

**AN EXPLORATION OF THE POTENTIAL OF A VIRTUAL WORLD TO SUPPORT
TEACHERS' PREPARATION FOR TEACHER PROFESSIONAL DEVELOPMENT
USING AN ACTION RESEARCH APPROACH**

Linda Darbey



National Centre *for* Guidance in Education
Lárionad Náisiúnta *um* Threoir *san* Oideachas

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FOREWORD

The National Centre for Guidance in Education (NCGE), an agency of the Department of Education and Skills, was established under the aegis of Léargas in 1995.

The remit of the NCGE includes promoting the implementation of best practice in guidance and counselling in schools, centres for education, and adult education settings in accordance with the requirements of the Education Act 1998, and advising on high quality and relevant initial guidance counselling education and training and the provision of Continuing Professional Development (CPD) for guidance practitioners.

Linda Darbey, Guidance Programme Co-ordinator in NCGE completed this research as part of the Trinity College Dublin (TCD) *Technology and Learning* programme. The findings of the research '*An Exploration of the Potential of a Virtual World to support Teachers' preparation for Teacher Professional Development using an Action Research Approach*' support and inform the NCGE developmental approach to both the use of ICT in guidance and CPD for guidance counsellors.

Jennifer McKenzie
Director
NCGE

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INTRODUCTION

This research explores the potential of a Virtual World (VW) to support guidance counsellors' preparation for a Teacher Professional Development (TPD) programme using an action research approach. The programme consists of three modules, each of three months duration, delivered using a combination of face-to-face workshops and e-learning. The programme is delivered using an action research approach. Practice based evidence identified a number of challenges faced by previous learners in progressing to a subsequent module of the programme.

The literature suggests that VWs support a constructivist approach to learning through the affordances (immersion, persistence, communication tools) of the technology (Dalgarno & Lee, 2009). In addition VWs offer the opportunity to address some of the challenges of TPD including, geographical dispersion of schools, the dominance of an information transfer approach, disconnection from practice and context, and lacking in intensity (Conway, Murphy, Rath & Hall, 2009).

This study involves guidance counsellors who were invited to participate in a learning experience to prepare them for a module of a TPD programme. The learning experience consisted of two practice based discussions, to take place in a school in a VW, and a number of learning activities. An action research approach was used by geographically dispersed participants to review the current status of guidance planning in their schools; to identify and implement actions (as appropriate) for progressing the planning process; to monitor/observe their progress; and to reflect on their experiences as part of a reconnaissance cycle of action research. The learning experience supported a constructivist and action research approach to TPD.

The research employed a case study approach involving three guidance counsellors working in post primary schools and two facilitators. A case study approach was employed as it allowed for an in-depth study of participants' experiences of using a VW for TPD. It also allowed the researcher to explore the potential of a VW to support an action research approach to professional development.

The data was collected using a mixed methods approach. During the learning experience guidance counsellors were asked to generate content to reflect their progress. After the learning experience took place all participants were asked to participate in a brief collective interview in

SL, complete a questionnaire and participate in a semi-structured interview. Throughout the learning experience the researcher acted as an observer recording her observations and reflections of the process. The data from all sources was coded and organised into themes for analysis.

The question which informed the research project was *'Can a Virtual World support teachers' in their preparation for Teacher Professional Development using an Action Research Approach'*. The results of the study demonstrated that VWs have huge potential for providing TPD and can support an action research approach. A number of challenges were highlighted and these included, accessing the technology, the need for ongoing technical support and to address the lack of social cues when facilitating discussions. The study has a number of limitations including, the sample size and the timeframe allowed for the research. Areas identified for future research were the integration of SL into a TPD programme and an investigation into how SL can support an action research approach.

CHAPTER ONE: LITERATURE REVIEW

1.1 Introduction

The purpose of this chapter is to explore Teacher Professional Development (TPD) and how some of the challenges facing TPD can be addressed using Virtual Worlds (VWs). TPD in Ireland is often referred to as in-service training, in-career development and/ or Continuing Professional Development (CPD) (Granville, 2005). For the purposes of this study the term TPD will be employed to refer to the ongoing professional development of teachers. There are a number of challenges facing the provision of TPD and these include, access to TPD, fragmented provision, impact on classroom practice and modes of delivery (Coolahan, 2003). The use of ICT to support the delivery of TPD in Ireland has been under utilised (Egan, 2004).

VWs are 3D online environments which allow the user to have a sense of presence in, and to interact with the environment via a representation of the user (avatar) in the environment (Warburton, 2009). They offer synchronous and asynchronous communication tools (text and voice chat, and instant messaging – IM) and VWs such as Second Life (SL) also allow the user to interact with the environment through the construction of objects (Hew & Cheung, 2010; Boulos, Hetherington & Wheeler, 2007; Girvan & Savage, 2010). As VWs are persistent and immersive environments, allowing users to interact in real time, they can provide a space for educators and learners separated by distance to engage in learning (Hew & Cheung, 2010). Thus they are ideal platforms for supporting the delivery of TPD allowing teachers to access professional development anytime and from anyplace.

This chapter will examine the potential of VWs to support the delivery of TPD. It will commence with an exploration of TPD and the use of ICT in supporting TPD and will then turn to exploring VWs as learning environments, highlighting the opportunities that VWs offer TPD. The chapter will conclude by highlighting areas for future research and development.

1.2 Method

In undertaking this literature review the author undertook a search of the principal journals in the area of technology and learning; visited the website of The Department of Education and Skills (DES) and its agencies/support services, and used the Google (www.google.ie) search engine.

The following search terms were employed, teacher education, teacher professional development, in-service/in-career training/development, ICT in teacher education, and Virtual Worlds/Second Life and learning/development/teaching.

