Pedagogical Immigration to 3D Virtual Worlds: a Critical Review of Underlying Themes and their Concepts

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Abstract

A contentious issue has been in debate for the past decade, over the extent of dependency of current generations of students on information and communication technology (ICT) for education. Despite this controversy, there is a generalization amongst researchers that fundamental shifting of educational methods towards e-learning is deemed inevitable and beneficial to cater for emerging students' skills and preferences. One of these newly emergent e-learning platforms is 3D Virtual Learning Environments (VLEs) like Second Life. To the authors' knowledge, this paper is the first to derive and critically analyse, using grounded theory, advantageous and disadvantageous themes and their sub concepts of providing e-learning through 3DVLEs.

1. Introduction

Online 3D Virtual Learning Environments have been a host for virtual campuses, erected by hundreds of universities, since their offset. These virtual existences offer e-learning opportunities for all diversities of students in many fields including science, medicine, engineering, business, law, computer science, humanities and many more. This has reaped noticeable participation, satisfaction and hence achievement from students [1]. Through 3D VLE online courses, online avatars allow students and their instructors to interact synchronously by audio, text chat and other media presentation techniques [2]. It thus becomes imperative to extract, analytically, the merits and drawbacks of migrating with delivery of e-learning to these environments, which previous research is lacking in focusing on.

The emergence of digitally influenced generations of students, whom Prensky [3], Oblinger and Oblinger [5] refer to as "Digital Natives, "Games Generation" and "Millenials", deems it logical to expect that in order to enhance future learning, students will be encouraged to utilise game-like 3D virtual worlds, or VLEs like Second Life, Active Worlds and others to accommodate for new cognitive style changes. These play an essential role in shaping future e-learning since "Today's students are no longer the people our educational system was designed to teach" [3]. This pedagogical immigration is considered beneficial even by researchers like Margaryan [4] who argues that students are not using technology effectively to support learning, but rather primarily for recreation. There is an emergent research theme emphasising on the importance of using such technologies primarily as supporting mechanisms for the delivery of e-learning.

This paper analyses previous literature and existing case studies, using grounded theory conceptions, to derive and compare three disadvantageous themes with thirteen major advantageous themes and their sub concepts for using 3D VLEs to deliver education, each theme beneficial in three approaches:

- Proving that 3D VLEs augment and complement traditional learning techniques in physical classrooms to help reach higher educational achievement.
- Proving that 3D VLEs provide additional opportunities and options for e-learning unavailable within 2D Virtual Learning environments such as webCT and Blackboard.
- Proving that 3D VLEs can, furthermore, not only sustain traditional methods of learning but can offer e-learning prospects that are not probable to achieve using conventional real-life methods of education.

2. Method

The fundamental concept of Grounded Theory as founded by Glaser and Strauss [6] denotes that research, starting with no predetermined hypothesis or theory, can ultimately generate one by analysing primary data sources, whether from qualitative empirical data, existing literature or any kind of data [7], where the unit of analysis is an incident. From many incidents, a series of key points can be extracted which are then marked with "codes". These in turn are grouped into "concepts", and from related concepts emerge main "categories" (or themes) [6]. Within this study, our raw source of data (or incidents) was

documented literature depicting case studies of Second Life immigration or usage by a multitude of educational institutions for e-learning in its various forms. Key points, each representing a possible advantage or disadvantage for delivering e-learning in Virtual Learning Environments (VLEs), were inferred from each documented incident and grouped into three main clusters of codes:

1- Those supporting traditional physical education,
2- Those unavailable in and adding to capabilities of 2D virtual learning environments (2D VLEs), and
3- Those unavailable in physical classroom learning.

Components of each code cluster were then named as 70 concepts, which were in turn grouped into 16 advantageous and disadvantageous categories (themes). A final general hypothesis was formulated as a result of the emerging categories (themes). The low level individually mined key points are not included in this paper. The paper provides, a description of each theme and its sub concepts, formulated from the key points, showing the division of these concepts into the three coding clusters mentioned above.

The authors believe that the three coding clusters summarise current practices and research objectives in the field. The motivation for clustering literature evidence, of using virtual worlds and 3D VLE applications in e-learning, was provided by the need to supply a mapping of currently disjointed efforts in the field. There seem to be underlying themes in current work that on one hand lead towards using 3D VLEs as supporting tools for traditional education along other applications. On the other hand there seems to be a push towards defining a new generation of e-learning shifting away from what was previously known as a VLE, exploiting the game acquainted generations.

