with Virtual Reality. Nobody had the same favourite game.

Most important to the subjects in their own game playing was variety. Immersion, interactive engagement, role-playing and learning were cited as reasons games were popular.

All subjects were seen as suitable for educational games with exception of war, crime, and sex. Pedagogical input to ensure learning outcomes was seen as important. One participant said *"Almost all of my knowledge of History comes purely from games"*.

Subjects overwhelmingly 6/8 thought the wired market would be bigger, and again 6/8 thought the wired option was healthier:

"VR will make you dizzy/sea sick after about 1.3 hours depending on the person",

'VR gives me a headache after a few minutes'

'VR uses radiation'

'VR can warp your sense of reality'.

'VR environment could become more addictive.'

'VR comes with the risk of not knowing your surroundings and possibly damaging to the eyes'.

Perhaps surprisingly in context, opinions on which would be better for education were divided equally, with two making no opinion.

2. Autoethnography/Case study

The case study included here is an autoethnographic account of a non-gamer using Duolingo to learn Spanish:

"Although I had not played a serious game I had started Duolingo some years ago and now decided to give it a proper go to see how it compared with my other favourite way of learning Spanish, watching Telenovella.

I found myself learning quickly, it suits my visual style of learning although I find the noises annoying as they are all the same.

I joined in November 2018. I have started three different languages on Duolingo. I do not have the paid version.

Currently in Emerald league I have completed 431 lessons so far in the beginner's Spanish course.

I have been bored but less so since I started trying to move up the leagues, in fact I can become very competitive with myself but also with others. Staying in the top ten each week is becoming an obsession because that's when you can move to the next league.

As an effective strategy for learning Spanish it is exceptional. It's cumulative and repetitive and sometimes that gets annoying but the jumps between leagues are getting bigger and the sentences I can translate both from English to Spanish and the other way round are getting longer. The noises are a bit annoying but you can operate in complete silence by choosing the 'cannot listen' and 'cannot speak now' buttons.

There is variety in sometimes picking words in order, sometimes translating either way round, sometimes repeating and also the ability to listen to stories. Threat is present as you can lose hearts and then unless you pay you have to stop until the next day, threatening the league position etc., This means that my main opponent is Duo itself as I'm determined to become fluent without having to pay."

Secondary Research

1. Comparing the Effects on Learning Outcomes of Tablet-Based and Virtual Reality-Based Serious Gaming Modules for Basic Life Support Training: Randomized Trial

Aksoy et al (2019).

The study was an RCT to find out about learning outcomes of serious games by comparing them in a controlled situation. They used the BLS serious gaming app and modules on both tablet and VR and found both to be effective. Citing Bandura's social learning Theory, the study authors argue that the interaction with the virtual world in the game provides high levels of 'perception, impersonation and demonstration' provided by other people in a real world learning environment. The study found that these immersion effects being greater in VR, so were the learning outcomes as tested at the time. The study pointed to other trials that found that what games are made on varies the response.

2. Virtual reality and gamification in marketing higher education: a review and research agenda.

Loureiro S, Bilro R, de Aires Angelino F (2020).

This study is a literature review of journals indexed to Web of Science (WOS) with two search terms applied, both featuring "education" and "Marketing or service". The searches were either for 'virtual reality' or 'gamification'. The 115 papers returned were then put through Topic Modelling (a text mining technique) to identify material on VR and gamification in higher education from a marketing perspective. Almost twice as many (281) articles were returned for VR as compared with 'gamification' (150).

VR is more present in research on medicine and health sciences, and other scientific areas, while gamification is more widely referred to in studies on business and management. Avenues for research include integration of VR into "cyber-physical systems" as well as seeking more 5G and immersive capabilities.

3. Designing a Virtual World to Mirror the Real Challenges of Life as an Amputee

Winkler, S., Kairalla, J., Ludwig, A., & Fowler, C. (2020).

This study used mixed methods to try and find out why published studies often found qualitatively positive reports about virtual world experiences, while quantitative evidence of effect was largely missing. Interviewing subjects revealed the situational context of the participants was where they actually lived.

The study found what they were measuring did not fit with the actual facts of peoples' lives, missing such ordinary distractions as, for example, "fear of falling and injury" or "the need to find employment", and this realisation led them to seek a finer quantitative sieve. Amputee participants meanwhile suggested collecting daily information to set goals and deadlines within the game, including around difficult subjects like fear, and grief.

4. Essential Features of Serious Games Design in Higher Education

Lameras P, (2015)

Describing itself as a scoping study this rather comprehensive overview of how design can serve both users and pedagogy talks of successful “*choices*” being strategic rather than just about skill. The study found a state of flow in players facing enjoyable learning challenges that reflect different elements of their progress.

The study echoes the previous one in terms of promoting personalisation and proposes more focus on qualitative research and less on RCTs as a way forward.

5. *People with Disabilities Leading the Design of Serious Games and Virtual Worlds.*

Politis, Y., Robb, N., Yakkundi, A., Dillenburger, K., Herbertson, N., Charlesworth, B., & Goodman, L. (2017).

Examining further the successful involvement of disabled people and games designers, the paper looks at international standards of User-Centred Design (UCD), which has nothing to do with disabled people per se, since games are designed to adapt to the end user by design in any case. It allows prototypes to be continually ‘*refined iteratively based on user feedback*’ which has potential. The paper links this to democratic and ethical Participatory Design practices.