1.3 Teacher Professional Development (TPD)

TPD refers to “the wide range of learning activities which teachers engage in, individually or collectively, to improve their professional practice and to enhance student learning” (ASTI, n.d.). While teachers have reported their experiences of TPD as positive they have questioned its impact on changing classroom practices and have described their experiences of professional development as lacking in intensity, of short duration and dominated by an information transfer approach (Sugrue, 2002; Conway et al., 2009). This is not just an Irish phenomena as research in the US has identified similar issues facing TPD (Schlager & Fusco, 2003).

From the early 1990s TPD in Ireland has received considerable interest and investment from policy makers with the establishment of the In-Career Development Unit (ICDU) in the Department of Education and Science (DES) in 1994 (renamed as the Teacher Education Section in 2004) and the establishment of the Second Level Support Service (SLSS) in 2001. The Teacher Education Section has responsibility for teacher education, and the SLSS responsibility for coordinating curriculum support services and providing support for TPD (Egan, 2004; Granville, 2005). Despite this investment in TPD it is regarded as having “a poor track record because it lacks a theoretical base and coherent focus” (Fullan, as cited in Conway et al., 2009, p.186). It has been characterised as fragmented, ad hoc and not learner centred, with schools reporting support services as unsatisfactory and complex (Coolahan, 2003). Furthermore, school principals have reported difficulties with current models of TPD calling for it to be held outside school time (SLSS, 2002).

The literature has identified solutions to these challenges including, delivering TPD in schools, grounding teachers’ learning experiences in their own practice and encouraging the development of reflective practice in teaching (SLSS, 2002; Conway et al., 2009). It is now recognised that as beliefs about teaching and learning can influence classroom practice there is a need for teachers to reflect on and theorise their practice, and to generate their own knowledge (Leitch & Day, 2000; Conway et al., 2009). Thus the action research cycle of planning, action, monitoring/observing, and reflection, is becoming an increasing trend in TPD facilitating

teachers in investigating, articulating, improving their practice and generating new theory (Leitch & Day, 2000; Conway et al., 2009; McNiff and Whitehead, 2005). Finally, the learning technologies have also been identified as a medium for supporting teacher education (SLSS, 2002; Lock, 2006; Conway et al., 2009).

1.4 Information and Communication Technologies (ICTs) in TPD

The ICTs provide enormous potential for the delivery of TPD including, improving access to opportunities for geographically dispersed schools, allowing for anytime and anyplace learning, and supporting different learning styles through the use of multimedia. In Ireland, the ICT Strategy Group (2008) recommended that ICT should be integrated into the development and delivery of TPD programmes taking into account the pedagogical affordances of the technology. A number of government agencies have to date successfully piloted and provided TPD programmes using technology (Granville, 2005). The National Centre for Guidance in Education (NCGE) for instance delivers a blended learning programme (using an action research approach) to guidance counsellors using a combination of face-to-face workshops and e-learning (Sherry, 2007). However it is recognised that in order to utilise ICT for TPD there is a need for the teaching profession to become confident in using ICTs as tools for learning and teaching; and for online strategies to be developed (Granville, 2005). With improved ICT infrastructure in schools, training available to teachers and recognition at policy level of the potential of ICT for providing and supporting TPD, it is now timely for these technologies to be harnessed.

1.5 Virtual Worlds (VWs)

VWs are open-ended, persistent and immersive (experience of the VW as reality) 3D environments providing users with the opportunity to share the environment and to collaborate without requiring physical co-presence (a feeling of being there with others) (Girvan & Savage, 2010). The representation of the user as an avatar in VWs supports deep communication, relationship development and collaboration with other users (de Freitas, 2006). Minocha and Roberts (2008) highlight the importance of communication tools in VWs for developing a sense of self, presence and immersion and in supporting socialisation and collaboration. Due to the richness and sophistication of graphics and the immersive experiences provided by VWs

educational institutions world-wide are beginning to exploit the potential of VWs for delivering learning and teaching opportunities (Warburton, 2009; Baker, Wentz & Woods, 2009).

1.6 Virtual Worlds as Learning Environments

VWs provide opportunities for educators to deliver educational experiences to learners that may not be possible in the real world such as, the design and building of objects, the creation of simulations, re-enactments, field trips, quests, and experiential tasks (Antonacci, Di Bartolo, Edwards, Fritch, McMullen & Murch-Shafer, 2008; Dalgarno & Lee, 2009; Pfeil, Ang & Zaphiris, 2009). The persistence of VWs offers opportunities for developing reflective practice, supporting social interaction forming the basis for collaborative learning, and facilitating knowledge transfer between groups and future learners (Girvan & Savage, 2010). In addition the multimedia capabilities of VWs can cater for a range of learning styles increasing learner engagement and interaction; and offer experimentation opportunities without real world repercussions and the opportunity to learn by doing (Falloon, 2009). As VWs are immersive they can support learning opportunities for geographically dispersed learners providing a rich opportunity for the provision of distance and flexible education, allowing learners to enjoy a more human and communication rich experience (Minocha & Roberts, 2008; Warburton, 2009). The affordances of VWs allow for different pedagogies such as constructivism and situated learning to be utilised within the environment. Constructivism, a basic tenet of which is the construction of knowledge, can be supported by VWs as they allow real time communication, provide opportunities for exploring and interacting, and allow learners to share information, adopt different perspectives, reflect on their learning and to create and showcase content (Dickey, 2003; Dalgarno & Lee, 2009). They thus potentially support an action research approach to professional development. Finally, Dalgarno and Lee (2009) report that VWs provide an opportunity for situated learning, allowing for the real world application of acquired knowledge and skills through the design of the learning environment being modelled on the context in which the knowledge is to be applied. Environments modelled on real places and objects can give an increased sense of presence and realism and lead to richer collaborative learning experiences than possible with 2D environments (Dalgarno & Lee, 2009).

1.7 Virtual Worlds as Learning Environments: Strengths and Challenges

As has been demonstrated VWs have considerable potential for providing learning opportunities. However there are a number of challenges in using the technology for learning including, the initial investment in using the technology for the first time, infrastructure requirements, accessibility, and the potential for learners to feel isolated and disembodied (Pfeil et al., 2009). The research identifies the need for educators to consider VWs with regard to their unique potential as learning environments as there is a tendency for educators to recreate and present information in ways that they are familiar with (Salmon, 2009).

