



ALICE ADEJOKE BAMIGBOLA

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**STUDENTS' CONCEPTIONS OF THE USE OF  
WEB 2.0 TOOLS**

**SUPERVISOR:**

**SIRJE VIRKUS**

Master thesis  
International Master in Digital Library Learning  
2010

## **DECLARATION**

I certify that all materials in this dissertation which is not my own work has been identified and that no material is included for which a degree has previously been conferred upon me.

A handwritten signature in black ink, appearing to read 'Alice Adejoke Bamigbola', written in a cursive style.

**Alice Adejoke Bamigbola**  
**June 25, 2010**

# DEDICATION

This thesis is dedicated:

to the glory of **GOD Almighty** for all His benefits in my life.

to my darling husband, **Oladapo**, “Okò ti kò common” who gave all within his power as human to support me to achieve my aspiration. The good LORD will reward you for being a ‘God-given’ husband.

## **ACKNOWLEDGEMENTS**

To God be the glory great things He has done. It is not of him that willeth or of him that runneth but of the Lord that showeth mercy. If not for God's mercy I wouldn't have been alive but He gave me life, mercy and favour to finish DILL programme. Halleluyah!!!

This thesis would not have been successfully completed without the support of the following people hereby appreciated:

My sincere appreciation goes to the DILL consortium for the opportunity granted me and the enabling environment to successfully complete this programme. All my professors, Ragnar Audunson, Ragnar Nordlie, Nils Pharo, Steve Pepper, Anna Maria Tammaro, Pat Dixon, and Vittore Casarosa are appreciated. Aira Lepik, you are highly appreciated for your support and sense of humour while DILL programme lasted; you gave critical comments at the onset of this thesis. Kersti Heloe, DILL administrator, thank you for always being there to administer us. My unreserved thanks go to my able supervisor, Sirje Virkus, for her patience, encouragement and determination to be used of God to bring out the 'gold' in me. Sirje, you are a mentor indeed, you have contributed a lot into my academic life, God bless you "Aitah".

Professor Tiiu Reimo is acknowledged for reading through the draft and offering valuable comments, also Dr. Gillian Oliver who out of her busy schedule promptly read through the draft and gave insightful comments. Dr. Gerslese Akerlind who generously sent some of her articles on phenomenographic research to me, you have made me a phenomenographer.

All my mates, DILL group 2, it was a wonderful experience knowing you and all the respondents are appreciated for their cooperation.

Back home, are wonderful people that were consistently encouraging me while DILL programme lasted: Dr. Matthew Umukoro, my encourager and boss, God will reward you, Dr. Airen Adetimirin, my senior colleague, thanks a lot.

To my mother, siblings, brethren and colleagues for their support throughout DILL programme, you are highly appreciated.

Last but not the least, I appreciate God for your lives, Promise, Precious and Praise, you are wonderful gifts from the Lord. You will live to manifest the glory of God at the due time. To my friend, brother, encourager, confidant and love of my life, Oladapo, I appreciate you for the grace of God upon your life. You are an uncommon husband, one in a zillion, you forfeited your comfort to enable me realize my life goal. Without your unreserved support I wouldn't be where I am today. You are my jewel.

**GOD BLESS YOU ALL.**

## **ABSTRACT**

In the past five years the emergence of Web 2.0 tools has permeated many human spheres including higher education sector. Some higher educational institutions had experimented with it and evidences showed that before its incorporation into educational systems some issues must be carefully considered. Such issues among others are students' preferences and required skills to use Web 2.0 tools, which hitherto, have little research done on them. Thus, this research aimed at acquiring a deeper understanding of DILL students' conceptions of the use of Web 2.0 tools, with particular focus on their preferences and the required skills to optimally use Web 2.0 tools.

The study adopted qualitative approach and used phenomenographic research strategy to identify DILL students' conceptions of Web 2.0 tools. Semi-structured interviews with open-ended questions were conducted with 12 DILL students from Africa and Asia.

The findings revealed four distinctive categories of descriptions: communication tools, educational tools, professional tools and multi-purpose tools. For each category of descriptions there were preferred Web 2.0 tools and required skills to use these tools. The need for training on some skills to optimally use Web 2.0 tools was evidently shown.

This study supports the incorporation of Web 2.0 tools in higher education, especially its inclusion in DILL curriculum and LIS education in general.

**Keywords:** Web 2.0, higher education, phenomenography, information literacy, Digital Library Learning, Library and Information Science.

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## **LIST OF ABBREVIATIONS**

DILL	-	Digital Library Learning
HE	-	Higher Education
ICT	-	Information and Communication Technology
IFLA	-	International Federation of Library Associations and Institutions
IL	-	Information Literacy
IVA	-	Learning Management System of Tallinn University, Estonia
JISC	-	Joint Information System Committee
LIS	-	Library and Information Science
LMS	-	Learning Management System

## **1.0 CHAPTER ONE: INTRODUCTION**

This chapter is the introductory section of this thesis and it outlines the background and context of the study, followed by the statement of the problem, research aims and objectives, research questions, justification for the study, research methodology, definition of terms, delimitation and scope of the study, thesis outlines and conclusions.

### **1.1 Motivation**

The stimulus for this research is because I belong to “digital immigrant” group. People born before the emergence of the Web have been described as “digital immigrant” (Prensky, 2001). I graduated from higher education institution in 1987, and had my first master degree in personnel psychology in 1999. Afterwards, out of inquisitiveness I went back to school and obtained diploma in librarianship (2003) and bachelor degree in Library and Information Science (2008). As a result, I had two different learning experiences, I discovered that my learning experience in the 1980s and 1999 were different from 2003 till date. Learning environment has changed from what it used to be up till the 1990s which usually was a passive and kind of broadcasting teaching model. From 2000 till date I observed that most of my course mates were “digital natives”, and characterised with the use of internet and Web 2.0

I saw a glimpse of it in Africa where I came from, especially the use of Web 2.0 tools outside the classroom but on getting to Europe it was a bit different, in the sense that even in the classroom while the lectures were on, most of the students were either chatting, searching for materials, or uploading a file in relation to what was being taught.

I was still in the old system of learning with full concentration in the class following the lecturer’s thought. After some time I found that in spite of their “divided attention” they were still following the lecture and finding relevant materials at the same time.

This prompted me to learn some of these tools and by second semester of the Digital Library Learning (DILL) course I had adjusted. Invariably, some of the tools were used in the class work by the lecturers and for the group assignments. Then, the question arose, how could

these tools be introduced into learning environment in developing countries. This prompted me to read literature on the use of Web 2.0 tools in higher education. This was the stimulant for this research into Web 2.0 tools.

## **1.2 Background and Context**

Human race has always been preoccupied with the desire to look for means of manipulating and changing her environment for improvement and enhancement of life. One major way of doing this is through development of technology. Technological innovations have changed the way we record information, share information, communicate and improve lives in general. With these ever changing technological innovations, life has improved from what it was in the primitive age, economy has been transformed and information sharing and communication are becoming highly sophisticated by the day.

At the wake of the twenty-first century, new technological innovations have changed many spheres of human endeavour. The emergence of internet in particular has made the whole world a global community where distance is no barrier to almost all human activities. The invention of world wide web (www) which is popularly referred to as traditional web by Tim Berners-Lee as a means of communication among European Organization for Nuclear Research (CERN) staff but was adopted by the whole world (Anderson, 2007), has practically reshaped the flow of information in the human world.

During the last five years, the most significant technological innovation is the emergence of “Web 2.0” tools or technologies; its wide spread and its use is exponential. Its influence is seen in all ages and in many spheres, such as, commerce, advertisement, publishing, government, marketing, media and others. The concept of “Web 2.0” was first coined by Dale Dougherty, in 2004 and refers to web based facilities that enable online “read/write” platform, sharing and collaboration (O’Reilly, 2005).

One obvious thing is that any sector that does not adopt or adjust to these technological innovations might be left behind. Therefore, educational sector is working hard to incorporate this latest version of Web developments into teaching and learning. However, students are already using these tools in their daily lives (Cochrane, 2008), thus, learners' behaviour and learning is changing. Hence, this century learners have been portrayed as "connected generation" or "Net generation" because of their heavy usage of Web. This Net generation learners have been characterized as learners that love to learn by doing, and the latest technology would immensely enable them to learn by doing, creating, manipulating and constructing knowledge (Prensky, 2001). Therefore, the educational sector should take into account the potentials of Web 2.0 tools and the preferences of learners in the use of these tools in the development of pedagogy.

The influence of Web 2.0 is becoming increasingly visible in higher education (HE) sector. Some higher institutions have experimented with the incorporation of Web 2.0 tools into teaching and learning, especially in Europe, United State of America, Australia and some other developed countries (Kvavik and Caruso, 2005, Franklin and Harmelen, 2007, Kennedy, *et al* 2007). Thus there are evidences of growing numbers of institutions that are exploring Web 2.0 tools for teaching and learning purposes (Grosseck, 2009). However, the influence of Web 2.0 tools in HE sector is yet to be seen in developing countries like it is obvious in developed countries.

Nevertheless, to incorporate these tools into teaching and learning, there is a need for critical understanding of the students' views, ideas and experiences of the use of Web 2.0 tools. Thus, the lack of the understanding of students' expectations of Web 2.0 tools might cause serious consequences, if implemented (Anderson, 2007). The uncertainty of their preferences and the required skills to use Web 2.0 tools must be reduced.

The impetus for this research, therefore, is the researcher's realization of the usefulness of Web 2.0 tools in HE, especially in LIS education. As a result, the research aims to reduce the

uncertainty in the areas of students' conceptions of Web 2.0 tools, their preferences of Web 2.0 tools and required skills to use Web 2.0.

### **1.3 Statement of the Problem**

Collis and Moonen (2008) note students are sophisticated users of Web 2.0 tools outside the mainstream of educational practices but it was found, however, that students ability to use the potentials of Web 2.0 tools in their formal learning context was low (Trinder, Guiller, Margaryan, Littlejohn, Nicol, 2008). Besides, it was also revealed that students prefer moderate use of Web 2.0 tools in classroom situation (Kvavik and Caruso, 2005; Aharony, 2009). The question then is why students are sophisticated users of Web 2.0 outside educational context but prefer moderate use in classroom situation?

There are many unresolved problems and issues regarding the use of Web 2.0 tools in HE (Franklin and Harmelen, 2007). For example, Franklin and Harmelen (2007, p.27) notes "introduction of Web 2.0 systems in HE is not without problems". Therefore, to just assume its uses and implement Web 2.0 in HE without critical evaluation could have serious consequences, thus, it is unavoidable to enquire learners' experiences of Web 2.0 tools, their preferences and the required skills to use Web 2.0 tools. Anderson (2007) identified some crucial issues of identity, digital divide and skills to be carefully considered before its implementation.

In UK, Joint Information Science Committee (JISC) report of an independent committee of inquiry into the impact on HE of students' widespread use of Web 2.0 technologies found that there were adequate infrastructure for Web 2.0, many institutions of higher education were at the advanced stage of exploring Web 2.0 in teaching and learning but there was no blueprint for its implementation, and each of the institutions were deciding its own path (JISC, 2009).

In Library and Information Sciences (LIS) education context, Virkus (2008) asserted that integration of information and communication technology, including Web 2.0 technologies into LIS education is an important challenge for LIS educator. She further contends that the preferences of both digital immigrant and digital natives learners' should be considered.

Therefore, it is inevitable to ask some salient questions relating to the key stakeholder, that is, the students, such as, what are their conceptions of the use of these interactive tools? What are their experiences so far, what are their preferences and required skills for the use of Web 2.0 tools among other things? Answers to these questions would inform the various education policy makers about the modality of implementation of Web 2.0 and development of the pedagogy.

This research, therefore, examines the Erasmus Mundus joint Master course “Digital Library Learning” (DILL) students’ conception of the use of Web 2.0. DILL students are the future digital librarians who are to identify different uses of Web 2.0 tools and thereby implement these tools in their future libraries.

This study would be useful to DILL curriculum planners, LIS education planners and general education policy makers who are to develop strategies that would support learners in the 21<sup>st</sup> century. Secondly, it is anticipated that it would be useful for academic librarians to develop required information and digital literacy tutorials for the 21<sup>st</sup> century learners.

#### **1.4 Research Aim, Objectives and Research Questions**

This research aims to acquire a deeper understanding of DILL students’ conceptions of the use of Web 2.0 tools. This aim would be realized through the following objectives:

- To identify students’ conceptions of the use of Web 2.0 tools.
- To examine students preferences for the uses of Web 2.0 tools.
- To identify required skills to use Web 2.0 tools.

To achieve the above named objectives the following research questions were framed:

- How do DILL students’ experience the Web 2.0 tools?
- What are the students’ preferences for the uses of Web 2.0 tools?
- What are the required skills to use Web 2.0 tools?

## 1.5 Justification for the Study

Though incorporation of Web 2.0 tools in education is a new phenomenon (Virkus, 2008), evidences have shown that HE sector has acknowledged its potentials. Several institutions have started to explore it, and many were in the advanced state of implementing Web 2.0 tools into teaching and learning system (Franklin and van Harmelen, 2007). However, before its implementation, there are crucial decisions to make in respect of which of these tools are suitable for HE education and how to implement them, hence, there is a need for inquiry into learners' experience of the Web 2.0 tools.

A review by Sharpe, Benfield, Lessner and DelCicco (2005) on post 2000 studies revealed that not many studies have been done in relation to students' experiences of the use of technologies but rather studies have been on the evaluation of e-learning with the focus either on practitioners, teaching methods or course design.

There is in general a scarcity of studies of learner experience, in particular there is a scarcity of studies that can be characterised as expressing a "learner voice" that in which the learners' own expressions of their experiences are central to the study (Sharpe, et al, 2005, p.3).

Therefore, JISC advocated for the need to investigate the ways technologies are used by students in order to identify opportunities for its integration within the existing institutional information technology. Two years later, there was a study by Anderson (2007) for JISC *Technology and Standards Watch*, on investigation of the substance behind the hyperbole of the implication of Web 2.0 technologies in HE. The results clearly showed that more work was required for further exploration; (1) to understand the students' usage of Web 2.0 technologies, (2) to analyze the uses, benefits and limitations of Web 2.0 technologies, and (3) to understand students' different learning modes.