3. Advantages of pedagogical immigration to 3D virtual learning environments

The following thirteen categories are high level advantageous themes of delivering e-learning within 3D VLEs, derived using the method described earlier.

3.1. Involvement

In the context of this paper, involvement can be defined as student participation, interaction and contribution during a 3D VLE e-learning session. This can be seen evidently in 3D VLEs, comprising the subsequent concepts grouped according to the following classification codes:

Concepts as supplement to real life education
• *Active student roles:* New roles emerge as students move from physical campus or online discussion boards to the virtual world classroom. Learning centres on discovery, yet students may feel space confined with a restricted view of their role in the physical classroom. Shifting students from passive roles of survivors and castaways in real-life to the active roles of researchers can be done in 3DVLEs [1].

Concepts as benefit over 2D VLEs
• *Object ownership:* The ability to buy or freely possess personalised accessories, buildings, gadgets etc. in each user's individual "in-world" inventory, gives a feeling of belonging and true existence adding to loyalty to the virtual world and will to return back again and resume activity within the environment [8]. The Second Life (SL) Design Competition organized by Massachusetts Institute of Technology for each student to design his own space for learning and residence, so as to interact and connect with others, is an example of enforcing active student roles and object ownership [9]. This can be done without needing much foreknowledge of how to build and create.
• *Embodiment and sense of belonging:* The embodiment of the user in the form of an avatar and ability to renovate its shape, skin and style, can transform the sentiment towards the space of a virtual world into a sense of belonging to a place [10].
• *Sense of presence:* The ability to communicate, add face gestures and body movements to the avatar, adds to the sense of presence within the scene [8]. For example, media students at Trinity University San Antonio implement promotional campaigns in SL utilizing these avatar functionalities to advertise [11].

3.2. Activities

Positive actions and behaviour undertaken by students in 3D virtual environments can be categorised into the following concepts:

As supplement to real life education
• *Experimentation:* The virtual world opens up opportunities that the physical world does not offer, e.g. experimentation with simulated real life science experiments, space phenomena, studying minute biological entities or chemical reactions enlarged.
• *Exploration:* This also includes exploring new ideas that might be impossible or too dangerous to approach in reality like nuclear explosions [10]. Johnson & Wales University demonstrates these concepts through BLAST, a scientific ballooning project dedicated to understanding the origins of the universe. Students work with practicing scientists to translate the complexity of scientific ballooning into SL. They design, build, and operate the balloon [12].

3.3. Existence

The nature of presence as a user in 3D VLEs varies completely from real life, enriching the e-learning process via the following concept:

As benefit over Real life Learning

• *Distributed/ co-present existence:* 3D VLEs enable immersion by being spaces inhabited by users, who are themselves both distributed (their physical bodies are spread out all over the world) and co-present (their avatars are in the same space) [13].

3.4. Communication

Contact methods during e-learning sessions between students, teachers and transportation between locations, are innovative within 3DVLEs, characterised by the consequent concepts coded as follows:

Concepts as benefit over Real life Learning

• *Public and private messaging:* Students can communicate via text or voice, ask confidentially whenever they please, without interrupting others, by corresponding with classmates or teacher via private messaging channels, thus overcoming shyness [1]. This is essential in interactive courses such as that conducted by Bradley University to coach its students in the qualitative research methodology field [14].

• *Teleporting* can be done in seconds between different 3D sites, whether existing or representations of historical simulations e.g. "Paris 1900" in SL [10]. A successful example introduced by Johnson and Wales University was creating "virtual Morocco" to provide an immersive experience that educates about Moroccan culture while enticing students to teleport to it, develop technical prototypes on an unfamiliar platform like SL, and communicate with partners on another continent and across language barriers [12].

Concepts as supplement to real life education

• *Alternative communication support:* There are also benefits from using alternative communication support for 3D VLEs via voice in the virtual world, voice over IP, or by means of a conferencing tool [15].

• *Ease of guest lecturing:* Guest speakers can also be invited in without their actual physical presence [16].

3.5. Educational Aids

Additional methods and objects are available within 3D VLEs to assist delivery of e-learning including the ensuing concepts grouped as follows:

Concepts as supplement to real life education

• *Ease of snapshots:* the simplicity of recording pictures/ snapshots within e.g. SL allows for future reference to events in lectures and workshops etc. For example University of Kansas hosted its first online International Media festival in SL featuring works by art students around the globe, with live interactive lectures. These events required extensive imagery recording as a form of documentation [17].