There are challenges facing educators in using VWs and these include, the time required to learn the technology and to find new ways of facilitating and managing discussions, the time delay in typing and the potential for overlapping conversations to occur due to the lack of social cues (Baker, Wentz & Woods, 2009). In addition the absence of visual cues can make it difficult to gauge the interest and understanding of learners (Minocha & Roberts, 2008). Educators may need to employ tools such as Wikis and Blogs to supplement the social networking tools of VWs and employ scaffolding to support learners (Warburton, 2009; de Freitas, Rebolledo-Mendez, Liarokapis, Magoulas & Poulouvasilis, 2010; Salmon, 2009).

1.8 Discussion and Conclusion

The literature has identified challenges facing TPD in Ireland and the potential of VWs for providing learning opportunities. As VWs are a relatively new technology much of the research has been focussed on the use of VWs for delivering learning opportunities in higher education. There is a need for future research to explore how the technology can be applied to other contexts such as TPD. VWs can support TPD and offer attractive solutions to some of the challenges facing TPD. These include, providing a geographically dispersed population with access to professional development at anytime and from anyplace so that teachers do not have to travel to access TPD; allowing for TPD to take place in schools connecting professional development with practice; and employing the sophisticated graphics of VWs to design learning environments modelled on schools promoting opportunities for situated learning. In addition, as VWs are immersive and persistent environments and allow for the application of different pedagogies to learning they have the potential to deliver TPD of a continuous nature which employ constructivist approaches to development, thus addressing the traditional short term

information transmission approaches to TPD. Furthermore, as action research is being recognised as an appropriate pedagogy for TPD future research could explore the potential of VWs in supporting an action research approach to TPD. It is clear that VWs offer rich and exciting opportunities to develop and deliver creative and immersive TPD programmes. How those opportunities will be harnessed is yet to be explored.

CHAPTER TWO: DESIGN

2.1 Introduction

The aim of this chapter is to highlight the theoretical underpinnings of the design features of the artefact which have been informed by the literature review, and to describe the artefact developed for the purposes of the project. This chapter will commence with an examination of the theoretical underpinnings of the design of the artefact and will then explore the artefact employed for the purposes of this project.

2.2 Theoretical Underpinnings of the Artefact

The literature review highlighted a number of shortcomings in TPD and highlighted the lack of utilisation of ICT for delivering and supporting TPD in Ireland (Conway et al, 2009; Egan, 2004).

VWs being immersive and persistent environments support a constructivist perspective, and potentially an action research approach, by allowing real time communication and affording opportunities for the social construction of knowledge (Dickey, 2003). They also allow for the real world application of acquired knowledge/skills through the design of the learning environment being modelled on the domain context (Dalgarno & Lee, 2009). The aim of the design of this artefact is to make use of the affordances of a VW to support a constructivist approach to TPD.

2.3 Elements of Constructivism (including Action Research and Situated Learning Approaches) supported by the Artefact

2.3.1 Immersive

The representation of the user as an avatar allows the user to experience the VW in the first person, and to interact with other users, objects (ability to create/modify objects), and the environment through the communication tools (text/voice chat, instant messaging). Creating environments within VWs that model real life scenarios allow for the transfer and application of

learning to the real world (situated learning) and allow for the user to be fully immersed in the experience. The multimedia environment enhances the immersive experience and supports different learning styles.

2.3.2 Collaborative

The various communication tools (text/voice chat and instant messaging) provided by VWs facilitate collaboration, and knowledge creation and sharing in real time. VWs support a social constructivist approach (and potentially an action research approach) by allowing users to communicate with one another in the first person (through an avatar) and to articulate and generate knowledge through dialogue and social exchange.

2.3.3 Persistence

The persistence of VWs allows learners to experience environments built to represent their domain contexts; and allows for geographically dispersed learners to connect and communicate synchronously, and to interact with the environment and the course content. In addition learners can create, display and showcase content, which current and future learners can share due to the persistent nature of the environment. This supports an action research approach to development as learners can reflect on the content at anytime. As VWs are hosted over the internet they are readily accessible.

2.4 Design of the Learning Experience/Environment

The artefact employed for the purposes of this project was Second Life (SL). An island in SL was used to provide the learning experience which consisted of two practice based discussions with guidance counsellors to prepare them for a TPD programme. In order to make use of the affordances of the technology a school was built in SL to take account of their daily context, to facilitate their immersion in the learning experience and to facilitate the transfer of learning to the real world.

A school was populated using the build tools of SL. The researcher used the 'build' facility to create and modify objects, and apply textures to objects, for example, book case, lockers. Images were sourced from IStockPhoto (www.istockphoto.com), modified as appropriate using Adobe Photoshop and were then uploaded to the school. The researcher also uploaded and

displayed content generated by participants on noticeboards. This content was prepared for SL by converting images to JPEG format using Adobe Photoshop, importing them with text into Microsoft PowerPoint and converting the PowerPoint files to JPEG and uploading them to SL.

The school consists of four main areas, a main hallway, a classroom, a library and a meeting area. The researcher populated the school with artefacts that can be found in schools to make the school seem more real to the participants. When entering the school there is a main hallway with a reception desk immediately to the right, and student lockers are located at the end of the hallway.



Figure 1: Main Hallway

Two main rooms can be accessed from the corridor, a classroom and a library with an area beyond the library for meetings.