Kennedy *et al.* (2007) also affirmed the need for further research to provide evidence of how various technologies are used by the HE students before its implementation. A set of similar issues were raised by Jones and Lea (2008) in their study of digital literacies in the lives of undergraduate students: exploring personal and curricular spheres of practice, under the

auspices of the Economic and Social Research Council, UK Digital Literacies in Higher Education.

Besides, there are few strands of studies that used learners own expressions of their experiences on the use of Web 2.0 tools (Sharpe *et al.* 2005); hence, there is a need for student-centred studies. On this note, the current study examined students' conceptions of the use of Web 2.0 tools with particular focus on students' preferences of Web 2.0 tools and the required skills. The results would proffer answers or solutions to some of the aforementioned crucial issues.

## **1.6 Methodology**

This study is based on interpretivist paradigm, a qualitative research design and used phenomenographic approach with semi-structured interviews. The interview questions were open ended type. The data were phenomenographically analyzed and arrived at an outcome space. The full detail of methodology is presented in chapter three.

### **1.6.1 Research Paradigm**

Interpretivism covers several approaches to research and they are categorized into two groups: empirical interpretivism and critical theory. Empirical interpretivism deals with investigations in natural setting of social phenomena while critical theory deals with ideologically orientated investigation. Interpretivism tenet is that people are involved in the interpretation of the ever changing world and there is no single reality but rather realities are multiple, constructed and holistic (Pickard, 2007, p. 11). This is discussed in more detail in chapter three.

## 1.6.2 Research Approach

A phenomenographic approach was employed for this research. Phenomenography was coined from two Greek words: “*phainemenon*” which means appearance and “*graphein*” which means description (Hasselgren and Beach, 1997, p. 192). It is an interpretive research approach which attempt to describe the different ways a phenomenon is experienced by a group. Phenomenography is “a research method adapted for mapping the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of, and phenomenon in, the world around them” (Marton, as cited in Boon, Johnston and Webber, 2007).

This study uses phenomenography because it aims to understand students’ conceptions of the use of Web 2.0, different variations in their experiences, their preferences and the required skills for its usage. The full detail of methodology is discussed in chapter three.

## 1.7 Definition of Terms

This section gives definitions of some key terms in this study. The definitions described in this section are not comprehensive but described in the context of this study.

**Web 2.0 tools:** Web 2.0 encompasses a variety of different meanings that include an increased emphasis on user generated content, data and content sharing and collaborative effort, together with the use of various kinds of social software, new ways of interacting with web-based applications, and the use of the web as a platform for generating, re-purposing and consuming content (Franklin and van Harmelen, 2007, p.4).

**Conception:** The formulation of ideas of what something or someone is like, or a basic understanding of a situation or a principle, as a result of interaction with or experience of such thing or person (Cambridge Advanced Learner’s Dictionary).

**Experience:** The process of getting knowledge or skill from doing, seeing or feeling things over a period of time (Cambridge Advanced Learner’s Dictionary).

**Preference:** an act of favouring one thing over another, or making of one choice of a thing among others (Cambridge Advanced Learner's Dictionary).

**Skills:** are abilities or competences to perform a certain activity or job well which one acquires through either training or practice over a period of time (Cambridge Advanced Learner's Dictionary).

**Digital Natives:** Today's students are referred to as either 'digital natives' or 'Net generation', It describes the generation of students born into digital world. They are characterized with the use of the latest technologies, receiving information fast, multi-tasking and functioning best when networked (Prensky, 2001).

**Digital Immigrants:** People that were not born into digital world but have adopted some of the latest technologies are referred to as 'digital immigrants'. They are characterized with doing one thing at a time and they see technological skills as foreign to them (Prensky, 2001).

## **1.8 Delimitations and Scope**

This research like other empirical researches has delimitations and scope. Web 2.0 tools in HE has a wider scope, but this research focus on the students conceptions of the use of Web 2.0 tools. Efforts were made to examine how they use it, their preferences and required skills. Secondly, the respondents were DILL students from Africa and Asia, DILL students from other continents were not represented.

This research only explored DILL students in HE using phenomenography, more research is needed to see if these results can be applicable also if other methods are used.

The research is connected with LIS discipline and further research with other disciplines is needed to identify applicability of these research findings in other context.

Besides, only English language resources were reviewed in this study.

## **1.9 Outline of the Thesis**

The thesis consists of five chapters.

Chapter one gives the background and context, for this research followed by the statement of the problem, research aims and objectives, research questions, justification of the study, research paradigm and methodology, then definition of terms, delimitation and scope of the study, thesis outline and finally conclusion are presented.

Chapter two presents the review of relevant literature and it consists of the general overview of Web 2.0 tools, Web 2.0 tools in HE context, why Web 2.0 tools are used, what purposes are these tools used for, and how Web 2.0 tools are used. Furthermore, the empirical studies of the use of Web 2.0 tools in HE are discussed, followed by studies on Web 2.0 tools and LIS education, the required skills to use Web 2.0 tools and challenges of Web 2.0 tools. Finally, the value of the study and conclusion are presented.

Chapter three outlines the detailed methodology of the study. This chapter comprises research paradigm, research design, research approach, roots of phenomenography, phenomenographic research, phenomenography in LIS research, benefits of phenomenography, research population, sample and sampling technique, data collection instrument, data analysis, validity and reliability, limitation of approach and conclusion.

Chapter four is the data analysis and discussion section which consists of demographic information, data analysis, discussion and conclusion.

Finally, chapter five presents conclusions of the study according to the research questions, and the research problem, and discusses implications for theory and practice. It also offers suggestions for further research.

## **1.10 Conclusion**

This chapter has laid the foundation and rationale for this study. The background and context of this study, statement of the problem, research aim and objectives, research questions, justification for the study, the methodology employed, delimitations and scope, definition of

terms, outline of the thesis and conclusion have been provided. The following chapter reviews literature relevant to this study.

## **2.0 CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter reviews literature on the domain of “Web 2.0” in higher education sector, studies on Web 2.0 and LIS education and the required skills for the use of Web 2.0 tools. A simple search technique with such phrases as “Web 2.0 tools and higher education”, “social software and higher education”, “technologies and higher education”, “e-learning and Web 2.0”, “Web 2.0 and information literacy”, and “phenomenography” were used to select peer reviewed articles from EBSCO Host databases, which included, Emerald Management Xtra, Sage, JISTOR, and LISTA.

Though the literature review cannot be considered exhaustive, many of the articles were obtained by examining the references of the initial results. Furthermore, many articles and project reports on students’ experiences of the use of Web 2.0 were obtained from Joint Information Systems Committee (JISC) Website <http://www.jisc.ac.uk/>.

Few theses and dissertations on phenomenographic approach were consulted from the Australasian Digital Theses Programme (<http://adt.caul.edu.au/>). The researcher also contacted few renowned phenomenographers to get some of their articles on phenomenography approach that could not be accessed online. A particular one is Dr. Gerlese Akerlind who sent three chapters of her work on phenomenography approach to the researcher.

The chapter is set out in five sections. First, an overview of Web 2.0 is offered, which describes inception of the phrase “Web 2.0”. Secondly, a discussion on the Web 2.0 tools in higher education is provided, followed by the main hub of this literature review: students’ experiences of Web 2.0 tools and Web 2.0 tools in Library and Information Science (LIS) education. The fifth section discusses the appropriate skills for the use of Web 2.0 tools.

### **2.2 An Overview of Web 2.0 Tools**

Several authors have discussed the development and the nature of the concept of Web 2.0 in higher education in general and in LIS education in particular, for example Downes (2005),

O'Reilly (2005), Alexander (2006), Anderson (2007), Bawden *et al* (2007), Franklin and Harmelen (2007), and Virkus (2008).

The phrase “Web 2.0” which is also referred to as “social software” (Trinder *et al.*, 2008) was coined by Dale Dougherty, O'Reilly Media Inc.'s vice president, during the O'Reilly and MediaLive Web 2.0 conference brainstorming session on potential future of the Web (O'Reilly, 2005) and since then it has become a popular and controversial phrase. Controversy as to whether “Web 2.0” is an upgraded version of World Wide Web (www) or a set of new technologies or a hype remains (Aharony, 2008). Tim Berners-Lee claimed that Web 2.0 is not different from Web 1.0 as the goal of Web 1.0 was also to connect people (Anderson, 2007).

Tim Berners-Lee's claim was confirmed by Alexander (2006) in his write up on “*Web 2.0: A New Wave of Innovation for Teaching and Learning?*” where he asserted that Web 2.0 hit the Web in the late 1990s hence it is not a brand new technology. Meanwhile, many facets of human enterprise have embraced its usage since its five years of existence, though; there is no agreed meaning or definition for this phrase. O'Reilly (2005, p.1) notes that there is “a huge amount of disagreement about just what Web 2.0 means”, and Bawden *et al* (2007) conclude that there is confusion as to the exact meaning or definition of Web 2.0.

Web 2.0 has been seen with different lenses, Downes (2005) saw it as “community-driven online platform or an attitude rather than technology”, while Franklin and Harmelen (2007) saw it as “technology” and Thompson (2007) called it as a potentially disruptive technology.

Owen *et al.*, (2006) listed the different ways Web 2.0 was described after the Internet Innovators 2005 Conference, for example:

- “It's made of people. It's not content.” (Jeff Jarvis, Buzz machine)
- “The interconnected Web.” (Andrew Anker, Six Apart)
- "Web 2.0 is the two-way Web where content finds you." (Ron Rasmussen, KnowNow)

- "People doing things together on the Web." (Mitchell Baker, Mozilla Foundation)
- "Web 2.0 is about platforms that other people can build on." (Rajat Paharia, Bunchball)

While, Bryant (2007) called it as “always on” culture, in short, Anderson (2007) described it as “a slippery character to pin down”. He pointed out that the individual profession determines the meaning one gives to Web 2.0 in his words:

Web 2.0 is a slippery character to pin down. Is it a revolution in the way we use the Web? Is it another technology 'bubble'? It rather depends on who you ask. A Web technologist will give quite a different answer to a marketing student or an economics professor (Anderson, 2007, p.5).

In essence, Web 2.0 is debatable and it could be defined from different perspectives. Whatever lens one uses to view it, the underlying fact is that any Web-based interactive mode has the features that Anderson (2007) referred to as “six big ideas behind Web 2.0”. They are: “individual production and user generated content”, “harness the power of the crowd”, “data on an epic scale”, “architecture of participation”, “network effects” and “openness” (Anderson, 2007, p.14).

Ashley *et al* (2009) defined Web 2.0 technologies as not an update to any technical specifications but changes in the software utilization of Web; it refers to Web development and design that facilitates interactivity, communication, information sharing, cooperation and collaboration on World Wide Web (p. 10).

Looking at Web 2.0 from another perspective, Dohn (2008) argued that Web 2.0 is a set of activities or practices that involve the following components:

- collaboration and/or distributed authorship;
- active, open-access, ‘bottom-up’ participation and interactive multi-way communication;

- continuous production, reproduction, and transformation of material in use and reuse across contexts;
- openness of content, renunciation of copyright, distributed ownership;
- taking place on the WWW, or to a large extent utilising web-mediated resources and activities (p.111).

For this study, Franklin and Harmelen's Web 2.0 definition is adopted

Web 2.0 encompasses a variety of different meanings that include an increased emphasis on user generated content, data and content sharing and collaborative effort, together with the use of various kinds of social software, new ways of interacting with web-based applications, and the use of the web as a platform for generating, re-purposing and consuming content (Franklin and van Harmelen, 2007, p.4).

Web 2.0 tools include collaborative publishing sites such as wikis, blogs; relationship management systems such as, Facebook, MySpace and Bebo; social bookmarking sites includes Furl, Del.icio.us, and photo sharing sites: Youtube, Flickr and Photobucket; multiplayer gaming environments such as EverQuest, and SecondLife (Trinder *et al*, 2008).

However, technologies are increasing at a faster rate and its influence is obvious in many venues (Alexander, 2006).

### **2.3 Web 2.0 Tools in Higher Education (HE) Context**

Web 2.0 has been popularised in the educational sector in the recent years. Reasons for its incorporation into teaching and learning practice and the students' experiences of its use are presented in this section of the thesis.

### **2.3.1 Why Use Web 2.0 Tools in Higher Education?**

A vivid example of the venues where Web 2.0 is popular is educational sector. Though, the usage of Web 2.0 in education context is a new phenomenon (Virkus, 2008) previous studies have shown that their implementations in education, especially in higher education sector, are on the increase (Owen *et al*, 2006; Franklin and Harmelen, 2007; Grosseck, 2009).

There are many reasons for this exponential implementation of Web 2.0 tools in higher education sector, such as, its reflective potentials to provoke possible change in HE sector. The potentials include permission of greater student independence and autonomy, greater collaboration, and increased pedagogic efficiency as enumerated by Franklin and Harmelen (2007).

Another reason for the exploration of Web 2.0 technologies in education context was the assumption that net generation students mostly embrace and use Web 2.0 tools successfully (Prensky, 2001; Conole, Laat, Dillon and Darby, 2006; Jones and Lea, 2008; Trinder *et al*, 2008). Dohn (2009) affirmed that students were already voluntary users of Web 2.0 conversely, Kennedy *et al*, (2007) found that the net generation students are not big users of Web 2.0 technologies.

In addition, it is presumed that students were already equipped with collaborative skills through the user-participatory activities of Web 2.0 tools, and that such skills could be transferred to their individual and collaborative knowledge construction in formal learning situations (Dohn, 2009).

Besides, other driving factors are its usefulness as a means of motivation for distance learners. The use of these tools makes distance learners feel a sense of belonging and serves as media of collaboration with other co-distance learner(s) (Anderson, 2007). Its benefits, such as, ease of use, amazing information sharing and ease of collaboration (Boulos, Maramba and Wheeler, 2006) and its support for social constructivist theory of learning (Aharony, 2008; Collis and Moonen, 2008; Virkus, 2008) are pointed out by several authors.

De Byl and Taylor (2007 as cited by Huijser, 2008) recognized three broad educational opportunities of Web 2.0 that are linked to support social constructivism learning. These tools could allow students to take control of their own learning, that is, learning at their own individual pace. They could provide students with authentic learning activities and spaces because with Web 2.0 tools learning is beyond classroom context and they could use these tools anywhere. Finally, they stimulate learning conversations and collaborative learning.

