EVALUATING MULTI-USER VIRTUAL ENVIRONMENT TECHNOLOGY FOR VISUAL ARTS INQUIRY USING ACTION CASE RESEARCH

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Abstract

Visual arts inquiry (VAI) is a valued part of teaching visual arts. While first hand exposure to original pieces is lauded as the ideal scenario, this is not always feasible for geographic, time and budgetary constraints. Unfortunately, secondary copies presented in popular electronic presentation software do not compare well to a gallery experience with respect to immersion, proximity and viewer autonomy. They often mislead the learner in relation to a work’s actual scale. Multi-user virtual environments have been explored for virtual field trips to 3D gallery spaces. Many museums and galleries have virtual counterparts. This action case research (Yen, Woolley & Hseih, 2002) evaluates the evolution and potential of a specially designed multi-user virtual gallery (MUVG) within the MUVE Second Life for VAI with student primary school teachers studying curriculum visual arts. Now embarking on a third cycle of planning, designing, implementing, evaluating, reflecting, and self-evaluating, this paper presents on ‘actions’ derived from key findings from two consecutive case studies to improve virtual VAI. While appreciating the findings are context specific, this action case research may be of interest to other educators interested in VAI, v-learning, MUVE technology for educational purposes or action case research.

Keywords: visual arts inquiry, teacher education, multi-user virtual environments, Second Life, action case research.

1 INTRODUCTION

This article will discuss the iterative process of evolving a multi-user virtual gallery (MUVG) for primary school student teachers studying curriculum visual arts for virtual visual arts inquiry (VAI) within the popular MUVE Second Life. It will discuss what and how learning took place with respect to VAI from two consecutive case studies. It will discuss participants’ perspectives regarding its strengths, limitations and potential for VAI and what actions, stemming from findings, were undertaken to improve the next cycle.

2 VISUAL ARTS INQUIRY

Visual arts inquiry (VAI) and its related contextual studies has long been ‘an established and valued element of visual arts education’ (Long, 2001, p. 257). Despite this, VAI has not been embraced to the same degree in primary schools as creating visual art partly because of a deficit in primary teacher’s subject knowledge and little confidence in their capacity to mediate meaningful engagement with works of art (Crafts Council, 2009; Flannery, 2010; INTO, 2009, NCCA, 2005). Another factor is teachers’ misconceptions that VAI will somehow impede children’s creativity. However, orchestrating opportunities for students to investigate visual art is deemed critically important to enable them understand, apply and reflect upon the constructs, processes and visual language employed by visual artists (Herz, 2010). Consequently, a key aim of initial teacher education is to develop student teachers subject knowledge about visual arts and VAI so that they will be more inclined to embrace VAI in their classroom practice.

3 MOTIVATION FOR THIS RESEARCH

While first hand exposure to, and engagement with diverse original pieces in a gallery setting is lauded as an ideal learning scenario (Colbert, 2001; Lai, 2009; Long, 2001; Unrath & Luehrman, 2009), this is not always feasible due to budgetary, geographical or timetabling constraints. Consequently, it behoves the teacher to approximate the closest VAI experience possible from the classroom. Reduced time for curriculum visual arts in recently reconfigured initial teacher education degree
programmes, timetabling restrictions and student numbers prevented the teacher-researcher from organising whole year group field trips to galleries and museums. Consequently, he turned to the multi-user virtual environment (MUVE) Second Life (SL) for virtual VAI (VVAI). This action case research evaluates MUVE's affordances for VVAI with student teachers to complement traditional classroom practica. It specifically evaluates a teacher-researcher designed MUVE gallery within SL in relation to expanding users’ subject connoisseurship and teaching particular constructs to inform their own work.

4 THE LIMITATIONS OF SECONDARY COPIES FOR VISUAL ARTS INQUIRY

VAI in the classroom has always included engagement with secondary copies for pragmatic reasons. Traditional hard copies on posters, postcards or publications can be brought into the classroom, looked at and handled in a very visceral manner. Traditional digital copies are usually sourced from the Internet and embedded in slides of popular electronic presentations such as Powerpoint and Prezi. However, both traditional hard and digital secondary sources often fail to fully approximate the original work (Whitworth, 2009). Usually, digital copies presented via electronic presentation software such as Powerpoint mislead students in terms of portraying a work’s actual size or excluding kinetic elements. They have limitations in accommodating proximity, differing viewpoints or interactivity. Whole class approaches necessary to view such presentations means there is very little learner autonomy for students to engage work at their own pace, in their own time or in their own way. Ironically, VAI in crowded galleries is often bounded by time, space and viewpoint. Frequently, prolonged looking, proximity and interactivity are not permitted in the gallery because of security or healthy and safety reasons. Sack (1997) contends that some gallery spaces are not designed for interactivity, and that ‘most museum walls are designed to be seen, but not touched’ (Sack, 1997, p.10).