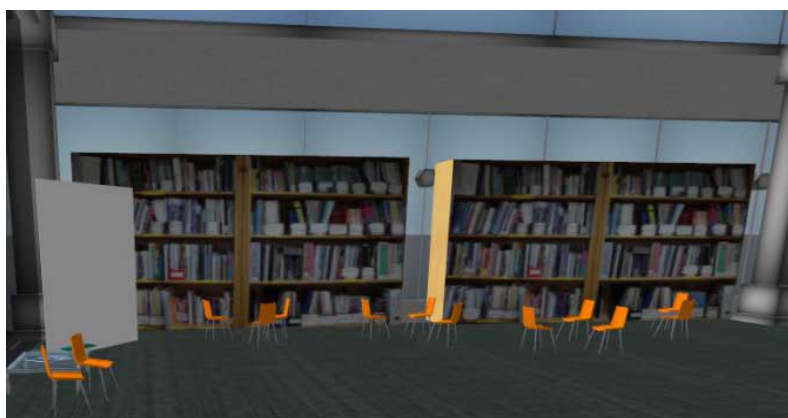


Figure 2: Library

Beyond the library is an area for school staff to meet where the two practice based discussions took place. The area was populated with course content displayed on noticeboards, and screenshots of publications familiar to the participants were made available. Participants were asked in advance of the first meeting to submit a photograph of their avatar with a short biography, and prior to the second meeting participants were asked to submit a short presentation of their progress for display in the discussion area. The aim of populating the artefact with materials developed by participants was to increase participants' immersion in the experience, to generate evidence of their practice (supporting an action research approach) and to give them a sense of ownership of the environment.



Figure 3: Meeting Area

2.5 Conclusion

The artefact employed to support the learning experience was described in this chapter. The aim of the design of the artefact was to use the affordances of VVs to support a constructivist and action research approach to TPD. The artefact was created to immerse geographically dispersed teachers in an environment familiar to them so that they could articulate, share and develop their practice and transfer their learning to the school context.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter outlines the methods to be employed by the research for the purposes of the investigation. The chapter will commence with an exploration of the current study and will then move to examine the research design and methods employed for the purposes of the investigation.

3.2 The Aim of the Current Study

The aim of the study is to investigate the use of a VW in supporting teachers' preparation (using an action research approach) for TPD. The challenges facing TPD and the under-utilisation of ICT for delivering and supporting TPD in Ireland were highlighted in the literature review (Conway et al, 2009; Egan, 2004).

The following research questions were identified for the purposes of this study:

- Can a Virtual World support teachers' preparation for TPD?
- Can Virtual Worlds support an Action Research Approach to TPD?
- What is the role of Virtual Worlds in providing immersive and collaborative learning experiences in TPD?

3.3 Research Design

Research design consists of three main methods, qualitative, quantitative and mixed methods research. In qualitative research the researcher collects open-ended data with the intention of developing themes from the data. Strategies can include narratives, questionnaire with open-ended questions and the case study approach (Cresswell, 2003). A quantitative approach is when the researcher uses a scientific approach for creating knowledge. It employs strategies such as surveys which yield statistical data (Cresswell, 2003). A mixed methods approach is a combination of qualitative and quantitative approaches.

A case study approach with explanatory and exploratory elements will be utilised for the purposes of this study. Other considered approaches included an action research approach and a survey design. Due to the lack of time allowed for this investigation it was not possible to

primarily use an action research approach as this would have required participants to have completed the action research cycle. However it was possible for participants to complete the first cycle of an action research process (a reconnaissance phase). Survey designs were not considered appropriate as the study is primarily explanatory with exploratory elements involving a very small number of participants. The case study approach was deemed appropriate as it allows phenomena to be examined in considerable depth and allowing for the study of phenomena that may not be readily accessible using other methods. Another advantage of the case study approach is that it provides hypotheses for further research (Cresswell, 2008). However a short coming of the case study approach is that the findings of the research cannot be generalisable to the wider population (Tellis, 1997).

The case study design to be utilised for the purposes of this research is a single case study design as it is not appropriate to employ a multiple design as participants are from a targeted sample (guidance counsellors who have applied for a TPD programme).

3.4 Research Method

The following data collection methods will be employed for the purposes of the investigation, unstructured observation, content generated by participants, questionnaires and interviews.

3.4.1 Unstructured Observation

The researcher will not participate in the learning experience as two facilitators will facilitate the practice based discussions in SL. However the researcher will record her observations of the process. Acting as an observer will allow the researcher to gain an insight into participants' experiences of SL.

3.4.2 Content Generated by Participants throughout the Process

Prior to the first meeting in SL participants will be asked to submit a profile about themselves for display the virtual school. Participants will also be asked to submit a report on the progress made after the first discussion for display prior to the second discussion. It is envisaged that displaying participants' content in SL will increase their immersion in the learning experience and will allow them to demonstrate that they have undertaken the reconnaissance phase of action research.

3.4.3 Questionnaires

Two questionnaires have been designed for the purposes of this investigation one for the facilitators and one for the guidance counsellors (see Appendices I – II). The findings from the questionnaires will inform the interviews. The questionnaires will be administered through Survey Monkey (www.surveymonkey.com) as this provides an efficient way of collecting the data. Participants will not be required to answer all questions. The questionnaires consist of a number of open and closed ended questions. The open-ended questions allow for respondents to make any response they wish, providing a medium for collecting rich and in-depth information. The questionnaires to be employed for the study were piloted with two colleagues of the researcher with experience of SL. One member was a teacher. The questionnaires were adjusted in accordance with the feedback received.

3.4.4 Interviews

Participants will be asked to give their feedback in a collective interview at the end of the second practice based discussion. Twenty minute semi-structured one-to-one interviews will also be conducted with each of the participants either through SL or Skype. Camtasia Studio 7 will be used to record the interviews. Interviewing participants will allow the researcher to collect in-depth information on their perceptions and experiences of SL and to clarify the responses to questionnaires.

3.4.5 Research Ethics

Ethical approval was sought for this research and was obtained in accordance with NCGE ethical requirements.

3.5 Research Sample

The research sample (targeted) includes two facilitators and three guidance counsellors. Twelve guidance counsellors who had applied for a TPD programme were invited to participate in a learning experience to prepare them for the TPD programme. Due to time and resource constraints it was necessary to limit the number of participants to five, three guidance counsellors and two facilitators. As three guidance counsellors have agreed to participate in the

learning experience and the research, the sample represents one quarter of the targeted population.