Minocha (2009) described the ways social software tools supports learning as follows:

- sharing of resources like bookmarks and photographs;
- collaborative learning;
- problem-based and inquiring-based learning;
- reflective learning;
- peer-to-peer learning.

Minocha ((2009) also identified that the use of Web 2.0 in higher education has the potential to inculcate transferable skills of team working, negotiation and communication, group reflection, and online collaboration.

Virkus (2008) highlighted the benefits of Web 2.0 tools in education as follows:

- It helps to overcome routine and repetitive tasks;
- It offers new and innovative modes of learning (multiple modes of interaction – (a)synchronous, differentiated content, interactive learning materials);
- It offers flexibility (time, place, pace); and
- It offers teachers opportunities to spend more time on the creation of lessons in a
- new and challenging way (p.272).

Similarly, Grosseck (2009, p.3) underscored some of the advantages of using Web 2.0 tools in higher education, such as:

- sharing accumulated experiences;
- possibility to control access to resources by authenticating users;
- easier and faster access to information, when and where it is needed;

- redistribution of effort, so that less and less time and energy are spent during search and information management;
- creating digital content;
- extensive opportunities of information and collaboration.

As a result of the above mentioned potentials among others, some HE institutions and university libraries in the United State of America, (Cochrane, 2008; Burhanna, Seeholzer and Salem, 2009), Europe (Sharpe, et al, 2005; Conole, *et al*, 2006; Franklin and Harmelen, 2007; Virkus, 2008), Australia and New Zealand (Kennedy *et al*, 2007) have explored possibilities of Web 2.0 technologies while others are in the process of its exploration (Aharony, 2008; Srivastava, 2009). For instance, Franklin and Harmelen (2007) reported the implementation of Web 2.0 technologies in Warwick University (2004), University of Leeds (2005), University of Brighton (2006), and University of Edinburgh, while, Virkus (2008) reported the use of Web 2.0 tools in the Institute of Information Studies at Tallinn University, Estonia. Kennedy *et al*, (2007) reported that of University of Melbourne, University of Wollongong and Charles Sturt University, just to mention a few.

The foregone paragraphs shed lights on some of the reasons for the implementation of Web 2.0 tools in HE. The next section gives examples of how the Web 2.0 tools have been used by HE students.

### **2.3.2 The Use of Web 2.0 Tools by Higher Education Students**

The preceding section has confirmed that HE sector use Web 2.0 tools because of its advantages or benefits to learning and teaching in general. This section presents what Web 2.0 tools are used for, which of them are used and how they are used by HE students.

#### **2.3.2.1 What are Web 2.0 Tools Used for?**

There are two main purposes for the usage of Web 2.0 tools by the students of HE. The use is blended in the sense that these tools are used for both personal purposes and educational purposes (Jones and Lea, 2008).

For personal purposes - students use Web 2.0 for communication with their fellow peers, and relatives; to find information on any personal interest and as travelling and entertainment tools (Kvavik and Caruso, 2005; Conole *et al*, 2006; Kennedy *et al* 2007; Jones and Lea, 2008; Trinder *et al*, 2008). Conole *et al*, 2006 found that personal purposes are the notable usage of Web 2.0 tools by HE students.

Furthermore, the second purpose for the use of Web 2.0 by HE students is for education or learning purposes. Alexander (2006) submitted that students of HE used Web 2.0 tools for education purposes such as collaboration between students and teachers and/or among students themselves. Many of the studies reviewed confirmed the use of Web 2.0 tools for education purposes: for example Kvavik and Caruso (2005), Conole *et al*, (2006), Bawden *et al*, (2007), Franklin and Hermelen (2007), Kennedy *et al*, (2007), and Glass (2008).

### **2.3.2.2 Which of Web 2.0 Tools are Used and How are They Used?**

Several authors have written extensively about the use of Web 2.0 tools in HE (Alexander, 2006; Anderson, 2007, Bryant, 2007, Franklin and Harmelen, 2007). Some of the Web 2.0 tools, such as, Blogs, Wikis, Social bookmarkings, Multimedia sharing tools, and Really Simple Syndication (RSS) are discussed in this section.

#### **2.3.2.2.1 Blogs**

Blog is one of the common Web 2.0 tools used in HE for building mass knowledge by individual or group of students, for course announcement, news and feedback by both students and teachers (Franklin and Harmelen, 2007). A blog was coined by John Barger in 1997. It is a simple webpage which consist of a brief opinion, information, or reflection. It is personal diary entries which are arranged chronologically with the most recent first. It permits visitors to add comment, hence, Yochia Benkler, a university law professor calls it a “weighted conversation” between the primary author and a group of secondary contributors. Blogs software aid syndication and each entry is called post and it is usually tagged (Anderson, 2007).

Bryant (2007) asserted that blogs are valued because of its conversational, sense-making and social networking characteristics. In addition, Alexander (2006) described blogs as motivating factors for students of HE, when their writings could be read by thousands of people on their blog instead of a handful of their peer students.

Franklin and Harmelen (2007, p.5) listed the educational uses of blogs as follows:

- A group of bloggers using their individual blogs can build up a corpus of interrelated knowledge via posts and comments. This might be a group of learners in a class, encouraged and facilitated by a teacher, or a group of relatively dedicated life-long learners.
- Teachers can use a blog for course announcements, news and feedback to students.
- Blogs can be used with syndication technologies to enable groups of learners and teachers to easily keep track of new posts.

Other studies confirmed that blogs are used as reflective practices in HE sector (Sharpe, *et al*, 2005; Aharony, 2009; Minocha, 2009) and the most valued tool for collaborative work by students (Sharpe, *et al*, 2005; Bawden *et al*, 2007; Cochrane, 2008; Glass, 2008).

#### **2.3.2.2 Wikis**

Wiki is another Web 2.0 tools that is popular in education sector. Wiki is a web page or set of web pages that can be easily edited by anyone who is allowed access. It is an open access and flexible collaborative tool which allow co-production. Wiki has history function in the sense that the previous version can be accessed and restored (Anderson, 2007). It is used for collaborative group building of body of knowledge, creating and editing content, for annotated reading lists, class projects, scaffolding for writing and for feedback (Sharpe *et al*, 2005; Anderson, 2007; Bryant, 2007; Kennedy *et al*, 2007; Minocha, 2009). Some of its educational uses according to Franklin and Harmelen (2007) are:

- for the creation of annotated reading lists by one or more teachers (see also social bookmarking below, for an alternative method for doing this).

- for class projects, and are particularly suited to the incremental accretion of knowledge by a group, or production of collaboratively edited material, including material documenting group projects.
- by teachers to supply scaffolding for writing activities – thus in a group project a teacher can supply page structure, hints as to desirable content, and then provide feedback on student generated content.
- Students can flag areas of the Wiki that need attention, and provide feedback on each other's writing (p.5).

However, Wikis' openness and flexibility has generated a lot of debate in the educational context because of its vulnerability to vandalism and low quality content (Anderson, 2007; Bryant, 2007).

### **2.3.2.2.3 Social Bookmarking and Tagging**

Another common and useful Web 2.0 tool in HE is social bookmarking. It permits users to create lists of bookmarks or favourites or web pages, tag (describe) it, store centrally on a remote service and share with other users. A tag is a keyword that is added to a digital object (Anderson, 2007). The most popular social book marking site is Del.icio.us website by Joshua Schacter (Anderson, 2007). Alexander (2006) noted that social bookmarking tools, such as, Del.icio.us are multi-authored bookmark pages for team projects and for collection and sharing of resources among group of students with similar research or professional interest. He describes it as "outboard memory", a good and useful tool for both personal and professional inquires (p.36). Bryant (2007) refers to it as an extremely easy and effective way of sharing and filtering information.

### **2.3.2.2.4 Multimedia Sharing Tools**

Multimedia sharing tools support storage and sharing of multimedia content; for example, Youtube (video), Flickr (photographs) and Odeo (podcasts). Others in this category are Slideshare (presentations), DeviantArt (art work) and Scribd (documents). Scribd offers choice of uploading and downloading documents in diverse formats (Franklin and Harmelen, 2007). Users consume and contribute to the production of the content (Anderson, 2007).

These media sharing services are used for sharing of education resources, annotations of images, commenting and critiquing of peers work and to record lectures for individual students to listen and catch up at his or her own speed (Anderson, 2007; Franklin and Harmelen, 2007; Minocha, 2009).

#### **2.3.2.2.5 Social Networking Tools**

Social networking applications are tools that facilitate networking of people for diverse purposes. Most popular ones are Facebook and MySpace (social networking) and LinkedIn (professional networking). The distinguished features of social networking tools are that they enable the users to describe themselves, their interest and signify who one's friends are. Social networking tools are used by HE students for educational purposes such as to seek information on any issue of interest, for community learning and spreading of information and knowledge (Franklin and Harmelen, 2007).

#### **2.3.2.2.6 Really Simple Syndication (RSS)**

Anderson (2007) described RSS as family of formats that allows users to find update to RSS-enabled content like website blogs or podcasts without visiting the site. The process of this updating is called syndication. Some of its educational uses according to Franklin and Harmelen (2007) are:

- In a group project where a wiki is being developed collaboratively RSS feeds can be used to keep all members of the group up to date with changes as they can be automatically notified of changes as they are made. Similarly for new blog posts made by class members.
- Feed Readers enable students and teachers to become aware of new blog posts in educational blogging scenarios to track the use of tags in social bookmarking systems, to keep track of new shared media, and to be aware of current news (p.7).

The next section presents empirical studies on the use of Web 2.0 tools in HE with the focus on students usage of these tools.

### **2.3.3 Studies on the Use of Web 2.0 Tools in Higher Education**

Empirical studies on the use of Web 2.0 tools or use of technologies in HE were reviewed. The studies represented some geographical contexts, for instance, Kvavik and Caruso (2005) American context, Conole *et al*, (2006), Trinder *et al*, (2008) and Minocha (2009) European contexts, Kennedy *et al*, (2007) Australian context.

Kvavik and Caruso (2005) under the auspices of EDUCAUSE surveyed 4,374 students from thirteen Universities in the United States with the aim to know the kinds of technologies that HE students use, their preferences and the level of their skills. They found that students used those technologies for varied purposes such as communication, pleasure, games and educational purposes. They asserted that 41.2% of students preferred moderate use of technology in the classroom while 30.8% of students preferred extensive use of technology in the classroom.

Another important issue was the gender difference in the preference of use. Kvavik and Caruso (2005) submitted that men spent more time for playing games, surfing the net and downloading music while women spent more time communicating with their friends. Furthermore, they found that the students over rated themselves on their competency, they proved to have the needed skills like basic office suite applications but they lacked in-depth application knowledge or problem solving skills. They claimed that the discipline/field predicted the type of skills or competency of the students; for instance, business students were skilled in presentation and spreadsheet applications while arts students were skilled in graphics applications.

They concluded that though it was a general assumption that students saw information technologies as tools; they used these tools because of convenience, time saving but with mixed feelings (Kvavik and Caruso, 2005).

Conole *et al*, (2006) conducted a case study in the United Kingdom funded by JISC. They used mixed methods; an online survey, interviews and audio log to investigate students'

experiences of technologies. The study discovered that students used technologies to find and synthesize information, for communication with fellow peers and tutors, personal individual needs such as for travelling and entertainment. They also used technologies for official course or as institutional tools and resources.

Conole *et al*, (2006) found that students used specific tools for specific tasks. Students claimed that they used the tools because they were comfortable, easy to use, fast, effective, efficient, multi-functional and accessible. It was evident from this study that there were changes in the way students worked among themselves and with the tools. Conole *et al*, (2006) submitted eight emerged factors on changing manner of the way students worked: “pervasive and integrated”, “personalized”, “social”, “interactive”, “changing skill sets”, “transferability”, “time” and “changing working patterns” (p. 5). However, it was noted that students lack skills to be able to select appropriate information, manipulate and use the information, and to manage and archive it for future use.

The findings of Conole *et al*, (2006) were consistent with Kvavik and Caruso (2005) even though these were in different contexts and different methodologies were used. Also, unlike Kvavik and Caruso, the issue of gender was not considered in the study of Conole *et al*.

Kennedy *et al*, (2007) in a cross-institutional survey of 2588 first year students from three universities (University of Melbourne, University of Wollongong and Charles Sturt University in Australia) examined the characteristics of the Net generation especially with regards to their preference and use of Web 2.0 technologies. The study found that students used 41 different Web 2.0 tools in learning and personal lives with a greater diversity in frequency of use than many commentators had suggested. The use of collaborative and self-publishing Web 2.0 technologies associated with this generation was quite low. Conclusively, they asserted that the Net generation students were not big users of Web 2.0 technology. This concurred with the findings of Kvavik and Caruso (2005) that students’ preferred moderate use of technology.

In Scotland, Trinder *et al*, (2008) employed mixed methodology to examine ways in which students used e-tools and how those tools could be harnessed to support the formal learning activities in HE. They surveyed 160 students from two Scottish universities, and two disciplines; engineering students and social work students. In addition to the survey, 8 students from the two subject areas and 8 members of staff were interviewed.

Trinder *et al*, (2008) found that students used Web 2.0 tools for informal communication, information gathering and content sharing. Besides, they used the institutional technologies and learning environments, but their ability to use the power of social networking tools and informal processes for their learning was low. It was also revealed that subject differences determine the focus of students' use of technology. Engineering students focus was on reliability and interoperability issues while social work students' focus was on communication and professional needs.

Similarly, a case study methodology was employed to analyze 26 initiatives from United Kingdom by Minocha (2009) on the effective use of social software by further and HE. Students and educators were interviewed on how social software could support learning. Minocha found the following uses of Web 2.0 tools by the students to:

- support a variety of ways of learning: sharing of resources such as bookmarks and photographs; collaborative learning; problem-based and inquiry-based learning, reflective learning and peer-to-peer learning;
- enhance students' sense of community sharing and collaboration;
- gain transferable skills of team working; online collaboration, negotiation and communication, individual and group reflection and managing digital identities (p.356).

However, in some institutions students were not sure of how to use some of these tools, a particular reference was made to blog. Conclusively she noted that students needed skills to guide them on the issues of copyright and licensing and privacy and ethical issues (Minocha, 2009).

The above reviewed studies were on the use of Web 2.0 tools in HE in general. From the studies it was revealed that students used Web 2.0 tools for varied purposes; personal and educational, but moderately used for educational purposes. Gender and field of specialization influenced students' preference of use of Web 2.0 tools and lastly, students overrated their level of skills but lack the required skills to evaluate and manage information accessed from Web 2.0 tools. The next section presents studies that are on Web 2.0 tools in LIS subject area.