5 ADVOCATED APPROACHES FOR VISUAL ARTS INQUIRY

While there are many recognised approaches, VAI can generally be experienced, explored or mediated on two levels. One set of approaches entail interrogating the work in its own right without any contextual details. Meaning is derived from the work only. Other approaches adopt a more contextual approach requiring certain connoisseurship about the work’s provenance, its historical, political or cultural context or artist’s intent (Heller, 2002; Slattery 2006). For example, visual thinking strategies (VTS) is a method initiated by teacher-facilitated discussions of art images that enables students unpack understandings informed by what they see, feel, think and hear from one another. An iconographic analysis approach seeks to establish the meaning of a piece at the time it was created. A contextual analysis approach considers whether the artist’s personal experiences and opinions may have affected the making or meaning of the artwork in some way. Formal analysis explores the formal qualities of the work and the processes entailed in its creation. Every approach has value. However, one might assert that if VAI entails judgement as opposed to interpretation only, then it behoves the viewer to provide an informed appraisal which is fair to the work and the artist which implies undertaking some contextual research.

Irrespective of VAI approach, the Irish primary school curriculum advocates that children acquire an open and curious disposition to the diversity of visual art and that they are taught to appreciate and become a discerning consumer of culture (NCCA, 1999). Therefore, it behoves teachers to have the necessary subject connoisseurship and pedagogical skills to orchestrate VAI that embraces appreciation and informed evaluation. SL functionality permits both approaches as students can engage with digital visual copies, and if they chose, they can obtain contextual information about exhibit in the form of embedded ‘notecard’ information or hyperlinks to other credible online sources. Meaningful VAI requires time and guided discovery (Barbe-Gall, 2002; Finlay, 2012; IMMA, 2010; Heller, 2002; Herz, 2010; NCCA, 1999). Guided discovery entails encouraging students to look closely at artwork, sharing observations with one another and gradually revealing information about work. It also entails answering and asking questions and eliciting emerging understandings from learners. This action case research hypothesises that SL functionality provides for extended looking and supports a guided discovery approach.

6 THE PROS AND CONS OF MULTI-USER ENVIRONMENTS FOR VAI

Regardless of the subject area, MUVE technology permits educators with sufficient technology pedagogical and content knowledge (TPACK) to build and modify virtual learning spaces and
scenarios, which multiple students can explore and respond to, in a synchronous manner. A key attraction for many educators is the extent to which MUVE’s topography and affordances can approximate a real world experience not so readily available to their students or that are hard to cultivate in the traditional classroom. (Educause, 2008; Dieterle & Clarke, ----; Through immersion of a specially designed simulation and engagement with authentic tasks, students can begin to act the part, for example, of the scientist, historian or art critic as they learn related principles and concepts, acquire related skills and undertake relevant tasks and challenges. The perceived advantages of learning in multi-user virtual learner environments (MUVE) relate to social learning, learning communities, satisfying the need for affiliation, self-determination, self-efficacy, engagement, simulation of real life environments and cultural diversity (Deci & Ryan, 2004; Nash, 2009; Sanchez, 2009). Other see benefits to education in relation to its imaginative aesthetics, less inhibiting atmosphere, potential for collaborative creativity and communication (Nash, 2009; Warbuton 2009). Consequently, many galleries and museums have MUVE counterparts in Second Life that enable visitors explore exhibits at their own pace and in their own way (Hay & Pymm; 2010/2011; Wang, 2012). However, MUVE technology does pose other challenges for learners and instructors. Its software has particular technological requirements and devices requires a very good graphics card to experience SL’s topography and aesthetics fully. Not all students are not technologically savvy or experienced in virtual game playing and so there can be a high learning curve for them in terms of controlling their avatar and using inter avatar communication tools. MUVE design requires time, expertise and money to develop an excellent learning environment and teachers can encounter technological troubleshooting that can impact on induction sessions (Baker, Wentz & Woods, 2009).

7 METHODOLOGY AND ACTION CASE RESEARCH

Typically, action research is initiated to solve a problem of practice. It may entail analytical, investigative and evaluative methods to diagnose and solve the problem. Researchers can act as participants of the research. The cycle of inquiry/ action entails collecting, analysing and interpreting data regarding the problem and the creating, implementing and evaluating action(s) undertaken to address the problem. Case study research is an in-depth examination of a particular event, situation or individual. Usually, case studies in design based research entails a detailed analysis and systematic evaluation of a product. In order to explore both interpretation and intervention for design research, Barr and Vidgen (1995) conceived of the methodology and coined the term action case research. Action case research was adopted for this study as it enabled the researcher to engage in cycles of inquiry regarding the efficacy of AISLE in a case by case and year by year manner with different cohorts student primary teachers studying the same module. It permitted the accumulation of design theory/practice knowledge regarding the potential of virtual visual arts inquiry in practice. Each case study adopted a convergent parallel mixed methods design (Creswell, 2014) as a number of methods were employed and both qualitative and quantitative data was gathered over a relatively short period of time. Methods included pre and post AISLE VAI writing tasks to measure understandings and any learning attributed to AISLE. They also included a post AISLE questionnaire and a semi-structured group interview to evaluate their experience. It also consisted of some researcher observation of avatar activity and dialogue.