3.6 Conclusion

This chapter examined the methodology employed to undertake the study. The next chapter will present and explore the findings of the research.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter will examine the findings of the study. It will commence with a short description of the sample, will explore the data analysis employed and will then present the findings of the research.

4.2 Sample Characteristics

Two facilitators, one male and one female, who have facilitated groups for eight and 25 years respectively participated in the research. One facilitator was based in the south east of Ireland and the other in The Middle East during the online practice based discussions. Neither of the facilitators had facilitated groups online or had used a VW previously.

Three guidance counsellors, two female and one male, working in post primary schools in the north, south and east of the country participated in the learning experience. None of the guidance counsellors had used a VW prior to the learning experience.

4.3 Data Analysis and Findings

The data collected included unstructured observation, content generated by participants between the two learning experiences, questionnaires and interviews. Each of these will be discussed in turn below.

4.3.1 *Unstructured Observation*

Throughout the learning experience the researcher recorded her observations. The observations commenced with the induction of participants to SL. The researcher's key observations will be explored below with a more detailed record available in Appendix III.

The induction of participants to SL was done remotely. On average it took the researcher one hour to induct each participant. The main issues were around accessing the technology. Once the participants arrived in the virtual school they seemed to be at ease with the technology. This observation surprised the researcher as the literature suggests that users can feel disembodied and disconcerted by being represented by an avatar. While all participants had received a user guide

to SL the researcher soon realised the importance of providing participants with a guide on how to access SL i.e. how to register, activate an account and download SL. The researcher had not anticipated the challenges that participants would face when accessing SL and had envisaged participants' support needs would be around orientation to the environment i.e. being represented by and using an avatar to communicate and move.

During the practice based discussions all of the participants actively engaged and the discussions flowed freely. All participants were very open in their communication and shared and exchanged practice although two of the three guidance counsellors had not met before. This finding could be attributed to the 'safety' presented by psychological distance, thus overcoming some of the challenges presented by face-to-face communication.



Figure 4: First Practice Based Discussion



Figure 5: Second Practice Based Discussion

The researcher noted that the absence of social cues in SL at times impacted on the discussion. On a number of occasions participants spoke across one another, that is, they did not know when a participant had finished speaking or when another wanted to start. The facilitators also had difficulties in identifying when the co-facilitator wanted to contribute. During the first and second practice based discussions, one and three participants (one facilitator) respectively, were unable to seat their avatars. The researcher noted that participants seemed uncomfortable with this and attributes this to the social rules that govern behaviour in the real world being extended into the VW, an observation supported by the literature.

The researcher observed that all participants seemed to feel immersed in the experience. This was supported by the observation that all participants were actively engaged in discussion and seemed reluctant to end the second practice based discussion. The dialogue was very rich and there was an in-depth exploration of practice and theoretical concepts, such as evidence based practice and the reconnaissance phase of action research. There was evidence of learning and development of thinking and generation of theory as the discourse evolved. Each participant also offered ideas and solutions to other participants. Knowledge was actively (socially and individually) constructed (identifying actions and learning) and showcased on noticeboards. All participants reflected on further action to take prior to the TPD programme taking place.

4.3.2 Content Generated by Participants

The three guidance counsellors were asked to submit a short summary of what they did and what they learned prior to the second practice based discussion. The researcher placed this on noticeboards in the school so that the knowledge could be shared with other participants. It was clear from the summary provided that participants had reflected, identified actions and had taken steps to implement these actions prior to the second practice based discussion, thus supporting a reconnaissance phase of action research.

What did I do?

- Convened a student support team meeting
- Informed members of my application
- Introduced the notion of action planning
- Consulted members of the team on priorities
- Discussed ideas for action plan

What did I learn?

- Value of consultation
- Importance of having management on board
- Need to listen to all ideas and opinions
- Benefit of having a small group

Figure 6: Content Generated by a Participant

4.3.3 Questionnaires

The facilitators and guidance counsellors were asked to complete an online questionnaire after the second practice based discussion. The data from the questionnaires was exported from Survey Monkey to Excel format and then imported into Microsoft Word using the Mail Merge feature. The findings of the questionnaires will be explored below.

i Facilitators' Responses

The two facilitators completed the questionnaire immediately after the second practice based discussion. Both facilitators reported that they enjoyed facilitating the discussion in SL and one reported the process as being “*very simple and straightforward*”. Both facilitators reported the challenge of “*not knowing when people had finished speaking*”, supporting the researcher’s observations above, and identified the need to develop protocols around managing discussion in SL. This finding is supported by the literature (Baker et al., 2009).

When asked if guidance counsellors had shared and exchanged practice during the discussions both facilitators agreed that they had. Facilitator 1 commented “*it seemed as if they were actually in the same room having a discussion*” which supports the claim that VWs can provide an immersive experience. However the two facilitators acknowledged that “*there is never a substitute for face-to-face communication*” and facilitator 1 stated that SL “*is the best I have seen yet as coming close to face-to-face*”.

When asked if SL supports an action research approach to professional development both facilitators concurred. Facilitator 2 commented “*these meetings provide data for the group’s*

learning and progress” and identified the potential of SL for “*gathering data and generating evidence about a group’s learning process*”.

ii Guidance Counsellors’ Responses

Two of the three guidance counsellors completed the online questionnaire. When asked about the learning experience the two guidance counsellors indicated that they found the learning experience to be very helpful, indicating that the experience got them to think about their practice and allowed them to re-familiarise themselves with the action research process. Guidance counsellor 1 highlighted that the practice based discussions allowed her to “*listen to and reflect on the opinions and ideas of the other participants*” and guidance counsellor 2 indicated that he learned about “*how other guidance counsellors are operating in their schools*”. When asked did SL support their learning guidance counsellor 2 stated that it “*facilitated hugely my learning and that without engaging in it I would not have learned as much. But rather than learning, it was more being provoked into thought about my practice and about module 2 and what I might need to do.*” It is evident that this guidance counsellor was actively reflecting on his practice during the learning experience suggesting that a VW can support an action research approach.

