KWAME NKRUMAH UNIVERSITY OF SCIENCE AND

TECHNOLOGY, KUMASI

USE OF VIRTUAL WORLDS IN DISTANCE EDUCATION IN

GHANA: CASE STUDY OF HO CENTRE OF UNIVERSITY OF

CAPE COAST

By

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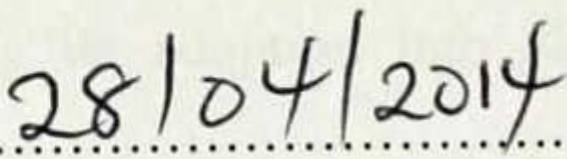of the requirements for the degree of

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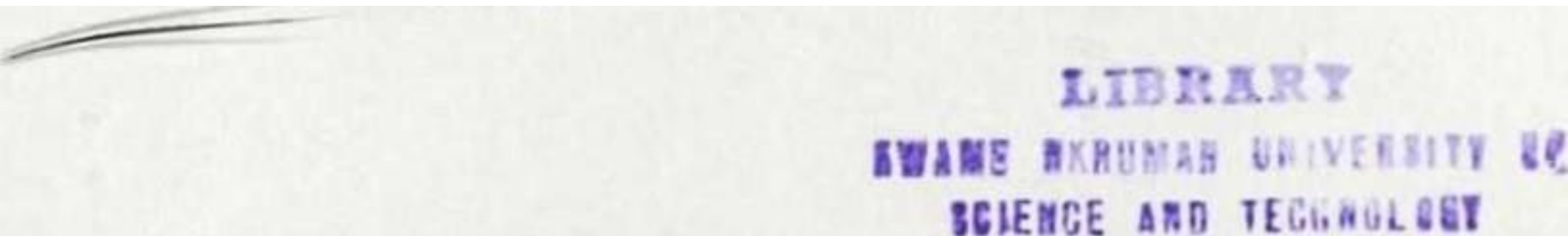
DECLARATION

I hereby declare that this submission is my own work towards the MPhil in IT and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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ABSTRACT

Online virtual worlds are emerging technologies that offer unique learning opportunities for traditional and distributed education. Virtual worlds are currently being used as a medium for distance learning. This thesis explores the possibility of using virtual worlds in distance education in Ghana to supplement the face-to-face sessions. Specifically it seeks to find out the learning experiences afforded by this medium for spatially distant learners and students' views concerning its adoption into distance education in Ghana. Fifty students were randomly selected and led through learning activities in Second Life (SL) and their views and opinions on the sessions and on Second Life as a learning environment asked. Both qualitative and quantitative data were collected through structured questionnaires, interviews and observation and analyzed using descriptive statistics and Narrative analysis. More positive experiences were recorded than negative with quality of graphics, ease of using the application, usefulness of SL as a learning environment and attitude towards SL all provoking positive responses. Internet connection on the other hand produced negative responses. Students found learning in SL rewarding and fun, and are in support of its use in distance education to supplement the traditional teaching method. Whilst more research is necessary to

explore fully the potential of 3D virtual worlds for learning, this initial investigation demonstrates that Second Life has potential as a learning environment in distance education environment.
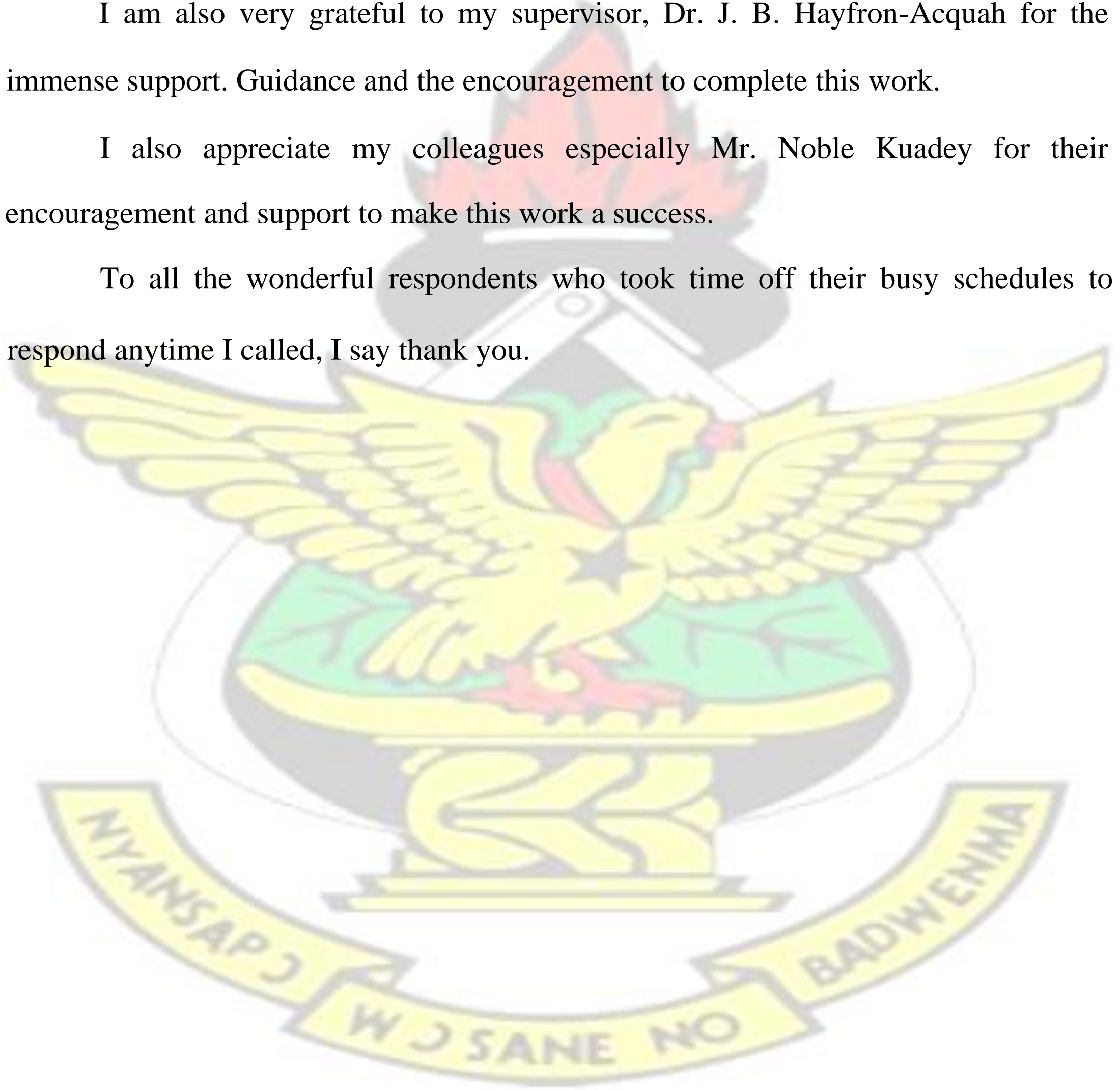
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Thanks to God almighty by whose grace, mercies wisdom I have been able to complete this work successfully.

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KNUST

I dedicate this work to my parents: Mr. C. R. K. Bensah and Mrs. Beatrice Bissih

Bensah.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

All over the world education is considered as a basic requirement for economic development and political stability. It is acknowledged that for Ghana to make any appreciable progress in its socio-economic development efforts, substantial resources need to be directed at reducing the percentage of the population without any educational attainment, widening access to education to the vast majority of the population and increasing the percentage of the population with tertiary level education (ICT4AD Policy, 2003). To impart education, various educational systems such as distance education have been introduced. Distance learning has become increasingly popular over the years and it appears most Universities and Colleges across the world are profiting from this particular educational system with others seeking to become involved.

The current extraordinary growth of distance education in Ghana can be attributed to factors such as the rise in number of qualified applicants who do not get admission into the main stream programmes due to limited facilities, more full-time employees are seeking to advance their careers by pursuing a second degree or taking training courses and it creates an avenue for income generation by the universities and polytechnics. With close to 60% of the population of Ghana under the age of 25 years (ICT4AD, 2003), the number of students enrolling in distance courses is continuously growing in tertiary campuses.

Tl€íð seems t e no universal definition of distance education but there is ally a separation between learners and the teaching institution or education

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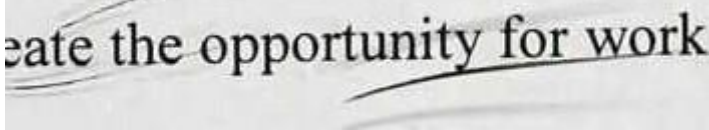
provider. At its most basic level, distance education takes place when a teacher and student(s) are separated by physical distance, and usually technology such as the internet or pre-recorded programs is used to deliver course content. Most of the distance learners are untraditional students who entered into job markets first after graduating from a high school and then decided to go back to schools to receive further education with majority being unable to secure study leave for a full time study. Distance education or learning therefore provides convenient and flexible access to education for students who for one reason or the other cannot be part of the regular on-campus programmes.

According to Moore and Kearsley (2011), distance education has evolved through several historical generations. The first generation was when the medium of communication was text and instruction was by postal correspondence. The second generation was teaching by means of broadcast radio and television. The third generation was not so much characterized by communication technology, but rather the invention of a new way of organizing education, most notably in the "open universities". Next, in 1980s was the first experience of real-time group interaction at a distance, in audio and video teleconferencing courses delivered by telephone, satellite, cable and computer networks. Finally, the most recent generation of distance education involves teaching and learning online in "virtual" classes and universities, based on internet technology. Many teaching methods honed over the years are transferable to the contemporary online platforms, and many issues encountered online have been experienced and dealt with by previous generations.

The distance education E) is not new in Ghana. It started decades ago and used to be known as correspondence education, an avenue through which a number of workers and professionals upgraded themselves. After some time the idea of using DE for manpower development resurfaced strongly and this led to the introduction of a number of DE initiatives including the Modular Teacher Training Programme (MTTP), which was introduced in 1982 (Mensah & Owusu-Mensah, 2002). This programme was meant to upgrade untrained teachers academically and professionally through some form of DE. However this programme was abandoned because of certain difficulties it faced. Despite the difficulties encountered in the earlier attempts with DE in Ghana, there was still a strong conviction on the part of the Government of Ghana that DE is a viable complement to conventional education especially at the tertiary level. This conviction was partly due to the fact that universities were not able to admit even half of qualified applicants due to limited facilities. Consequently, between 1991 and 1994, the government of Ghana through the Ministry of Education (MOE) sponsored a number of surveys to assess the DE needs of Ghana. Upon the recommendations from these surveys the universities agreed to start and prepare for this new model of educational delivery (Mensah & Owusu-Mensah, 2002).

Addah el al (2012) outlined the objectives of the government of Ghana for adopting distance learning as a viable complement to the conventional face-to-face education, which are to:

- provide opportunity for a large number of qualified applicants who do not get admission into the face-to-face programmes as a result of limited facilities to have access to tertiary education

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- create the opportunity for work and study
- increase access to and participation in education at all levels for all
- facilitate progression through the education system from basic to tertiary
- improve the capacity of Ghanaians to cope with the technological advancement and the knowledge society and be able to enhance their contribution to nation building

- increase equality and democratization of education
- provide cost-effective and affordable education
- serve as an avenue for financial resource mobilization for the public universities

All the public universities; University of Ghana (UG), University of Cape Coast (UCC), Kwame Nkrumah University of Science and Technology (KNUST), University of Education, Winneba (I-JEW), University for Development Studies (LIDS) and some polytechnics are currently offering higher education programs in a dual mode. The higher education distance learning program was first begun in I-JEW in the year 1996, followed by UCC in 2001, then KNUST in 2004 and finally UG in 2007 (Addah et al, 2012).

The growing demand for work and study has made most higher education institutions to utilize e-learning tools to support the interactivity in distance education programs. Distance education from both the pedagogical and technological perspectives is changing fast; and the predominance of e-learning as a delivery method for instruction is well documented. Moore and Kearsley (2011) stated that in distance education, technology is the principal means of communication, and introducing distance education

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into an institution or setting up a new distance education institution means making significant_ghanges in ho>achlngand other resources are used.

One of the pedagogies that have dominated the current generation of distance education is the delivery of courses through the internet. The choice of this method by most distance education providers can be attributed to the fact that it helps students alleviate their time management problems among work, family and school. With a lot of innovative instructional pedagogies emerging rapidly, distance education and e-learning will continue with the move to wirelessness in society. Unfortunately, the use of the internet-based technologies for distance education is still young in Ghana. Most institutions providing distance education in Ghana including the University of Cape coast rely heavily on face-to-face and printed course modules for their distance learning programmes.

The rapid advancement in technology has made it possible to shift from institution-led learning to own-time self-learning at a distance using e-learning platforms. Thus from conventional way of teaching to self-paced-learning, which is moving towards flexibility and openness. The majority of distance education today take place using the Internet, now readily accessible for the vast majority of students whether in their own homes or at facilities such as libraries. These electronic means are used for the delivery of education for students who are separated from their teachers both in time and space; to distribute the learning material, keep students in touch with lecturers, and provide access to communication between students. In the early days of distance learning, technologies such as radio, television, DVDs, printable material, among others were

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popular but the immediacy and functionality of Web learning has made it a first choice for níaâ\ydistance learners.

The idea of widening access to education, promoting independent and lifelong learning and adopting alternative approaches to delivery of education is prominent in the goals of education in Ghana. The key role that ICTs can play in widening access to education to a wider section of the population; and in literacy education and for facilitating educational delivery and training at all levels has been recognized (ICT4AD Policy, 2003). As such, the educational policy of the country has emphasized the promotion of e-learning in its distance education programs. With the technological advancement, the distance and isolation in the distance learning system has been overcome to a very large extent. An account of the sorts of engagements that go on in mobile telephony, facebook and twitter for instance testify to the possibility of having a social presence in e-learning programs which can be harnessed to support distance education programs in a developing country such as Ghana.

Educators must change teaching modalities and integrate active learning and experience-based approaches, while making an effort to experiment with new techniques to promote creativity in students (Gempesaw, 2009). Regarding new technology, Internet-based virtual worlds have been emerging rapidly since 2003. Virtual worlds are technologies that offer unique Teaching and Learning opportunities for traditional and distributed education. Educators have been quick to spot the enormous potential afforded by virtual worlds for situated and authentic learning, and for bringing geographically dispersed faculty and students together in the same space (Johnson and Levine, 2008). The virtual world allows for student interaction, intense engagement, scripted immersive

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experiences, simulations, role-la ing, and constructivist learning. Some popular virtual worlds such as Active World and Second Life are currently being used as a medium for distance learning in some parts of the world.

Virtual worlds , immersive three-dimensional virtual spaces where users interact with projected identities of other users (avatars) and objects, are becoming increasingly popular and continue to grow as highly interactive, collaborative, and commercial cyberspaces (Lee & Chen, 2011). Originating as environments for play, today's virtual world services have gained legitimacy in business as well as in educational and government settings for their application to serious endeavors such as distributed collaboration, multimedia meetings and training, and real-time simulation with tens of millions of consumers (Zhou et al, 2012). The media attention they have recently attracted has led to research exploring their potential impact in a variety of fields as the technology is now viewed as something more than just a game with many positive applications in education, marketing, communication and information provision (Clarke, 2012). Within these virtual worlds, users select and reside in their preferred virtual places, including online communities and educational institutions. Social institutions such as universities, hospitals, and the military, are using virtual world services for action learning, immersive training, and innovation among others. Some of the many advantages of virtual worlds outlined by Morris (2008) are the fact that they are always opened, they can be a global resource of knowledge, they are environmentally friendly, and that they cut down on cost of travelling.

According to Harwood & Ward (2013), Virtual worlds combine multi-player game technology with social networking and, as such, are more technologically

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advanced than the average internet site or weblog (blog). Harwood & Ward outlined some key differences between virtual worlds and web browser environments as follows:

- Users in virtual world take the form of avatars, graphical representations of themselves which enables practice for real-life experiences, where avatars can be seen as extensions of real-world identities. These avatars are endowed with mannerisms and skills that their users use to interact with other avatars.

- Thousands of users can interact in real time. Virtual reality provides 'enhanced support for work and interaction between remote participants by delivering a common world of digital data and virtual objects for co-participants to discuss.

- These worlds are persistent, which means they continue when the user leaves and 'remember' the location of possessions. This means that users may have a wide range of possessions and an inventory which they can keep, and indeed make available to others, while they are away.

- There are potentially multiple means of communication, via text chat, instant messaging and voice, as well as access to the internet, Skype, etc. Virtual-world 3D environments use voice over internet protocol (VOIP) technologies, which enable new ways of communication, collaboration and cooperation enabled through the internet.

Authors have identified more than 45 virtual worlds, each targeting a different age group of the population and satisfying users' needs for a variety of purposes including social networking, entertainment, commerce and education (Wood et al, 2008). Forgxample virtual worlds such as Club Penguin, Disney's Toontown and Pirates

of the Caribbean are geared toward children. Others such as Whyville and Habbo Hotel are for Teens whilst Sims Online, World of Warcraft, Second Life, Active Worlds, etc, are for adults (Virtual Worlds List By Category, 2009). In regard to purpose virtual worlds such as Active Worlds and Second Life have gained popularity in educational institutions worldwide, the majority of which are colleges and universities (Wood et al, 2008 and Baker et al, 2009).

Second Life (SL), a three-dimensional virtual world created by San Francisco based company Linden Labs was released in 2003 (Linden Lab, 2011). Though a vast of virtual worlds exists, none has matched the popularity of Second Life. Second Life has been a popular option even though it sometimes feels like it is always under construction. Over the last few years the graphics have improved and the platform has become more stable (Floyd &Ilene, 2012).This popularity can be attributed to its strong user base, where the content and activity within the world depend almost entirely on user contributions (Schultze et al, 2008) and strong attraction for new users, with some attributing its popularity to the large amount of varying in-world activities (Wagner, 2008). In SL residents can not only create their own avatars or 3D representations, but they can also create their own objects and products and retain the property rights of their digital creations (Fetscherin & Lattemann, 2008).

Most virtual worlds are free to join, but additional fees may be requested to customize one's experience or purchase virtual "goods" such as lands. This customization has resulted in a cottage industry of sorts. While anyone can create content and design objects in a virtual world, it does require considerable time and basic design skills. In Second Life for ins ance, users can join for free which has also been a big help for educators and librarians who may be exploring virtual worlds without much

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in the way of institutional support (Floyd &llene, 2012). While owning land costs money, users can use public areas, rent space, and/or find other educators willing to share space for building environments or holding meetings, etc.

In most virtual worlds, avatars can be controlled using the keyboard and can often communicate with other avatars in real-time. In Second Life, avatars can communicate through chat, instant messaging, and even voice chat. Movement in Second Life is done through walking, flying or teleportation. Avatars can even ride in vehicles or boats as they explore their virtual world. It has its own economy, where users buy and sell virtual products and services with other users using Linden dollars (IS). For example, users can buy or rent different sizes of land including an entire island or buy furniture, art, and other virtual products for their avatars or buildings. (Buckless et al, 2012). Virtually anything one could want can be built (for a price). Avatars interact with each other in public and private places that mirror real life settings such as discussion rooms, shopping malls, bars, historical places or may be user-developed alternative realities. One obvious use of SL is as a meeting site for instructors and students. Instructors can hold office hours or arrange meeting times with online students who otherwise do not meet face to face. Instructors can deliver lectures in SL that can be attended by student avatars. Even students in face-to-face classes can enjoy the convenience of meeting in SL because they do not need to travel to campus to meet (Baker et al, 2009).

Admittedly, not much has been done in implementing the concept of learnercentered education in distance edu tion in Ghana. One of the reasons that Ghana has failed in this area has been unavailability of tools and resources. Now, computers

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and telecommunications have opened the way to formats other than pen-and-paper correspondence courses and allow for a more interactive, integrated learning environment. While virtual world is by no means the sole elixir for Ghana's problem, it will go a long way in addressing some of the challenges in distance education in Ghana.

It is against this background that this study tends to investigate the feasibility of using virtual worlds in distance education in Ghana. Considering the fact that Ghana is lagging behind in integrating technology, especially e-learning into its distance education programmes, it is pertinent to embark on a comprehensive study on how emerging technologies such as virtual worlds can be used in improving the quality of teaching and learning in distance education.

1.2 PROBLEM STATEMENT

Although technological advancement has made it possible to overcome to a very large extent the distance and isolation in the distance learning system, it appears Ghana is still lagging in the use of technology; especially e-learning in distance education. The Web is rapidly becoming popular as a place to teach or take a class or for students to interact virtually with each other. A number of emerging internet based technologies is being harnessed to support distance education. Among this technology is Virtual Worlds, which seems to be the leading e-learning environments currently.

The number of students enrolling for distance education in the tertiary institutions in Ghana continues to grow by the day. University of Cape Coast is one of such institutions with about 18,000 students, drawn from all the 10 regions for its distance education programmes. Most of these students are working, married and live away from campus hence travel to the campuses where the distance programs are being offered. Students may be forced to leave their jobs more often and those who may not afford to

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leave the workplace or cannot obtain permission may drop out of the program. These are challenges that most countries, especially those in the developed world, have used e-learning to overcome. But in Ghana the delivery mode of courses has been predominantly regular face-to-face tutorials at the various learning centers with printbased learning materials. This study therefore seeks to find out how emerging technologies such as virtual worlds can be used to alleviate the problems mentioned above using Cape Coast University as case study.