## **2.4 Web 2.0 Tools in Library and Information Science (LIS) Education**

Having considered the experience of Web 2.0 tools in HE, this section presents the studies that are in LIS field which is the context of the current study. The ever changing information platform of the 21<sup>st</sup> century, as a result of rapid innovation in technologies, social and cultural factors has brought inherent changes to LIS profession in general. Librarians and LIS students are in constant self development to be relevant to market demands (Aharony, 2008; Srivastava, 2009).

This changing information landscape has transformed information processes, use and users' behaviour which made librarianship profession to embrace Web 2.0 technologies in its activities and services (Chawner, 2008; Lihn, 2008). Its implication brought about the phrase "Library 2.0" in 2005 by Michael Casey. Library 2.0 is the incorporation of Web 2.0 technologies into library whereby users are involved through interactive and collaborative activities such as tagging, contributing comments and rating different library items. Notess (2006) as cited in Aharony (2008) described library 2.0 as incorporation of Blogs, Wikis, instant messaging, RSS and social networking into library services.

Library 2.0, therefore, implies that library practices are changing and subsequent changes are inevitable in LIS education and the profession. The LIS traditional knowledge and skills are not adequate or appropriate to serve the 21<sup>st</sup> generation library users. Therefore, inclusion of Web 2.0 courses in the LIS education is obvious and in the recent years some notable LIS researchers had done studies on it; for example, inclusion of Web 2.0 course in LIS curricula

(Bawden *et al*, 2007; Aharony, 2008; Glass, 2008; Srivastava, 2009), use of Web 2.0 in LIS education (Virkus, 2008), LIS students perceptions and attitudes towards Web 2.0 (Aharony, 2009) and the LIS masters students perceptions of Web 2.0 (Al-Daihani, 2010).

#### **2.4.1 Studies on the Use of Web 2.0 Tools in LIS Education**

Some empirical studies have been carried out on the use of Web 2.0 tools in LIS education. These studies illustrate developments in different regions, for example, Bawden *et al*, (2007) in Europe and Australia, Glass (2008), Virkus (2008) and Aharony, (2009) in Europe; Aharony (2008) in United States; Srivastava, (2008) in India and Al-Daihani, (2010) in both Arab Emirate and the United States. However, the incorporation of Web 2.0 tools could be viewed from two perspectives; either as a means of learning and teaching and/or as topics of study in the curriculum.

Bawden *et al*, (2007) conducted analysis of five case studies of LIS schools in Europe and Australia (Dublin, London, Ljubljana, Sydney and Vilnius). They employed thematic analysis to examine the impact of the communication and social networking features of Web 2.0 on LIS curricula in response to the changing information market of the 21<sup>st</sup> century and beyond with particular focus on the changes in the curriculum content and the methods of teaching and learning. Bawden *et al*, (2007) described the process of inclusion of Web 2.0 tools in curriculum in these five case studies as ‘incremental approaches’ because Web 2.0 tools were numerous. It means that at every level of LIS programme in these five case studies Web 2.0 tools were included as modules in the curricula.

Furthermore, it was discovered that the five LIS schools used Web 2.0 tools as method of teaching and learning. Conclusively, they submitted that inclusion of Web 2.0 into LIS education could bring insight into the academic and professional use of the tools; and increase the credibility of LIS teaching. However, Bawden *et al* cautioned that these tools should be carefully introduced from the perspective of the students and academic staff. Importantly, students’ expectations and preference should be considerately managed (Bawden *et al*, 2007).

A case study of the Information and Communication Department of the Manchester Metropolitan University in United Kingdom by Glass (2008), reported that the department incorporated Web 2.0 tools namely Blogs, Wikis, Second life, Facebook in the curriculum. Each of the Web 2.0 tools was taught in the modules at different level both at undergraduate and postgraduate programmes and they were made compulsory. Glass affirmed that the essence of the compulsion of the Web 2.0 modules was to prepare the students for the future career in the information world. Blogs were used to develop students reflection and employability skills, Wikis for collaboration and assessed presentations in student seminars, Secondlife to facilitate community for students undertaking an online community information course, Facebook to create a graduate contact site and finally to create a community network for UK LIS students.

Overall, students reacted positively and it has contributed immensely to their experiences and a better sense of community and involvement. From the study it was obvious that students were enthusiastic and found Web 2.0 tools enjoyable and useful but needed technical skills to use Web 2.0 effectively (Glass, 2008).

In a case study of the use of Web 2.0 in LIS education, Virkus (2008) described the experiences of the Institute of Information Studies in Tallinn University, Estonia. She claimed that Web 2.0 is useful for LIS education because it supports constructivist approaches to learning and its inherent potential to socialise online learning is greater than ever imagined. Its implementation in the Institute of Information Studies of Tallinn University has been a huge success because it transformed teaching and learning, provided new alternative delivery modes, and helped to reach new target groups. She, therefore, recommended that LIS educators should implement Web 2.0 considering the pedagogical perspectives and the learning preferences of digital natives and digital immigrants.

Considering the three different case studies (Bawden *et al*, 2007; Glass, 2008; and Virkus, 2008), Web 2.0 tools were used as methods of teaching and learning in the LIS schools.

However, only two case studies (Bawden *et al*, 2007; Glass, 2008) reported that Web 2.0 was included as courses in the curricula.

A survey of 59 accredited LIS schools in the United States (US) was conducted by Aharony (2008) to examine US LIS schools' situation and to determine the degree of adoption of courses on Web 2.0. She described the situation of many US LIS schools as not adequately prepared because the importance of Web 2.0 tools has not been internalized by LIS programme planners. However, Aharony emphasised the importance of Web 2.0 tools in LIS profession that "there is no doubt that the present students who are librarians or information professional of the future should know, master, and apply Web 2.0 principles and applications and be able to convey them to their users" they should practice and experience the new applications in order to assimilate them into their professional lives (p.3).

Aharony (2008) submitted that the expansion of the curriculum and integration of Web 2.0 courses might improve the image and status of LIS programmes in comparison with other programmes. She recommended the inclusion of Web 2.0 courses into LIS curricula to sufficiently train LIS graduates with the theoretical and practical competencies and skills required in the market place. She noted that Web 2.0 supports constructivist approaches to learning; this is in line with Virkus (2008).

To verify the changing information landscape as a result of Web 2.0 and its attendant competencies to effectively work as information professional in Library 2.0 Srivastava (2009) surveyed 15 librarians in Mumbai, India. The study aimed to find out the extent of application of Web 2.0 tools in libraries and the feasibility of inclusion of the Web 2.0 in LIS syllabi. The impetus for her study was that Web 2.0 applications are being entrenched into library services and is thus constantly reshaping the ways users search, find, access and use information. This however, has a direct impact on the librarians and LIS students: librarians are now eagerly updating themselves to keep pace with the changes, hence, the need for current LIS students/graduates to be equipped with the necessary skills to meet the challenges of the growing market demands. The results highlighted that librarians are conscious of the hidden

potentials of Web 2.0 tools; they supported the inclusion of Web 2.0 on LIS curriculum with emphasis on teaching the LIS students on basic concepts and practical skills.

However, they were unenthusiastic about using the resources because of “authenticity of the content and copyright issues” this might be responsible for their reluctance to develop Web 2.0 services in their libraries. She noted that LIS courses were falling short of practical skills then recommends that LIS teachers should train the future librarians on the needed skills to be able to successfully compete with various skilled professionals like computer scientists (Aharony, 2008).

In connection with the current research context only two studies have been found that explored the perceptions of LIS students of the use of Web 2.0 tools. Aharony (2009), as a follow up to her previous study, surveyed 148 LIS students in Israel to examine (1) if the LIS students are familiar with technological changes and innovations; (2) whether they make use of the different Web 2.0 applications; (3) whether personality characteristics, learning facilitators affect their use of Web 2.0 applications, and (4) whether there is difference in usage of Web 2.0 by university students and professional LIS academic college students. The students were from three different LIS programmes; two universities LIS schools and one professional academic school of information science. Out of 148 students 89 of them were from two universities while 59 were from the professional LIS academic college.

Aharony (2009) found that:

- commonly used Web tools by LIS students were Wiki, Blogs, social network sites, Flickr and RSS;
- personality characteristics and learning facilitators influenced LIS students’ perceptions towards Web 2.0 use;
- the more deep learners the students were the higher was the importance they would attribute to Web 2.0 applications, and the higher their Web 2.0 use;
- there were differences in use of Web 2.0 of university students and professional academic college students. The latter were more deep learners and less surface

learners, more challenged, more motivated and used Web 2.0 more than the former;

- the older students are more motivated to learn about Web 2.0 tools; this finding was contradictory to Prensky's (2001) claim;
- a moderate tendency of LIS students to use Web 2.0 applications occurred; this is associated to the findings of Kvavik and Caruso (2005) and Kennedy *et al*, (2007).

Similarly, a study by Al-Daihani (2010) used a Web-based survey method to investigate the perceptions of 132 masters of library and information science (MLIS) students of Kuwait University (KU) and University of Wisconsin Milwaukee (USA). The goals of the study were (1) to investigate the online activities of MLIS students; (2) to identify the social software used by MLIS students; (3) to explore information-sharing patterns of MLIS students on social software; (4) to explore their views on the use of social software applications in education; and (5) to determine the obstacles to their use of social software (Al-Daihani, 2010, p.120). Al-Daihani claimed that MLIS students' perceptions of the social software applications in education were high. A greater number of them were aware of the tools but claimed to use them moderately which agrees with the previous studies, Kvavik and Caruso (2005), Kennedy *et al*, (2007) and Aharony (2009). Another crucial issue from the findings which was related to the earlier studies was that LIS students need training to acquire needed skills for optimal use of Web 2.0 tools (Bawden *et al*, 2007; Glass, 2008; Aharony, 2008; Srivastava, 2009).

From the literature reviewed on the implementation of Web 2.0 tools in education, the most common findings emphasized some crucial issues to be considered in implementing Web 2.0 in LIS education, that is, the issue of students' preferences and expectations of Web 2.0 tools (Bawden, *et al*, 2007; Virkus, 2008) and the needed competencies or skills to maximally utilise Web 2.0 potentials (Bawden *et al*, 2007; Glass, 2008; Aharony, 2008; Srivastava, 2009; Al-Daihani, 2010).

Thus, the literature reviewed highlighted the need to examine students' preferences and expectations of Web 2.0 tools which is the area of interest of this Thesis.

## 2.5 Required Skills to Use Web 2.0 Tools

It has been repeatedly emphasised that the use of Web 2.0 tools within the HE sector has brought a great challenge with it, that is, the issue of appropriate skills to effectively use it (Kvavik and Caruso, 2005; Conole *et al*, 2006; Glass, 2008; Al-Daihani, 2010). Also, revolutionary changes in finding and processing of information in the 21<sup>st</sup> century through the collaborative and interactive nature of the Web 2.0 has brought the need to be equipped with new skills (Anderson-Inman, 2009; Godwin, 2009).

Dohn (2009) claimed that the use of Web 2.0 tools place both explicit and implicit competence demand on the students, while Godwin (2009) submitted that information overload induced by the use of Web 2.0 tools had made it pretty difficult for the students to search and evaluate information effectively. Anderson-Inman (2009) argued that the literacy skills required to be successful students, citizens and employees in the 21<sup>st</sup> century have dramatically changed from what it was before the invention of internet.

The multimedia nature of the information landscape has made changes in the literacy skills in the 21<sup>st</sup> century and it is important to review some of the multimedia features of Web 2.0 content. Anderson-Inman (2009) divided the digital text features into six categories:

- **Modifiable:** The digital text could be modified unlike the print text that is static. It could be changed in appearance, extended, altered and deleted. Insertion of new content could be made on the old one by the creator and or the user which made it difficult to distinguish between the reader and the author.
- **Enhanceable:** Digital text has the capability to be enhanced with various forms of media, with images and other variety of media which make it multimedia in nature.
- **Programmable:** It is processed or structured in certain way that is programmable under some conditions and which make it responsive to input and output. Modification of structure is possible to suit the user.
- **Linkable:** The linkable feature is possible because it resides on computers and servers instead of paper in print context. This made it conformable for convergence of information across boundaries.

- Searchable: Through search engines by using of key words and specific search strategies digital texts are searchable.
- Collapsible: It is collapsible in the fact that it is not permanently on, it could be hidden from view until when it is needed, such as pull down menus and mouse-over pop ups.
- Collaborative: It allows online chat, instant messaging, threaded discussions, blogs and other collaborative tools.

Considering the above listed features of Web based interactivensess and collaborative nature of online information, it is imperative to say that the traditional literacy skills cannot be adequate or appropriate for the use of the dynamically changing Web 2.0 technologies.

The appropriate literacy skills needed to use Web 2. 0 tools have been referred to as “silicon literacies” or “novel literacy skills” which New Media Consortium defines as “the set of abilities and skills where aural, visual and digital literacy overlap. These include the ability to:

- understand the power of images and sounds,
- recognise and use that power,
- manipulate and transform digital media,
- distribute them pervasively, and
- easily adapt to new forms” (New Media Consortium as cited by Anderson-Inman, 2009, p.124).

The aforementioned characteristics of Web 2.0 tools demand some specified skills on the part of the users. The literature reviewed in this study asserted that students needed appropriated skills to use Web 2.0 tools, though; it was generally assumed that today’s “Net generation” students were comfortable with Web 2.0 tools (Prensky, 2001).

Kvavik and Caruso (2005) reported that students proved to have the needed skills especially in basic office suite but they lacked knowledge and skills in in-depth applications. Four years later, Godwin (2009) noted that technical ability of “Net generation” or “Google generation”

was easily overstated and their information literacy, IT and communication skills were not better than those so called “Baby boomers”.

### **2.5.1 Type of Skills**

Having confirmed that students need to develop some skills to use Web 2.0 tools, the next section will present the skills needed to use Web 2.0 tools on the basis of the reviewed literature.

#### **2.5.1.1 Information Literacy (IL) Skills**

The phrase ‘Information literacy’ was first used in the 1970s by Paul Zurkowski and since then, it has been severally defined. For this study the definition of American Library Association (ALA) is adopted. According to ALA information literate person is a person that is able to:

- recognise a need for information;
- identify what information would address a particular problem;
- find the needed information;
- evaluate the information found;
- organise the information;
- use the information effectively in addressing the specific problem (Bawden, 2001, p.234).