6. *Workshop: Designing games for specific contexts*

Sedano C I, (2012).

This workshop proposal examines context in games design, seeking to remain within players’ own contexts and referring to that as a ‘location’. The necessity to be so anchored is increased by the desire to actually teach something but exacerbated by the decreasing likely knowledge of one another’s contexts, that can be taken for granted. On the contrary, knowledge cannot be seen as separate from player’s multifaceted ‘location’ and thus the necessity arises to ‘*make context operational*’.

7. *Situated Cognition and the Culture of Learning*

Seely Brown, J. Collins, A. Duguid, P. (1989)

The final paper goes further, yet predates all of the others. The paper seeks to remove the artificial construct of a difference between ‘*knowing what*’ and ‘*knowing how*’. It makes the case that knowledge is always rooted in culture, and that without being viewed from within that culture, cannot be understood. The antidote is learning by ‘*authentic activities*’ which provide experience, as well as a stand-point from which to approach learning.

Discussion

The questionnaire answers cited variety as being the most important attribute of a game. A design fault of the questionnaire was that the terminology reflected a common misunderstanding: virtual reality is often spoken of as being alternative to ‘serious games’ rather than another platform to play serious games on, and this caused some uncertainty in the answers.

The autoethnographic account again emphasised variety and control, within this simple app, leading to competition with self and others and motivation to compete with the app

itself, together with accessibility, the convenience of being able to access it basically anywhere at any time.

The heightened effectiveness on the all important learning outcomes for VR over wired serious games in the first (RCT) trial turned out to be only based on questioning immediately afterwards, with no follow up. As the difference was small anyway this finding looks insubstantial. Unsurprisingly the team were part of a virtual reality company.

From a marketing perspective the Loureiro trial's desire to "*develop methodologies that can aggregate a community*" looks promising, but the recommended research questions focus on more and more applications for VR and 5G including the integration of VR into '*cyber-physical systems*'.

Neither of these approaches meet our need for a user-centred diverse and inclusive learning experience since both exclude by definition those who are electro-hypersensitive, i.e. experience the effects directly and strongly from RFR. The lack of questioning about the relative safety of methods reflects the pre-occupations of those funding and conducting the research.

The danger of making empirical statements about efficacy of games without looking at context was further born out in the the trial looking at amputees' experiences. It was news to those researchers that taking account of situational variables could make so much difference. Yet the participants knew the game could cope with more subtle distinctions to be more personally reflexive, and what challenges it needed to address.

Meanwhile Lamas' (SRHE) exploration of "*qualitatively different ways of using games in HE*", leads to specificity and user engagement. Politis points out the alignment of co-design with EU Research and Innovation standards, leading to Responsible Research and Innovation (RRI) approaches of collaborative working, "*to better align both the process and its outcomes with the values, needs and expectations of society*".

This theme is developed by the Sedano study, which acknowledges that designers no longer share 'contexts' with many of those variety-demanding players. The the final paper, Situated Cognition redefines education as necessarily existing and emanating entirely from situation.

Conclusion

Serious games are both practically and theoretically suitable for further study as diversity and inclusion strategies. Autonomy and agency are necessary features of games, effective learning and inclusion, leading to active kinaesthetic learning.

Only if the user/student has some opportunity to control what happens next, can it be said to be a serious game and the same is true for inclusion.

While homogeneity will always be a problem for tick-box inclusion and diversity, sustainable communication demands we go further, (QAA 2014). The games industry is already primed, having already built mechanisms to adapt to different users, where their interaction with the game itself decides what happens next.

Variety and diversity are hard to differentiate in this context, increasing the suitability of games as a vehicle for communal, and community study in the suggested context.

Generations would inherit iterations of products remixed and with archived paths of exploration, discussion, argument, discovery and transformation, to which they would know, on first arriving, that they will be expected to contribute.

Further Recommendations/research directions include:

1. Identify existing resources within USTSD to begin this process, and to solicit feedback on the idea from those areas in the first instance.
2. Involving as diverse team as possible so avoid the ill-fated “retro-fitting”.
3. Clarify terms, referring to ‘VR serious games’ and to ‘wired’ or ‘non VR serious games’ to differentiate between these two platforms rather than artificially differentiating “VR” from “serious games”, which even the RCT showed to be false as it used the same serious game for both groups.
4. Making sure all applications are wired, thus serving both education and diversity, as well helping to clarify terms. The lack of underwriting for electromagnetic radiation (Smart Meter Harms 2015), as well as Lloyds comparisons with asbestos (Lloyds risk report 2010), point to the likelihood that the future will eventually favour wired internet, and so developing serious games for wired connection is the only choice in line with sustainability goals.
5. Need to be realistic about both the addictiveness, pain-allying and mood enhancement of games which has been a feature of the year under Covid restrictions.

According to the flow framework, the learner enjoys learning and playing if the challenges are based on learner’s skills and abilities. This drives the learner into a state of flow while the SRHE report talks about an *‘inclusive hierarchy for describing ways, frames and discourses of experiencing the phenomenon and contextualising it in particular academic tribes and territories.’*

This again echoes the need to contextualise and situate diversity and inclusion as both product and process, synthesising variety and diversity in a self-sustaining Common Module serious game - Unitzero.

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