Concepts as benefit over 2D VLES

• *Cheap file upload* is also available for presentations, images etc. only requiring inexpensive payment per file for usage within a 3D VLE [18].

• *Streaming music* can also be used by instructors during live lectures unlike in 2D VLEs [18].

• *Presentations on 3D objects:* Furthermore PowerPoint presentations and streaming videos can be placed on cubical objects and presented to students in a more interesting manner than 2D environments [18]. Professors from Texas A & M University upload photographs, students' work, streaming video, written projects and presentations to conduct Second Life classes, provide tutorials, assign projects and achieve research related to digital visual culture [16].

• *Sandboxes to practice building* are used freely by students and instructors in VLEs like Second Life [10]. Students from Colorado Technical University learned basic virtual world building and texturing skills, developed user-interface prototypes, designed usability experiments, and conducted usability evaluations in Second Life. The virtual world classroom became an open space version of a usability lab [1].

• *Supporting all learning styles:* Some people learn best by listening to course content, others by seeing and visualizing, and some using a hands-on approach. In 3DVLEs, a mix of content and activity supports all learning styles: auditory, visual, and kinaesthetic [16].

• *3D learning stations and objects:* Learning stations "in-world" can be designed to provide content to students who are absent or who need extra time to study and reflect. Students can take notecards by touching 3D objects, listen to podcasts, or watch streaming video covering lesson material. Although this ability is also obtainable in online course management systems and websites (2D VLEs), the shared nature of an avatar interacting with an object and seeing 3D simulations of the content come to life, is more powerful [1]. This is exemplified in stations offered by Texas A&M University for students to receive assignments written on note cards along paths on the SL campus [11].

Concepts as benefit over real life learning

• *Session message logs:* Instant messages can be saved as logs for future reference of lectures [1].

• *Online assignment submission:* Students can also submit assignments in the form of notecards easily to teacher by dropping it over his avatar or profile [18].

• *Program execution in linden language:* Submission of a program assignment can be done in

SL Linden scripting language (LSL) to see the program run directly in the environment and working. The advantage is that LSL is easy to learn for its similarity to Java and other programming languages like C# [19]. Students from University of Florida, for example, created programs represented in 3D using scripting languages like LSL, Java, Python and Lisp [12].

• **3D architectural assignments** can moreover be submitted in a virtual environment as 3D models that can be rotated around or entered inside. Students can create any structure, using built-in tools to construct their ideas as a form of virtual sketching. These 3D objects and models help students express ideas and offer a context for discussion during class projects [1]. Architecture students from University of Colorado are an example of utilising SL to design buildings [11].

• **Engagement in real world issues** is another experience, undergone by students from University of South Australia. Interacting with their clients through SL provides insight into the real world through virtual work encounters i.e. by experiential learning [20]. Furthermore Texas A&M University engages students in SL with significant questions about real-life and virtual associations [11].

3.6. Interaction

Additionally, different types of networking options between users are offered in 3DVLEs, characterised by the following concepts:

As supplement to real life education

• **Social spaces** existing within 3D VLEs provide successful shared communities. These are also **cultural spaces** opening up opportunities to truly engage and communicate with others to learn about different customs, behaviours and ethnicities [10].
Hong Kong Polytechnic University uses SL to help 1st year students get acquainted with university life and adjust to the transition from high school, offering a variety of interpersonal, learning and self-management ideas to help excel in their undergraduate life [14].

As benefit over real life learning

• **Networks of distant users** can be created for the sharing of skills and knowledge through blogs, wikis and knowledge repositories that can be opened within a 3D VLE window during active e-learning sessions [2].

• **Network evolution and Future group work:** Any network within a 3D VL E can develop and increase in size with time to include people from many backgrounds or collaborative universities [2].

• **Instructor practical role shift:** In virtual worlds, the instructor's role shifts from being the "sage on the stage" to being the domain specialist or facilitator who motivates and manages discovery while providing

organization, guidance, feedback, and assessment without being the main focus of the session [1].
A successful implementation at Harvard University (Law School) involved building a court room in SL for students to practice their advocacy skills, but without the intimidation from similar real-life spaces. Under the supervision of their professors, simulations of trials were conducted on Berkman Island in SL. Weekly office hours were also held on SL to discuss material and homework with teachers, or simply socialize with classmates & faculty [9].

3.7. Security

User identity protection and account safety are vital issues within 3D VLEs, as demonstrated by the following concepts:

As supplement to real life education

• **Anonymity safety**: The sense of safety through anonymity of a user's identity can encourage students to experiment in ways not possible offline [10].