From the above definition, information literacy includes competencies to be able to recognise the need, access, find, evaluate, organise and use information, no matter the medium or channel of information that is involved. Information literacy seems to cut across both print and digital media. These sets of skills have been identified as required skills for the use of Web 2.0 tools by a quite number of the literature (Kvavik and Caruso, 2005; Conole *et al*, 2006). Thus, there is a need for the development of information literacy skills.

#### **2.5.1.2 Digital/Information Technology (IT) Skills**

Apart from information literacy, digital/IT skills are another crucial competencies needed by HE students to use Web 2.0 tools effectively. Bawden (2001) named four main digital

literacy competencies that are needed in our networked society: internet searching; hypertextual navigation; and content evaluation. The previous studies mentioned some needed skills, such as technical competencies, internet skills, IT skills, soft skills and digital skills (Kvavik and Casuro, 2005; Conole *et al*, 2006, Glass, 2008; JISC, 2009). JISC (2009) report on HE in a Web 2.0 world grouped the needed skills for Web 2.0 as ‘soft skills’ consisting of networking, teamwork, collaboration and self direction skills. Glass (2008) also found that students needed the technical competencies to use Web 2.0 tools effectively (See Appendix1: Table of summary of reviewed literature).

## **2.6 Key Challenges of the Use of Web 2.0 in Higher Education**

Apart from the challenge of required skills to use Web 2.0 tools, it is pertinent to mention some key challenges of Web 2.0 tools. A typical challenge is what Dohn (2009) described as conceptual tensions between inherent epistemology of Web 2.0 practices and the educational system. Dohn claimed that in educational system the issue of copy and paste without referencing is a grave offence but in Web 2.0 practice users could copy and paste from Wikipedia article without referencing it and this is legitimate.

Other key challenges were highlighted by Franklin and Harmelen (2007) as issues of accessibility, visibility and privacy, data ownership, intellectual property right (IPR) and copyright for material created and modified by university members and external contributors, control over content, longevity of data, preservation, information literacy, staff and student training, and appropriate teaching and assessment methods.

These challenges could hinder the effective use of Web 2.0 tools by HE students, and such, require urgent attention to minimise its consequences.

## **2.7 Methods Used to Study the Use of Web 2.0 Tools**

In considering the use of Web 2.0 tools in HE in general and LIS education in particular, a number of methods have been used by the researchers. The most prominent is a survey method; Kvavik and Caruso (2005), Kennedy *et al* (2007), Aharony (2008), Aharony (2009), Srivastava (2009) and Al-Daihani (2010) have used surveys to explore the use of Web 2.0 tools.

Another research approach used is a case study. In case study research, efforts were made to present what have been done in the different cases analyzed. Examples of such were Bawden *et al*, (2007), Franklin and Hermelen (2007), Glass (2008), Virkus (2008) and Minocha (2009). Only two studies employed mixed methods, that is, the combination of survey, interview and content analysis. They were Conole *et al*, (2006), and Trinder *et al*, (2008), while, Anderson (2007) used debate (conference attendees) for his study.

None of the studies reviewed in this study employed phenomenography approach which is the approach for the current study (as shown in Appendix1: Table of summary of reviewed literature) .

## **2.8 Conclusion**

This chapter reviewed some relevant literature on Web 2.0 tools, its implementation in HE sector, students' experiences of the use of Web 2.0 tools, its importance in relation to library and information science education and profession and lastly the required literacy skills to maximize its usage. The review identified the worthy research issues for this research but the review cannot claim to be exhaustive because of time constraint.

### **3.0 CHAPTER THREE: METHODOLOGY**

This chapter describes the methodology used in this research with due justification for the choices made. It comprises research paradigm, research design, research approach, sample and sampling techniques, method of data collection, data collection instrument, interview protocol, pilot study and data analysis methods.

#### **3.1 Research Paradigm: Interpretivism**

In information science like other social sciences disciplines there are three major research paradigms (Pickard, 2007). A paradigm as defined by Kuhn (1970) is “the entire constellation of beliefs, values, techniques and so on shared by members of a given (scientific) community” (as cited in Pickard, 2007, p.6). Therefore, paradigm consists of ‘ontology’, the nature of reality; ‘epistemology’ the philosophy of how we can know that reality; and ‘methodology’, the practice of how we come to know that reality (Pickard, 2007, p.5). The three major research paradigms are positivism, postpositivism and interpretivism. The three major paradigms are presented here according to Pickard (2007).

##### **3.1.1 Positivist Paradigm**

This paradigm was attributed to a French philosopher, Auguste Comte. Proponents of this paradigm adopt realist ontology; they believe in social reality that exists independently of those creating the reality (Pickard, 2007).

This paradigm follows epistemologically objectivist/dualist view; this means that the researcher and what is being observed are independent of each other and the relationship between the two is ‘objective observer’. Dualism occurs in the sense that the researcher and subject are two independent entities in the research process (Pickard, 2007).

The methodology for this paradigm is mostly experimental or manipulative, with quantitative approach and analysis of variables. The research focus for this paradigm is either for prediction or control or explanation to derive generalizations (Pickard, 2007).

### **3.1.2 Postpositivist Paradigm**

The ontology of postpositivism is critical realism. Postpositivists believe in the existence of social reality independently of any external being but with recognition that the reality is subject to uncertainty. Epistemologically – it can be described as modified objectivist/dualist view, meaning that the researcher is responsible for the interpretation of the discovery with objectivity. The objectivity is showed by external validity. Postpositivists employ modified experimental or manipulative methodology, with quantitative and/or qualitative approaches and variables analyzed. The research purpose for using this paradigm is either for prediction or control or explanation leading to generalizations (Pickard, 2007).

### **3.1.3 Interpretivist Paradigm**

The ontology of interpretivism is relativism. Interpretivists believe that there is no universal and multiple realities, and realities are constructed within the social context (Pickard, 2007).

Interpretivist epistemology is described as subjectivist/transactional. The researcher and the subject are dependent on each other and are both changed by the experience and knowledge as a result of interaction, time and context (Pickard, 2007, p.12). In short, the tenet of interpretivism is that people are involved in interpreting their changing world.

The methodology for this paradigm is usually empathetic interaction. The researcher interacts with the object of the research, then, reality is constructed and interpreted by the researcher. The approach usually is qualitative and the focus of research is to understand or reconstruct leading to transfer of findings (Pickard, 2007).

This paradigm is further categorized into two: empirical interpretivism, a human inquiry approach which examines natural social phenomena, while the second one, critical theory investigates ideologically oriented social structures (Pickard, 2007).

Having briefly explained these three major paradigms in social science research, it is important to know that this current research is based on interpretivism paradigm and empirical interpretivism in particular.

The research focused on different conceptions of the use of Web 2.0 tools by DILL students. The conception is as a result of their interactions or experiences of Web 2.0 tools.

### **3.2 Research Design: Qualitative Approach**

Research design has been defined by Creswell (2009, p. 3) as “plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis.” Creswell explained further that in social science research there are three distinct research designs: qualitative, quantitative and mixed methods. Creswell describes the distinction between qualitative and quantitative as representing different ends on a continuum (p.3). Historically, according to Creswell, quantitative research dominates social science disciplines in 19<sup>th</sup> century up till the mid 20<sup>th</sup> century and qualitative research was in vogue in the latter half of 20<sup>th</sup> century with the development of mixed methods.

Quantitative approach is used to test theories by studying the relationship among variables. It uses closed-ended questions and hypotheses and presents the results of the research in numbers and statistical figures. It is a deductive style; hence it uses a relatively large sample (Creswell, 2009).

While qualitative approach is a design that is used to investigate and understand the meaning individuals or group attribute to a social or human problem. It uses open-ended questions in qualitative interview questions and this approach presents the research results in words in a relatively flexible structure. It is an inductive style with small samples (Creswell, 2009).

The mixed methods combine the two approaches both in its data collection method and presentation of the results (Creswell, 2009).

The current research used a qualitative approach because it aimed to understand the meaning that group of DILL students attribute to Web 2.0 tools. In addition, the qualitative approach was used because the use of Web 2.0 tools in education context is relatively new phenomenon and little research has been done in this context, hence, the appropriate design was qualitative (Creswell, 2009).

### **3.3 Research Approach: Phenomenography**

In the empirical interpretivism research paradigm, there are many qualitative research approaches, they include, phenomenology, phenomenography, ethnography, action research and case study. Out of all these, phenomenography is unique in some ways and Alsop and Tompsett (2006) described the uniqueness in three distinctive ways:

- the presumed objectivity of data collection,
- the structure of outcome space as a hierarchy, and
- the characteristics of the hierarchy as a limit to the experience of any individual (p.244).

Marton (1994) defined phenomenography as “the empirical study of the differing ways in which people experience, perceive, apprehend, understand and conceptualise various phenomena in any aspects of the world around us” (p.4426). It seeks to describe the conceptions of any phenomenon by individuals to generate different variations in the way of experiencing it. Svensson (1997, p. 163) described it as ‘description of conceptions of the surrounding world’.

Phenomenographic approach brings out the holistic variation in experience, with simplicity and elegance descriptions of the experience of a phenomenon. Besides, the collective experience is focused and the structural relationships between the different ways of experiencing a phenomenon are shown (Akerlind, Bowden and Green, 2005).

Phenomenography, therefore, was chosen because the aim of this research was to acquire a deeper understanding of DILL students' conceptions of the use of Web 2.0 tools, their preferences and skills needed. The focus was on collective holistic variation in experience of DILL students and the structural relationship between the different ways of experiencing Web 2.0 tools.

For all the aforementioned intension of this research, phenomenography seemed to be the most appropriate to realise this goal. In addition, the researcher's employed the phenomenographic approach uniqueness to present the result of the study (Alsop and Tompsett, 2006).

### **3.3.1 Roots of Phenomenography**

This research approach was first used in Gotenborg University in the early 1970s to explore what it meant that some students were better learners than others and why it was so? Although, according to Hasselgren and Beach (1997), its first appearance was in 1954 in an article about phenomenology and existential analysis by Ulrich Sonneman.

The word phenomenography was coined from two Greek words "*phainomenon*" (appearance) and "*graphein*" (description) rendering phenomenography, a description of appearances (Hasselgren and Beach, 1997, p. 192).

The intent of Phenomenographic research is to identify multiple conceptions, or meanings that a particular group of people have for a particular phenomenon. Then, the researcher acts as a neutral foil for the ideas expressed by the participants of the study, that is, the research studies the subjects' awareness and reflection not his/her own (Orgill, 2002).

Phenomenography is different from phenomenology in the sense that phenomenography does not accept that it is possible to separate "that which is experienced from the experience per se" (Marton, 1981, p. 180) but phenomenology is concerned with understanding how a subjective perception of "essence" can be understood as distinct from particular experiences (Orgill, 2002). Secondly, phenomenology is limited to 'pre-reflective level of consciousness ... of the taken-for-granted world' (p.243), that is, what is at the thought level about phenomena

whereas phenomenography is both at the conceptual and the experiential levels, meaning, both at the thought and experience levels (Alsop and Tompsett, 2006).

### **3.3.2 Phenomenographic Research**

Phenomenographic research does not make assumptions about the nature of reality nor claim that the results represent truth but rather claims that the result is useful about the nature of conceptions. It claims that conceptions are the product of an interaction between humans and their experiences with their external world (Orgill, 2002).

The ontological assumptions are subjectivist: there is only one world, and that people experience and interpret it in different ways; and with a non-dualist viewpoint meaning that a person and phenomenon are inseparable. The two are connected in a relationship and that very relationship is what phenomenography aims to investigate (Marton and Booth, 1997).

Phenomenography is based on second order perspective, that is, a phenomenon is investigated through the experience of the research subjects not the researcher's, while the first order perspective is where the phenomenon is investigated through the experience of the researcher (Lupton, 2008). Thus, this study investigated conceptions of the use of Web 2.0 tools through the experience of the research subjects: DILL students, which invariably is the second order perspective.

### **3.3.3 Phenomenographic Approach in LIS**

Since the 1970s phenomenography has been used in various educational contexts, and LIS education is not an exception. In LIS field, there are substantial numbers of researchers who have used phenomenographic approach. Phenomenography is especially popular in information literacy research, which includes Bruce (1997) study of higher education administrators' conceptions of and experiences with information literacy, Limberg (1998)

research on the relation between information seeking and learning, Edwards (2005) study of the experiences of web-based information searching, Webber, Boon and Johnston (2005) study on UK academics conceptions of information literacy, Lupton (2008) research on information literacy and learning. Besides the information literacy studies, there are also studies on IT education, for example, Booth (1992) and Boamah (2009) research on Ghana LIS professionals' conceptions of digital libraries.

### **3.3.4 Potential Benefits of Phenomenographic Approach**

According to Entwistle (1997) there are some potential educational benefits of this research approach as listed below:

- It encourages students to develop conceptual understanding;
- It helps to reveal conditions that facilitate the transition from one way of thinking to a qualitatively better perception of reality;
- It will uncover different conceptions that students hold for a specific phenomenon (Entwistle, 1997). For instance, the current research will be useful to teachers who are developing ways of helping their students to experience or understand the use of Web 2.0 tools from students perspective;
- Lastly, it has the potential to make the students conscious of contradictions in their own reasoning and become more open to alternative ideas as they reflect on their perceptions and understandings of their world experiences (Entwistle, 1997).

## **3.4 Research Sampling Techniques**

The sample technique for this study is purposive, a non-probability technique, which is the common tradition in phenomenographic study (Webber and Johnston, 2005), in order to maximise variation (Akerlind, Bowden and Green, 2005).

According to Pickard (2007) there are two approaches to purposive sampling: a priori criteria sampling and snowball sampling. A priori criteria sampling is an approach whereby a sample framework is established before the sampling begins whereas, the snowball sampling is an approach where there is no prior criteria, the sample grows gradually in the sense that the researcher begins with key informants who would direct the researcher to another eligible participant.

A priori criteria sampling approach was used for this research as recommended for a first attempt qualitative researcher (Pickard, 2007).