When asked if SL enabled them to share and exchange practice with other participating guidance counsellors both guidance counsellors agreed that it did. However when it came to collaboration guidance counsellor 2 indicated that he was not too sure if the participants had collaborated indicating that their unique contexts and ways of doing things may not have supported a collaborative approach. It is likely that the timeframe of this project was not of sufficient duration for collaboration to develop.

Both guidance counsellors agreed that SL can support an action research approach stating that it facilitates reflection. Guidance counsellor 2 indicated that this was particularly evident in the second practice based discussion during the discourse on action research.

When asked if they would participate in a similar learning experience in the future both guidance counsellors indicated that they would. Guidance counsellor 2 stated “*... it stimulated my thinking and ...prepared me for the module in a way that engaged me and increased my learning in a way that I am not too sure would have happened in some other*

manner.” This statement suggests VWs can support preparation for TPD and highlights the potential of VWs to support and develop learning in a unique way.

4.3.4 Interview

A brief collective interview was conducted at the end of the second practice based discussion and individual interviews were conducted with participants through SL and Skype one/two day(s) after the discussion. The findings of each will be discussed in turn below.

i Collective Interview

The guidance counsellors and facilitators were asked for their feedback on the learning experience at the end of the second practice based discussion. The researcher recorded the feedback using pen and paper, reviewed the record after the interview and identified themes emerging from the data. The guidance counsellors indicated that while they were apprehensive about using the technology initially they saw the benefits of it in terms of being able to “*talk to other guidance counsellors from their desk*” and reported that they had got a lot from the experience and felt prepared for the TPD programme. The two facilitators reported that SL had huge potential for TPD, for supporting an action research project and for developing a community of practice.

ii Interviews with Facilitators

Each facilitator was interviewed for approximately 30 minutes. The interviews were conducted in SL and through Skype and were recorded using Camtasia Studio 7. The researcher also took hand written notes of the discussion which were reviewed and organised according to emergent themes following the interviews.

The two facilitators agreed that SL has enormous potential for supporting TPD indicating that it allows participants to meet virtually to engage in dialogue, and that it addresses access issues to TPD. Facilitator 1 highlighted that the conversations had not been limited by the virtual context but that the lack of social cues was a challenge. Furthermore he highlighted a drawback as being unable to see the participants and to check if they were actively listening and engaging. He reported that it was like “*facilitating a meeting blindfolded*”. This finding is supported by the literature (Minocha & Roberts, 2008).

When asked about their experiences of being virtually represented by an avatar facilitator 2 reported that she felt fully present through her avatar, supporting the findings of the literature that representation of self in the first person supports a sense of presence in VWs (Warburton, 2009). The facilitator continued that she was able to project herself through her avatar and reported that she felt she had an “*embodied presence*” in SL. Facilitator 1 reported that his avatar enabled him to engage with the participants and “*to technically look them in the eye*”, thus presenting an advantage over 2D environments. However he reported that not being able to give his avatar his real life name was a disadvantage and when facilitating discussions he did not know if he should use the person’s real life or avatar name.

When asked about the impact of being present in a virtual school facilitator 2 reported that this had contributed to her immersion and “*groundedness*” in the experience and facilitator 1 reported that it helped to set the scene. Interestingly while the virtual school was seen as contributing to a sense of ease amongst participants it was not regarded by facilitator 1 as crucial. More research is clearly needed on whether environments modelled on real places lead to an increased sense of presence in VWs.

The facilitators were asked to give their views on the role of VWs in supporting an action research approach. Facilitator 2 reported that the principles underpinning action research were supported by SL, that is, democratic and participatory discussion, an open-ended environment allowing for freedom and personal choice, and in giving the ‘I’ a central position. The fact that the discussions could be recorded was seen as facilitating the creation of a rich data archive for participants facilitating their personal growth, as they could look back and witness the discourse developing and evolving. This facilitator explained that often the “*research*” side of action research was forgotten and that examining one’s own practice and providing “*explanations of what one is doing*” is very important. She also stated that the process of action research is not just about action and highlighted that SL supports a live interchange facilitating discussion around what people do and why. The noticeboards with participants’ content were also seen as supporting an action research approach as they allowed participants to review and reflect on their own content and to share this with others.

iii Interviews with Guidance Counsellors

Individual interviews were held with two of the three guidance counsellors. One interview was conducted through SL and recorded using Camtasia Studio 7, and the second was conducted by telephone during which handwritten notes were taken. The handwritten notes were organised and coded into themes immediately after the interview took place. They were analysed in terms of emergent and unexpected themes arising from the data.

The guidance counsellors were asked about their SL experiences. Guidance counsellor 1 reported that the lack of non-verbal communication was a disadvantage as the “*human touch*” was lost and that there was a risk of “*tuning out*” while others were speaking. However both guidance counsellors reported that being represented by an avatar helped them to feel less inhibited. Guidance counsellor 2 reported that “*all her senses were engaged*” through her avatar supporting “*a multiple intelligence approach to learning*”.

Being present in a school did not hold any significance for the two guidance counsellors. They reported that it was a nice environment but felt that it did not contribute to their learning. The guidance counsellors acknowledged that the artefacts (noticeboards with their content) allowed them to review what they had written and had helped to develop their thinking.

When asked about the potential of SL for supporting TPD both guidance counsellors agreed that the technology had enormous potential indicating that it would allow teachers to access opportunities from school/home and to share and exchange practice.

4.4 Conclusion

This research aimed to address the following research questions:

- Can a Virtual World support teachers’ preparation for TPD?
- Can Virtual Worlds support an Action Research Approach to TPD?
- What is the role of Virtual Worlds in providing immersive and collaborative learning experiences in TPD?