• **Username & password**: Requirement of access permissions is similar in 2D and 3D VLEs – both environments necessitate authorisation of the participant in the form of a user name and password. Furthermore each educational institution can restrict usage of its premises within a 3D VLE to only specified lists of students thus ensuring security [8].

• **Free registration** to 3D VLEs is available for normal users e.g. students. Premium (paid) access is only for organizations like universities to purchase lands and build their personalized virtual campuses [2], e.g. Oxford University's virtual First World War Poetry Digital Archive inside SL dedicated to commemorating classical works and poems connected to this era, including audio and video interactive tools and tutorials for students [21].

3.8. Output

The degree of productivity of courses within 3D VLEs can be assessed through the following concepts:

As benefit over 2D Virtual Learning Environments

• **Immediate instructor feedback** within the synchronous class experience in a 3D VLE allows for engaging interaction and expression while drafting ideas and conducting activities [1].

• **Early assessment of course** can be performed by students since the learning process and measurement instruments are observable. This allows immediate in-course enhancement and spending less time in critically assessing a course after it ends [1], e.g. The Management School at Edinburgh University UK,

relies heavily on instructor feedback and assessment issues for its MBA courses delivered in SL [9].

3.9. Educational Strategies

3D learning environments can provide innovative instructional techniques, methods or archetypes for facilitating learning [22] including:

Concepts as benefit over 2D VLEs

• *Classroom emulation* allows for re-creation of the physical classroom environment within the 3D world. The advantage of this method is achieving familiarity with the virtual space because of its analogy with the real-life space. This provides students with a sense of connection through the classroom representation [22], as can be observed by the immersion experience of Texas A&M University in SL, teaching reading competency in reality depicted learning spaces [11].

• *Game based learning - treasure, scavenger hunts:* With little time and a lot of content to cover, one way to realize effective learning is to use game-based techniques to pique students' interest especially with the resemblance in appearance of 3D VLEs with game settings [1]. Examples of such game metaphors are treasure or scavenger hunts which provide opportunities to explore areas. This could e.g. be used to orient students with how a campus is laid out [22]. A software design class from Colorado Technical University, for example, created a 3D game maze and populated it with traps, sensors, flags, a scoreboard, treasures, and other game features, then played the game on the last night of class as a form of testing. These students were so immersed in the learning experience they didn't realize they had accomplished goals of several classes in a single term [1].

• *Role play:* enacting or assuming an alternate character to oneself is a widely employed learning technique which can also occur virtually within a 3D VLE. This virtuality might remove some of the traditional hindrances and obstacles of performing face-to-face role plays, e.g. it's easier to dress the avatar in a variety of clothes, be placed in the right imaginary situation, be given the right tools and not be shy to participate. This enhances learning because students are encouraged to use all their skills and abilities to impersonate the role play presented to them [22]. One example of class role-play represents literature activity in which students enact the courtroom scene from John Steinbeck's Of Mice and Men, to benefit from this social learning environment [1].

• *Guided Tours* are used to show learners in a 3D synchronous environment the location of items and features within an area. A tour can be led by the instructor or it could be a pre-programmed item the avatar carries with him that takes him on a virtual "guided tour" without the need for a live person. E.g. a tour of countries or historical buildings or battle fields or forts or a tour inside a blood capillary or volcano where the learners appear to be diminished to a tiny size to experience areas they could not otherwise travel to [22], like project "Virtual Morocco" created by Johnson and Wales University described earlier [12].

• *Conceptual Orienting:* learning to create plans, e.g. for business, entails providing the student with examples and non-examples of a concept and then allowing him to determine the attributes that do and do not apply to the concept. The procedure of side-by-side contrast allows a student to identify and apply concepts in a multitude of environments and do a mental comparison through the capability of instantaneously moving from one site to another [22]. As an example, University of Houston architecture students build business plans in the SL virtual world and subject their models to the forces of SL's free market [11].

• *Operational Application:* This is "learning by doing" in the virtual environment. Students must follow the regulations and constraints of the physical world to achieve a goal. The facilitator monitors the students and then makes remarks or commendations. This could be fixing a piece of equipment, trouble shooting a computer network, performing a virtual experiment or repairing a car [22].