### **3.4.1 Research Population: Digital Library Learning (DILL) Students**

The population for this study was Digital Library Learning students from sets 2 and 3. Digital Library Learning programme is an international master programme which is running among three European universities: Oslo University College, Norway; Tallinn University, Estonia and Parma University, Italy (<http://dill.hio.no/>). It is a programme that is sponsored by the European Union under the auspices of Erasmus Mundus. Each year students are admitted from all across the globe. The first set of the DILL students graduated last year (2009) while the second set is running their last semester to be completed in June 2010 and the third set is in their second semester.

### **3.4.2 Research Sample**

The sample for this study was twelve (12) DILL students, and made up of six males and six females, to ensure equal representation of gender perspectives. The small size of the sample in this study is in line with phenomenographic research tradition (Akerlind, Bowden and Green, 2005). Intentionally, the subjects were chosen from two continents, Africa and Asia, nine countries in all, because the two continents had a large number of students in the two DILL sets population. Besides, there may be likelihood of a predisposition to use Web 2.0 tools

because of the digital nature of the subject matter of DILL. Additionally, all DILL students were away from home, and therefore physically distant from their social networks, and the programme itself is geographically dispersed; not only had the students moved around but in the final stage the students is split between three locations (Norway, Estonia and Italy). These factors indicate that there is a need to communicate with family, friends and colleagues who are living elsewhere and therefore great motivation to use web 2.0 tools for communication.

This regional diversity was an addition to other key indicators of variation, such as, age, experience and gender (Akerlind, Bowden and Green, 2005).

### **3.5 Data Collection Instrument: Interview**

The main and richest source of data collection in phenomenographic research is an interview (Marton, 1994; Akerlind, 2005a; Akerlind, Bowden and Green, 2005). An interview is a descriptive qualitative and an in-depth data collection instrument. It is a useful means of accessing data from the respondents, it also allows respondents to be free and express their opinion, thought or experience in their own words (Pickard, 2007).

Interviews could be structured, semi-structured or unstructured; it depends on the aim of the study and the researcher's competency in conducting the interview.

A structured interview is a type of interview where the questions are pre-established, and the interviewer is not free to change or alter the questions. It is sometimes referred to as 'researchers administered questionnaire' because it is highly structured. It could include open-ended or closed-ended questions (Pickard, 2007).

An unstructured interview on the other hand, is the direct opposite of the structured one. It is like an informal conversation between the interviewer and the interviewee. This is mostly used to get a holistic picture of any issue from the interviewee. However, this type of interview is good for only an expert in the field of the object of research (Pickard, 2007).

A semi-structured interview is in between the first two types of interviews. In this instance, there is a pre-determined interview guide where all the relevant areas of the topic have been listed in the questions but the interviewer is free to expand it. Apart from the interview guide the interviewer could ask other probing questions (Pickard, 2007).

This research used semi-structured interviews to allow flexibility. Secondly it allowed the subjects to reveal relevant information in a naturalistic way to answer the research questions. The questions were open-ended and deep, thus the participants were probed until they had nothing else to say about their experience of the use of Web 2.0 tools (Booth, 1997).

### **3.5.1 Pilot Study**

The pilot study for this research was arranged with two DILL students in order to test the interview questions and to know if the questions would elicit variation in the students' conceptions of the use of Web 2.0 tools. The transcript of the pilot interview elicited variations and all the research questions were adequately answered; this was confirmed by the researcher's supervisor. One of the pilot interview transcriptions was used as part of the 12 for the main study because the data was adequately rich for the study.

### **3.5.2 Interview Instrument**

After the pilot study, one question was added to the main interview questions the question was 'why do you use those Web 2.0 tools you mentioned?'. The 'why question' in phenomenographic study is to elicit the interviewees' intentional attitude towards the phenomenon (Akerlind, 2005b, p.114).

The interview was conducted in a natural conversational approach, aiming to move from the general to the specific (Akerlind, 2005a). The key interview questions were: what do you think Web 2.0 tools are all about? How have you used them? Which of them do you use? Why do you use those Web 2.0 tools you mentioned? In your opinion what skills do you think would be required to use these tools effectively? How did you acquire these skills? What

skills do you think you still need to enhance your usage of Web 2.0 tools? (see Appendix 3). Apart from these, some generic and unstructured questions were asked to further probe the interviewees on the issues that have been raised by them (Akerlind, 2005b). Such questions like, can you tell me more about it?, Can you expatiate on that?, Can you give me an example? (Lupton, 2008).

The interviewer, however, bracketed her experience about Web 2.0 tools during the interview process in order not to influence the interviewee in any way and to ensure validity of data (Ashworth and Lucas, 2000). Importantly, each interview was audio-recorded for verbatim transcription and security purposes (Pickard, 2007).

### **3.6 Phenomenographic Data Analysis**

In phenomenography research, the data analysis aims at developing categories of descriptions representing different ways of understanding a phenomenon, in this context, Web 2.0 tools, then "giving" a map of the "collective mind" (Marton, 1994). It is always in several phases of familiarization, condensation, comparison, grouping, articulating, labeling and contrasting to arrive at categories of description and outcome space (Bruce, 2003; Alsop and Tompsett, 2006). The raw interview transcripts were used and manually analyzed.

The first phase was the transcription of an interview or "utterances of research subjects" (Hasselgren and Beach, 1997). Each interview session was transcribed verbatim immediately after the session. It was rigorous and iterative because the audio recording was replayed several times in order to get all information transcribed. Each interview of about 20 minutes took about three hours to transcribe verbatim and invariably about 39 hours were spent on the whole interview sessions, however, this was spread over one week. The transcription was first typed and edited in text format but was later converted to table format of two columns; first column for the interview transcription and the second was left blank for comments.

The second phase was the discovery of the categories of description through repetitive process of immersion in data that led to familiarization with data (Bruce, 2003). A category is a

description of what is the common meaning of the meanings of a phenomenon grouped together (Svensson, 1997, p.168). Edwards described categories of description as the written or graphical representation of conception (Edwards, 2005, p.92). This means, that conception is just like a label or title given to a category of description of a distinctive ways of experiencing or understanding a phenomenon.

Initially, several themes emerged which were highlighted to differentiate them but after further immersion in the data, the themes were reduced and finally four categories emerged. This was done in order to conform with the main aim of phenomenographic research which is to identify small number of qualitatively distinct descriptive categories of the ways a group of people experience a phenomenon (Booth, 1997), in this context, Web 2.0 tools.

The next phase in the analysis tackles the identification of the structural aspects of each expressed conception. At this stage, the researcher was a bit frightened being a first timer in phenomenographic research. The framework for this phase of the data analysis was based on referential components, the dimension of variation and structure of awareness (Marton and Booth, 1997).

The referential aspect is the ‘what’ of an experience or phenomenon, the core meaning given to a phenomenon or object of research by the respondent as shown in Fig.1. For this research, the core meaning that DILL students gave to the use of Web 2.0 tools.

The dimensions of variation are aspects or factors that are common to all the categories of description yet which are experienced differently in each category and it results in some expansion of awareness. These factors are presented as phenomenographic “dimensions of variation” (Boon, Johnston and Webber, 2007, p.214). In this study the dimensions of variation are the contextual focus, the preferential focus and skills focus.

The variation focuses on the context within which Web 2.0 tools are experienced by the DILL students; the students’ preference among Web 2.0 tools; and the skills required and its acquisition to use Web 2.0 tools.

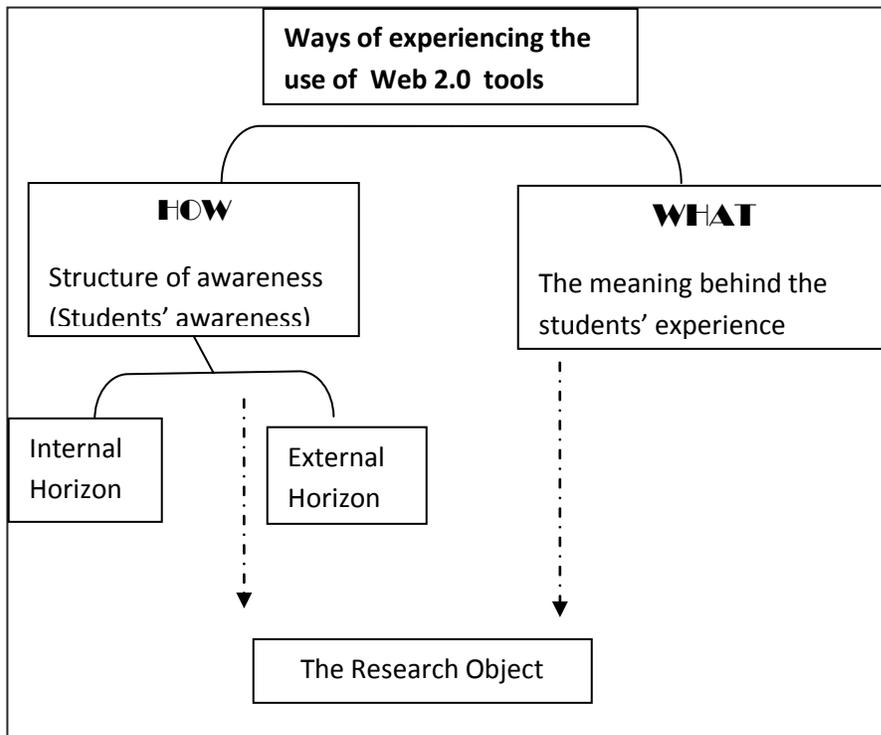
The structure of awareness in phenomenography analysis framework is a modern trend and it has been emphasized in the recent research (Marton and Pang, 1999). Structure of awareness

is the 'how' of an experience or phenomenon. It could be explained as what the subject is aware about an object at the time of the expression of the experience of that object. Booth (1997) elucidated that structure of awareness has its origin from phenomenological works of Gurwitsch (1964).

Booth (1997) explained that the awareness comprises (1) 'theme', the central focus or initial theme (theme of awareness) that comes to the mind of subject/student when faced with an object/problem, and (2) 'thematic field', these are other associated and relevant themes and 'margin' other irrelevant themes but present at the time of the awareness.

In another way of explaining the structure of awareness, Bruce (2003) explained that it consists of two horizons: internal horizon and external horizon. The internal horizon (theme) is what comes to the mind of the subject/student at the time an experience is expressed while the external horizon (thematic field and margin) is what recedes to the background when an experience is expressed. Edwards (2007) described the two horizons as inner and outer rings. She asserted that presenting the internal and external horizons in rings makes structure of awareness clearer to people. For the current study the internal and external horizons are used for the structure of awareness.

Thereafter, an outcome space was constructed and an attempt was made to develop a deep understanding of what has been said or what was meant by considering how each category relate with one another (Marton, 1994). The following figure (Fig.1) shows the referential and the structural aspects of Web 2.0 conception by DILL students.



**Figure 1:** The referential and structural aspects of the use of Web 2.0 tools. (Adapted from Marton and Booth 1992, p.91).

### 3.7 Trustworthiness of the Enquiry

In qualitative research, the evaluation of trustworthiness of data is done using credibility instead of validity and dependability instead of reliability (Pickard, 2007).

Phenomenographic approach as a qualitative design evaluates trustworthiness of data through a rigorous iterative process throughout the research processes (Akerlind, 2005). Starting from interview sessions the researcher is expected to inform the subjects that there was no wrong or right answers, and the interview session must be a dialogue process, communicating with the subject rather than a question and answer process. This is possible with the use of open ended questions.

Having conducted the interview, the validity is ensured through verbatim transcription of the interview. Also, the data analysis is done after all the interview sessions have been

transcribed. The categories of description should be discovered through iterative process of communicating with the data, there should be no imposition of categories of description. The outcome space should not be predicted in advance but rather it should be constructed as a result of the content of the transcripts. Lastly, the research is expected to communicate the result of the study to other researchers (Akerlind, 2005).

Reliability in phenomenography study is established right from the time of formulating the research questions. The questions should be able to elicit different variations in the understanding of the object of research by the subjects. Additionally, the selection of the subjects must be done with specific diversity criteria to ensure variation in sample age, gender, experience and background (Akerlind, Bowen and Green, 2005).

For this study, the evaluation of trustworthiness of data was ensured throughout the research process by following all the aforementioned processes.

### **3.8 Limitation of the Approach**

In a phenomenographic approach data analysis is both explorative and interpretative methods. This has been severely criticised by some scholars who fault both the analytic nature of the results as well as the methods of arriving at the results (Svensson, 1997).

According to Svensson (1997) there are two schools of thought. One of them accepts the analytic characteristics of explicating results in form of categories and relations but questions the explorative and interpretative methods of arriving at the result. On the other hand, the other school of thought accepts the explorative and interpretative methods but faults the analytic nature of elucidating results in form of categories and relations.

Secondly, phenomenography results may not be the truth because people may not be able to accurately describe ways of experiencing a phenomenon, but that notwithstanding the result is useful. Account is not always equivalent to experience (Orgill, 2002).

The results of this research are limited to the group of DILL students studied. Therefore, there is need for further research to study other groups of students if the results might be similar or different.

### **3.9 Ethical Consideration**

All the participants were mailed to seek their consent and they were duly informed of the purpose of the research and the interview. At the first email only 3 potential respondents gave their consent. Subsequently, three follow-up emails were sent and invariably all of them gave their consent.

During the interview the respondents filled a consent form to approve the use of the interview transcripts (verbatim quotation) in the thesis (see Appendix 2). However, the confidentiality of the respondents was assured and to ensure that, their real names were replaced with numbers.

### **3.10 Conclusion**

This chapter has outlined in details the methodology used in this study, roots of phenomenography, phenomenographic research approach, its application in LIS research, its potential benefits, sample and sampling techniques, population, data collection instruments, interview protocol, pilot study, data analysis and limitation of the approach. The justifications for the choices made were given.

## 4.0 CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

This chapter presents the analysis of data and discussion of findings. The study used a phenomenographic approach as discussed in chapter three. It comprises the demographic information, categories of description, outcome space, discussion and conclusion.

### 4.1 Demographic Information

The participants for this research were 12 DILL students, consisting of 6 males and 6 females. The gender information can be seen in Table 1 below.

**Table 1: Gender Information**

<b>Gender</b>	<b>No. of participants</b>
Male	6
Female	6

They were from two regions: Africa and Asia because the two regions had the highest number of students in DILL programme. The regional information can be seen in Table 2.