The findings of the research will be discussed under each of the research questions above in the following chapter.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

5.1 Introduction

This chapter will explore the key findings of the research under each of the research questions, highlighting the limitations of the research and indicating areas for future research.

5.2 Research Findings

5.2.1 *Can a Virtual World support teachers' preparation for TPD?*

It is evident from the findings of the research that a VW can support teachers' preparation for TPD. This finding emerged from the questionnaires and the interviews with participants. In the collective interview at the end of the second practice based discussion all guidance counsellors agreed that they had benefited from the learning experience and felt prepared for the TPD programme. This is supported by the content displayed on the noticeboards in the virtual school. Each guidance counsellor identified what they had done and what they had learned from the experience. In response to the questionnaire one guidance counsellor highlighted that as a result of the learning experience she had "*re-familiarised herself with the action research process*" and felt prepared for the module. The two facilitators reported that SL supported guidance counsellors' preparation for TPD by allowing them to meet virtually to articulate, discuss and share practice: "*The evidence is that they all participated and there was open and quality discussion*" and "*I believe the guidance counsellors learned a great deal though the interaction*". More evidence supporting the claim that VWs can support teachers' preparation for TPD will be available once the guidance counsellors commence the TPD programme.

5.2.2 *Can Virtual Worlds support an Action Research Approach to TPD?*

The findings from the research suggest that VWs can support an action research approach to TPD. The three guidance counsellors undertook the reconnaissance cycle of an action research approach in terms of exploring their practice and identifying actions for implementation which is supported by the content they placed on the virtual noticeboards. One of the facilitators in her interview highlighted the potential of VWs for supporting an action research approach to learning. She stated that by providing a forum for discussion SL allows participants to discuss

what they did and why, and by being able to record discussions allows for the generation of “*data for the group’s learning and progress*” and the production of a “*portfolio of professional learning*”.

The display of the guidance counsellors’ learning on noticeboards in the virtual school also supports an action research approach. This is supported by the interview data as guidance counsellors indicated that, displaying their content enabled them to reflect, review and develop their thinking.

5.2.3 What is the role of Virtual Worlds in providing immersive and collaborative learning experiences in TPD?

The findings support the role of VWs in providing immersive learning experiences in TPD. All participants reported feeling immersed in the experience. One of the facilitators attributed her sense of presence in SL to her avatar and reported that she was able to be “*present to the other*” through her avatar. She also indicated that the virtual school and the artefacts also contributed to this sense of presence and immersion in the experience. This finding is supported by the literature (Dalgarno & Lee, 2009).

All the participants reported that they shared and exchanged practice. This was evident to the researcher as she observed the practice based discussions evolve and develop. One of the facilitators also identified SL as supporting ongoing conversation and dialogue and stated that she believed that the guidance counsellors “*learned a great deal through the interaction*”. She added that SL could present an opportunity for guidance counsellors “*to share stories of practice..... the beginnings of a real community of practice*”.

The findings were mixed in relation to collaborative learning as one guidance counsellor indicated that collaboration did not occur. Further research is required to explore this further.

5.3 Limitations of the Research and Recommendations for Future Research

There were a number of limitations to the research and these included, the short timeframe in which to complete the research i.e. eight weeks, the small sample size i.e. three guidance counsellors and two facilitators, and the potential bias of the researcher (who also coordinated the learning experience) which could have influenced participants’ responses. The literature also suggests a novelty bias can occur (Hew & Cheung, 2010).

Due to the short timeframe it was not possible for participants to complete an action research cycle, thus the findings of this study in relation to action research need to be treated tentatively. As the research design employed for the purposes of the research was a case study approach it is not possible to generalise the findings of the research.

A number of areas have been identified for future research and these build on the findings of this study. A longer term study, that is, over six to nine months could explore how VWs can support an action research approach to TPD. Future research could also investigate how a VW could be integrated into a programme of TPD and used to support the development of a community of practice.

5.4 Conclusion

This research explored the potential of a VW to support teachers' preparation for a TPD programme using an action research approach. The findings of the research suggest that a VW can support teachers' preparation for TPD and an action research approach, though further investigation over a longer timeframe with a larger sample is required. The findings of this research also suggest that VWs can be used to address some of the challenges facing TPD such as a disconnection from practice and access to TPD. It is clear that VWs have the potential to provide creative and engaging learning opportunities for TPD, allowing teachers to actively participate in immersive experiences to develop their practice in collaboration with their peers. It is now timely for providers of TPD to tap into and harness the potential of VWs to provide immersive and meaningful learning experiences for teachers allowing them to develop into researchers of their own practice and to generate their own living educational theory.

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APPENDICES

APPENDIX I: GUIDANCE COUNSELLOR QUESTIONNAIRE

OVERVIEW

There are 16 questions in this questionnaire. It consists of seven closed and nine open-ended questions. This questionnaire should take approximately 20 minutes to complete.

SECTION 1: BACKGROUND INFORMATION

Please tick (✓) one option for each question as appropriate:

About Me:

Gender: Male Female

Number of years working as a guidance counsellor:

1-5 6-10 11-15 16+

About My School:

School Type

Voluntary Secondary

Community School /Comprehensive School

Community College

Vocational School

School Size:

Small Medium Large

Community served by the school:

Urban Medium size town/rural Mainly rural

SECTION 2: PRE TPD LEARNING EXPERIENCE

Have you ever used a Virtual World prior to this experience?

Yes No

If yes, please state the Virtual World _____

What were your reasons for participating in this learning experience (please tick as many as appropriate):

Preparation for the module

Re-familiarise myself with Action Research

Re-familiarise myself with Guidance Planning

Engage with new technology

Experience a Virtual World

Other (please specify) _____

Did you find the learning experience helpful? Please indicate why (indicating what you did and what you learned if appropriate).

Did Second Life support your learning? Please indicate reasons for your answer.

Did participating in the meetings in Second Life enable you to share and exchange practice, and collaborate with the other participating guidance counsellors? Please state 'how' if appropriate.

What were your initial impressions of Second Life? Did these change during the learning experience? If so, how?