• *Joint Co-Creation:* This is when more than one person collaboratively craft items within the 3D world. This procedure teaches teamwork, cooperation and sheds light on benefits and pitfalls of group work [22]. An innovative group work approach adopted by St George's, University of London and Kingston University was presenting paramedic students with critical patient emergency scenarios on the streets "inworld". The students then have to collaborate in synchronous teams taking rapid decisions to check a dummy avatar's vital signs e.g. pulse, and apply preliminary treatment e.g. dressing wounds, oxygen masks, administering drugs, setting GPS in ambulance etc. Their submitted reports in virtual hospital are then mailed to their real-life instructor. This educational approach solves the problem of rarity of critical cases in reality to practice on, and relieves stress from risk of trying out incorrect remedial techniques in reality [23].

• *Critical Incident involvement:* students are positioned into an environment or predicament analogous to the real situation, where they have to use their former knowledge to resolve a problem. For example a student can be placed into the heart of a disaster like the aftermath of a hurricane, earthquake, car accident or into a blazing building [22].

Concepts as benefit over real life learning

• *Practical training:* Students get the chance to be given real life situations to train at within a 3D VLE allows them to brainstorm together.

University of Kansas teaches medical and nurse training in Second Life, including how to deal with different equipment, studying anatomy of patients and attaching different devices to them. Moreover, physical therapy and occupational therapy students use Second Life to evaluate handicap hazards in virtual homes, recommend improvements and apply changes. The simulation records all steps of the process, which are then sent to the instructor [23].

3.10. Performance

Speed, efficiency, quality of technical connectivity and delivery issues online while using 3D VLEs for e-learning are palpable through the following concepts as a supplement to delivering real life Education.

• *Faster MONO virtual machine:* on August 29, 2008, the entire production grid of SL was updated to being able to use the Mono Virtual Machine (VM). The LSL scripting language remains, but executing on the Mono VM gives up to 220 times speed increase, reduced lag and improved stability [19].

• *Dot-net languages' support:* An additional benefit is that any dot-net language that compiles to the Mono VM can be uploaded to execute in SL. This will enable any program of a student to be seen working immediately by an instructor on submission [19].

3.11. Setting

The importance of the surrounding environmental arrangement and background settings of the spaces, where educational sessions are held within 3D VLEs, constitutes the following succeeding concepts as benefit over real-life physical learning conditions:

• *Untraditional class settings,* including non confinement to having chairs facing forwards, helps revolutionize to capture students' attention by moving freely within the learning environment, putting chairs or sitting in any position without affecting the view [15]. Examples of untraditional classrooms are on display within the Art Department at the University of Kansas featuring a lecture hall, open air studios, a film production area and an interactive gallery of sculpture, animation, game creation and performance arts [24].

• *Easy class management* can be attained, for few problems can arise from noisy interruptions of students since communication is either text-based or even with audio transmissions, only one person can talk on the system at a time. Instructors can also block or remove inappropriately behaving students [18].

3.12. Perspective

The viewpoint and angles of perception of a user within a virtual 3D space are essential factors denoted by the consequent concepts encoded as follows:

As benefit over 2D Virtual Learning Environments

• *Customisation and conceptual imagination of avatar:* As mentioned before, alteration of the personal representative avatar in the virtual world allows for the user's identification with it. Conceptual blending also provides further insight into the role of imagination e.g. using talking animal avatars. One can change his or her gender, race, and even species [10].

Students from Colorado Technical University commented that "the sense of presence and customization of avatars are high on the list of priorities for learning and participating in virtual world classes", despite the fact that it took time for them to modify their avatars and to perfect communication, expressing emotion and gesturing [1].

• *Virtual reality versus virtual world view:* The option of changing between virtual reality view (in 1st person by looking through the eyes of the avatar within the environment) or as a virtual world view (in 3rd person by watching the avatar move) can change the feeling of immersion in the environment [15].

• *Adjusting cameras and lighting:* This can be done by adjusting cameras/ lighting etc within the 3D environment to change the angle of perception of the real user within the 3D VLE despite the position and direction of the avatar [25].

• *Day and night settings* can also be customised within a 3D VLE according to users' preferences e.g. to be dusk, dawn, midday, to help learn in the most idealistic and comfortable surroundings possible [8].

An example of teaching by adjusting viewpoints inside Second Life can be seen through the virtual historic and contemporary worlds' visit of students, at the University of Texas, inside enlarged replicas of Vincent van Gogh's Starry Night, the cave paintings in Lascaux and Gotham City--the home of Batman [16].

• *Attractive 3D graphical setting:* The three-dimensional (3D) graphical settings themselves are very attractive and vivid for users. The dominant content form of a 3D VLE is imagery thus making it an image-based environment [8].