1.3 AIM OF THE STUDY

The study aims at exploring the possibility of using virtual worlds to supplement the face-to-face sessions of distance learning in Ghana.

1.4 OBJECTIVES OF THE STUDY

The objectives of the study are to:

i. discover the learning experiences afforded by this medium for distant learners.

ii. determine the advantages and disadvantages of learning in virtual world .

iii. examine students' attitudes toward virtual world and intention to use if adopted into distance education.

1.5 RESEARCH QUESTIONS

i. What learning experiences are afforded by this medium for spatially distant learners?

ii. What are the advantages and disadvantages of teaching and learning in virtual worlds?

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iii.   What are students' attitudes toward virtual world and intention to use if adopted into distance education?

1.6 SIGNIFICANCE OF THE STUDY

There are several researches advanced to the study of use of technology in education. The fact that promoting technology use in education is core to the development goals of Ghana cannot be overemphasized. The efforts being made by the Ghana government in this effect such as the distribution of free laptops to students and schools to facilitate the deployment and exploitation of ICTs within the educational system are well acknowledged. Studies have shown how virtual worlds are being used across the world in ways that are engaging for students, encouraging creativity, learning through simulations, experimentation and observation while promoting increased immediacy, expanded horizons and the building of self-awareness. There is a need for research that is parallel and complementary to the above and concentrates on the Ghanaian higher education perspective, transcending anecdotal reports to accurately depict and represent in detail the unique opportunities, challenges and realities of the technology and its deployment and use within the highly dynamic, evolving distance education context in Ghana.

The study is intended to address this need, culminating in the provision of analysis and recommendations to inform policy, practice and future research in the field. It is particularly significant for the following reasons:

- Not much research has been conducted on the use of this technology in education in GWana, not t mention distance education, and there has been no national

capture of activities, uses and impact of the use of the 3D immersive virtual worlds for enhancing learning and teaching in the country.

- There is a need for an accurate picture of the "state of play", including current, past and planned applications of the technology, so as to help direct future research, development and use.

- An examination of the lessons learnt, including perceived and actual costs and benefits, and barriers to use of the technology in education, will be invaluable in informing future applications and initiatives.

- The research could assist distance education administrators to take advantage of the technology to promote consistency, improve quality, increase efficiency and reduce costs, all the while making their programs more attractive to both local and international students.

1.7 SCOPE OF WORK

There are a good number of virtual worlds that are geared towards education but Second Life was chosen for the survey. Second Life was chosen because of its popularity and use in other educational institutions across the world (Schultze et al, 2008, Baker et al, 2009). The intent of this study is not to suggest that one virtual world is superior to the other nor opt for a particular virtual world. Rather, the purpose of the research is to propose the adoption of virtual worlds in distance education as a supplement or occasional alternative to the traditional face-to-face delivery in Ghana by exploring the potentials of this medium as an educational tool.

The survey covered only students though they are not the sole stakeholders in

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Äis1ance education, due to time investment involved. Since students are the most disadvantaged as far as distance from the offering institution is concerned, they are in a much better position to give insightful feedback regarding the technology, particularly its potentials and drawbacks as a learning medium.

Institutions with distance learners in Ghana are many and will be a difficult task for a single study to cover them all. The focus of the study is not on Cape Coast University but Ghana as a whole. Cape Coast University was chosen because its distance learning program was in full session during the study period and students were available for the survey. Additionally, since most of its distance learners have probably gone through the preliminary distance programs, they might have spent an appreciable time in the distance learning environment and therefore may be the best candidates to access the feasibility of this medium.

1.8 ORGANIZATION OF STUDY

The study is divided into five chapters. Chapter One introduces the study — it provides background to the study, statement of problem, study objectives, research questions, scope of study, significance of the study and organization of work. Chapter Two focuses on both theoretical and empirical reviews of existing related literature.

Chapter Three provides in detail the methodology adopted for the study. This is where methods adopted in data collection and procedures of data analysis were discussed. The findings of the study are presented and discussed in Chapter 4 while the final chapter, Chapter Five comprises of summary, conclusions and recommendations of the study.

CHAPTER TWO

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LITERATURE REVIEW

STUDIES ON THE USE OF VIRTUAL WORLDS IN EDUCATION

According to Floyd and Ilene (2012), over 800 educational institutions currently manage and maintain full regions in SL. Of these 650 and above represent colleges/universities and service organizations including 60 of the top international universities. These spaces are used by faculty to hold lectures or meetings with students, display digital artwork, hold music performances, host gatherings, and build virtual environments (Baker et al, 2009).

Likewise, Schultze et al (2008) revealed that more than 100 universities have reportedly held classes or sessions in Second Life when they undertook a study on the use of synthetic worlds for work and learning. Schultze et al designed two pilot studies in SL for two categories of students. The first was in a small Ph.D. level course for a single chat session in an online course enrolling both distant and on campus students. Results showed that of seven students, age range of 25 to 50, only two seemed comfortable or competent by the end of the experience whilst the others reported challenges with the technology.

The second pilot was designed for undergraduate students, age around 20. Rather than trying to assemble everyone at the same time for a chat session, the students were given a numúr of sites to visit over weeks, and semi-structured interviews were conducted for them after their experiences online. When asked how easy or difficult it was for them to communicate with others and to make themselves understood in the virtual world, the students were of varied views. Opposed to the earlier result, majority

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were positive than negative. The varied opinions of the two sets of students could probably be due to their age differences which Schultze et al failed to establish. Though the results were disappointing and there is more cost to this in time and money than with older technologies, Schultze et al maintained that there is a lot of potential, even if the current Second Life system is disappointing.

Dickey (2005) investigated how Active World has been used asynchronously and synchronously for formal and informal education by undergraduate students of University of Colorado and Active Worlds University respectively. According to him, Active Worlds proved an effective medium as spatially distance learners were observed to meet and collaborate on projects. An informal interviews with students revealed that most seemed to enjoy and value the use of the 3D setting. When the students were asked about the advantage of this environment over traditional classroom or lab settings, most students answered that the main advantage was "not having to go to class." However, further probing revealed that the environment made them feel like they were "at school" or "in school" or "actually there" embodied in the environment.

Buckless et al (2012) conducted a research case in SL for accounting students where students were asked to complete research assignments in SL. A survey conducted for the students after completion of the assignments revealed that students believe the Second Life research assignment was realistic and an effective learning environment and the only drawback they faced was the time it took to get SL up and running for all members. Also a research by Baker et al (2009) where students were made to attend lectures in SL shows that reactions from students were generally positive though some

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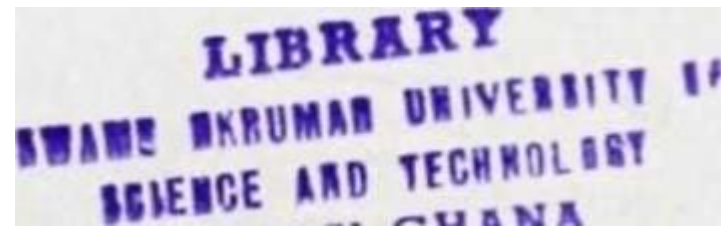
challenges were observed. Students appreciated the convenience of being able to attend the lecture from any location and they also liked having the text version of the lecture available during the talk, with many of them maintaining that they enjoyed interacting socially with the instructor and with their fellow students in the virtual world.

In regard to the benefits of virtual worlds for distance learning, Franceschi et al (2009), maintain that virtual worlds offer a potential solution to a significant shortcoming of e-learning technologies which has been poor support for group oriented learning. Dreher et al (2009) further revealed that Virtual Worlds foster social and group participation by enabling communication through a rich array of media, including visual, contextual, nonverbal gestural, voice, and textual communication media.

Results from Dickey (2005) in a study of three dimensional virtual worlds and distance learning shows that Active Worlds provide a means for spatially distant learners to converse and construct in a collaborative environment because of the types of design features it affords. Unique names provide both trust and accountability necessary for a collaborative learning environment, whilst at the same time allowing users to adopt a new identity or roles that might not be available to them in a traditional learning environment. Dickey equally observed that the user-extensible options provided by Active World afford educators and learners the means to self-define the context of the learning environment, and may also enhance learning by providing more opportunities for engagement (Dickey 2005).

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Halvorson et al (2011) investigated a case teaching experience in Second Life and realized that the anonymit of e avatar allows for some freedom of expression particularly among very private and introverted students. Students could express themselves with less fear of personal retribution for their thoughts and, thus, tended to express themselves more profoundly than they would in real life. Halvorson et al opined that a student who is reluctant to comment or ask questions in a traditional face-to-face class might feel more comfortable doing so in a virtual world. Equally, Baker et al (2009) observed that the use of an avatar provides anonymity that enables some students to feel more comfortable speaking up. Also, most virtual worlds allow acceptance rather than judgment of such expression and group behavior tends to be democratic (Stuart et al, 2011).

Baker et al (2009) organized a lecture in SL for an upper level psychology class when investigating the use of virtual worlds in education. Reactions gauged from the students were generally positive. Students appreciated the convenience of being able to attend the lecture from any location. Baker et al noted that SL could be especially useful for students who are prevented from attending class due to constraints such as illness or distance from campus. Equally, a later study by Halvorson et al (2011) shows that virtual world is an option when the majority of a class or the instructor might have difficulty attending physical classes because of work, travel, or bad weather conditions .1n regard to teaching, Halvorson et al (2011) revealed that teachers who have had a teaching experience in SL appreciated the fact that SL gave them teaching flexibility when they had to be away from the real classroom in another part of the world or time zone.

Franceschi et al (2009) investigated the claim that social presence in e-learning situations using virtual worlds fosters higher levels of student engagement than other e-learning environments. The resul of their research show that the participants in the virtual world learning environment experienced significantly higher levels of engagement and group presence than participants in the traditional learning environment. According to Franceschi et al, the possible explanation is that participants in the classroom environment not only share the same physical space, they also share the same sources of distractions, making it easier for all the team members to become simultaneously distracted. On the other hand, participants of virtual world learning environments share a virtual environment but not the possible distractions, and while any member can lose concentration at any given time, the others most likely will not and they will subsequently call the distracted member's attention back to the task at hand.

Baker et al (2009) further maintained that using an online virtual world such as SL increases student engagement, particularly for online classes, by providing opportunities for real-time student-faculty and student-student interaction. Likewise virtual environments make it possible for students taking a distance course to develop a real sense of community thereby replacing the feeling of isolation many distance learners experience (Wong, 2006).

Virtual reality promises us a place where there are no limits, no gravity so we can fly, no pain so we can fall, no death so we can live forever (Cheal, 2007). According to Wood et al (2008), virtual worlds provide educators with the opportunity to create real-life simulations in a safe environment to enhance experiential learning; thus, they offer a risk-free way for students to practice skills, try new ideas, and learn from their

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mistakes. The flexibility of SL also makes it possible for a problem to be simplified in the early stages of a project process by removing factors which would need to be addressed in real life. For example, by providing ready-made scripts or objects for users to work with will allow them to focus on a specific area of a problem (Good et al, 2008).

Reports of student enjoyment of these worlds are common and several researchers and instructors report striking improvements in student motivation. According to Calongne (2008), Virtual Worlds motivate students to learn by providing means of discovering new ways to study, discuss, create, and express the course subject under the supervision and support of the instructor. Unlike other e-learning environments, the easy-to-learn and user friendly creativity tools provided by virtual worlds make them attractive for a wide variety of learning applications and their support of creativity has long been shown to be a critical factor in achieving student engagement (Franceschi et al, 2009). Additionally, worlds such as Second Life is being used in educational organizations to encourage students to engage in collaborative team situations, to immerse students in creative settings that foster innovative thinking, and to facilitate cultural exchanges (Buckless et al, 2012). Furthermore, SL enhances the student experience by providing new styles of learning and allows students to make conceptual bridges with the real world (Ward, 2010).

Concerning the challenges in teaching and learning in SL, Wood et al (2008) pointed out that many beginners find it more difficult to deliver a good lesson in SL than in real life at first. Lessons need to be well prepared if they are to work properly and given the heavy reliance on the technology to deliver course material, it is wise to prepare backup plans in case something goes wrong. Halvorson et al (2011) further shows that

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both instructors and students ran into technological problems with SL. Students had

problems with their own abilities in controlling the sound and voice and

with the speed ~~d and continuity of connection~~ (which was out of their control). Also, Baker et al (2009), discovered that despite the positive aspects of SL, a few students had technical difficulties such as having a slow computer connection, and not able to view the slides during the lecture, with most students reporting that it took some time and practice before they felt comfortable navigating through SL. Thus the level of technological expertise is critical to the success of teaching and learning in this environment.

To overcome these challenges, Dreher et al (2009) proposed that institutions that

are not abreast with technology may use institutional servers to host Virtual Worlds

inhouse. They maintained that though Second Life is hosted centrally by Linden Lab on

servers in the United States, there is the possibility for geographically distributed servers

to be provided which could facilitate private Second Life servers and may help address

concerns on the security, speed and reliability of Second Life's service provision.

Halvorson et al (2011) discovered that developing student involvement in a

virtual world is challenging. According to Halvorson et al, two instructors (a novice and

an expert) were made to teach classes in SL, results showed that both instructors

experienced a low level of engagement with students but could not tell what the causes

may be. Moreover, Schultze et al (2008) observed that rather than students engaging in

"meaningful" discussion on the topics that had been prepared, almost all of the chat that

appeared was related to issues of navigating in world and sharing impressions of features

in the environment. Meanwhile Schultze et al have been able to identify technological

problems reported by students to be a contributing factor to students' low level of

involvement.

Clarke 2012) further identif d that the time required to reach an adequate level of

familiarity with the world is an issue for new users, and much like teaching an online

course, carefully developed sessions that incorporate a variety of tools to keep the "distant" learner engaged are necessary. To increase students' involvement, instructors can give the learning materials to students ahead of time in order to prepare them for the class. According to Wood et al (2008) and Baker et al (2009), a virtual environment like Second Life is often limited only by the scope of the instructor's skill hence it is important for instructors to take the time to explore the space and interact with others in order to experience the role of the student. Instructors can have the opportunity to see what activities and tools will work best for their material and for the learning styles of their students by participating in some of the many free online classes, advertised in the community section of the Second Life web page. Wood et al (2008) and Baker et al (2009) maintained that instructors may need to facilitate interactivity at first, but once students become comfortable with the environment this generally is not a problem. Baker et al (2009) further suggested that instructors develop class management techniques to counter issues that may arise in group discussions in SL such as delay incurred while participants type out comments and responses, and multiple overlapping conversations occurring simultaneously.

Another challenge identified by Wood et al (2008) is attempting to measure student comprehension, because even though everyone has the ability to see each other as they would in real life there is no natural body language or facial expressions. Therefore, it is difficult for instructors to "read" students' countenance and determine if they understand the concepts they are presenting. Additionally, when instructors are physically Epresent" with student s they tend to monitor the impact of their communication and modify accordingly. So often, however, in virtual classrooms,

instructors simply transmit without knowing the impact they are having on students since they

are not physical present with them (Morris, 2008).

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter captures the methods and the techniques that were applied in carrying out the research to arrive at accurate and reliable conclusions. It takes into account specific areas such as data collection methods and techniques, target groups and sample size, data analysis procedure and description of statistics.

3.2 STUDY AREA

The University of Cape Coast is one of the rare sea front universities in the world, located at Cape Coast, the regional capital of Central Region, Ghana. It was established in October, 1962 as a University College and placed in a special relationship with the University of Ghana, Legon.

On October 1, 1971, the College attained the status of a full and independent University, with the authority to confer its own degrees, diplomas and certificates by an Act of Parliament - The University of Cape Coast Act, 1971 [Act 3901 and subsequently the University of Cape Coast Law, 1992 [PNDC Law 278].

The University was established out of a dire need for highly qualified and skilled manpower in education to provide leadership and enlightenment. Its original mandate was therefore to train graduate professional teachers for Ghana's second cycle institutions and the Ministry of Education, in order to meet the manpower needs of the country's accelerated education programme at the time. Today, with the expansion of

some of its_faculties and the diversification of programmes, the University has the capacity to meet the manpower needs of other ministries and industries in the country, besides that of the Ministry of Education.

The University started with only two departments, namely: Arts and Science which later developed into faculties in 1963. The University currently has four faculties: Arts, Education, Law, Social Sciences, and six schools: Agriculture, Biological Sciences, Business, Graduate Studies and Research, Medical Sciences, Physical Sciences, including Centre for Continuing Education. Apart from its regular programmes, the university runs sandwich and distance courses at diploma, graduate and postgraduate levels.

The school currently has a total student population of over Thirty Five Thousand, Nine Hundred and Twenty Two (35,922) with the following breakdown: Fourteen Thousand, Eight Hundred and Fifteen (14,815) Regular Students, Two Thousand, One Hundred and Forty Six (2,146) Sandwich Students and Eighteen Thousand and Eighteen (18,018) Distant Learning Students.

The Centre for Continuing Education was established in 1997. The Centre is an affiliated member of the West African Distance Education Association (WADEA). The Centre, apart from being a sub vented sector of the Ministry of Education, maintains active collegial relationship with the sister universities in Ghana and Simon Fraser university of Canada. The Centre has been established, primarily, to:

i.   provide opportunities for people to pursue higher education.

ii.   train more professional teachers for all levels of Education in the Ghana

Education ServiceÁGES):—— iii. train high caliber personnel for national development. iv. raise the professional competence of serving teachers and personnel of the Ghana Education Service, as well as accounting and secretarial personnel in civil/public service, commerce and industry through Continuing Education.

v. provide opportunities for applicants who, even though qualify for admission, fail to enter the University due to constraints in physical facilities.

The Centre for Continuing Education (CCE) has centres scattered across the ten regions of the country and as part of its desire to vigorously promote distance education, it has acquired sites in seven out of ten regions for the construction of permanent study centres. The centres will eventually serve as UCC campuses in the regions to run some campus-based programmes.

Ho centre in the Volta region with a population of about 956 students, offers diploma and degree programs and has successfully churned out graduates of different caliber. It was chosen for the survey due to its proximity to the researcher and resources used.

3.3 SAMPLE SIZE AND SAMPLING TECHNIQUE

The sample for the study consisted of Fifty (50) UCC distance students randomly selected from Ho centre of which 31 were males and 19 were females. The simple random sampling technique was used to select respondents from whom data was collected. The determination of the sample size was based on the resources available and the amount of time involved.

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3.4 DATA COLLECTION

Structuréd questionnaires were directly administered to the fifty (50) respondents, interviews conducted and observations made. Before the questionnaires were administered and interviews conducted, two separate practical sessions were held with the respondents. The first session included the SL registration and orientation process after which the students were led to carry out activities including changing their avatar's appearance and navigating in Second Life. Students were instructed to use their real names for easy identification. The respondents were given a month to familiarize themselves with the world before taking part in an online class in the second session. In the second session which lasted for two hours, the respondents were divided into five groups (each with 10 students) and then placed into five different lecture halls in one of the open universities in SL. Respondents were made to explore educational slides displayed in the lecture rooms and interact among themselves. The researcher interacted with the respondents (see figure 3.1) and observed the way participants interacted with the world and other users, their responses to various stimuli within SL during their time in-world.

All students who participated in the Second Life sessions were asked about their views on these sessions and on Second Life as a learning environment. Structured questionnaires containing descriptions of their experiences and overall opinion of learning in SL were directly administered to the respondents in a hard copy form to identify their perceptions, after the second session. Interviews were also conducted and responses recorded on their experiences in SL and views on its adoption into distance education.

The raw data collected with the questionnaires is presented in table 3.1 and table 3.2. Table 3.1 contains data on respondents' profile whilst Table 3.2 contains data on respondents' views after using SL for learning where the abbreviations SD, D, SID, UN, SIVA, A, SA and TOT stand for strongly disagree, disagree, slightly disagree, undecided, slightly agree, agree, strongly agree and total respectively.