Do you think Second Life supports an action research approach to professional development? Please indicate reasons for your answer.

What are the advantages/disadvantages to using Virtual Worlds such as Second Life for learning? Please provide reasons for your answer.

How do you think Virtual Worlds such as Second Life compare to (a) face-to-face approaches to learning and (b) other technology platforms such as the NCGE VLE, video conferencing etc.

If you had the opportunity to participate in a similar learning experience again in the future would you avail of this opportunity? Please indicate the reasons for your answers.

Any other comments you would like to make?

Thank you for taking the time to complete this questionnaire.

APPENDIX II: FACILITATOR QUESTIONNAIRE

OVERVIEW

There are 12 questions to complete as part of this questionnaire. Four of the questions are closed and eight are open-ended questions. This questionnaire should take approximately 20 minutes of your time to complete.

SECTION 1: BACKGROUND INFORMATION

Please tick (✓) one option for each question as appropriate:

About Me:

Gender: Male Female

Number of years experience facilitating groups:

1-5 6-10 11-20 21+

Have you ever facilitated group discussions online prior to this experience?

Yes No

If yes, please indicate the technology used: _____

Have you ever used a Virtual World prior to this experience?

Yes No If yes, please state the Virtual World used: _____

SECTION 2: SECOND LIFE EXPERIENCE

How did you find facilitating the group discussion in Second Life? Please elaborate outlining the strategies you employed (indicating how you managed the absence of non-verbal cues, how facilitating the group differed from face-to-face facilitation, etc) and what you learned from the process.

In your opinion did participating in the meetings in Second Life enable guidance counsellors to share, exchange practice and collaborate with other participating guidance counsellors? Please indicate 'how' if appropriate.

How do you think Virtual Worlds such as Second Life compare to (a) face-to-face approaches and (b) other technology platforms such as the NCGE VLE, video conferencing etc?

Do you think Second Life supports an action research approach to professional development? Please indicate reasons for your answer.

What were your initial impressions of Second Life? Did these change during the learning experience? If yes, how.

What are the advantages/disadvantages to using Virtual Worlds such as Second Life for learning? Please provide reasons for your answer.

If you had the opportunity to facilitate a similar learning experience again in the future would you avail of this opportunity? If yes, what supports/strategies would you employ? Please elaborate.

Are there any other comments you would like to make?

Thank you for taking the time to complete this questionnaire.

APPENDIX III: UNSTRUCTURED OBSERVATION

Induction

The researcher spent on average one hour inducting the participants individually to SL. Some participants required longer due to accessibility issues in the school i.e. SL being blocked by the school's firewall and insufficient computer spec (graphics card). Each participant received a guide to SL from the researcher in advance of the induction. This guide focussed on navigating the user through SL that is, using the controls and SL interface to manage the avatar's movements and communication in SL. With the benefit of hindsight the researcher realises that it would have been beneficial if she had provided participants with a guide to registering with SL, activating accounts and downloading SL to the desktop. Most of the researcher's time in providing support was spent assisting participants in accessing SL. As this support was provided remotely (over the telephone) it took longer than in a face-to-face context.

Another issue which emerged was that participants downloaded the new beta version i.e. version 2 of SL. The researcher was working from version 1 and thus had to upgrade to version 2 in order to provide effective and meaningful guidance to participants. Unfortunately the researcher was unable to 'speak' in version 2 due to a sound card issue and had to revert to version 1 to communicate with participants once they were comfortable with version 2. None of the participants had difficulty communicating in version 2.

Once participants arrived into SL the researcher offered them a teleport to the location of the school. The researcher then explored if the participant could use the communication and movement tools provided. All participants were very comfortable with using their avatar and had no main communication or movement issues. This observation surprised the researcher as the literature suggests that users can feel disembodied and disconnected due to being represented by an avatar and that it can take quite a bit of time for users to become oriented to SL. In addition one of the facilitators embraced and recognised the pedagogical affordances of the technology immediately.

First Practice Based Discussion

During the first practice based discussion there were a number of technical issues in getting the meeting started. One facilitator was unable to make the meeting and the second facilitator had communication difficulties as there was significant interference and feedback when he spoke. One of the participants was using an Apple Mac and was unable to get her avatar to sit down and another had arrived to the meeting area and had to be teleported to the school. The meeting commenced thirty minutes later than planned due to the technical issues. During this thirty minutes the participants all communicated with one another, even though two of them had not met before. The meeting commenced and lasted for 45 minutes. All participants engaged and were very open in their discussions. The researcher was surprised by how comfortable the participants seem to be with the technology and the ease in which the conversation flowed. For some participants being represented by an avatar may have given them a feeling of ‘distance’ that enabled them to be more open in their communication and thus overcome some of the barriers that face-to-face communication may present, such as shyness. Participants shared and exchanged practice and agreed to identify/implement actions in their schools prior to the second practice based discussion. The ease of communication supports the claim of the literature that VVs are immersive environments.

Second Practice Based Discussion

The second meeting was held three weeks after the first meeting. The researcher arrived into the virtual school earlier than the scheduled meeting to address the technical issues that may have arisen. The meeting commenced on time and lasted for one hour. Three of the participants were unable to seat their avatars due to using Apple Macs, and in one case part of the school disappeared when the avatar was seated. All participants engaged in the discussion and were very open about their practice. The conversation flowed continuously and participants contributed one at a time and then through an open floor. The participants seemed reluctant to end the discussion 1.5 hours later though they all had prior commitments.

There were times when participants spoke across one another and the researcher attributed this to the lack of social cues available in SL for knowing when one participant had completed speaking and when another wanted to start. The two facilitators also had difficulty in knowing when the other wanted to make a contribution. Protocols had not been agreed by them in advance as one

of the facilitators was unsure if she would be able to access SL from The Middle East. This challenge of communicating in VWs is supported by the literature. The researcher noted that for future learning experiences in SL there would be a need for clear protocols around communicating through SL.