8 AISLE (ART INQUIRY IN A SECOND LIFE ENVIRONMENT)

AISLE is teacher designed gallery in a privately owned residence purchased in the MUVE Second Life. Having downloaded SL software, and created an avatar, any invited user can visit, explore, document and communicate about the exhibition using key available tools including navigation, camera viewing and inter-avatar communication tools. However, they cannot ‘build’ within the residence. AISLE permits no more than twelve visiting avatars at any given moment. User’s avatars can walk around the gallery spaces and view work on their screen at their own pace, in their own way and in their own time. For the purposes of this research, participants scheduled themselves to visit at agreed times. The key general learning theories underpinning AISLE design include social constructivist, constructionist and inquiry based learning (Jordan et al, 2008; Prichard, 2009). It was also influenced by the Global Virtual Education model (GloVED) which in turn is based on the Teaching-Studying-Learning process and characteristics of meaningful learning (Keskitalo, Pyykkö & Ruokamo (2011). AISLE was undergone a number of design changes informed by evaluations from a pilot study and two case studies so far.
For case study one, AISLE comprised of a number of rooms which exhibited a selection of diverse canonical work, which illustrated particular constructs concerning scale, movement and mood in visual arts (see figure 1). For example, some pieces illustrated how scale can be implied within a work using a variety for techniques including relation size, relative height, aerial perspective, vanishing points or occlusion. There were similar constructs threading the exhibition in relation to movement and mood. The exhibition itself was a mixture of large scale, medium sized and miniature work that reflect the exact dimensions of the original work in a real gallery setting. Embedded in each virtual exhibit was information ‘notecards’ that contained contextual information about each piece and explained particular constructs illustrated within the work in relation to scale, movement and mood.

AISLE design was reconfigured for case study two. These ‘actions’ stemmed from findings derived from case study one. Actions included increased signage on walls to help visitors navigate the gallery and reminders of how to use the various SL tools more effectively. Other actions included having less exhibits per room and reducing the amount of contextual content in embedded ‘notecards for easier reading. Exhibits were organised into more clearly defined conceptual chunks concerning movement, media and musicality in art. For example, one section of exhibits and their embedded notecards illustrated how gestural, directional and diagonal lines as well as pattern can imply movement and musicality in art. Teacher mediated instructions prior their visit to AISLE were less open ended and more inquiry-based in terms of challenging participants to wonder, investigate, discuss, reflect and create particular constructs in follow up artwork.

9 PARTICIPANTS AND PROCEDURES

Thirty-six student primary teachers participated in case study one in 2015 and eighty student primary teachers partook in case study two in 2016. Participation was voluntary and ethical considerations regarding the researcher’s position of power were addressed satisfactorily for the higher education institutes’ ethics in research committee. Participants completed pre and post AISLE VAI writing tasks to measure their subject knowledge and understanding of constructs addressed in AISLE. Having visited the MUVG, they complete a post AISLE evaluation questionnaire. These were completed anonymously. A smaller group of participants took part in a semi-structured group discussion following questionnaire analysis. Researcher observation proved too difficult as the viewing tool could not capture all the different groupings wandering through different gallery spaces at any given time. Furthermore, it felt too intrusive as the researcher’s avatar would have to follow participants in order to
observe and this kind of surveillance did align well with AISLE’s aspirations for learner autonomy. However, listening proved to be informative as the researcher could hear the various kinds of conversations taking place between participants. Dialogue comprised of humourous exchanges at the expensive other avatar’s misfortunes, coordinating group selfies in front of particular artworks, trying to identify other people’s avatars, helping other students’ troubleshoot their technological issues, explaining how to use particular SL tools and group discussions about the exhibits.