As benefit over Real life Learning

• *Viewing and hearing from any position:* Viewing and hearing any part of the learning space from any angle with clarity, regardless of the position of the avatar (even if seated behind the lecturer), eliminates the need, like in real-life, to sit near an instructor or find acoustic solutions for hearing a lecture [15].

Buffalo State College fashion design students [23] can for example host fashion shows in SL without worrying about positioning all spectator avatars near the runway for proper viewing.

3.13. Locations

There are multitudes of places to visit and learn from, in 3D VLEs as benefit over real life learning places:
• *Imaginary, dangerous, historical or unreachable places:* Students are able to examine and explore a variety of places that are imaginary or difficult to reach or teach in reality e.g. on the top of a mountain, in outer space, bottom of the ocean, representations of historic or extinct civilizations, travelling between continents during the same session thus saving time and money to do so in reality, etc [10]. Texas University, for example, holds classes on a tropical island in SL [11].

4. Disadvantages of pedagogical immigration to 3D VLEs

Contrary to the preceding allegations elaborated so far within this paper, the following categories are the perceived high level disadvantageous themes of delivering e-learning within 3DVLEs derived using the grounded theory methods described earlier.

4.1. Connectivity problems

Smooth online server connections with 3D VLEs are not always available since they necessitate:
• *High connectivity requirements:* Dial-up access is inadequate for connectivity with online 3D virtual worlds like Second Life [2].
• *Limited internet quotas:* For practical and financial reasons, universities commonly limit student internet access by imposing quotas. Access to virtual worlds for synchronous classes, or extended periods required for creating educational models, such as virtual landscaping and orientation to Second Life, can quickly exhaust standard access quotas [2].
Connectivity problems become more critical with 3D VLEs compared to the traditional online support tools used in typical e-learning settings. Since the current use of virtual worlds in education is commonly in the form of synchronous sessions that require the ability to collaborate and communicate effectively. Lagging or frequently broken connections can significantly alter the learning experience of virtual world users. Furthermore the fact that learning content is intrinsic to the 3D VLE dictates minimum connectivity requirements. For example the usefulness of a document that is presented through a poster board in Second Life depends on the user's ability to effectively use the facility.

4.2. Expenses

Financial requirements to setup and maintain an existence on a 3D VLE can be quite high. Involvement in Second Life, for example, requires a modest investment of funds by the university to establish an ongoing base of operation and premium account to assist with distribution of 'in world' currency. Staff and students however are not required to make a monetary investment. Return from this investment may be measured in terms of learning experience afforded to students and professional development of staff in the skills and pedagogy associated with the technology [2].
Although academic institutions may find it affordable to establish a presence in Second Life, their efforts focus mainly (and sometimes solely) to invest on the establishment of a virtual campus. The financial needs of the end users are unfortunately ignored. It is quite common for students to side track and waste so much time in an effort to obtain artefacts, SL objects and virtual currency. It is a growing trend for students to invest more time away from their SL not researching but in an endeavour to acquire more Linden dollars through surveys and other opt-in methods.

4.3. Prerequisites

Previous technological knowledge of users can be an asset for using a 3D VLE easily. Students familiar with 3D gaming environments do not need much orientation to utilise 3D VLEs unlike novice users to technology. Also, the text-based nature of 3D VLES sometimes does not favour every learning style, since it requires that its participants have fast fingers and strong imaginations as they attempt to conjure up realms of shared existence that have no presence in reality. This is further aggravated by what educators refer to as loss of face-face contact between instructors and students, which is important for visual learners in particular. However significantly, many online learners are familiar with the principles of an alternative online social environment, one that is not text-based but instead predominately visual – e.g. the immersive, interactive online game environments which alleviates from the gravity of the previously mentioned disadvantages [17].
Evidence gathered from literature and several demonstrations and presentations organised by the hosts indicates a misalignment between skills possessed by the learners and those required for instructors.

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5. Conclusion

This paper aimed to derive analytically, using grounded theory research methods, the advantageous and disadvantageous categories (themes) and sub concepts of using 3D virtual learning environments, such as Second Life, for conducting e-learning within them. Hence also prove that the advantages not only support traditional physical learning techniques, but can also provide more options for delivering education than traditional classroom methods and also more than those provided by 2D virtual learning environments such as blackboard. Thirteen major categories were revealed to be important themes of delivering e-learning in 3D VLEs versus only three major disadvantageous themes, some of which will automatically be resolved in time due to technological progress in future. It is therefore clear that pedagogical immigration of educators to 3D VLEs can reap more virtues than drawbacks if utilised efficiently.

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