Table 3.1 Data collected on respondents' profile

What is your Gender?	Male		Female		Total
Fre uencies	31		19		50
What is your Age?	< 20 yrs old	20—30 yrs old	> 30 years		Total
Fre uencies	1	20	29		50
What are you pursuing?	Diploma		1 st Degree		Total
Fre uencies	30		20		50
Marital status	Single		Married		Total
Fre uencies	19		31		50
Are you working?	Yes		No		Total
Fre uencies	45		5		50
Do you live in Ho?	Yes		No		Total
Fre uencies	21		29		50
What is your Nationali ?	Ghanaian		Foreigner		Total
Fre uencies	50				50
Experience in ICT usage	0-1 yr	2-5 yrs	Over 5 yrs		Total
Fre uencies	6	36	8		50

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Have you used a virtual world before this	Yes	No	Total
Fre uencies	3	47	50
If Yes, for how lon	Less than a month	7 months- 1 ear	Total
Fre uencies	2	1	3

Table 32 Post experiment data from respondents

CODE	SCALE		SO		SID		SUA			
ibil										
LEG I	virtual world is visually attractive	o	o	o	o	S	21	24	so	
LEC,2	SL	ars fessional	o	o	1					
LEG3	SL contains vivid objects and back und									

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Code	Statement								Total
LEG4	The user interface is clear and understandable			4	o	13	11	22	50
Perceived Ease o Use									
PEOUI	Learnin to o rate SL was eas forme	o	5	o	4	14	23	4	50
PEOU2	It was easy to find the information I was lookin for.								
PEOU3	It was flexible to interact with SL					16	10	24	50
PEOU4	It was eas to navi at move around			4			24		
PEOU5	I find it eas to communicate with others.						27	23	50
PEOU6	SL was easy to use (user-friendl).	o	o	o	4	4	20	22	50
Perceived Use ulness									
PUI	It is effective to search for information in SL.	o	o	o	o	14	20	16	50
PU2	SL improves collaboration (working to ether	o	o	o	o	o	12	38	50
PU3	SL is motivatin	o	o	o	o		17		
PU4	SL improves communication between I and m collea ues.	o	o	o	o	11		39	50
PtJ5	SL is useful for me as a student.	o	o	o	o	o	4	46	50
Challen es									
CHA I	I had problems with internet connectivity		10	3	6	13	12	6	50
CHA2	1 had problem with my computer	30	18	o	o	o	2	o	50
Attitude Toward Technolo									
	Usin SL was interestin	o	o	o	o	4	6	40	50
ATI2	I had fun usin SL.		o	o	7	o	17	26	50
	I feel comfortable usin SL.	o	o	4	o	4	25	17	50
ATI'4	SL makes learnin interestin	o	o	o	o	o	21	29	50
	I find it rewardin to use SL.	o	o	o	o	5	27	18	50
	SL isa ood learnin environment.	o	o	o	o	o	28	22	50
	I feel a sense of freedom in SL that I do not feel in the offline world.	o	o	o	4	19	16	11	50
Intention to use									
IUI	I intend to visit SL a ain.	o	o	o	o		18	31	50
IU2	I intend to use SL for learnin	o	o	o	o	1	11	38	50
IU3	If m colle e ado ts SL, I would use it.	o	o	o	o	o	9	41	50

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Figure 3.1 Respondents in a learning session in SL

These sessions were necessary since most of the respondents had no prior knowledge on the use of SL or other Virtual worlds and needed to have an experience with the world in order to provide reliable responses. SL was chosen because basic membership is free and there are well-established educational sites and network. Also there were not considered to be any ethical issues as SL is an 18 and above environment and the target population meets this criterion. Furthermore, studies on virtual worlds have been conducted mostly in the Second Life environment and using the same target site allowed the researcher to compare findings with those of previous studies.

3.5 INSTRUMENTS

The data for the study was collected from both primary and secondary sources. Primary data was—gathered through questionnaires, interviews and observations. The

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instruments were self developed based on issues raised in the literature review. The semi-structured interviews were based on respondents' experiences in Second Life, views on its benefits and challenges and opinions on its use by their institution. Observations bordered on how involved and committed respondents were. The questionnaire was designed with closed multiple-choice questions and a comment section to create room for participant's inputs such as opinions and suggestions. Closed questions have the advantage of simple coding and make it easy to quantitatively analyze and interpret the outcome. The questionnaire was divided into two main parts: Personal Information and Post Experiment questions. The post experiment questions were grouped into the following construct variables: Legibility (LEG) which contained questions relating to clarity of SL and understandability of the user interface , Ease of Use (EOU) , Perceived Usefulness (PU) , Challenges (CHA), Attitude Toward Technology (ATF) and Intention to Use technology (ICJ). Each item under these construct variables was formatted into a seven-point Likert scale.

Secondary data was obtained from already existing documents such as Journals, books, school's database. Existing literatures and books on use of virtual world in education were searched to determine how virtual worlds are being used in education in other parts of the world, its potentials and challenges to help in answering research questions. Also information such as student enrollment was obtained from the school's registry.

3.6 RESEARCH DESIGN

The study employed mixed method approach which allowed the collection of both quantitative and qualitative data and the combination of the strengths of each to answer

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research questions. Creswell (2009) defines mixed method approach as a design that combines both qualitative and quantitative form. According to Hulme (2007), the key argument for the mixed method approach is that it permits the strengths of both qualitative and quantitative approaches to be captured and that some of the weaknesses of a single approach are avoided or overcome. The use of this method is not without demerits. Creswell (2009) pointed out the extra personnel and field activities of a combined study resulting in inevitably higher costs and the complexity of data collection and analysis which almost inevitably leads to a longer time between start-up and initial findings as some of the disadvantages ofthe mixed method.

Mixed method approach was appropriate for the study as O'Cathian et al (2007) stated that using this method will provide a better understanding of the research problem by triangulating the data source. The quantitative data was derived from the questionnaires and qualitative data from respondents' comments in the questionnaire and answers to interview questions. The rationale for using this combination of sources of data is that it was felt that a complete picture could not be generated by any one method alone. The goal of the quantitative data was to provide a sense of the degree to which particular views regarding the technology were held. The interviews on the other hand were designed to allow a variety of issues to be explored in greater depth than was possible in the questionnaire. Specifically in relation to the issues addressed in this study, the semi-structured interviews allowed for an enhancement of the findings from questionnaires.

3.7 DATA ANALYSIS

Quantitative data from returned questionnaires was thoroughly edited to eliminate errorsíand then coded to ensure consistency. Omissions, non-responses,

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validity and reliability of responses were not taken for granted. The analysis was done using the Statistical Package for the Social Science and Microsoft Excel. Descriptive statistics involving the computation of frequencies, percentages, means and standard deviations often presented graphically were used. Most of the graphs were generated in excel because of the varied formatting options it provides.

The responses from the interview were recorded on paper. The collected data was transcribed, edited, coded and checked for accuracy and to give meaning that represents the voice of the respondents. Analysis of qualitative data is the process of bringing order, structure and meaning to the mass of collected data (Ghauri & Grønhaug, 2002). The study employed both narrative (data narrated as it is) and thematic analysis (data was organized into groups on theme basis and linkages between them determined). This made information attained to be understandable to others.

3.8 SOURCES OF DATA

In order to draw valid conclusion from a statistical analysis, there is the need for relevant and accurate information which depends on the quality of data collected. The study relied on both primary and secondary data. This was useful in validation of data. Primary data was gathered through structured questionnaires whilst secondary data were obtained from existing documents such as policy documents, books, journals and reports and other internet sources.

3.9 TARGET POPULATION

The population for the study consisted of all distance students of UCC, Ho centre. There were Nine Hundred and Fifty Six (956) students made up of Three Hundred and Sixty Two (362) females and Five Hundred and Ninety Four (594) males.

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DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

The main analysis of the research data and the results emanating from the analysis are captured in this chapter. The first section presents the profile of respondents using graphs. In the second section, tables for the means, standard deviations and percentages of responses for each item were constructed.

4.2 RESPONDENTS' PROFILE
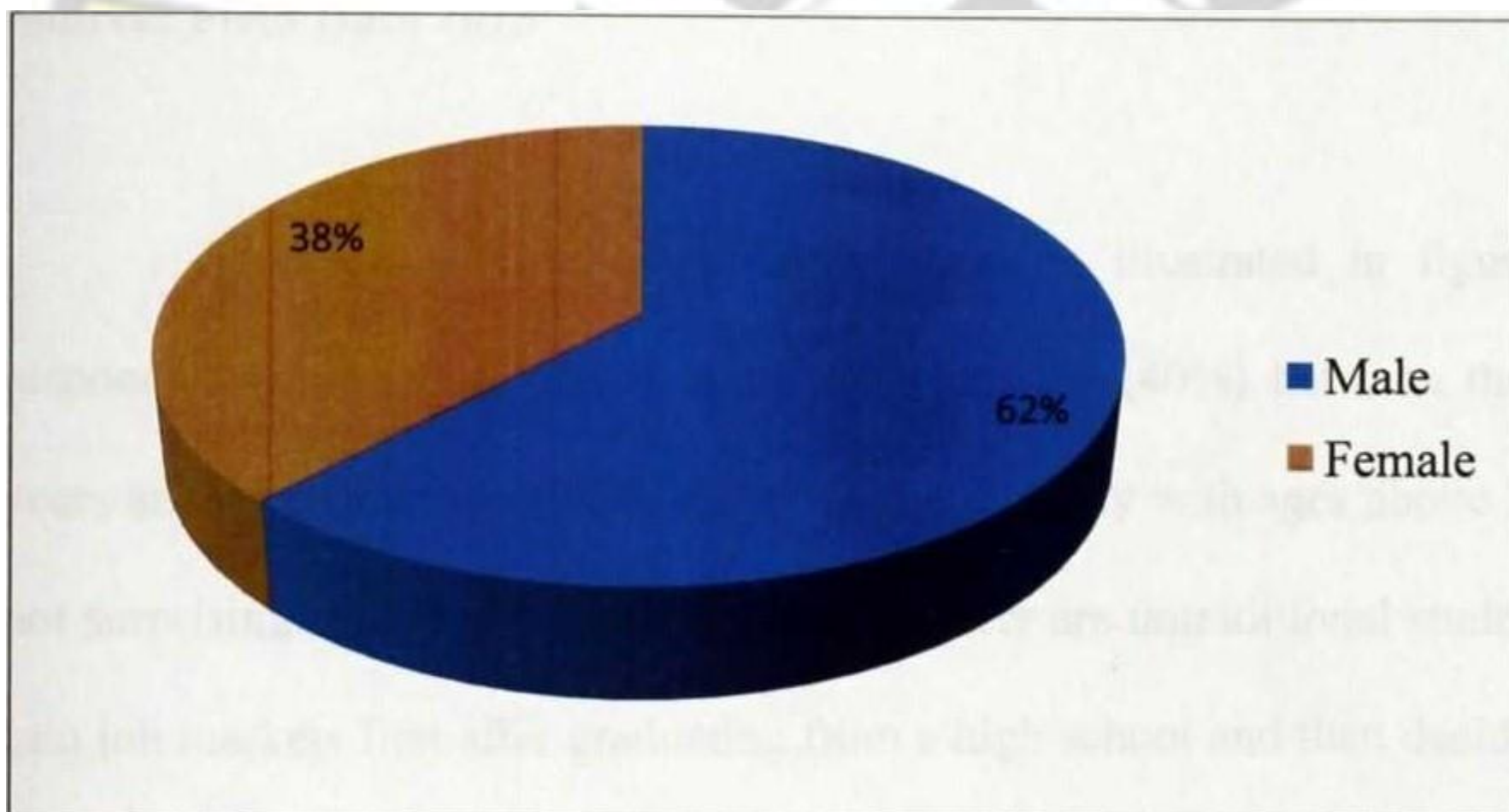
Figure 4.1: Gender distribution of respondents.

Source: Field Data 2013

The survey shows that 62% of respondents were males while 38% were females as shownin figure 4.LThis-implies that the study was a male dominated study. This is because the males form approximately 62% of the target population.

2%

40%

58%

- Less than 20 years old
  20—30 years old

- Above 30 years
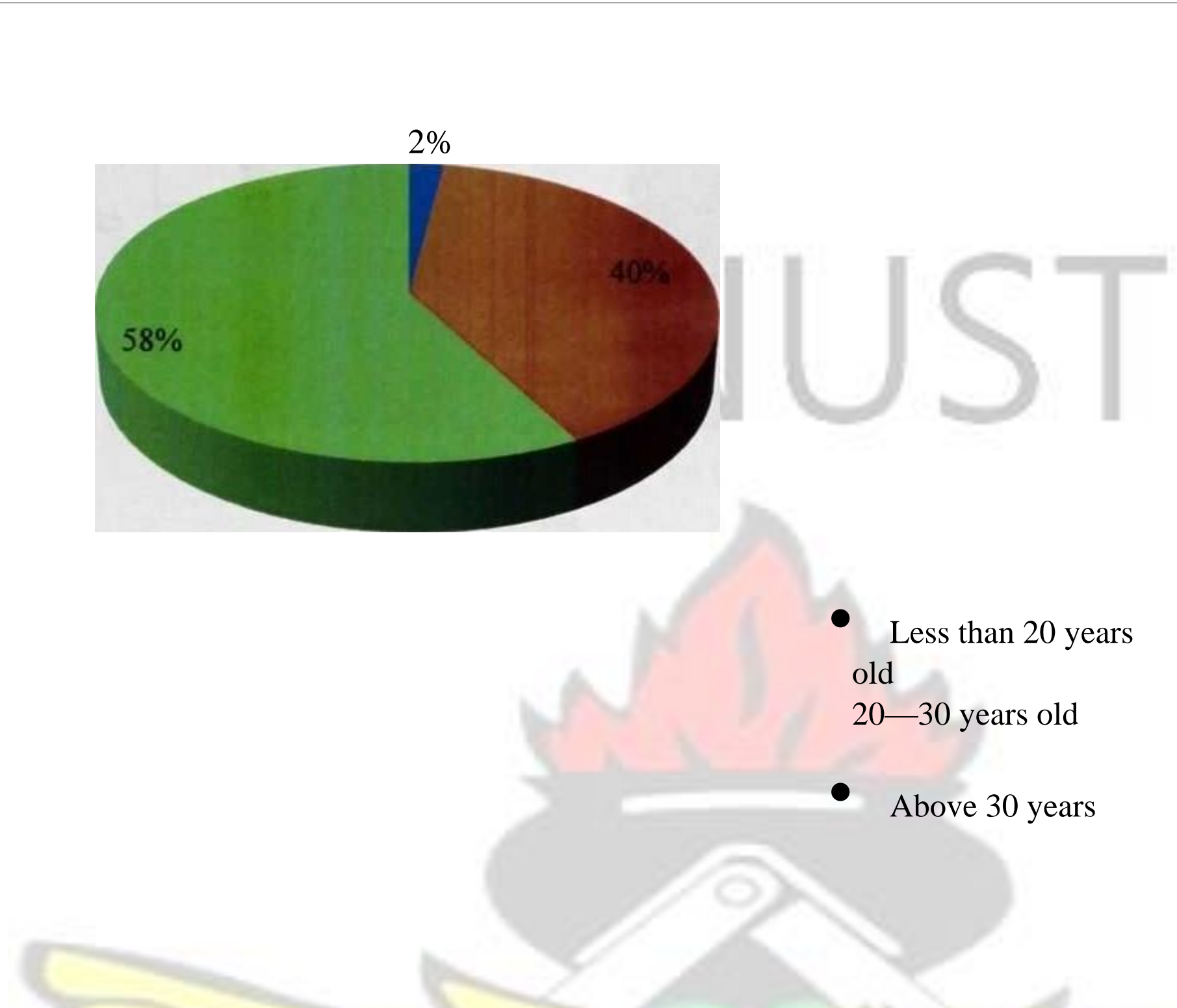
Figure 4.2: Age distribution of respondents

Source: Field Data 2013

The age distribution of respondents is illustrated in figure 4.2. One (1) respondent representing 2% is below 20 years; 20 (40%) between the ages of 20-30 years and 29 representing 58% constitute the majority with ages above 30 years. This is not surprising since most of the distance learners are untraditional students who entered into job markets first after graduating from a high school and then decided to go back to schools to receive further education.

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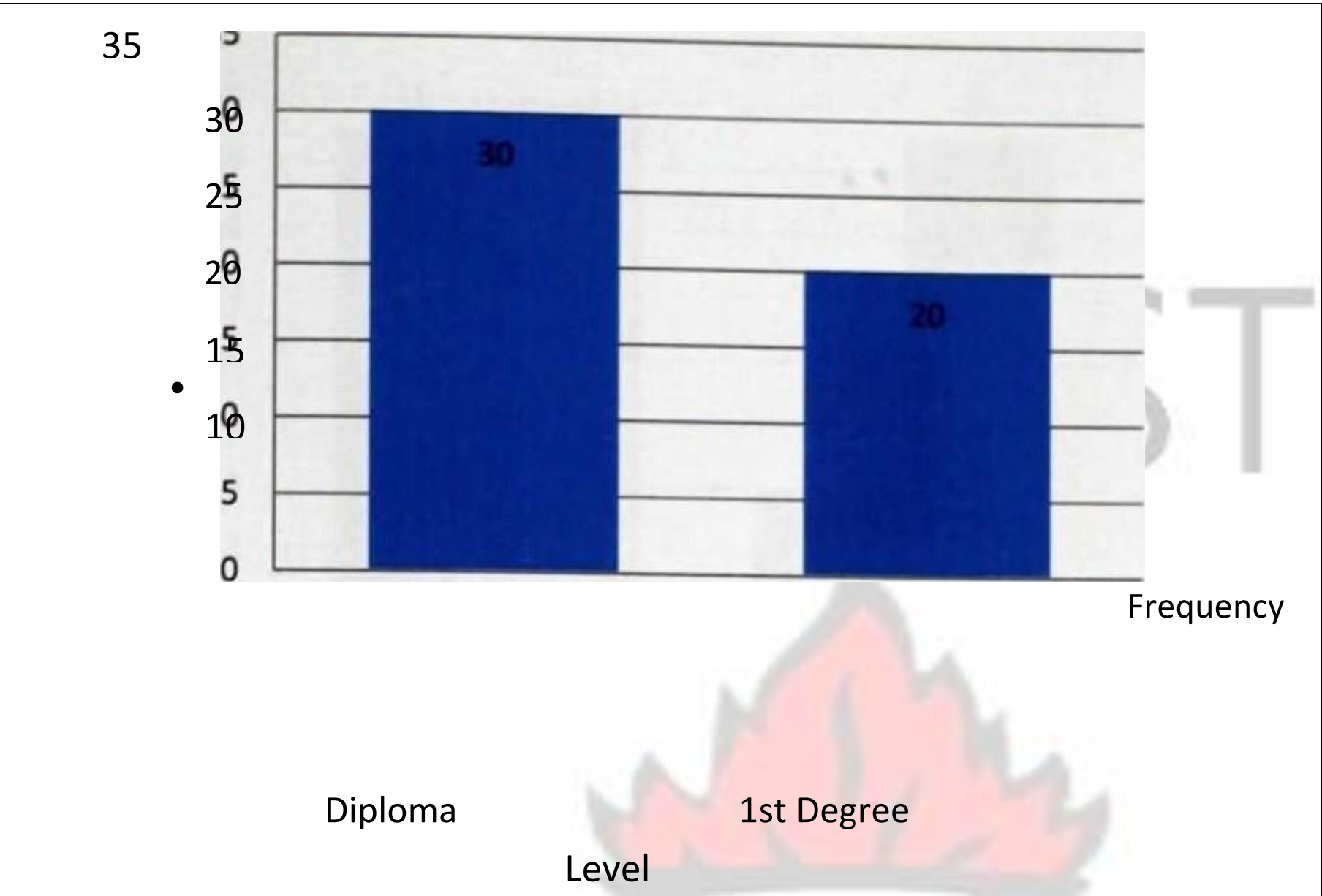
Figure 4.3 : Levels being pursued by respondents
Source: Field Data 2013

The study encompasses students from all levels in the centre. This is to enable the researcher collect in-depth and varying information for the study. Figure 4.3 presents the educational levels being pursued by respondents. Thirty (30) of the respondents are pursuing diploma while 20 are pursuing degree. This is because the diploma students are more than the degree students at the centre.