**Table 2: Regional Information**

<b>Continent</b>	<b>No. of Participants</b>
Africa	6
Asia	6

Seven (58%) of them were between age range of 26-30 and five (42%) between age range of 31 – 35. Out of seven respondents in age range of 26-30, five (71%) of them were female while two (29%) were male. The age information can be seen in Table 3 and the comparison of gender and age in Table 4.

**Table 3: Age Information**

<b>Age Range</b>	<b>Number of Participants</b>
26 – 30	7
31-35	5

**Table 4: Gender and Age Comparison**

<b>Gender</b>	<b>26 -30</b>	<b>31 -35</b>
<b>Male</b>	2	4
<b>Female</b>	5	1

## **4.2 Data Analysis**

The data analysis is presented following phenomenographic approach, as outlined in chapter three.

### **4.2.1 Gender Variation**

The female respondents were more enthusiastic about the use of Web 2.0 tools than the male. On the frequency of use six (100%) females said they used Web 2.0 tools on daily basis, putting it in their words ‘24/7’, while four (66%) males used Web 2.0 tools on daily basis ‘24/7’.

## **4.2.2 Regional Variation**

African countries that were represented in the sample were Ghana, Botswana, Kenya, Ethiopia and Uganda while the Asian countries were China, Philippines, Iran, Indonesia and Bangladesh.

As regards to the regional variation, there was no significant difference between the two continents used in this study. Looking at the rate at which they used Web 2.0 tools there was a tie, five (83%) from each of the regions were heavy users of Web 2.0 tools.

## **4.2.3 Categories of Description**

The categories of description were discovered through iterative process of analysis as it has been discussed in chapter three. In summary, the analysis of data was in phases as familiarization, condensation, comparison, grouping, articulating, labeling and contrasting. Four categories of descriptions emerged that represent the qualitatively different ways of experiencing the use of Web 2.0 tools by DILL students. The names of the categories of description were used as were mentioned in the transcripts.

### **4.2.3.1 Category 1: Communication Tools Conception**

**Referential Aspect:** In this category, students experienced the use of Web 2.0 tools mainly as means of communicating with their families, friends, professional colleagues and professors thereby to socialize, get connected and keep their relationships.

**Respondent#1:** I see them as social network tools, I use it mostly to communicate with people, mostly say with my friends, families and colleagues to be in touch with people, to make new friends, to keep in touch with people, it can help in relationships, they become closer, they know more about each other, maybe you see person once, you make friends on Facebook with each

other, you can follow the relationship you make, otherwise you don't hear of him/her again.

**Respondent#11:** It is very good for communication, for instance all my friends are on Facebook, in Estonia, in Bangladesh and all over the world, I communicate with them, when they are online, I don't need to make a phone call, I don't need to spend my money. I just use Skype and Yahoo messenger for chatting, oh! It is good.

**Structural Aspects:** In this category the **internal horizon** is communication, the key purpose of use of Web 2.0 tools is communication.

**Respondent #9:** I think the most important thing I know about Web 2.0 is that it helps us communicate with different people and share different information for example, I use Facebook especially now that I am far from my country, from my friends; it has helped us to keep in touch to share what is happening in my country, what is happening here, how everything moves around us.

The **contextual focus** is to make contacts with friends, families, colleagues by calling or receiving a call, by chatting and reading of profiles. The **preferences** are Skype, Yahoo messenger, Facebook and Meebo.

**Respondent#11:** I use Skype every day, Yahoo messenger everyday to communicate, and Facebook, not often maybe once or three times a week.

The **skills focuses** are basic computer skills and internet skills which are acquired through self learning.

**Respondent#6:** I don't know of any particular skills, all I can say is by practice, clicking, clicking, just manoeuvring, trying and using all the features, I think it helps to know how it works. Just know basic computer and internet skills you are ok.

**Respondent#9:** Hmm ... I think mostly one has to know the basic skills in computer use know how to, I think basic skills in computer use and I think you

really get to know more or learn more once you are using it. You don't need to learn when it comes to what I use, you don't need to become like an expert, but I think basic skills like computer use and know how to put it on here, sign in there, put my password here, my username here, the basic ones, but you get to know and learn more about them as you use them.

The **external horizon** as can be seen below is the use of Web 2.0 tools for collaboration and sharing of knowledge.

**Respondent #6:** Web 2.0 tools, I think they are applications which are available on the internet which you can use to communicate, to get in touch with friends and relatives. Apart from that, to share knowledge, and for collaboration...

#### **4.2.3.2 Category 2: Educational Tools Conception**

**Referential Aspect:** This category conceptualized Web 2.0 as educational tools because they have experienced varied Web 2.0 tools for educational purposes whether in their formal learning or informal learning context.

**Respondent#10:** Oh, I use them in learning, I use it for bookmarking, like I am doing right now, you can also use Facebook and other things in collaborating with your colleagues, your lecturers, the lecturers can put information on Youtube, and the students can follow and the students can put their presentation on Youtube and others can follow. I have also used delicious most especially right now to bookmark some articles that I am going to refer to later or to share them with my friends. I have used Twitter even though I am not competent in that one, but I have used it because of the Bergen people, most of the time they communicate with Twitter since I am doing my research here.

**Respondent#7:** In terms of applicability there are lot of things it can be used for as educational tools let say just like what I have been expressing in Tallinn, so also as virtual classroom, let say, simply class blog, it is an educational tool, it is also used as tool for communication tools in the circle of the profession, it is really a good tool because with these web 2.0 tools it is really helpful.

### **Structural Aspects:**

The **internal horizon** in this category is education. Web 2.0 tools have been explored in many educational pursuits. The **contextual focus** is class lecture presentations, personal assignments, group collaborations and e-learning courses. Unlike category 1 this category had a wider awareness of the use of Web 2.0 tools which exceeds communication to educational activities.

**Respondent#3:** Hmm, I use them for my studies, for example, I use bookmarking a lot, for articles for my academic purposes and Youtube, and we used it when we had our presentation in class. It was IKM on analyzing different case studies and I and my group we had to look for data on company we supposed to, hmm, can I say analyze and we got a video on Youtube so we added it to our presentation and it was really nice because it brought the whole story. I usually prefer in class to listen and see visual and that one I think it sticks to our heads even if you forget everything you will remember what you saw yes! [...] we used a lot of Web 2.0 tools in class which is really nice after explaining something in theory, I think it is better to show us the practical things because video brings it out well, so you can see it properly. [...] I think Web 2.0 tools are good tools for learning.

**Respondent #2:** ... in Norway, we were all part of Oslo University group of Facebook. So whenever they have any activities we would be able to see the invitation and then now here in Tallinn, our teachers, I realized they actually use Facebook a lot, even the professors in Norway, we don't see them face to face right now but we are all on Facebook and we can keep in touch with them, but as far as for learning perspective, we have IVA as our major tool for our

type of study here in Tallinn, as you know. IVA is a kind of some Web 2.0 tools because I remember one time we had a heating discussion about what is learning? in our class and then our teacher established a forum on IVA just for people to post their immediate ideas on learning... This also reminds me am taking another course which is online from Institute of Informatics, actually I never met with the teacher because we are using system called 'iCampus' something like that to post our weekly assignment of course, every week the teacher will post articles for us to read and we have to submit our assignment so that is also Web 2.0 tool. To talk to our teacher that I have never met and the others because don't go to the classroom to take the course we only take it online so with this kind of Web 2.0 tool we would be able to still share with each other and get feedback from teachers and learn new knowledge from her and also to me is like accomplishing a goal together using the same platform even though the people are located in different places and we never met in real life.

The **preferential focus** in educational tools conception is Facebook, MySpace, Skype, Yahoo messenger, Blogs, Wikis, iCampus, IVA, Youtube, Google Scholar, iGoogle and social bookmarking as indicated in Table 5 and Fig.3. The frequency of use for educational purposes is varied: some of the tools were used on daily basis while some were used three times a week. The **skills focus** for this category are basic computer skills, ICT skills, collaboration skills, information literacy skills, time management skills and English language skills as expressed by the respondents (as shown in Table 5).

**Respondent#3:** ... in order for people to have access ... you have to have IT skills and so people who don't have IT or who are not IT literate or not capable of doing it, have to learn it. But that is one of the skills we need, also, you should be someone who can evaluate if the information available to you is useful also. I think you have to know who the source of that information is, when was it created and where it was created in general information literacy skills is needed. Language skills, especially English, are important and time

management skills, plus collaboration skills, because you have to work with other people, in team.

**Respondent#10:** I think you should be computer literate, information literate, you should know how to navigate, know where to go, how to do it.

These skills were acquired either through self efforts, friends or formal learning in schools.

**Respondent#2:** I think of computer and language skills, of course, [...], nowadays you have to learn English even in China and computer literacy, these are pretty basic courses but for other skills like communication and time management skills. I think these are basic skills you have to learn in life, working and studies, every aspects of your life but I think I never had a formal education in communication and time management skills, but it just seems that those are something you have to learn in order to survive in this world.

The respondents requested for more training to be able to use these tools effectively in this category as indicated below.

**Respondent#10:** As DILL students I think, they should have something like practical hands on about these tools for us. I know some are already there as part of our curriculum, even though we haven't stated that, but you know, we have talked about social networking tools, but I think we need to have more hands on training, do more basic practicals, so that we can be competent, so that we can teach our clients after graduation. I tell you, not all of us are good on the use of Web 2.0 tools.

**Respondent#12:** I think that many would need to be trained more on how to[...] for example, not everyone can bring out the video and present it to the class, yes, I can access a video on Youtube but do I know how I can attach it to my assignment and show it in the class [...]. These Web 2.0 tools I learnt it on my own, no one taught me, because it was like try and error you try this and next time you are looking for it and you get lost and you ask a friend and she doesn't know [...].

The **external horizon** looks beyond the education and extends to professional boundary.

**Respondent#4:** Web 2.0 tools are relevant to DILL programme because we use it a lot in the class and as a student outside the class we use it a lot, so it is very relevant. As DILL students it is really useful to us when we go out because if we are going to work in digital libraries these Web 2.0 tools are very useful, not only in doing our work but in dealing with people, because people use it a lot and in order to be connected to them we have to be where they are [...] because they are using it, we can use these technologies to promote what we have, to tell them what we are doing and to connect them.

#### 4.2.3.3 Category 3: Professional Tools Conception

**Referential Aspect:** This category conceptualized Web 2.0 tools as means of building one's business or profession in order to generate fund or promote services. Also respondents see Web 2.0 tools as means of professional development where they use these tools in professional community to update themselves on the trends in their profession.

**Respondent#8:** [...] I realize that LinkedIn is more or less a sort of professional network which I think is really good for students, where you tend to get in touch with other professionals if you want to develop yourself professionally, get to know what is the development/trend in a particular specialized field, you want to know much about. For instance, on LinkedIn I joined IFLA group, you are kind of updated on what is going on like new things happening in information world, and all that, even though I don't contribute now but I make time to read what other people posted, what social media is and how you can use it to market your product and all that, it could broaden one's knowledge.

**Structural Aspects:** The **internal horizon** here is professional uses of Web 2.0 tools with particular focus to LIS field. The **contextual focus** is promotion and marketing of library

services, communicating with clients, collaboration among professional communities and professional development training.

**Respondent#2:** Web 2.0 is changing people's lives, business models, economy, it changes the revenue of people, and how business can generate revenue. People use it for advertisements on the website [...] and they can get their share of some revenue as well. It's a new era to me. I mean you can basically just sit at home and make money also, also for the small and medium scale enterprises, small businesses that just start their business can use social Web 2.0 to help them promote their products, without that, it was impossible in the past because when you start your business you cannot afford to put your advertisement on those big advertisement company or big traditional media like TV or radio. But with Web 2.0 they can use Facebook or Twitters or other social web can help them to promote.

The **preferential focus** is Facebook, Skype, Yahoo messenger, Blogs, Wikis, LinkedIn, Twitter, Youtube, Google site and social bookmarking. The frequency of use in this category is varied: some of the respondents used the tools on daily basis while some of them used the tools three times a week for professional purposes.

**Respondent#10:** I think Web 2.0 tools are really very good, I think its something the library can really use, like Youtube, you can use it maybe for library instructions, maybe you are introducing a new service like soft service, like soft issue books, you can just upload the video to show the users how to use it themselves, you know, you can advertise your library through Youtube, or Blogs or Facebook, and you can encourage library users to use Social bookmarking, especially to facilitate literature selection. I think, in a nutshell, they are really effective tools to use in the library profession. Also you can use these tools to update yourself professionally by reading your colleagues Blogs and Twitter to know what is happening to him or her and other things.

**Respondent#7:** [...] I prefer using Blogs, Wikis and also the new one that am being exploring into is LinkedIn I really like it because it is good to work with

these tools especially Google site because you can create or recreate anything and upload your curriculum vitae in LinkedIn. It is easy to use, to get identified and connected with your professional colleagues out there that you have never met and you may not even meet face to face for life.

The **skills focus** for this category seems similar to that of category 2, such as basic computer skills, internet skills, collaboration skills, and time management skills.

**Respondent#10:** Of course the technology, you need to know how these things work, you need to have computer skills, to open a computer, to use the keyboard, mouse to navigate, you know, you should have digital skills, ICT ethics, hmm... collaboration skills, and time management skills because these tools can really take your time so you must be time disciplined person.

The participants learnt these skills either by self-learning, colleagues or in the school.

**Respondent#8:** I think I started that when I was an information studies student and we had computer classes alongside our studies. So I started familiarizing myself with the computer system, I developed interest in that and then I didn't have a computer of my own, I had to go to the café at least once in a week, having an email helped me to familiarize myself with the internet, once one can familiarize himself with the internet, one can easily adapt to Web 2.0 tools, because like Facebook, no one taught me how to use it. It comes as I explore, same thing with LinkedIn, too.

**Respondent#7:** Hmm... I developed my skills by learning. I learnt it in school because my field is IT, I mean computer science so I learnt it but I never learnt specifically Web 2.0 but generally I learnt information technology computer skills.

There is a need for formal training to use Web 2.0 tools as professional tools.

**Respondent#4:** ... I think to be a producer or to use these tools as professional tools I think I still have much to learn. For examples, I can use RSS, I can

subscribe to it, but for me to write or create it, I need something like XML stuff, digital documents stuff.

The **external horizon** for this category is communication in general, business world at large and ethical issues that underpinned the use of Web 2.0 tools.