10 FINDINGS AND ACTIONS FROM CASE STUDY ONE

Findings from case study one revealed that while participants learned the more overt constructs concerning actual scale and movement and colour’s impact on mood, participants learned far fewer of the more covert and complex constructs concerning mood or implied scale and movement. Post AISLE research tools evidenced that participants learned of new artists, broadened their definition of what constitutes as visual art and increased their appreciation for the impact of large-scale artwork especially. They attributed their learning mostly to SL’s virtual topography, the navigation tools and the camera viewing tools. These enabled them to ascertain actual scale, exercise proximity and take multiple viewpoints points for focused looking. Notwithstanding this, the first case study conceded that the teacher was still required to unpack more complex scale-related constructs and that depth of learning experience hinged on students’ confidence and competence in using and exploring available SL functionality. This echoed research conducted with learners using MUVEs for learning in other subject domains (Dreher et al, 2009; Hay & Pym, 2010; Wood et al, 2008). Case study one conceded that novice MUVE users really need to learn to use MUVE functionality before they use MUVE functionality to learn. This also aligned with other similar studies on MUVE technology and learning (De Lucia, Francese, Passero & Tortora, 200; Wang & Shao, 2012). The ‘actions’ stemming from these findings, as mentioned earlier, informed AISLE design for the second case study.

11 FINDINGS AND ACTIONS FROM THE SECOND STUDY TWO

Eighty student teachers participated in the second case study. Post AISLE research tools evidenced that participants learned about new artists, increased their understanding of the diversity of media used in visual art and its impact on meaning, increased their understanding regarding actual and implied movement in visual arts and made conceptual connections between implied movement and musicality in art. There was more learning of the more covert and complex constructs in case study two. Most interestingly, the tools to which they attributed most of their learning this time were the embedded contextual notecards (n45), the exhibits (n20) and other avatars (n18). Less attributed their learning to the three dimensional environment (n16) and navigation tools (n12) which were credited the most in the first case study. Perhaps, this is not so surprising considering that we measure scale as addressed in AISLE for case study one using our depth and perception cues and we tend to need to read and reflect more about more abstracted concepts such as musicality as addressed in AISLE for case study two in text and imagery.

Seventy-eight out of the eighty participants deemed AISLE to be quite a worthwhile (n30), a worthwhile (n42) or very worthwhile (n6) learning experience in the post AISLE questionnaire. Many participants liked AISLE because it was different (n22); it facilitated learner autonomy (n14); it was explorative (n18) or because it was new experience for them (n16). Others liked AISLE because it was three-dimensional (n8), interactive (n8) and similar to a gallery visit (n6). Some liked it because it was interesting (n10), engaging (n6), creative (n8) and fun (n10).

Some participants recommended even more in-class time beforehand to better prepare them for AISLE (n10) and that the exhibition of work could be further expanded (n8). Other respondents remarked that MUVE technology could be more responsive and easier to navigate (n4). Some suggested that podcasts and videos could be embedded as textures even though they were actually included to show animated work by the artist Julian Opie and digital Optical artists. A few others recommended that AISLE should permit more than twelve avatars at any given time (n4). In terms of what they disliked about the experience, many mentioned the troubleshooting difficulties they encountered (n21) or the fact they found the technology confusing (n15). Others voiced concerns that it is over-18s (n13) and had wondered about security (n10). For example, some students found it unnerving entering AISLE if no other avatar was present. They wanted greater assurance that whomever they encountered was a fellow student and not a stranger avatar. Regarding future possibilities for AISLE, some participants proposed developing an interactive repository of their art work and possibility exploring it for collaborative creativity.
12 CONCLUSIONS

This paper presented 'actions' stemming from findings derived from two consecutive case studies as part of an action research project which was evaluating the potential of MUVE technology for VAI. Both case studies found that AISLE impacted positively on student primary teachers’ subject knowledge and deepened their understandings of particular visual arts constructs. Findings from both case studies implied specific 'actions' to improve virtual VAI. Security concerns communicated from case study two have resulted in the purchasing of a private island entitled Engage. Consequently, AISLE is larger and can accommodate a far larger number of avatars at any given time as recommended from case study one. The larger buildings now permit more physicality including ‘flying’ and ‘teleporting’ from one exhibition space to another as opposed to merely walking inside one gallery building. While some might perceive flying and teleporting as novelty mainly, others would assert that from a transformative learning theory perspective, these very MUVE capacities and activities provide the structural shift in the basic premises of actions, feelings and thoughts and trigger the shift of consciousness that alters students’ way of being in the MUVE. The gallery now contains exemplars of student teachers’ and children's work as suggested from case study two but also include 'embedded' lesson plans to help with school placement planning and teaching. However, despite these actions, case study three will be particularly significant in considering AISLE’s future. Notwithstanding quite positive results from both case studies regarding participants’ increased knowledge, understanding and appreciation for specific constructs in visual arts, the monetary cost and time required to implement these design changes is emerging as a key challenge. Therefore, case study three will be critical in establishing whether the learning derived on a more secure and extended AISLE is worth the additional cost and commitment for student SL induction and continual AISLE design development. There is further research to ascertain whether virtual VAI in a MUVE can be a creative complement to traditional teaching art practice.

REFERENCES