Figure 4.4 presents the marital statuses of respondents based on gender. According to the results, 16 out of the 31 male respondents are married while 15 are single. Also, 15 out of the 19 female respondents are married while 4 are single indicating that majority of the female distance students are married.
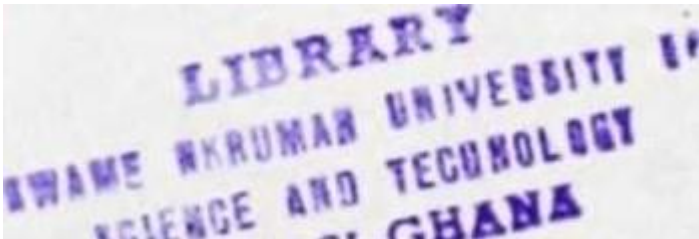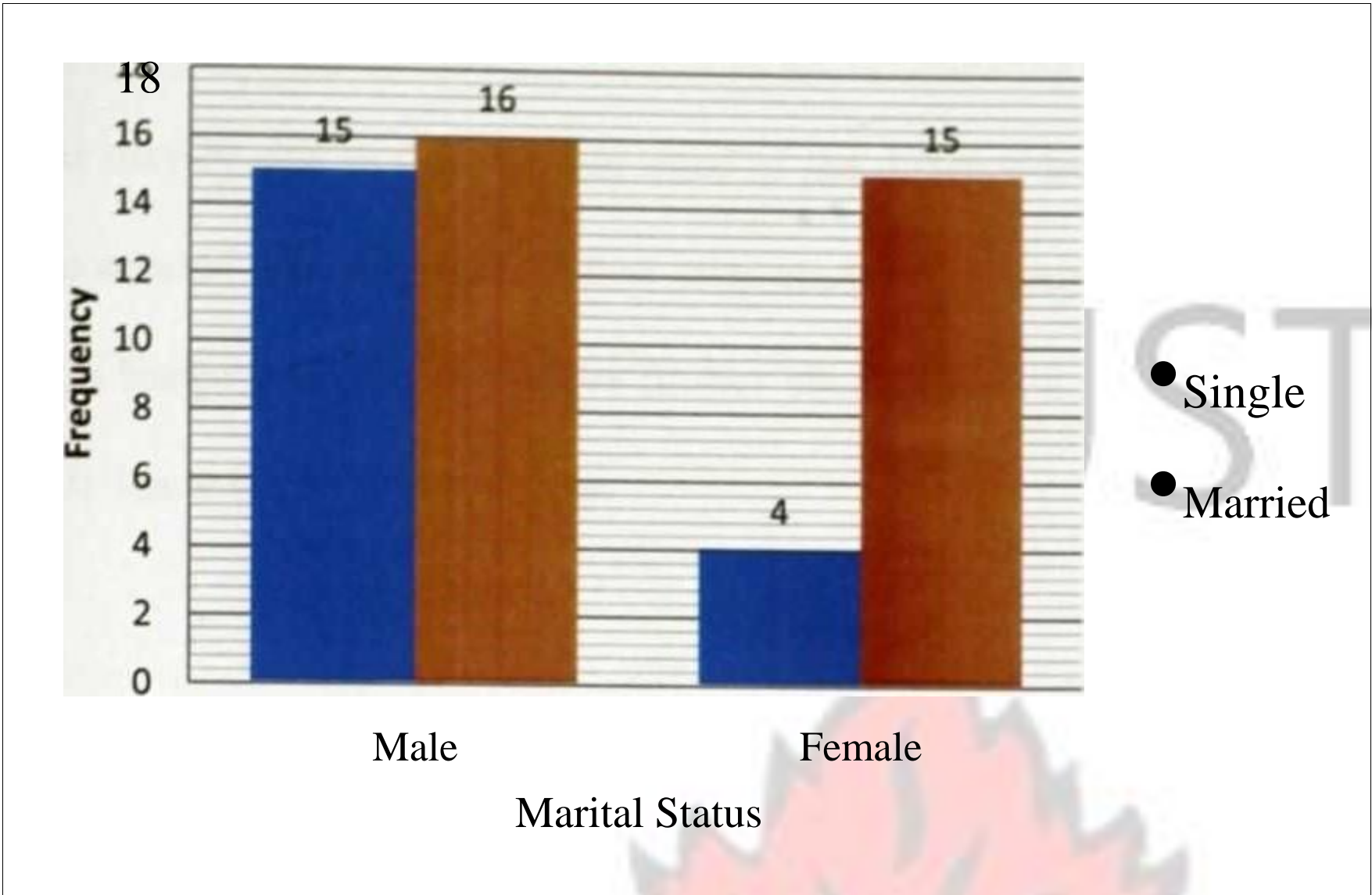
Figure 4.4: Distribution of Marital statuses of respondents

Source: Field Data 2013
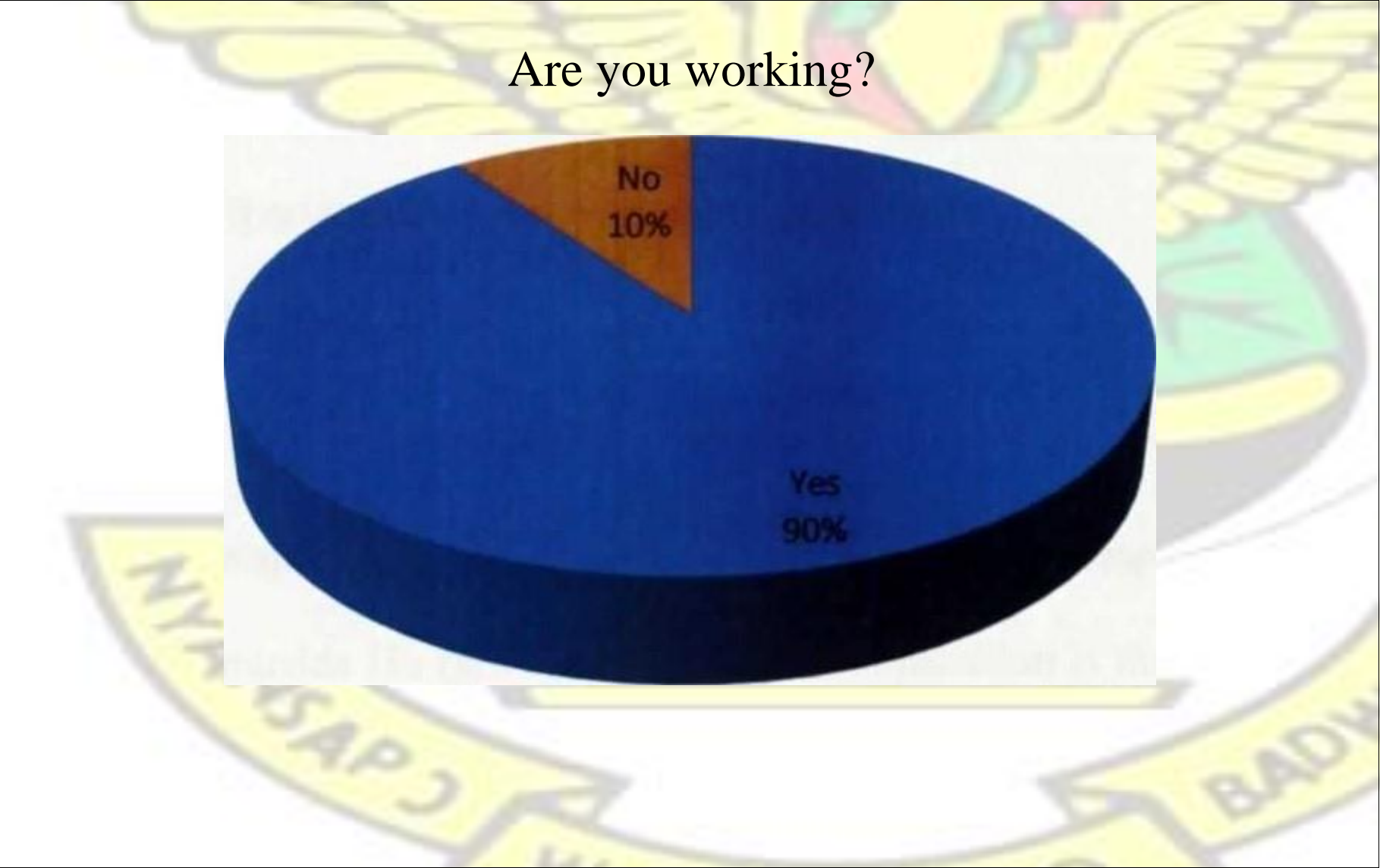
Figure 4.5: Working statuses of respondents

Source: Field Data 2013

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According to Figure 4.5, 90% of the respondents are working whilst 10% are not. This may be due to the fact that most of the distance learners are untraditional students who entered into job markets first after graduating from a high school and then decided to go back to schools to receive further education with majority being unable to secure study leave for a full time study.
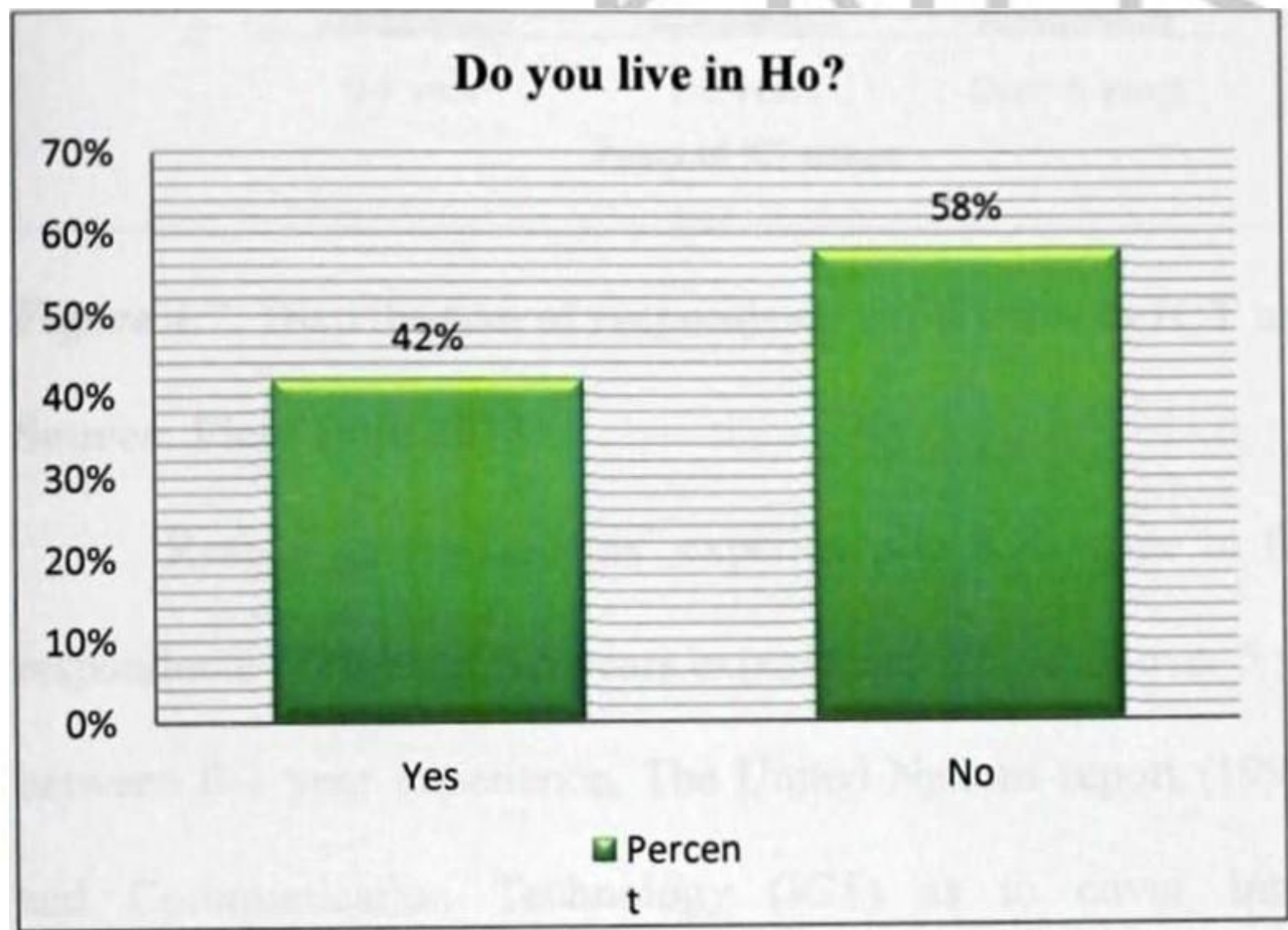
Figure 4.6: Residence of respondents

Source: Field Data 2013

All respondents are Ghanaians with 42% of the respondents living in Ho and 58% living outside Ho (see figure 4.6). The implication is that majority of the students travel to Ho for lectures.

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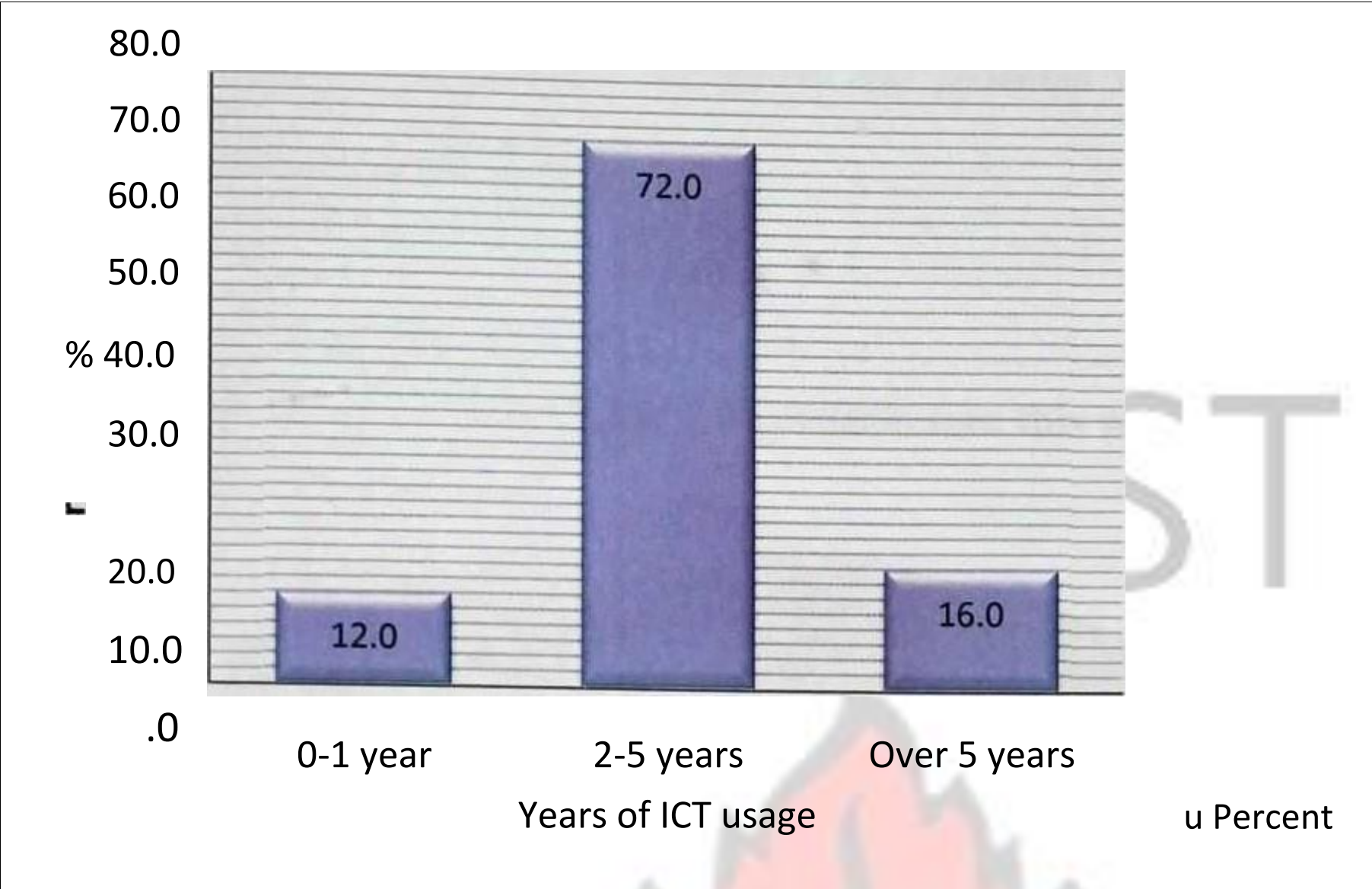
Figure 4.7: Distribution of respondents experience in ICT usage

Source: Field Data 2013

Results on respondents' experience in ICT usage in figure 4.7 show that most respondents (72%) had 2-5 years experience, 16% with over 5 years experience and 12% between 0-1 year experience. The United Nations report (1999) explained Information and Communication Technology (ICT) as to cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities(Wagner & Kozma, 2003). Nevertheless the ICT considered by the researcher covers personal computers and internet services. These findings are not surprising since ICT has been integrated into the curricula at all level of education in Ghana (ICT4AD policy, 2003).

The researcher cher wanting to find out respondents' ICT ownership asked whether

they have their personal computers and internet access (modems). It was revealed that

only a few have their personal computers and modems with majority depending on internet cafes for their ICT needs.

Have you ever used a virtual world before this survey?
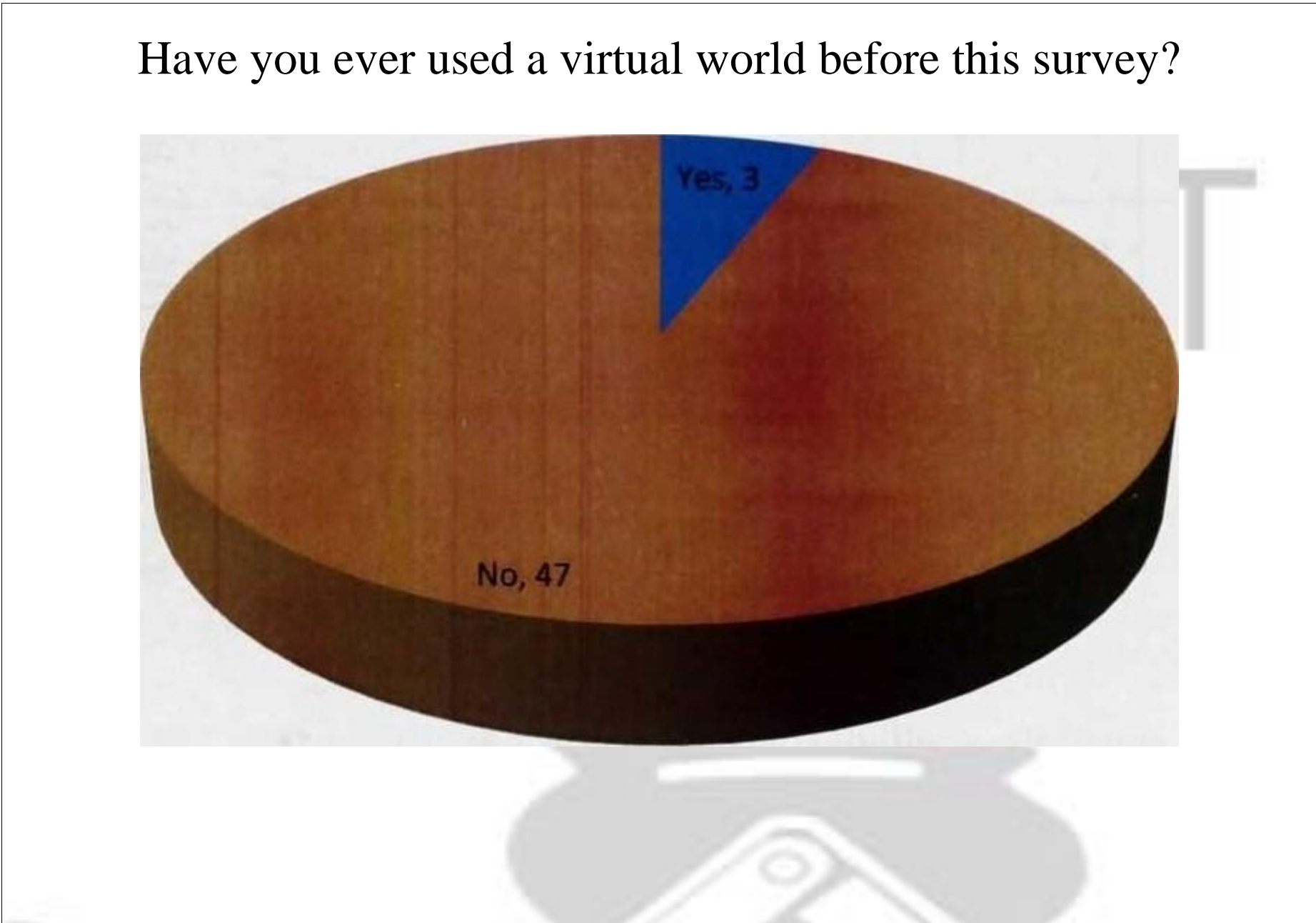
Figure 4.8: Distribution of respondents experience in VW

Source: Field Data 2013

The popularity of virtual world across the world (Lee & Chen, 2011, Zhou et al, 2012) and the experiences of respondents in ICT usage as indicated above led to the researcher's expectation that this technology will be popular among students in Ghana. Conversely, results in figure 4.8 show that majority of the respondents (47 representing 94%) had never used a virtual world before the survey whilst 3 respondents (all males) representing 6% had. However 2 other respondents mentioned in an interview that they have heard of virtual worlds but never used before the survey. Furthermore, information was collected owhow long tlTéúÑGåents had used or been using virtual world. Two hadA1seda virtual world for less than a month while the other had used a virtual world

4.3. I Legibility ofSecond Life

Table 4.1 : Means and Standard deviations for items under legibility

Scale: Legibility		Mean	Std. Deviation
Code	Item Variable		
LEGI	Visually attractive	6.3800	0.66670
LEG2	Appears professional	5.7600	1.07968
LEG3	Contains vivid objects and background	6.4200	0.67279
LEG4	User interface is clear and understandable	5.9400	1.20221

From Table 4.1, the mean for the legibility scale items range from 5.7600 to 6.4200, and the standard deviations range from 0.66670 to 1.20221. Therefore, on the basis of the Likert scale, legibility of Second Life appears to be very good with the scale item LEG3 (SL Contains vivid objects and background) having the highest mean of 6.4200 and 52% of the respondents strongly agreeing as shown in figure 4.9. The low standard deviations (see table 4.1) show that the data is clustered closely around the means. In regard to whether the user interface is clear and understandable, 44% of the respondents strongly agreed, 22% agreed and 26% slightly agreed in the affirmative as indicated in figure 4.10.

• SL contains vivid objects and background
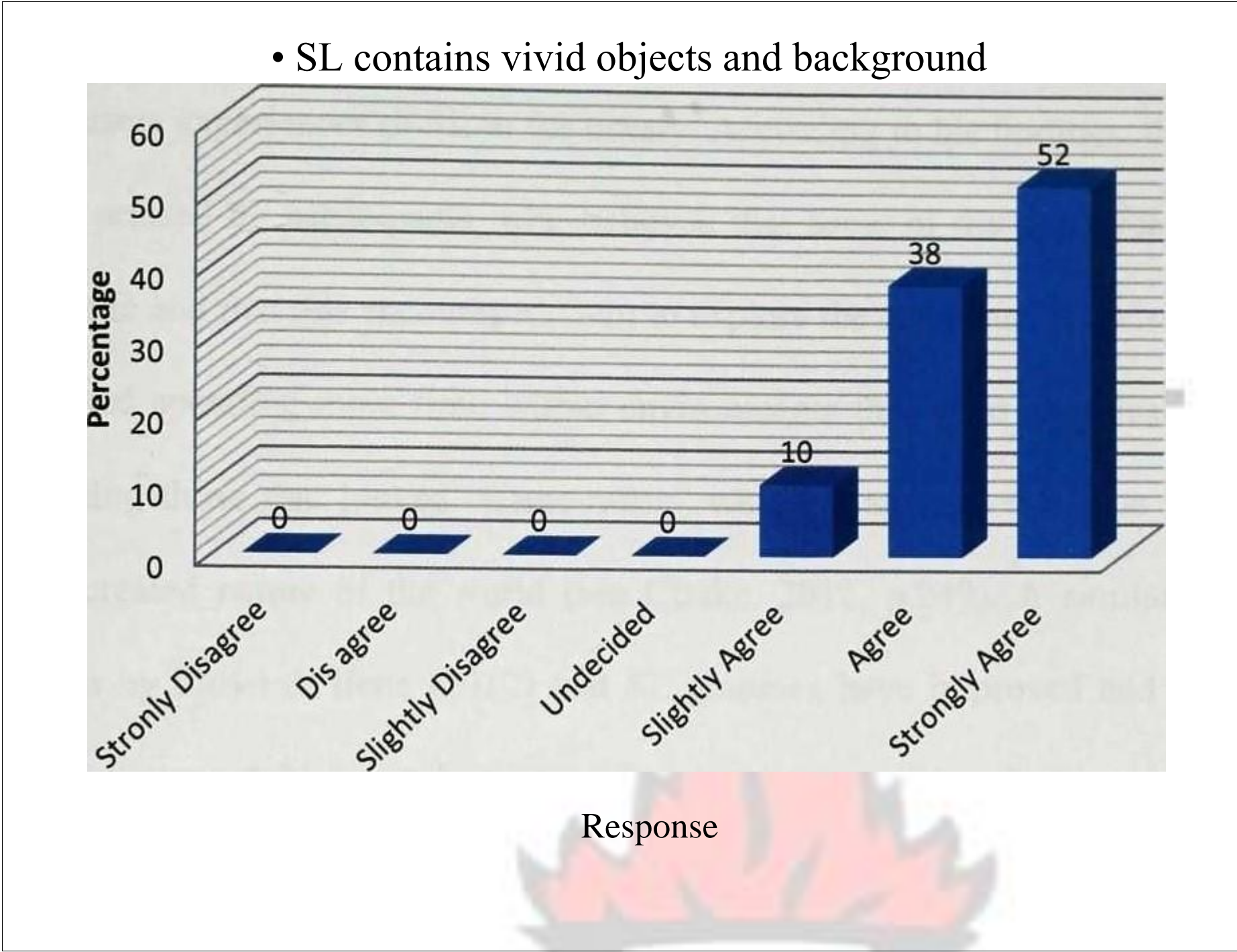
Figure 4. 9: SL contains vivid objects and background

Source: Field Data 2013
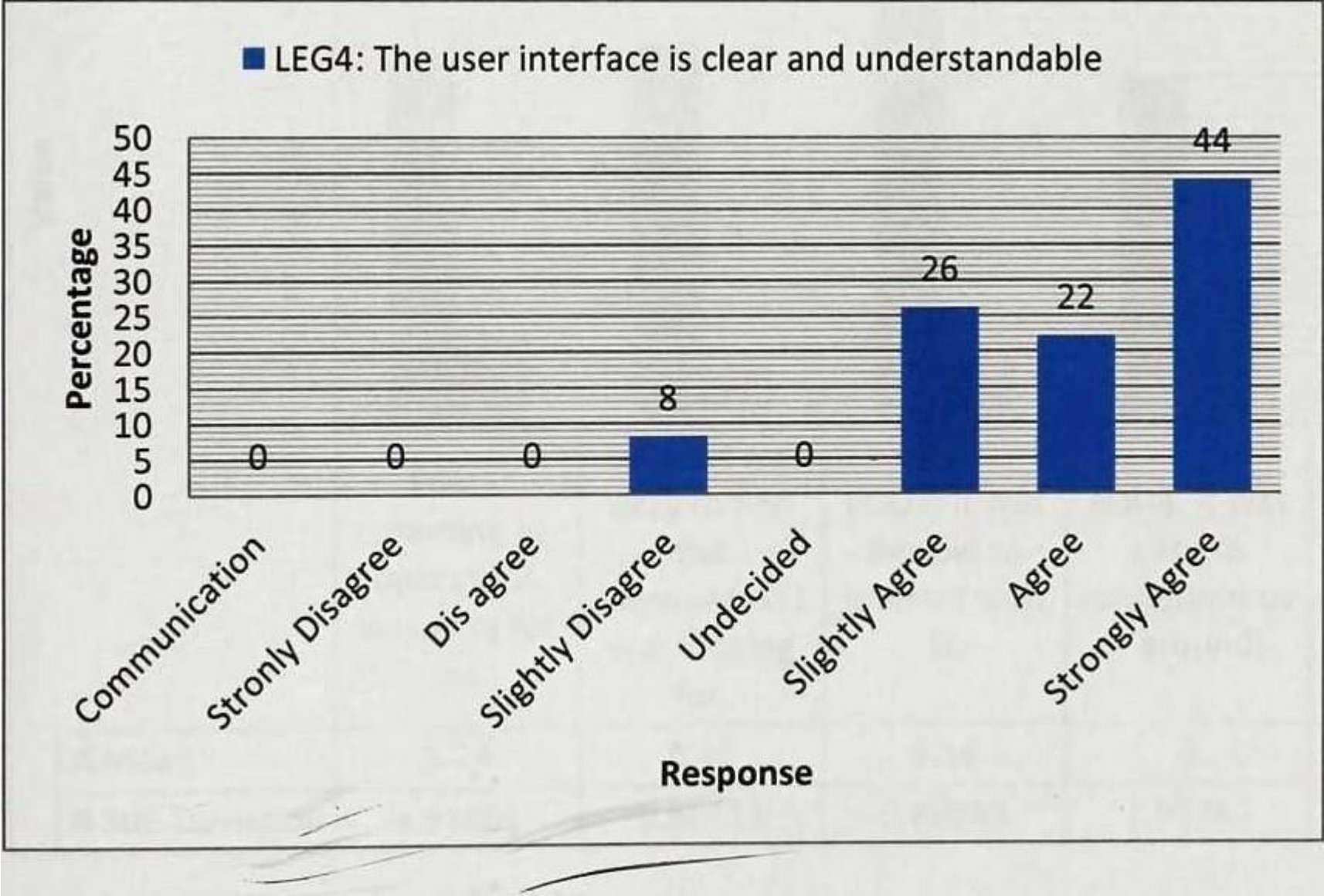
Figure 4.10: User interface is clear and Understandable

Source: Field Data 2013

The results on legibility are in line with findings by Clarke (2012) in a study of new users experiences of SL in the library. According to his findings, the graphics of SL were praised by participants, who believed that some of the user created designs were fantastic and that this encouraged them to explore the environment. Also, all respondents reported spending more time within environments that were graphically attractive and avoiding those that looked "home-made" which is an inherent issue in SL due to the user-created nature of the world (see Clarke, 2012, p.249). A similar conclusion was drawn by Floyd & Ilene (2012) that SL graphics have improved and the platform has become more stable over the years. Likewise, it seems from the present study's findings on legibility that the graphics are ok, at least from respondents' perspective.

43.2 Ease of Use

	EOU1: Learning to operate SL was easy for me	EOU2: It was easy to find the information I was looking for.	EOU3: It was flexible to interact with SL	EOU4: It was easy to navigate(move around)	EOU5: I find it easy to communicate with others.	EOU6: SL was easy to use (user-friendly).
■ Mean	5.24	5.46	6.16	5	6.46	6.2
■ Std. Deviation	1.31801	0.86213	0.88893	1.86263	0.50346	0.90351
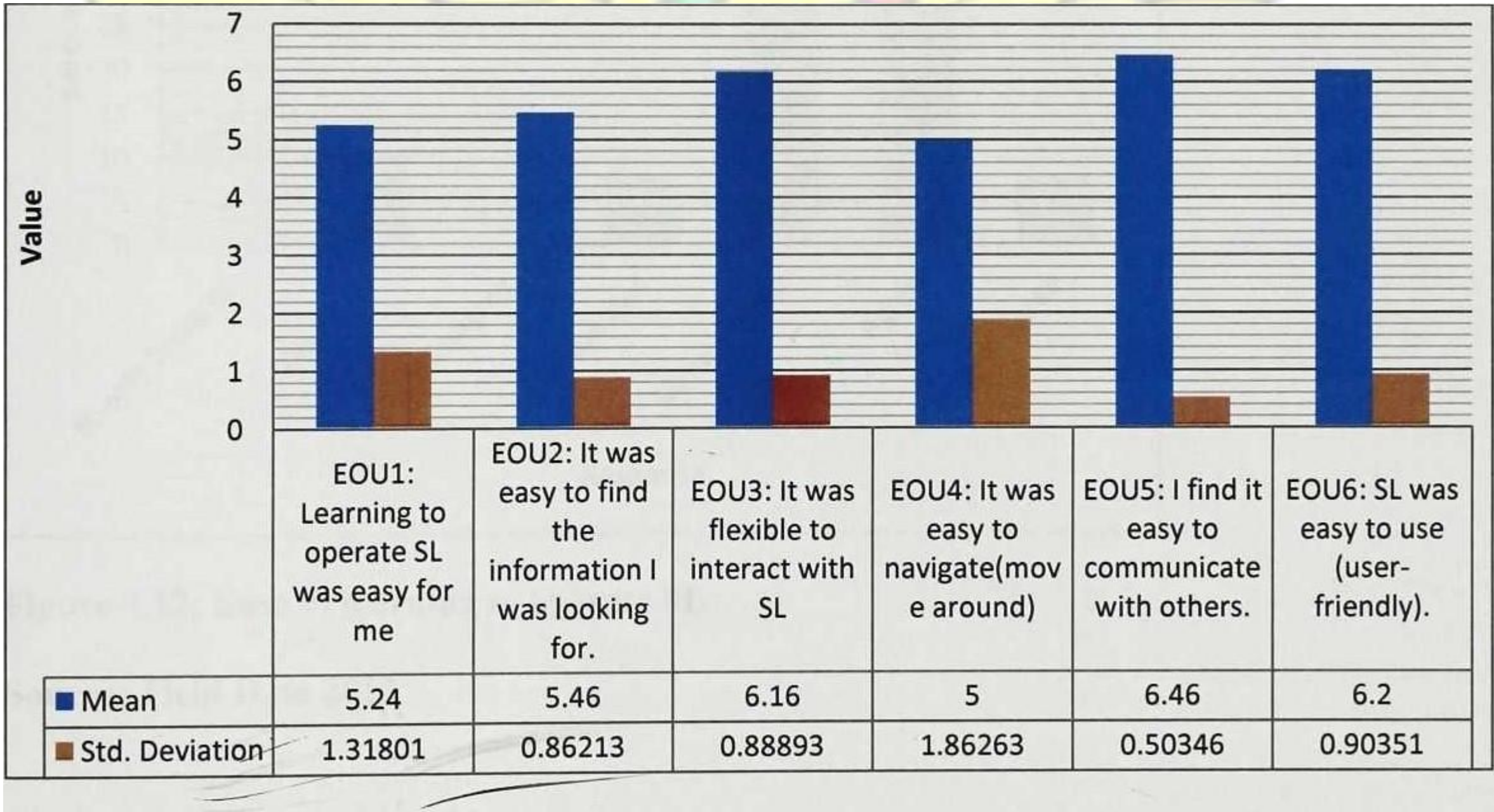
Figure 4.11: Plot of means and standard deviations for items under ease of use

Source: Field Data 2013

Figure 4.11 shows that mean values for perceived ease of use scale items range from 5.0000to 6.4600 suggesting that respondents found it easy using SL and standard

deviations range from 0.50346 to 1.86263. In regard to item EOUI (learning to operate SL was easy for me), 8% strongly agreed and 46% agreed while 8% disagreed that learning to operate SL was easy for them (see figure 4.12). The researcher equally noticed that, respondents were able to master movements and functions easier than anticipated. This is not surprising since instructional guides are available in SL and users need little or no external help in order to use the application.
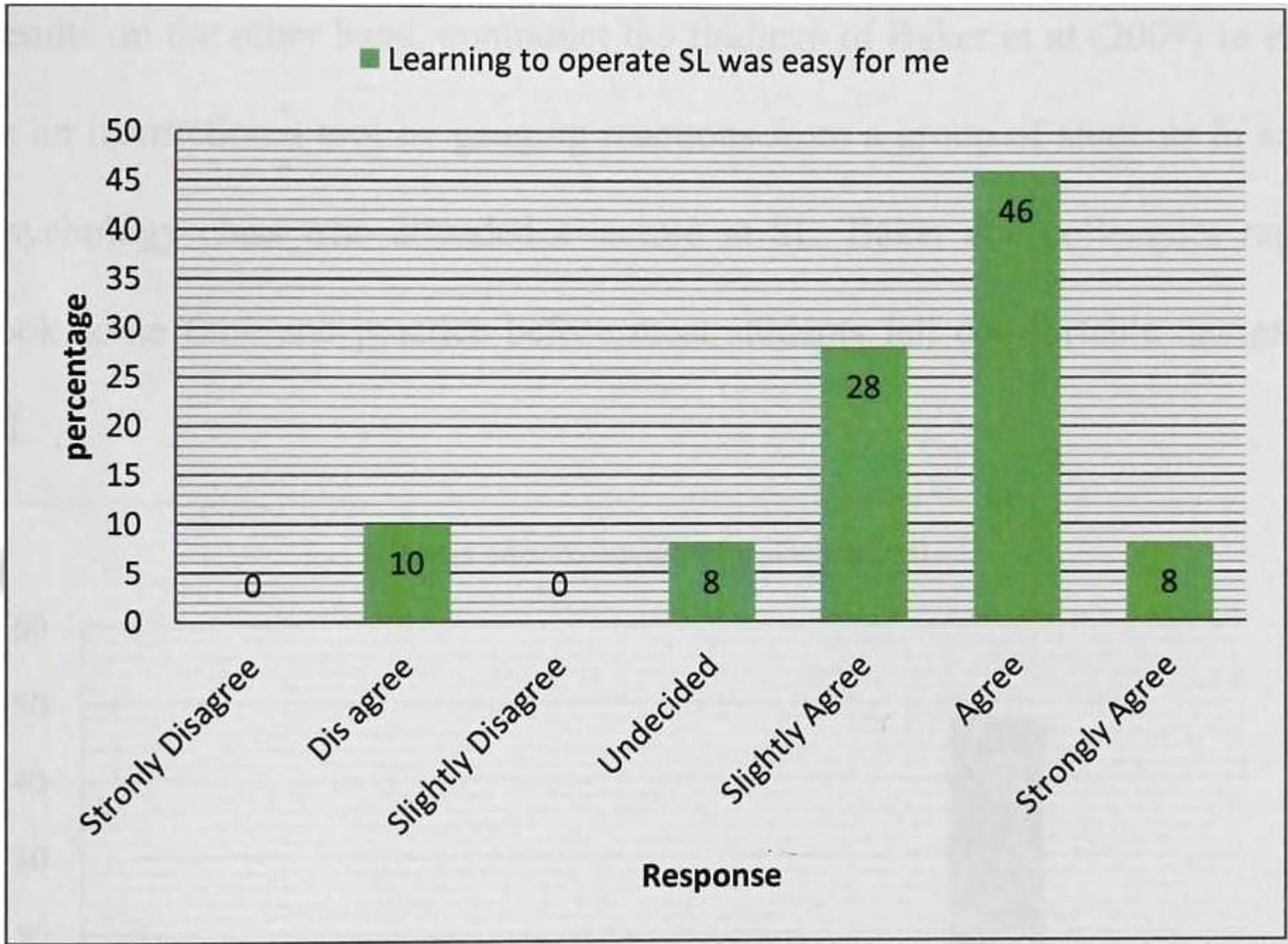

Figure 4.12: Ease of learning to operate SL

Source: Field Data 2013

However, item EOU4 (it was easy to navigate) though having a mean of 5.000 has standard deviation of 1.86263 showing that responses were a bit varied, as depicted in see figure 4.13. In all, majority (10% slightly agreed, 48% agreed and 14%

strongly) accepted it was easy to navigate in SL while 8% each slightly disagreed, disagreed and strongly disagreed.

The researcher assumed in advance that maneuvering in Second Life might be challenging for students with no experience in virtual worlds. This assumption was incorrect. As in Holmberg & Huvila (2008), the respondents didn't think that using a virtual world (in this case Second Life) was difficult, besides technical problems. These results on the other hand, contradict the findings of Baker et al (2009) in evaluating SL as an instructional tool by gauging reactions from a group of students in an upper level psychology class who attended a lecture in SL. Baker and colleagues reported that it took some time and practice before most students felt comfortable navigating through SL.
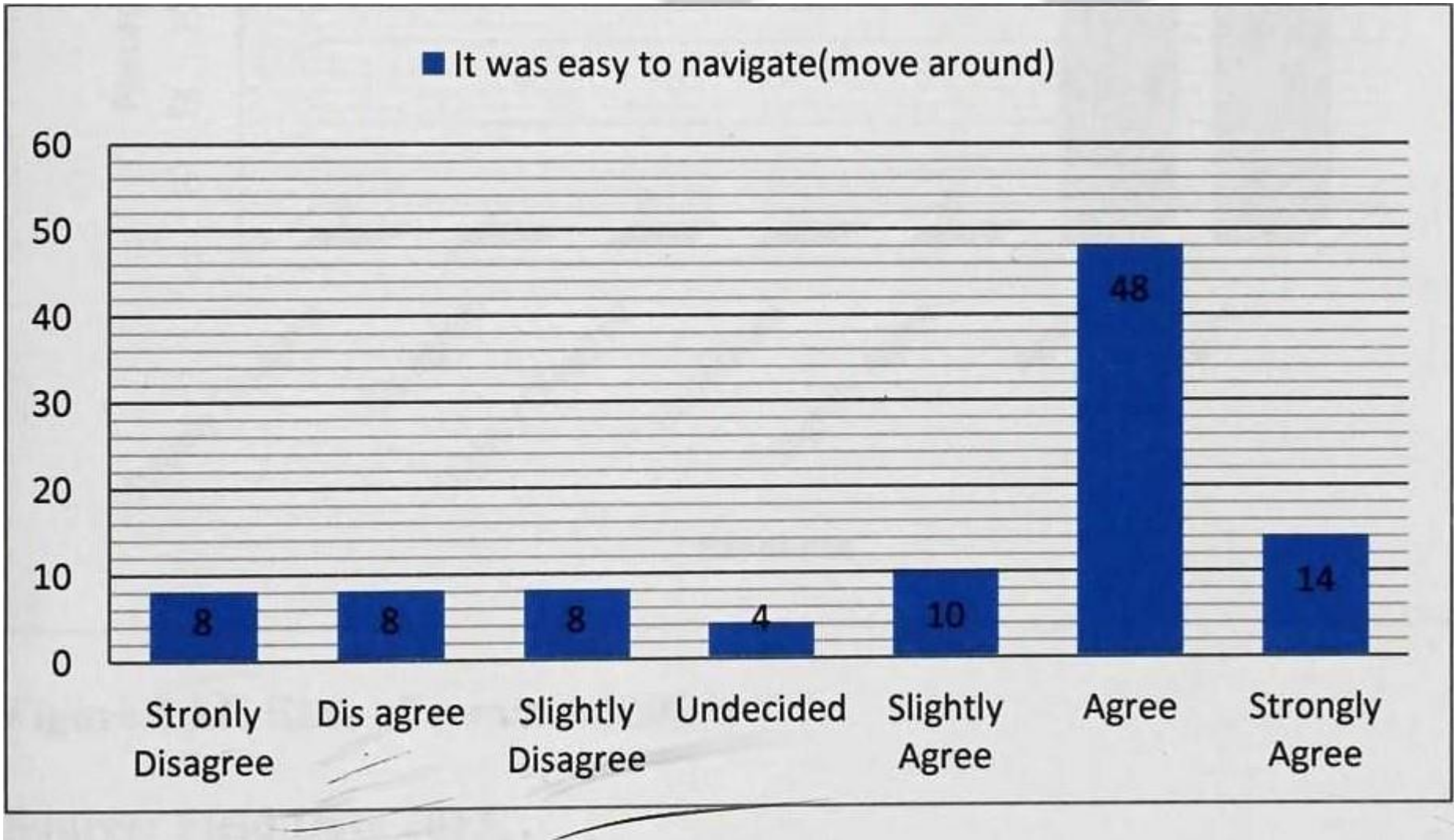
Figure 13: Ease of navigation

Source: Field Data 2013

In regard to communication, 54% agreed and 46% strongly agreed it was easy to communicate with their colleagues in SL as shown in table 4.14. Thus all respondents agreed chat communication (which was used in this study) in SL was easy for them. Schultze et al (2008) designed a pilot study in SL for undergraduate students, where the students were given a number of sites to visit over weeks, and semi-structured interviews were conducted for them after their experiences online. When asked how easy or difficult it was for them to communicate with others and to make themselves understood in the virtual world, majority were positive than negative which apparently mirror the present study's result on communication.
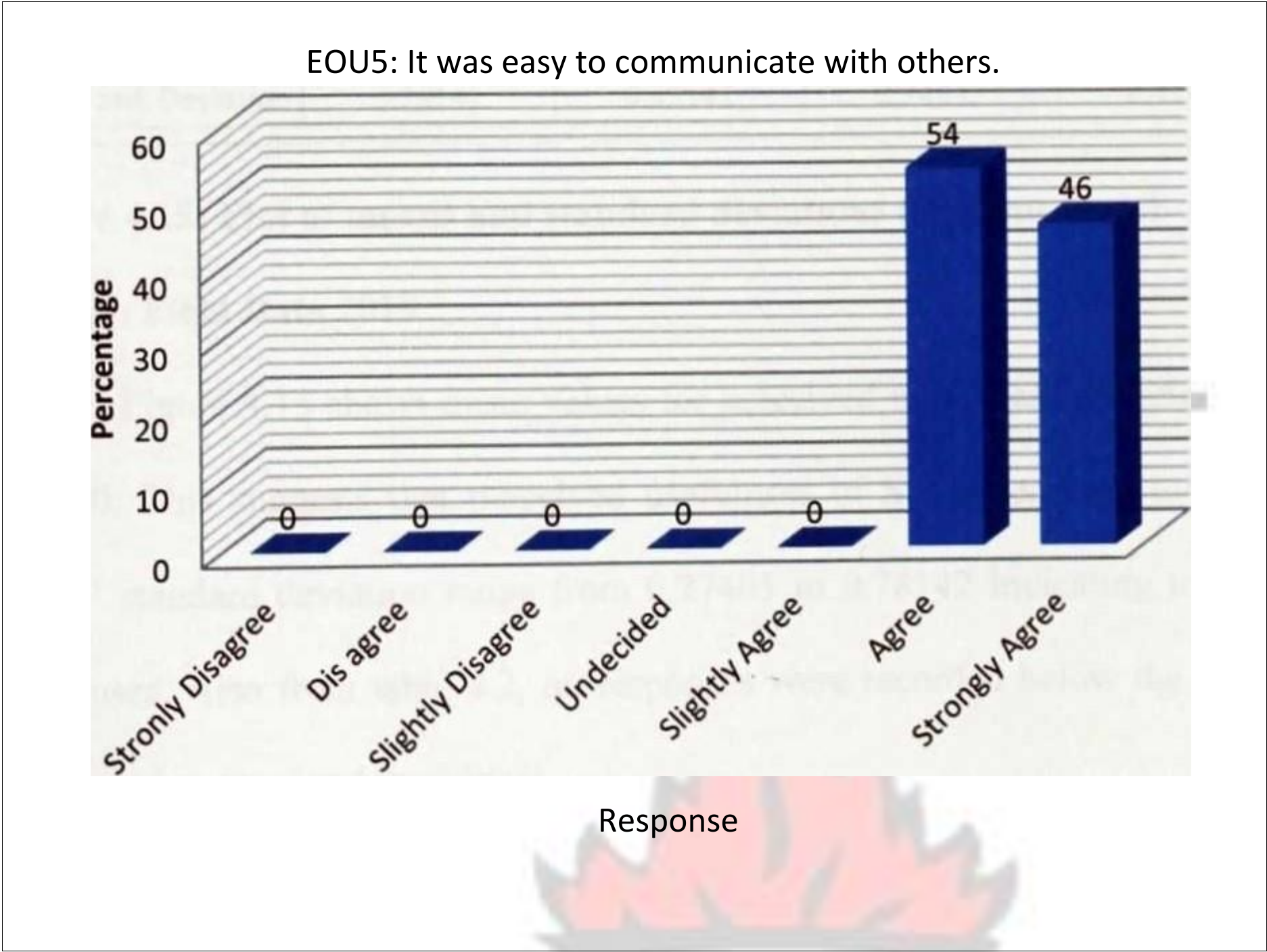
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Figure 4.14: Ease of communication

43.3 Perceived Usefulness

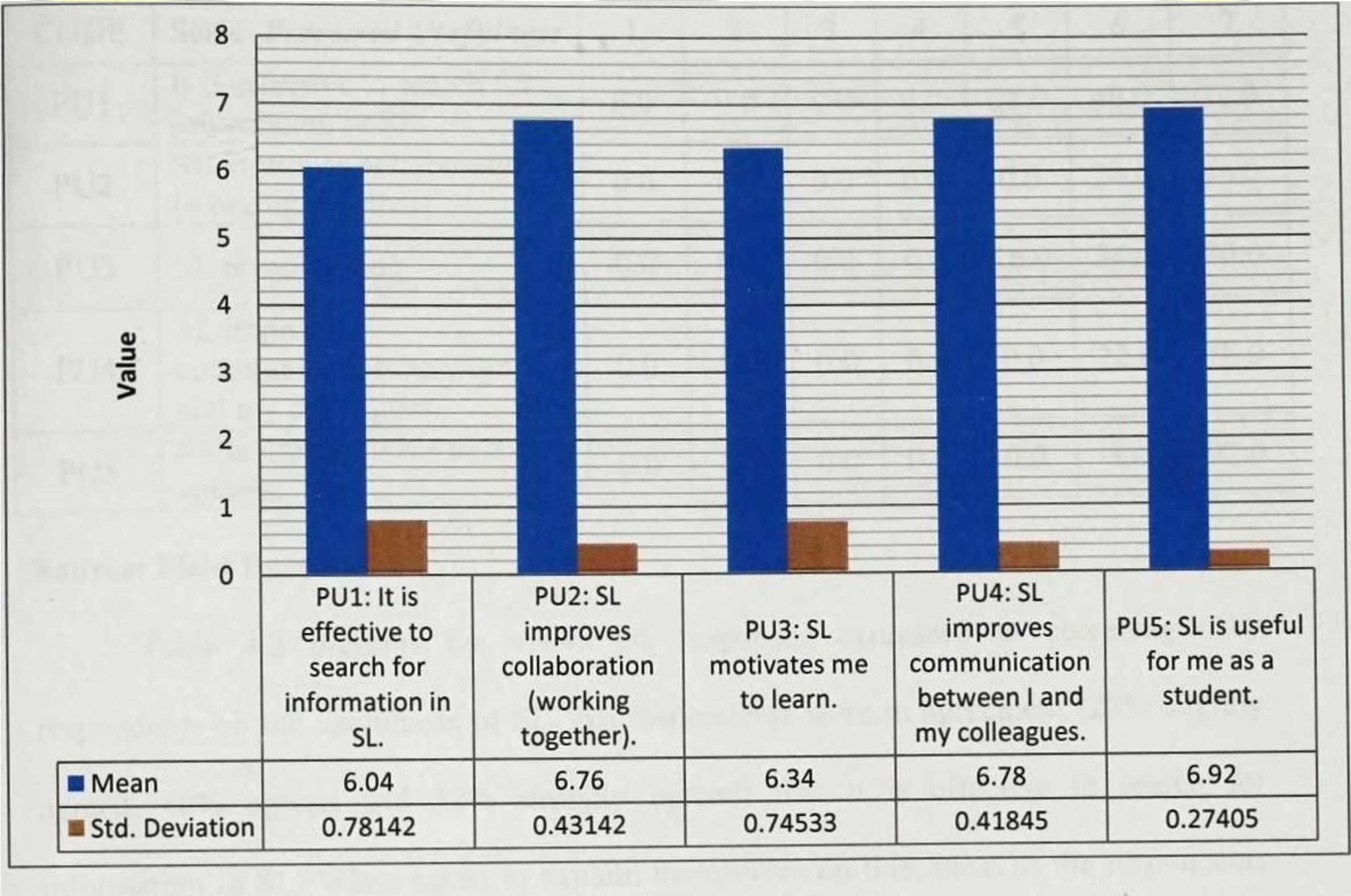|	PU1: It is effective to search for information in SL.	PU2: SL improves collaboration (working together).	PU3: SL motivates me to learn.	PU4: SL improves communication between I and my colleagues.	PU5: SL is useful for me as a student.
■ Mean	6.04	6.76	6.34	6.78	6.92
■ Std. Deviation	0.78142	0.43142	0.74533	0.41845	0.27405

Figure 4.15: Plot of means and standard deviations for items under Usefulness

Source: Field Data 2013

Figure 4.15 shows mean values for perceived usefulness ranging from 6.0400 to 6.9200. This suggests that perceived usefulness of SL as learning tool is quite high. Items' standard deviation range from 0.27405 to 0.78142 indicating low variability in responses. Also from table 4.2, no responses were recorded below the midpoint for all items under perceived usefulness.

Table 4.2 : Percentages of responses for items under perceived usefulness

CODE	Scale: Perceived Usefulness	1	2	3	4	5	6	7
PUI	It is effective to search for information in SL.	0.0	0.0	0.0	0.0	28.0	40.0	32.0
PU2	SL improves collaboration workin to ether	0.0	0.0	0.0	0.0	0.0	24.0	76.0
PU3	SL is motivating.	0.0	0.0	0.0	0.0	16.0	34.0	50.0
PU4	SL improves communication between I and m collea ues.	0.0	0.0	0.0	0.0	0.0	22.0	78.0
PU5	SL is useful for me as a student.	0.0	0.0	0.0	0.0	0.0	8.0	92.0

Source: Field Data 2013

Table 4.2 presents the views the responses expressed in percentages by respondents on

the usefulness of SL. All respondents were in agreement (28% slightly

agreed, 40% agreed and 32% strongly agreed) that it is effective to search for

information in SL. When asked to explain themselves on this, most of the respondents

talked about how information was made available at click. The researcher wanting to know the

effectiveness in retrieving educational slides and sites probed further by asking

the following question: "how effective is it to access slides and educational sites within

the world". One had this to say:

"My lecture room had the slides visibly projected on separate screens. All I did was to move from slide to slide. It was really fun."

Some of the respondents also said there were hyperlinks that link you to other slides or

sites within the world. One of them however mentioned it took about a minute for a

particular set of slides to be displayed but was quick to add that this may be due to

internet cotiiiectivity. FurthõííiQQffry by the researcher revealed that few of the

respondents had 2 major problems with accessing websites within the world. The first was the delay for some sites in opening, which supports the findings on internet connectivity. The second was how the sites are opened in a new window thus being taken out of the world. One female said:

" I just clicked on a link and before I realized I was staring at a strange screen. It took some time to figure where I was."

However all respondents agreed searching for information in all, was effective despite the few hitches observed.

In an attempt to measure information retrieval time, respondents were asked to indicate the time it took in retrieving information in SL. The results presented in figure 4.15.1 revealed that 66% of the respondents took less than 15 sec to retrieve information while 4% took more than a minute.
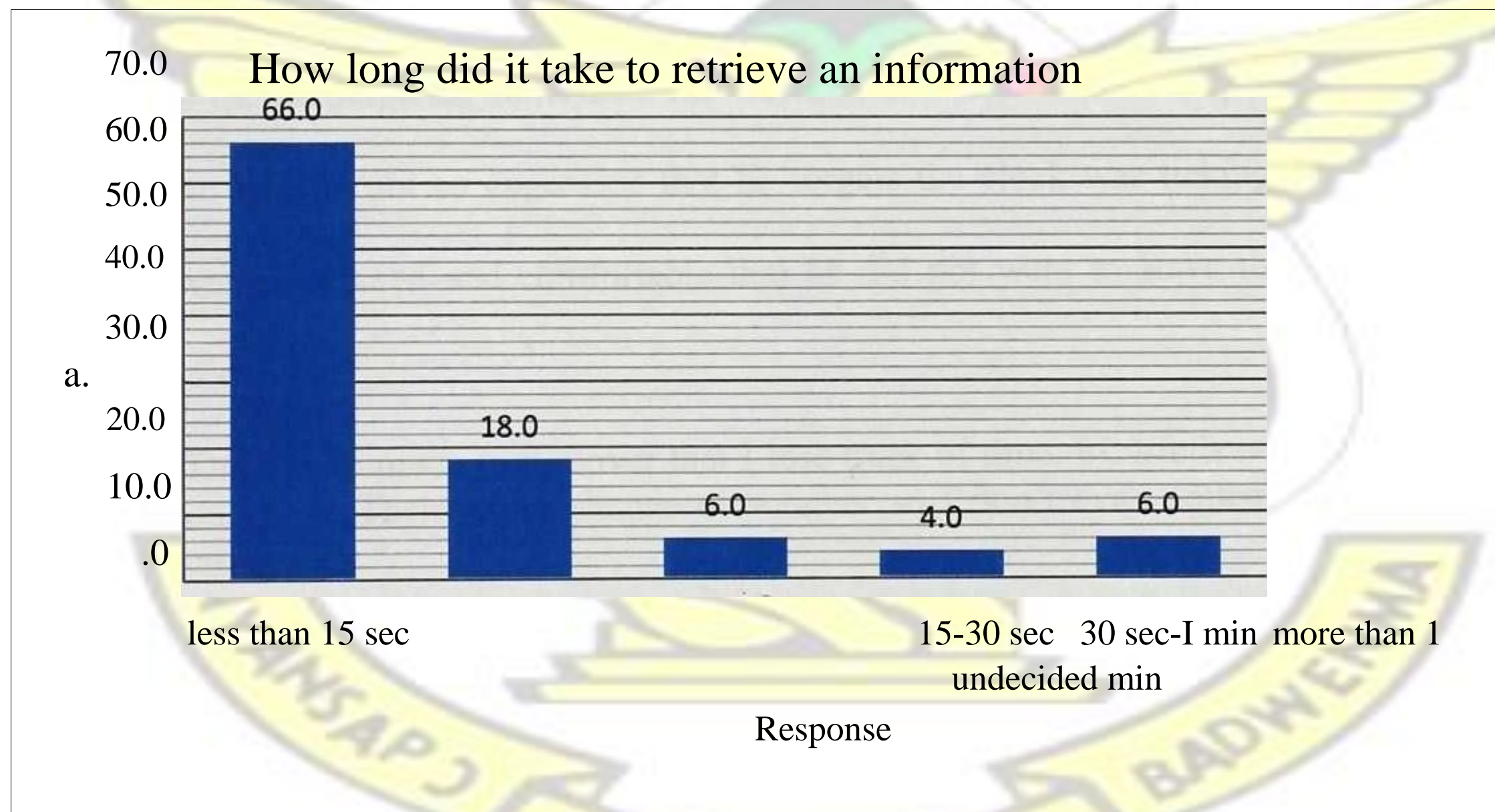
Figure 4.15.1 Information retrieval time

Source: Field Data 2013 _____

In regard to whether SL improves collaboration, it is observed from table 4.2 that 76% of respondents strongly agreed and 24% agreed that SL improves collaboration.

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When interviewed on how SL improves collaboration, most of the respondents mentioned that it allows them to meet as a group for discussions and for doing group assignments. One said he can meet with friends or colleagues for a meeting even when he is not physically with them. These results appear to agree with Franceschi et al (2009) that virtual worlds offer a potential solution to a significant shortcoming of e-learning technologies which has been poor support for group oriented learning and Dreher et al (2009) that Virtual Worlds foster social and group participation.

Equally, results in Table 4.2 show that majority of the respondents were in the affirmation that SL is motivating. Specifically 50% strongly agreed, 34% agreed and 16% slightly agreed that SL motivates them to learn. In an attempt to find out how SL motivates the participants, some said the world is so attractive that they don't want to leave. One said he got so engrossed that he forgets the clock was ticking and another said he was so relaxed and comfortable that he did not want to leave the world. Yet another said

> "There is so much to discover that I lose track of time. SL life is not time bound you know. There is no change of weather so I don't even notice it when it is getting dark. "

The researcher wanted to find out other benefits afforded by SL by asking respondents to write down some benefits of second life as a learning medium. Some mentioned that it allows for easy communication and interaction among students while some wrote itÁilLhelp them learn even when away from school. In all, majority of respondents suggested its introduction into their academic curriculum. One wrote this:

> "It will enhance the learning of computer related courses"

Another wrote this:

> "You can learn even when you are in the house"

Another also wrote:

"It facilitates good studies and all features look real"

Yet another wrote this:

"It is a good software for learning especially for distance students. We don't need to travel to meet their colleagues or lecturers"

Yet again another wrote:

"It can foster good relationship among students, and students and their instructors"

When asked the advantages of this medium of learning over the traditional classroom learning, most mentioned the convenience of attending lecture from anywhere so long as there is access to the internet. The researcher observed that there was no form of intimidation among respondents in world. As in whether respondents consider SL as being useful for them as students, 92% strongly agreed while 8% agreed in the affirmative (see table 4.2).

These findings corroborates that of Baker et al (2009) where students were found to appreciate the convenience of being able to attend the lecture from any location and they also liked having the text version of the lecture available during the talk, with many of them maintaining that they enjoyed interacting socially with the instructor and with their fellow students in the virtual world.

43.4 Challenges
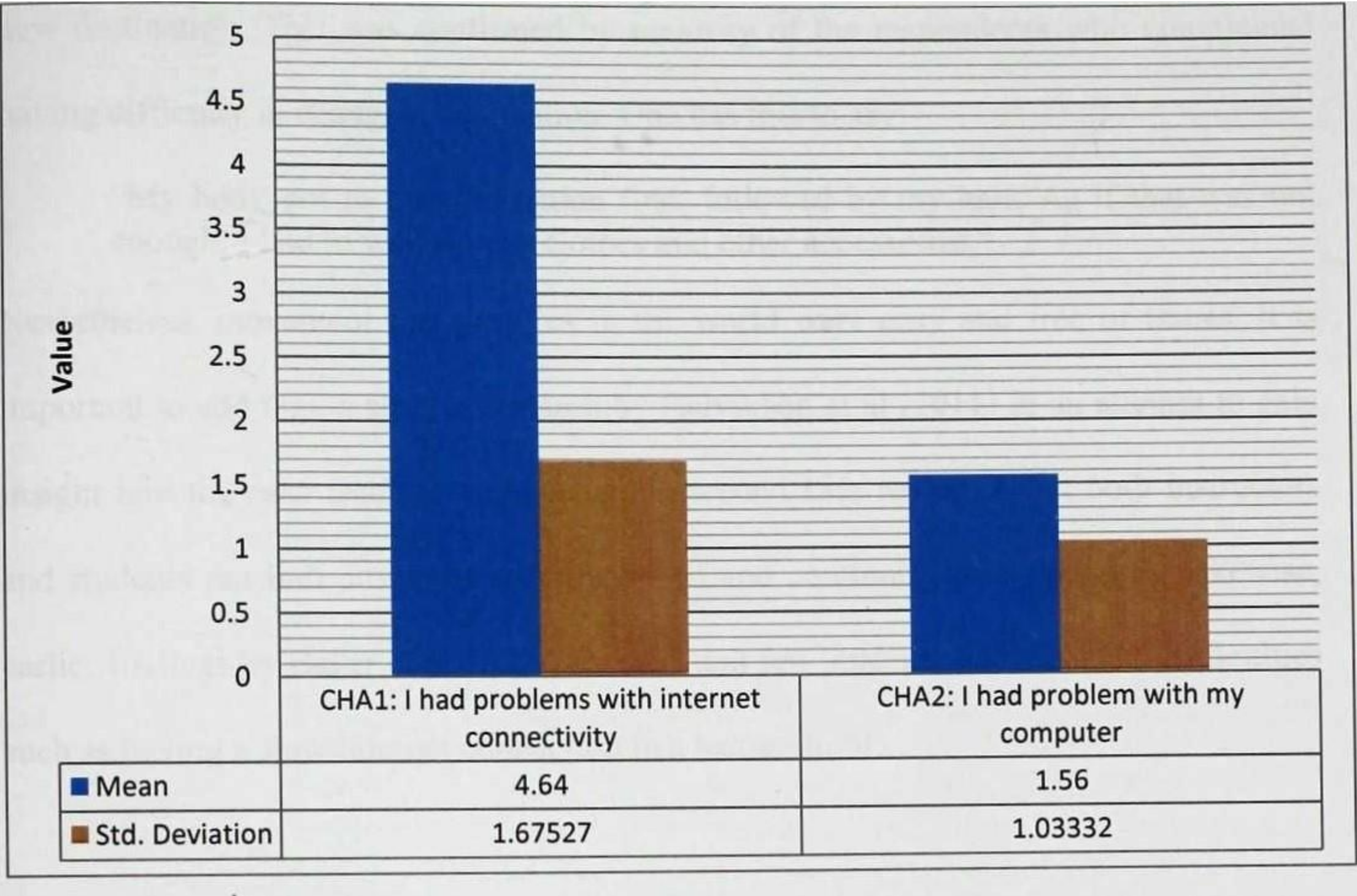
Figure 4.16: Plot of Means and Standard deviations of Items under challenges

Source: Field Data 2013

The means and standard deviation for perceived challenges are displayed in figure 4.16 . The scale item CHAI (I had problems with internet connection) has a mean of 4.64 which is above the midpoint, implying majority of the respondents had problem with internet connectivity and a standard deviation of 1.67527 suggesting that they had varied views. Figure 4.17 shows the views of the respondents on the issue of internet connectivity. Twenty six percent (26%) of the respondents slightly agreed, 24% agreed and 12% strongly agreed having problem with internet connectivity. However 20% of the respondents disagreed having problems with internet connectivity.

The researcher _____ equally had problems with internet connection. The major problem encountered in relation to internet connection was the delay in teleporting to

a new destination. This was confirmed by majority of the respondents who complained having difficulty in changing destination. One has this to say:

> "My body got to the destination first, followed by my hair. As if that was not enough, I had to wait for my clothes and other accessories."

Nevertheless, movement and gestures in the world were easy and free of issues. It is important to add that, a similar research by Halvorson et al (2011) in an attempt to gain insight into the case teaching experience in Second Life revealed that both instructors and students ran into problems with the speed and continuity of connection. Likewise, earlier findings by Baker et al (2009) showed that few students had technical difficulties such as having a slow internet connection in a lecture in SL.
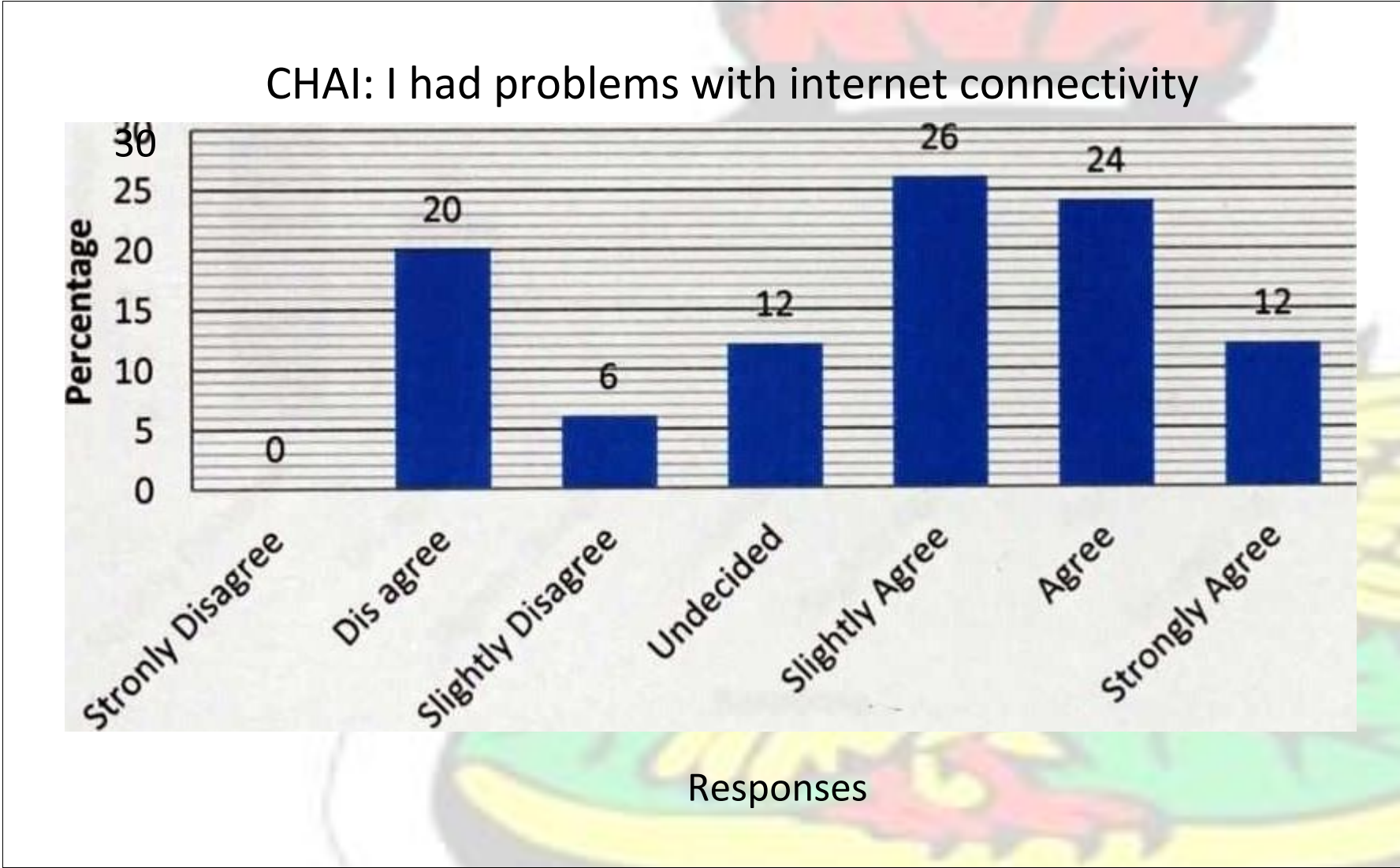
Figure 4.17 : Internet connection
Source: Field Data 2013

On hand, the-fiúÉcomputer failure is 1.5600 (figure 4.18) which is far_lower than the midpoint, indicating majority of the respondents did not have computer failure. Though the standard deviation is large (1.03332) indicating large variability, it can be seen form figure 4.18 below that this high standard deviation is due to responses clustering at the edges of the scale. Sixty percent (60%) of respondents forming the majority strongly disagreed having problem with their computers and 36% disagreed having problems as against 4% agreeing to having

problems with their computers. To the researcher best knowledge, there are no major findings

on users having computer failures during learning section. However the application could not

be installed on computer with low specification. Thus Virtual Worlds require relatively powerful

computers to run.
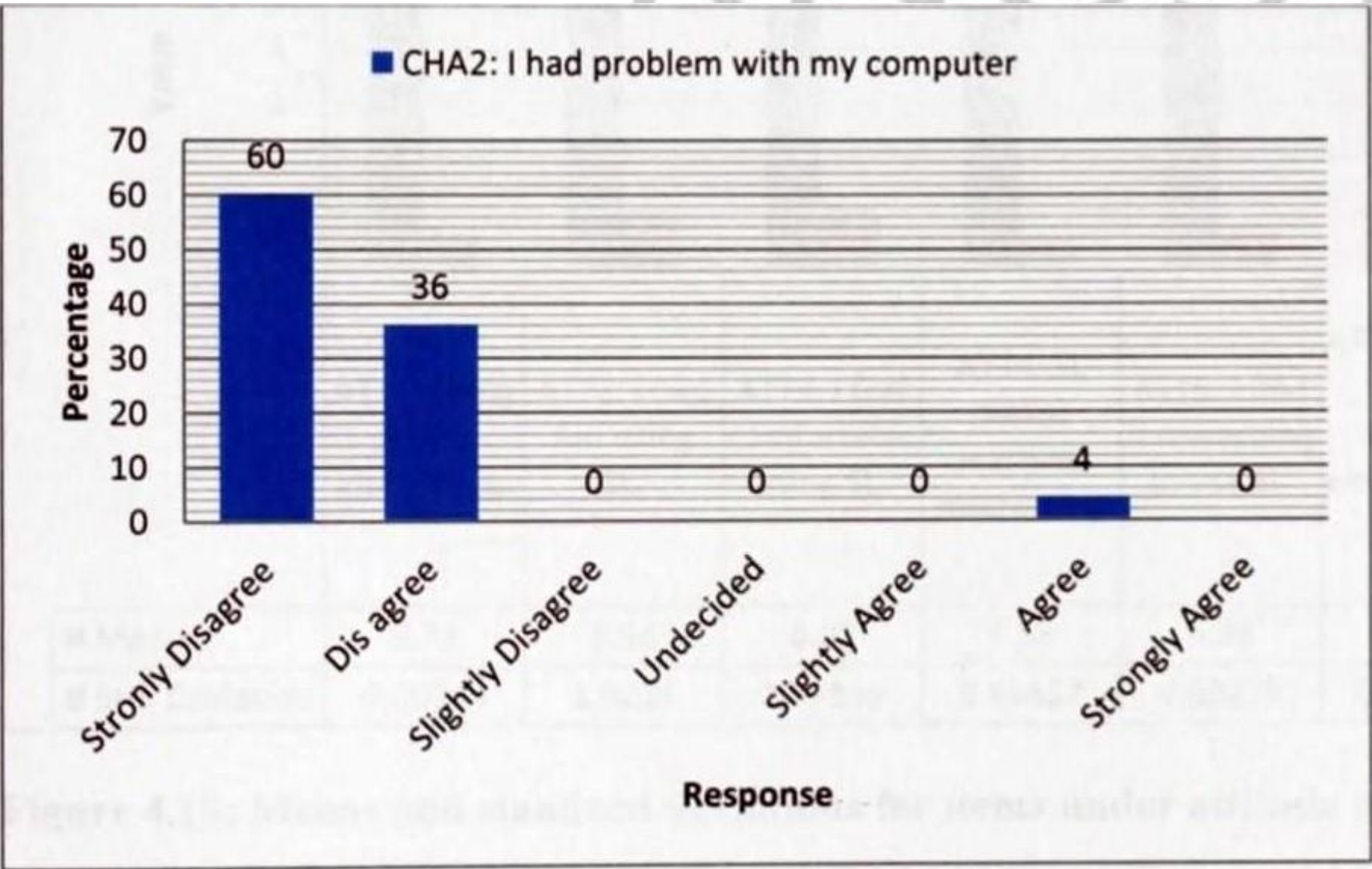
Figure 4.18 : Computer failure
Source: Field Data 2013

The researcher attempted finding out other challenges encountered by

respondents by asking them to   down other challenges encountered. However this did

not yield much result. Only one mentioned that his lecture room was a bit crowded hence

movement around was not that smooth. This is in line with findings by Buckless et al

(2012) that students after completing a research assignment believe Second Life was

realistic and an effective learning environment and the only drawback they faced was the

time it took to get SL up and running for all members.

43.5 Respondents' Attitude Towords Technology (ATT)

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ATT7: I feel

	ATTI: Using SL was learning interesting.	ATT2: I had fun using SL.	ATT3: I feel comfortable using SL.	ATT4: SL makes it rewarding to use SL	ATT5: I find good learning environmen t.	AIT6: SL is a a sense of freedom in makes SL that I do not feel in the offline world.
• Mean	6.72	6.24	6.02	6.58	6.26	6.44	5.68
Std. Deviation	0.60744	1.0214	1.07836	0.49857	0.63278	0.50143	0.91339

Figure 4.19: Means and standard deviations for items under attitude towards tech.

Source: Field Data 2013

Figure 4.19 presents means and standard deviations for items measuring respondents' attitudes toward SL. The mean values range from 5.6800 to 6.7200. Clearly, the means for th Items are all above the scale midpoint, indicating that respondents have a positive attitude towards the technology. Standard deviations ranging from 0.49857to 1.07836 suggests responses with respect to attitude toward technology

are not consistent across all the items. Item ATTI (using SL was interesting) recorded the highest mean of 6.7200 while item ATT7 (I feel a sense of freedom in SL that I do not feel in the offline world.) recorded the lowest of 5.6800.

Table 4.3: Percentages of responses for items under Attitude towards technology

CODE	SCALE: Attitude Toward Technolo	1	2	3	4	5	6	7
ATTI	Using SL was interesting.	0.0	0.0	0.0	0.0	8.0	12.0	80.0
ATT2	I had fun using SL.	0.0	0.0	0.0	14.0	0.0	34.0	52.0
ATT3	I feel comfortable using SL.	0.0	0.0	8.0	0.0	8.0	50.0	34.0

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ATT4	SL makes learning interesting	0.0	0.0	0.0	0.0	0.0	42.0	58.0
ATT5	I find it rewarding to use SL.	0.0	0.0	0.0	0.0	10.0	54.0	36.0
ATT6	SL is a good learning environment.	0.0	0.0	0.0	0.0	0.0	56.0	44.0
ATT7	I feel a sense of freedom in SL that I do not feel in the offline world.	0.0	0.0	0.0	8.0	38.0	32.0	22.0

Source: Field Data 2013

Table 4.3 shows the responses of respondents in percentages in relation to their attitude toward SL. Eighty percent (80%) of the respondents strongly agreed that using SL was interesting whiles none disagreed. Similarly, 52% strongly agreed having fun using SL, 34% agreed and 14% were undecided as shown in table 4.3. The interview further reveals that most of the respondents found avatar creation the most interesting event in SL. Interestingly, one of the the respondent (a male) mentioned it was boring and frustating waiting o be teleported to a new environment. Since no disagrement was reflected in the questionnaire, this respondent might have fallen under those undecided.

On the issue of whether respondents felt comfortable in the world, 34% strongly agreed, 50% agreed, 8% slightly agreed and 8% slightly disagred being comfortable in the world. It is however baffling how 8% could be slightly uncomfortable yet had fun. But again these respondents could be part of the 14% that were undecided whether they had fun. When asked what made them uncomfortable about the world, two of the repondents mentioned the slowness of the internet and one had this to say:

"I was not comfortable with others watching the way I was struggling with my movement in the world. In fact I felt dumb."

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Still from table 4.3, the percentage of respondents that strongly agreed that SL makes learning interesting is 58% which is 22% lower than the percentge that strongly agreed that it is generally interesting. This was not suprising since only a few of the respondents mentioned learning as the most interesting experirnce in the world. Equally, the remaining 42% of respondents agreed that SL makes learning interesting indicating that

SL makes learning(from respondents perspectives)

Table 4.3 further shows the views elicited from the respondents in regard to whether it was rewarding to use SL. Ten percent (10%) slightly agreed, 54% agreed and 36% strongly agreed it was rewarding to use SL. Accordingly, all respondents found SL to be a good learning environment with (56%) agreeing and 44% strongly agreeing that SL is a good learning environment.

Respondents were asked to compare virtual worlds with face—to—face education. Majority OYthe respon ents felt that learning in Second Life was somewhat more difficult than face—to—face education but learning in Second Life was considered to be clearly more fun.

Twenty two percent strongly agreed they felt a sense of freedom in SL that they do not feel in the offline world, 32 agreed, 38% slightly agreed and 8% was undecided.

43.6 Intention to use Second Life

From figue 4.20, the items on intention to use SL record mean values in the range of 6.6000 to 6.8200 and standard deviations from 0.38809 to 0.67763. First, the mean values are all above the scale midpoint, indicating that respondents intend to SL.

Second, the standard deviations, which are all below 1, suggest that this observation is somewhat consistent across all the respondents.

	IU1: I intend to visit SL again.	IU2: I intend to use SL for learning.	IU3: If my college adopts SL, I would use it.
■ Mean	6.6	6.7	6.82
■ Std. Deviation	0.53452	0.67763	0.38809
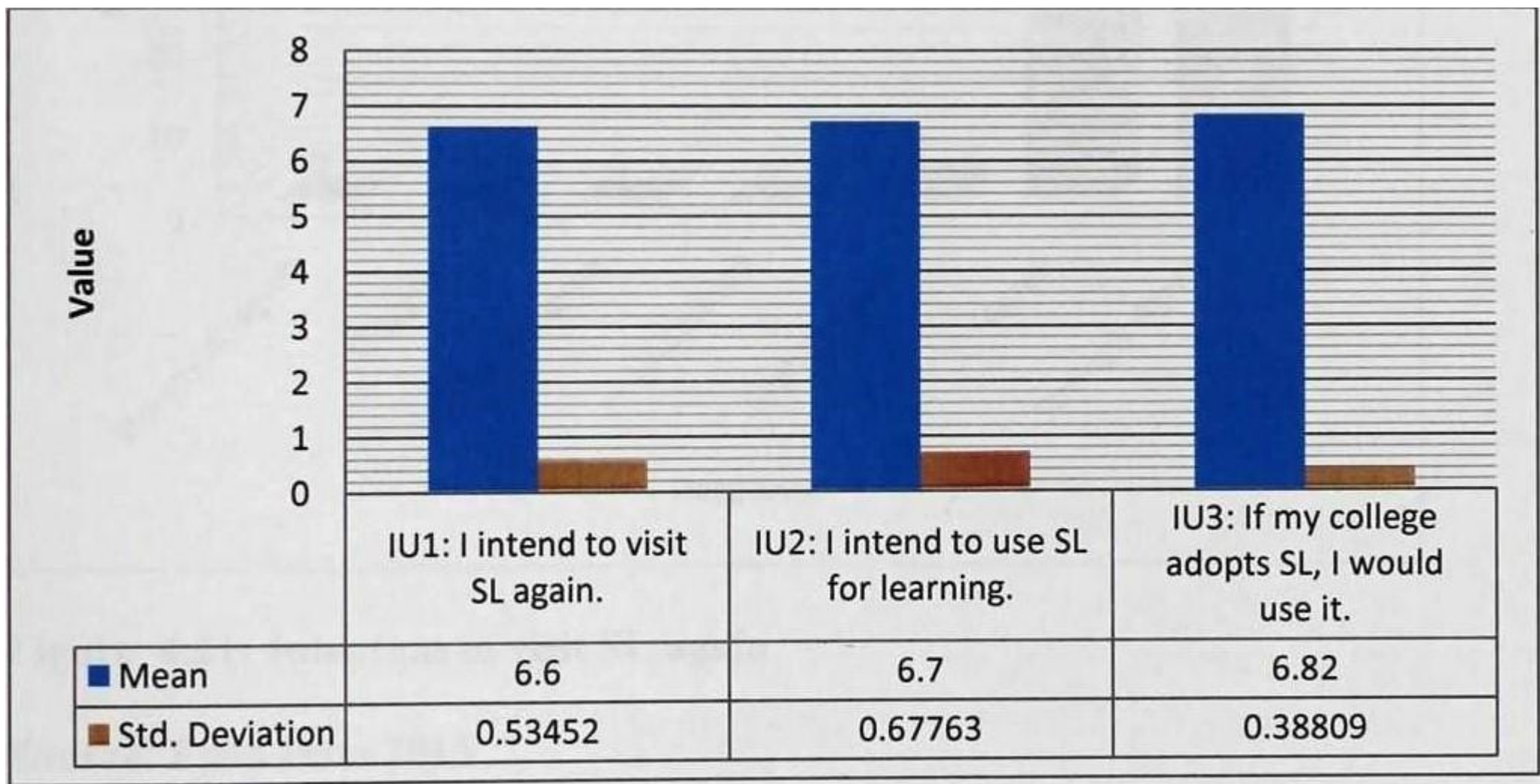
Figure 4.20: Means and standard deviations for items under intention to use SL

Source: Field Data 2013

Figure 4.21 presents the responses(in percentages) for the intention to visit SL again. The data in the figure reveals that all respondents have the intention to visit SL again, out of which 62% strongly agreed. In view of intention to use SL for learning, 76% strongly agreed, 22% agreed and 2% slightly agreed to use SL for learning (see figure 4.22).

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IUI: I intend to visit SL...
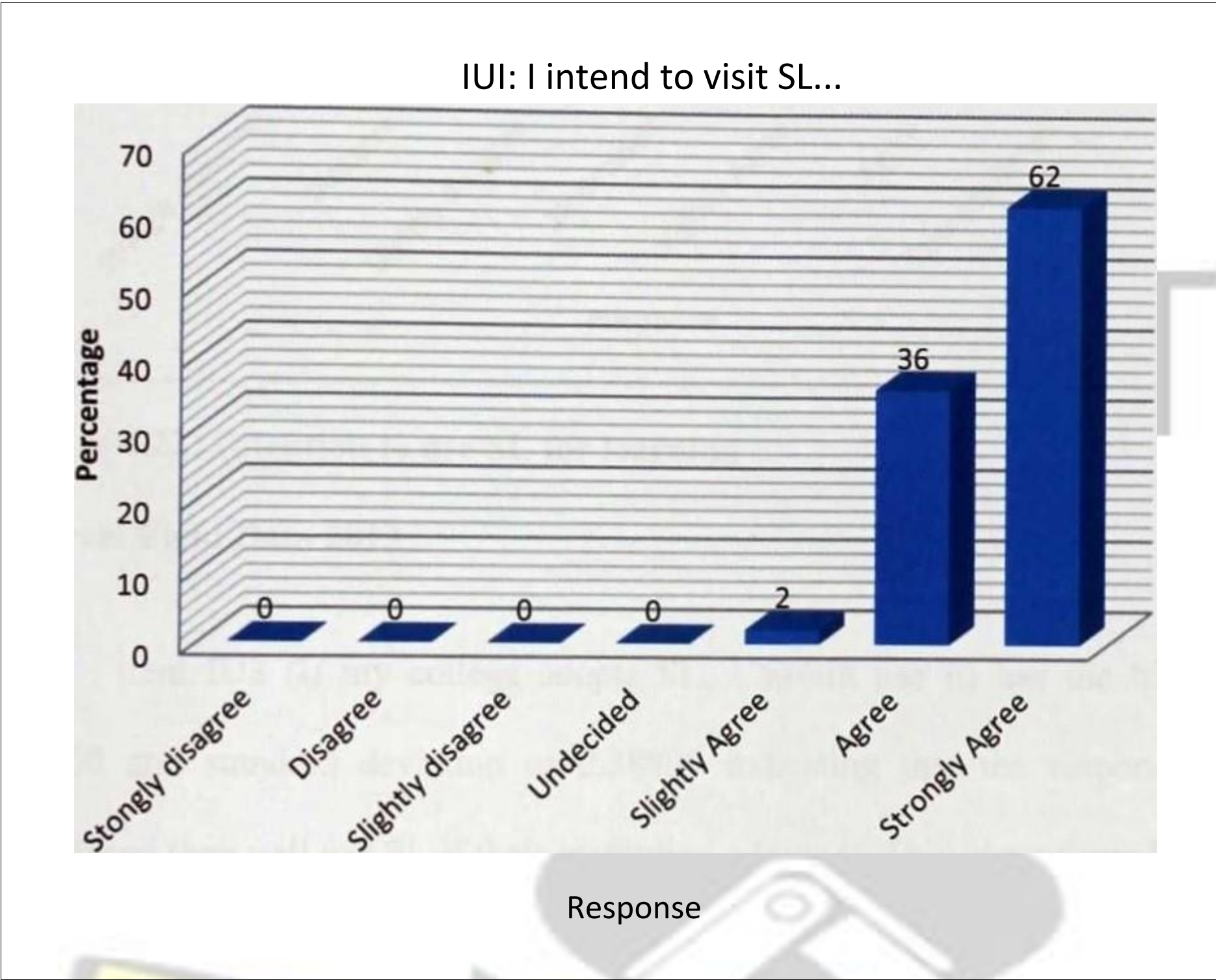
Figure 4.21: Intention to visit SL again

Source: Field Data 2013
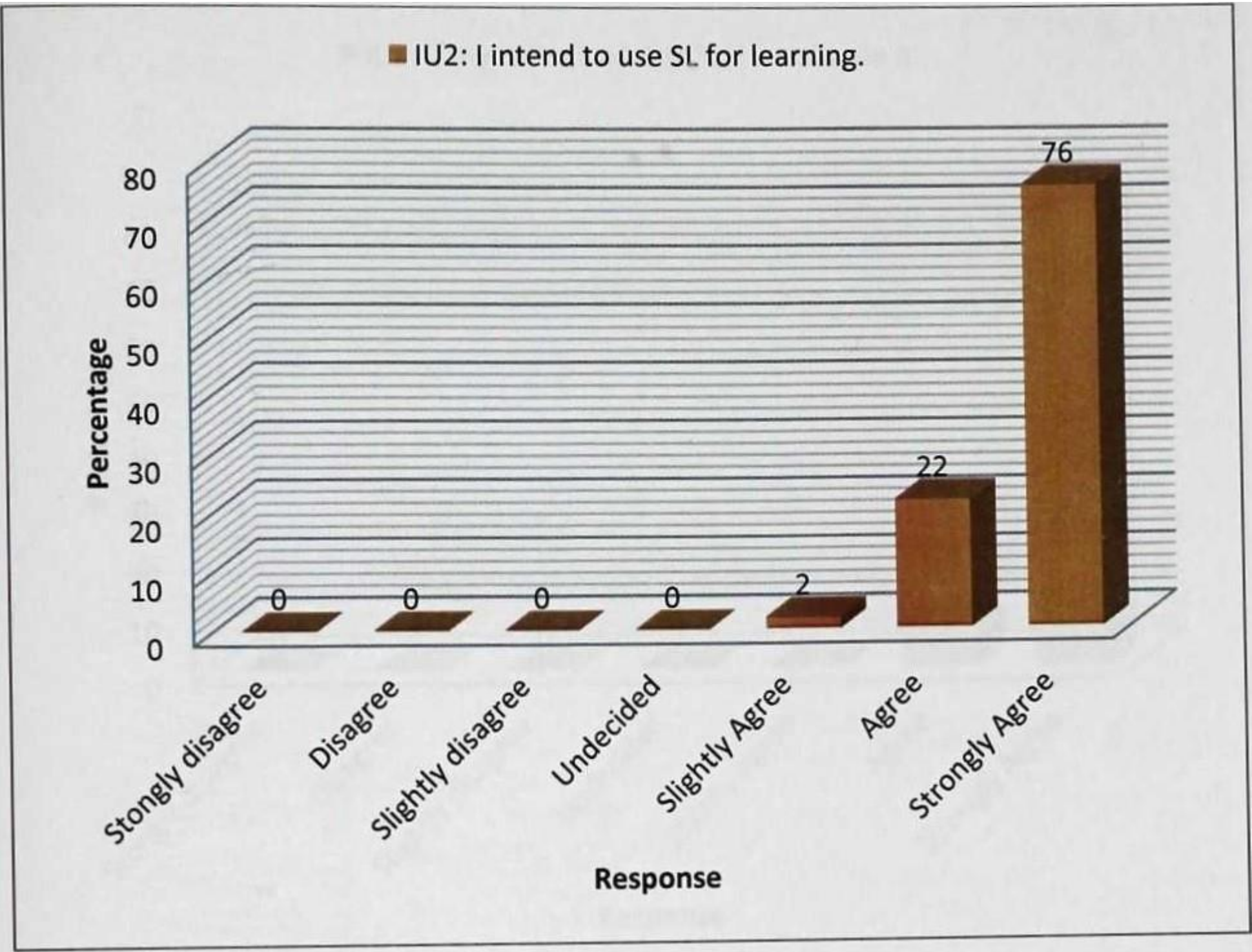
Figure 4.22: Intention to use SL for learning

Source: Field Data 2013

Item IU3 (If my college adopts SL, I would use it) has the highest mean of 6.8200 and standard deviation of 0.38809 indicating that the respondents are very convinced they will use SL if their institution adopts it. This is confirmed in figure 4.23, where 82% stronly agreed to use SL if their college adopts it while 28% agreed.

These results are not surprising since SL has attracted millions of users across the world. According to Zhou et al (2012), virtual worlds though originating as environments for play, have gained legitimacy in business as well as in educational and government sett)ngs with tens of millions of consumers.

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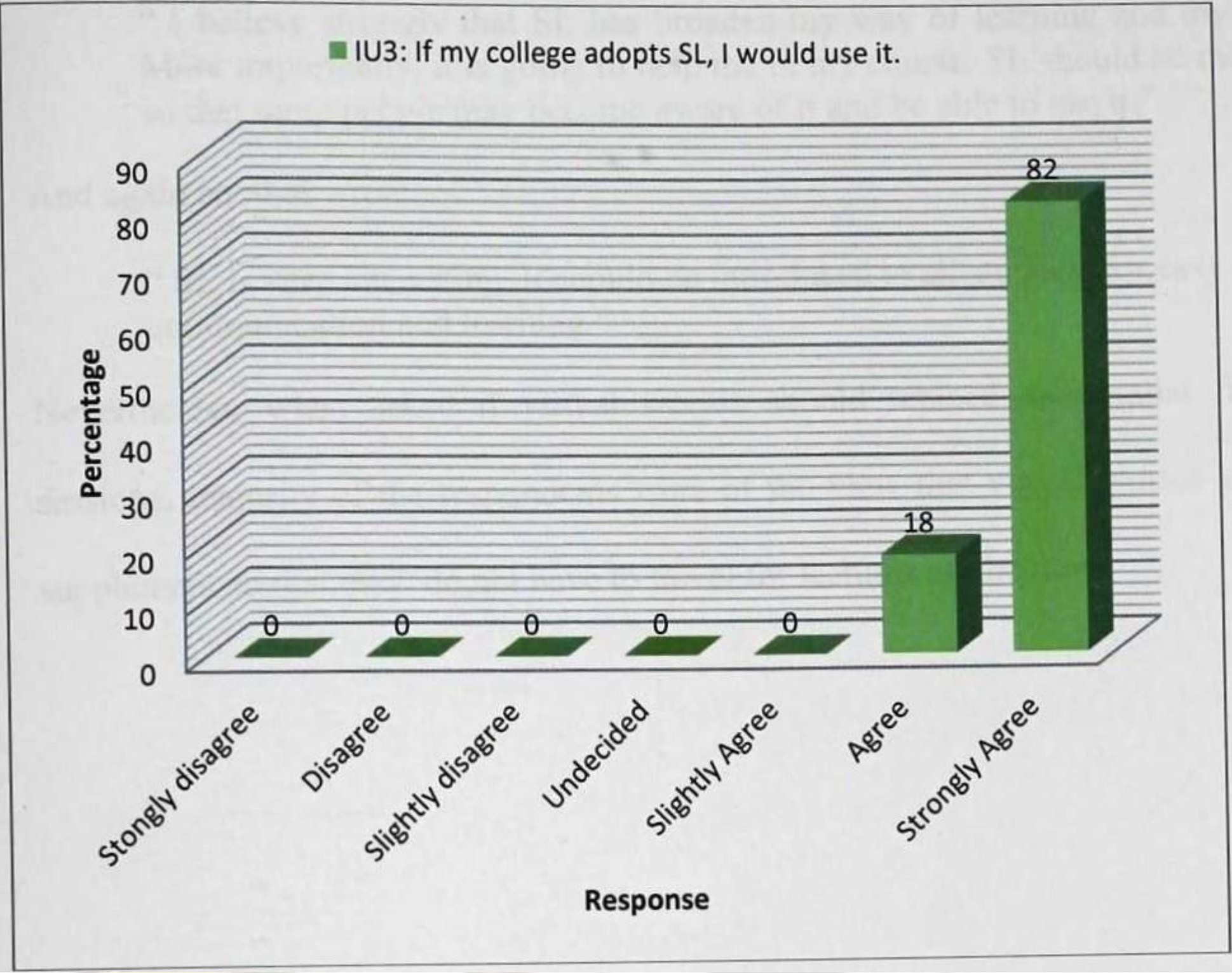
Figure 4.23: Intention to use SL if adopted by the institution

Source: Field Data 2013

When asked to add their comments and suggestions, majority of the respondents were very impressed about SL and suggested its adoption by their institution. One wrote:

"I will like my college to support SL because it is very good and you can learn even when you are in the house. I really enjoyed myself."

Another wrote:

" SL is very rewarding and I think it would help solve a lot of problems in our educational system if introduced especially at the tertiary level."

Another also wrote:

.' It wasinteresting to use. I would encourage its introduction into the school's curriculum." Yet another wrote:

"

I believe strongly that SL has broaden my way of learning and my horizons. More importantly, it is going to help me in my course. SL should be made public so that more people may become aware of it and be able to use it."

And again another wrote:

" SL is very interesting. It should be introduced to all students for easy communication and learning.'

Nevertheless, when asked if virtual worlds should replace the regular face-to-face sessions, majority of the respondents were of the view that virtual worlds should be a supplement so that they do not have to travel for lectures all the time.
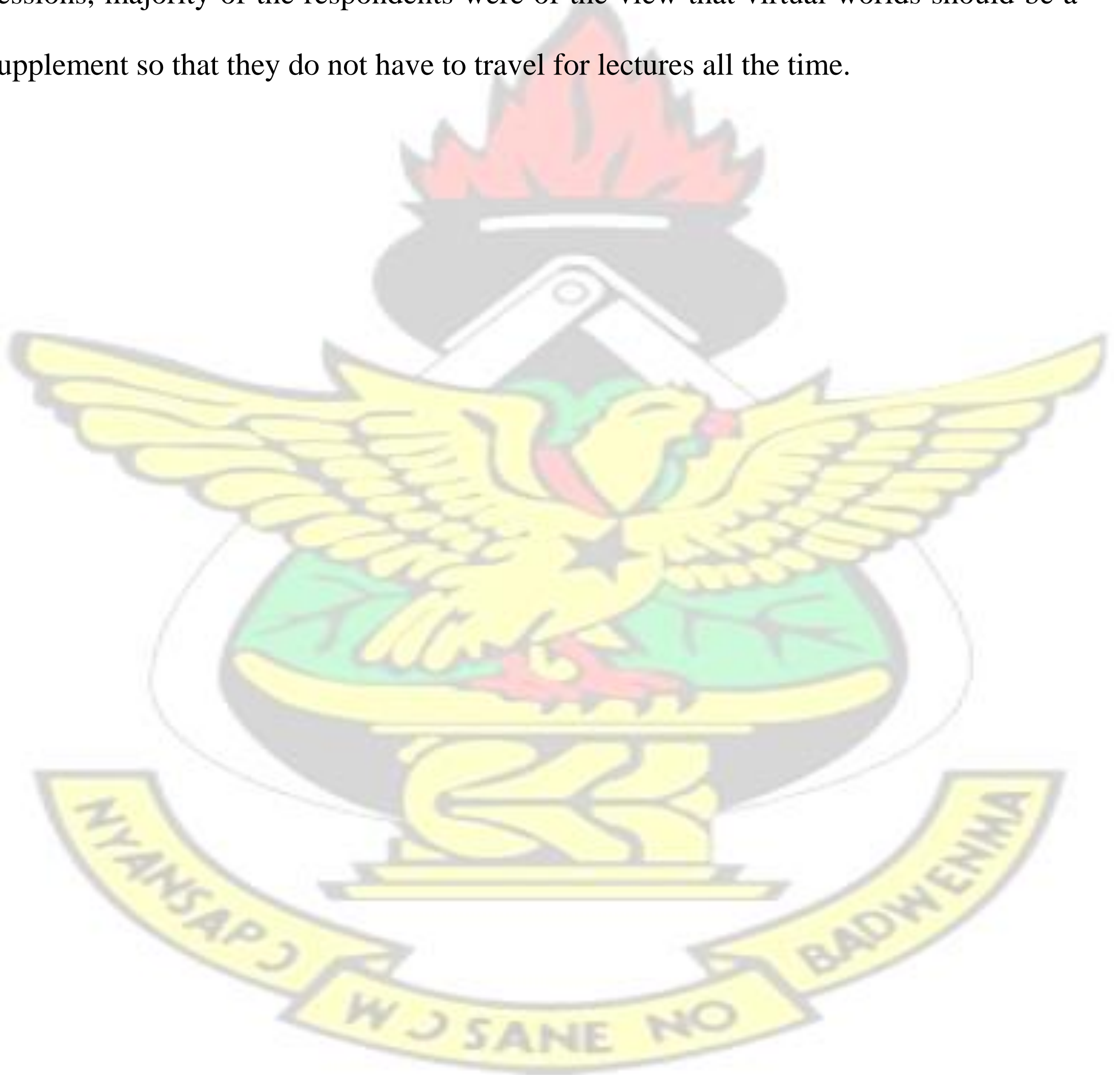
CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The study sought to explore the possibility of using virtual worlds (VW) in distance education to supplement the regular face-to-face sections in Ghana by discovering the learning experiences afforded by this medium for spatially distant learners and their intention to use VW if adopted into distance education in Ghana.

There seemed to be common themes as to what advantages of virtual worlds made them educationally useful. One was the collective learning and sharing of information that lets students learn from teachers and other students alike. Collaboration is greatly facilitated when conducting educational activities in-world. Virtual worlds also kept the students involved with technology. As virtual worlds are a subset of web based technologies, they enable teaching and learning to occur regardless of time and geographical location which are great concerns for distance students, and can equally enhance social interactions.

However, SL requires computers with high specifications, especially graphic cards and high RAM. Internet broadband speed is also crucial to the use of SL. If the internet connection is not fast enough, there will be a lot of lag and downtime.

Overall, students' attitudes toward SL was very positive, which is heartening, considering this being the first time for most of them and the potential uncertainties associated with an unfamiliar environment. The informal setting of SL seemed to allow respondents to feel comfortable interacting with the world as well as other respondents and there are clear indications th t students will use virtual worlds if adopted into distance education.

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5.1 KEY FINDINGS

    i.   The study revealed that out of the 50 respondents of the study, only 3 had used virtual worlds for less than seven months to the survey.

    ii. Majority of the respondents found SL visually attractive and easy to use . The user interface was clearly understood and navigation in SL was easy for majority of respondents. All respondents maintained it was easy to communicate in SL.

    iii. Majority of the respondents indicated that SL is useful to them as distance students. The study revealed some benefits of learning SL as follows: SL improves collaboration and communication among students, motivates students to learn, and enables learning to occur regardless of time and location.

    iv. SL could only run on computers with high specifications, especially graphic cards and high RAM and the Internet connection was slow. Majority of the respondents reported having problem with the speed of internet connectivity.

    v. Respondents had positive attitudes toward the technology. Majority accepted having fun and feeling comfortable in SL. All respondents found SL rewarding and interesting to use and indicated that SL is a good learning environment.

    vi. All respondents intend to use SL for learning and are in favour of its adoption by their institution.

5.2 RECOMMENDATIONS

ased the findings and the conclusions drawn from them, the following recommendations are made for facilitating the use of virtual worlds to improve the Auality of teaching and learning in distance education.
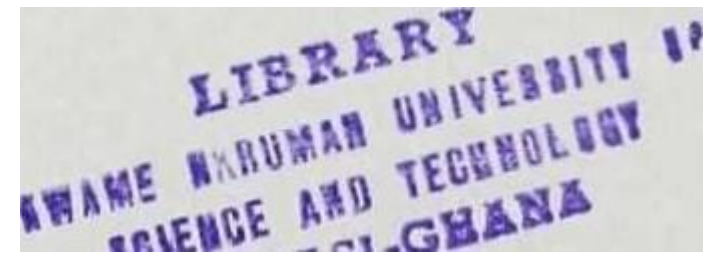
For virtual worlds to gain popularity among students, it should be introduced to students during their orientation. They should be taken through registration and trained to use VW. Students should also be made to understand the potentials of virtual worlds so as to appreciate it. Assignments can be given to students in world to get them involved.

For the benefits of virtual worlds to be fully realized, students must be sent to the world with educational purposes. There is a need for educators to ensure the use of a virtual world is carefully considered and integrated. The unique affordances of virtual worlds should be considered in assigning learning task to students.

Also, the institution needs to work on the provision of laptops and Modems for students to facilitate the use of VW by students. Arrangements can be made with distributors or manufacturers for example rlg for the provision of laptops of the required specifications and internet service providers for high speed and stable Modems at a reduced cost that will be absorbed by students through fees.

It is important for instructors to take the time to explore the space and interact with others in order to experience the role of the student. Sessions should be carefully developed so that a variety of tools are incorporated to keep the "distant" learner engaged and make learning interesting and fun for students.

The researcher would like to recommend the adoption of virtual worlds by Centre for Continuing Education, UCC and all interested distance education providers to supplement-the face-to-fgce-sessions. Pre-made regions can be bought or lands bought and outsourced to developers based on the institution's specification or yet lands acquired and developed by the institution itself. These worlds can be used by lecturers for meeting

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with individual students or group of students and by students for group assignments and collaborative tasks, so that both do not travel to meet all the time.

Suggestion for further studies

This study has explored the possibility of using virtual worlds in distance education in Ghana. Although the study has contributed to the existing body of knowledge on the topic by enriching the literature with empirical evidence from a Ghanaian context; improvement and further research are needed to fully understand the potentials of virtual worlds for distance and distributed learning.

The use of the case study approach, the time frame of the study and the use of only one of the various existing Virtual Worlds, SL, could limit the validity and the generalizability of the study.

Future research should increase the sample size, target population, time frame, and scope of the study to include not only students but their lecturers, to determine how the environment is effective for teaching online classes.

Additional research should be targeted at identifying a virtual world that best support the development of engagement, group presence, and role playing.

Finally, it is also necessary to investigate the learning activities that are better supported by virtual world learning environment and which are not.

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APPENDIX

Second Life (SC) Experiment Questionnaire

Dear Participant,

This questionnaire is part of a Master's Thesis about the use of Virtual Worlds in distance education in Ghana. The questionnaire will provide me with the relevant information that I need to complete the research.

All respondents remain anonymous.

Thanks in advance for your time and effort!

PART 1- PERSONAL INFORMATION

1. What is your Gender? ❏ Female   Male

2. What is your Age?
❏ Less than 20 years old 20—30 years old Above 30 years

3. What are you pursuing?
❏ Diploma   1st Degree

4. What is your marital status? ❏ Single Married

5. Are you working?
   Yes

6. Do you live in Ho?
 t) Yes   ❏

7. What is your Nationality?
❏ Ghanaian   Foreigner

8. What is your experience in ICT usage?
❏ 0-1 year   2-5 years   Over 5 years

9. Have you ever used a ~~virtual world~~ before this study? a Yes   No

10. If Yes, for how long?
   ❏ Less than a month 1-6 months 7 months- 1 year   more than a year

PART 2- POST-EXPERIMENT QUESTIONS

Please use a few minutes to answer the following questions pertaining to your impression of Second Life.

The seven-point Likert scale ranges from strongly disagree to strongly agree with the mid-point being undecided/neutral. Tick as applicable to you.

Legibility (LEG)

LEG 1. This virtual world is visually attractive.

LEG 2. The virtual world appears professional.

LEG 3. The virtual world contains vivid objects and background. LEG 4. The user interface is clear and Understandable.

Perceived Ease of Use (PEOU)

Strongly disagree Strongly agree

PEOU 1. Learning to operate SL was easy for me.

PEOU 2 It was easy to find the information I was looking for.

PEOU 3. It was flexible to interact with SL.

PEOU 4. It is easy to navigate (move around).

PEOU 5. I find it easy to communicate with others. PEOU 6. SL was easy to use (user-friendly).

Perceived Usefulness (PU)

Strongly disagree Strongly agree

PUI. It is effective to search for information in SL.

PU2. SL improves collaboration (working together).

PU3. SL motivates me to learn.

PU4. SL improves communication between I and my colleagues. PU5. SL is useful for me as a student.

PUI.I How long did it take in retrieving information in SL?

Less than 15 sec.   15-30 sec.   30-1 min. ❑   More than 1 min. Cl
_____

Write down other perceived usefulness

75

Challenges (CHA)   Strongly disagree   Strongly agree

CHA 1. I had problems with internet connection.
CHA 2. I had problems with my computer.

Write than other challenges encountered below

Attitude Toward Technology (ATT)

ATT 1. Using SL was interesting.   Strongly disagree   Strongly agre

ATT 2. I had fun using SL.

ATT 3. I feel comfortable using SL ATT 4. SL makes learning interesting

ATT 5. I find it rewarding to use SL.

ATT 6. SL is a good learning environment

ATT 7. I feel a sense of freedom on SL that I do not feel in the offline world

Intention to Use (IU)

Strongly disagree Strongly agree IU

1. I intend to visit SL again.

IU 2. I intend to use SL for learning.

IU 2. If my college adopts it, I would use it.

I would describe my overall experience while visiting the virtual world as (tick as many as applicable) Exciting OInteresting ORewarding OBoring OScaring OTime wasting

Please add your comments below (if any):