**Respondent#7:** When you say Web 2.0 tools, I think we can mention the popular ones, sometimes by my feelings I am not encouraged to use them, social software, for example, because of privacy issues and a lot of things. Sometimes I am not happy about things that are posted on the social software sites [...] because of our lack of understanding of the uses, because sometimes we do not know what tool is created for which goal. Sometimes what I observe makes me discouraged to use the tools, the abuse of technology, even though I use them as professional tools and as a trained computer scientist.

**Respondent#8:** I mean as a professional you can basically just sit at home, communicate with people and make money, also for the small and medium scale enterprises, small businesses that just start their... like entrepreneur who just start their business, they can use social web 2.0 to help them promote their business, without that, it was impossible in the past because when you start your business...

#### **4.2.3.4 Category 4: Multi-purpose Tools Conception**

**Referential Aspect:** Web 2.0 tools are seen as multi-purpose tools of the 21<sup>st</sup> century; these tools are used for many purposes ranging from personal communication, to entertainment, health, religious, political and economical purposes. In fact it was called ‘all-weather’ tools.

**Respondent#4:** Oh! I use Web 2.0 tools for many things, for entertainment, especially Youtube now that I am here in abroad, I also use it for religious purposes [...] in the Church we have an online worship, so I worship every Sunday and every time I have time and for learning, the things I do not know

when our professors mention something and is not really available yet in their presentations I can check it online, in Youtube or in slide share those kind of things. In short, I use Web 2.0 tools for everything that I want and that I am interested in, so I see them as communication, education, collaboration, connection, religious and entertainment tools. I see them as 'all-weather' tools.

### **Structural Aspects:**

The **internal horizon** is general or multi-purpose potentials of Web 2.0 tools that is central in this category.

**Respondent#7:** Web 2.0 tools are just the version or emergence of technology or an improvement of Web 1.0 and one of the findings of 21st century. This Web 2.0 in general is a very good way of managing web services, systems if you consider that the previous one was static, which means you can't give comments, you can't do anything, you just upload it, read it, but this one is dynamic you can give comment, a lot of very interactive content . A lot of tools are emerging as Web 2.0 tools and these tools have a lot of impacts/effects/factors in the world either directly or indirectly, you can consider the America election, how Obama used Facebook to generate income and to campaign, his election and even some other things, for example when somebody wants to construct something, building, just for corporation purpose or fund raising purpose, they use a lot of things, so it has a lot of impacts you can take Twitter nowadays, a high profiting company and that is a result, so really it is a changing world.

The **contextual focus** is multi-dimensional, they are:

- communication: link up with people,
- religious purpose: fellowship with online Church services;
- travelling purpose: booking travelling ticket and hotel reservations;

- health related issues: reading online articles on health;
- entertainment: listening to music and watching of movies;
- educational issues: class lectures and presentations;
- political issues: watching political campaign for instance Obama's election issue and Iran war instances; and
- Sport: watching different types of sport like football, and just concluded winter Olympic games.

It is obvious that the awareness has widening more than all other categories (see Table 5).

**Respondent#12:** Different things, so many things, I can't say one thing or two. For example, I have used bookmarking when I am doing assignments and I am looking for articles and I am not sure whether I can get back, then I usually bookmark that page for the next time. Another thing is maybe sharing music in Youtube. [...] a local song, I had published it to my Facebook world and that is the way of communication, I think. Other thing I have used them to, for example, is for the exchange rate. I had to bookmark a specific one so that it remains consistent.

The **preferential focus** in this category from the above quotations includes but is not limited to Facebook, Youtube, Slide share, Skype, Blogs, Yahoo messenger, social bookmarking and Wikis. The frequency of use in this category is not definite, it depends on when the need arise.

The **skills focus** for this category is computer skills, internet skills, time management skills, English language skills

**Respondent#12:** To use Web tools as 'all-weather' tools one needs computer skills, digital skills, time management skills, English language skills and information skills.

In this category, it was found that the skills were acquired just like skills in other categories that is, through individual efforts or with the help of friends or by formal training. The need for more formal training depends on the level of usage of the tools.

**Respondent#11:** My skills, ah, I'm very ambitious, this Web 2.0 tools are really exciting, you know. You don't have to wait for someone to teach you, you just fiddle with the computer until you know something. Like Facebook, no one taught me about it, even Youtube, you have to do by yourself until you know how to do it. But if you want to make an extensive use of these tools you really need to be trained on some core technical tips. There are many things to use them and I think the purpose of your usage determines your skills level.

The **external horizon** in this category focused on the usage of Web 2.0 tools at the global community, not only as student or information professional but seeing it at all levels of the society.

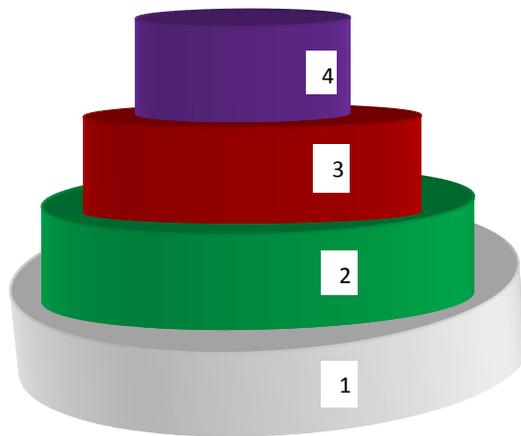
**Respondent#1:** It is also, ah... a way to connect the whole world, via the internet to make the whole world become a village, Web 2.0 makes the world become a community where everybody is a member of it not just ah..., we are like a team, we can do things together to achieve some goals together.

#### **4.2.4 Outcome Space**

Outcome space is the comprehensive structured expression of the phenomenon of the research and it depicts how individual category of experiencing Web 2.0 tools is related to the whole range of different categories. It is also important to know that individual students belong to more than one single category of description in the outcome space. This confirms the submission of Marton (1994) that the same participant may express more than one way of understanding a phenomenon. The hierarchical structure of the outcome space is shown in Fig. 2 below. The base level is communication tools conception, followed by level 2 which is

educational tools conception, then level 3, the professional tools conception and the last one is the multi-purpose tools conception.

The summary of outcome space is shown in Table 5 below, the referential meaning, contextual focus, preference and frequency focus, skills focus, internal horizon and external horizon of each category of description are presented.

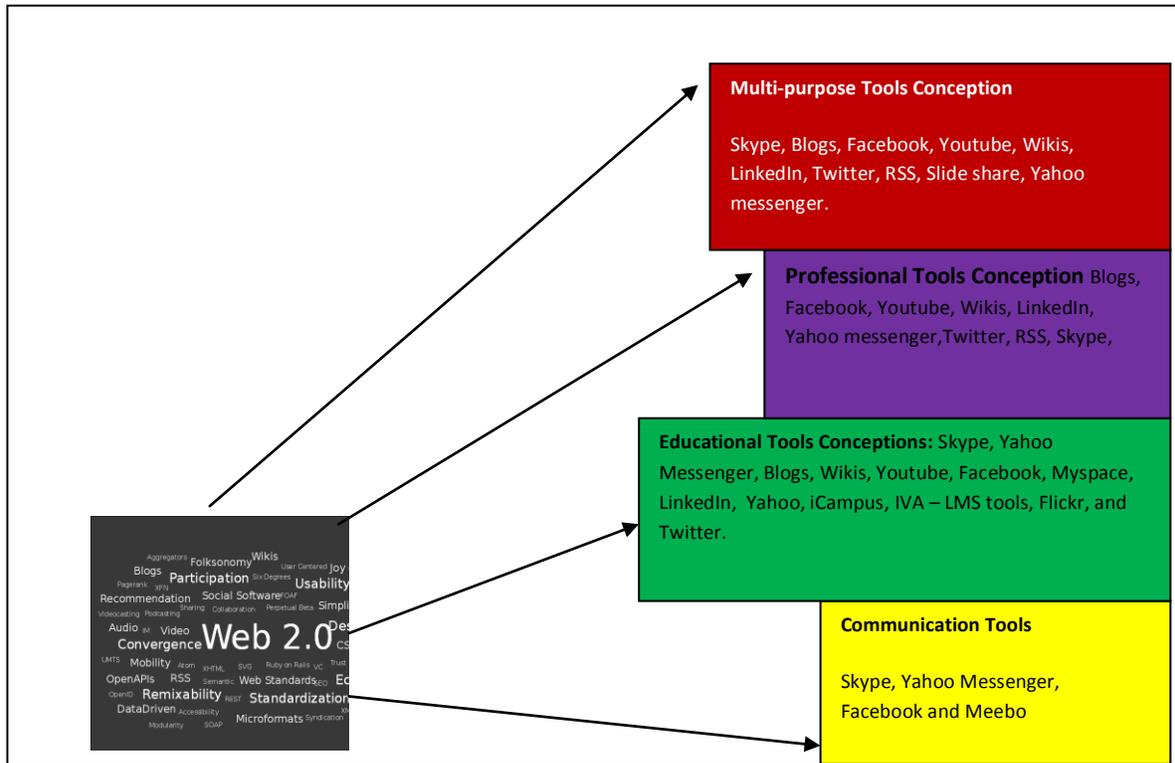


**Figure 2: Graphical outcome space showing the four categories of description of Web 2.0 tools of DILL students in hierarchical order.**

**Table 5: Summary of Outcome Space**

Structure of Awareness	Communication Tools	Educational Tools	Professional Tools	Multi-purpose Tools
Referential Aspect	Web 2.0 tools are seen as means of communication.	Web 2.0 tools as educational tools	Web 2.0 tools as professional tools	Web 2.0 tools as tools for general use, for multi-purpose tools
Contextual Focus	To call and chat with friends, families, colleagues, and lecturers.	Lectures; presentations; Individual/group assignments; Group collaborations; E-learning.	Promotion and marketing of library services;  Collaboration in professional communities;  Professional development training.	Purposes: Personal link up with people, Religious, Travelling, Health, Entertainment, Educational, Politics, Sport, Business, fund generating purposes
Preferential Focus & Frequency Focus	Skype, Yahoo messenger, Facebook, Meebo  Daily usage (24/7)	Skype, Yahoo messenger, Social Bookmarking, Youtube, iGoogle, LinkedIn, Facebook, Twitter, Myspace, Wikis, Blogs, iCampus, Flickr, IVA(TLU) Learning platform  Varied:  Daily usage(24/7)- some of the tools, and  Three times a week- other tools	Facebook, Blogs, Wikis, Skype, Yahoo messenger, LinkedIn, Twitter  Varied:  Some Daily – by some respondents, and  Three times in a week – by some respondents.	Facebook, Youtube, Slide share, Skype, LinkedIn, RSS, Twitter, Social bookmarking and Yahoo messenger.  At any time the need arises
Skills Focus	Skills: Basic computer/ internet, English language,  *Learnt by self and through friends/  *No need of any skills or formal training.	Skills: Computer/internet, IL, time management, critical thinking, ICT, collaboration.  Self-learning, friends, training in school  Need more formal training: IL, IT literacy and collaboration skills	Skills: Computer/internet, collaboration, in-depth technical.  Self-learning, communities of professionals.  Need for training on IT skills.	Skills: Computer skills, internet, time management, English language.  It depends on the motive of use and the type of Web 2.0 tools.
Internal Horizon	Communication	Education	Profession	Multi-purpose
External Horizon	Collaboration, Information and Knowledge sharing	Profession, Communication and Career building	Communication, Business, Information ethical issues	Communication, Education and Society tools as a whole

Each of the categories of descriptions has its preferred Web 2.0 tools according to the respondents. The purpose of use determines the preferential focus as it is indicated in Fig.3 below.



**Figure 3: Graphical representation of the preferential focus in each category of description of Web 2.0 tools conception by DILL students**

### 4.3 Discussion and Relationship to Previous Studies

This section discusses the results of the data analysis presented in the earlier sections of this chapter. The students’ conceptions of the use of Web 2.0 tools, their preferences among Web 2.0 tools, the skills required to use Web 2.0 tools and lastly the relationship between the current study and the previous studies are presented.

### 4.3.1 Students' Conception of the Use of Web 2.0 Tools

From the findings, four distinctively qualitative categories of description emerged as the different ways DILL students experienced the use of Web 2.0 tools as shown in Fig. 2. However, it is important to emphasize that the category of description does not represent the experience of an individual but represents the experience of group of individuals. In addition, individual respondents reflected more than one category of description during the interview. 12 (100%) respondents reflected category 1: communication tools, 12 (100%) respondents reflected category 2: educational tools, 9 (75%) respondents reflected category 3: professional tools and 7 (58%) respondents reflected category 4: multi-purpose tools as indicated in Table 6 below. The categories of descriptions are related in a hierarchical order.

**Table 6: The number of respondents that reflect each category of description**

<b>Categories of Description</b>	<b>No of Respondents that reflect it</b>
Communication Tools	12
Educational Tools	12
Professional Tools	9
Multi-purpose Tools	7

#### 4.3.1.1 Category 1: Communication Tools Conception

The first category of description is the lowest level of awareness of the use of Web 2.0 tools. All the respondents are aware of this level of use that is referred as, communication tools. This reveals that DILL students use Web 2.0 tools to communicate with their friends, families and lecturers, both on personal as well as other matters of interest to them. As it was mentioned earlier on, all DILL students were away from home, and therefore physically distant from their social networks, thus, a motivation to use the tools for communication

purpose was evident. These findings are supported by some previous studies for example, Conole *et al*, (2006), Kennedy *et al*, (2007) and Jones and Lea (2008) have found that the most common purpose of use of Web 2.0 tools by students is for communication between students and their friends, relatives and fellow peers.

DILL students preferred to communicate mainly via Skype, Yahoo messenger, Meebo and Facebook as shown in Fig. 3. The limited number of preferred tools was probably because of a low level of awareness. They mostly used them to get in touch either by calling or chatting via Skype, Yahoo messenger and Meebo while they read through the profiles of their friends, relatives and fellow peers on the Facebook.

In this category the tools are used on daily basis by the respondents, many declared that they used these tools 24/7 as indicated in Table 5. The reason for daily usage of Web 2.0 tools as communication tools might probably because DILL students were all a long way from home and their social networks; hence, the heavy tendency to use Web 2.0 tools is understandable.

All the respondents as shown in Table 6 reflected this category of description and believed that basic computer literacy skills and internet skills were enough to operate Web 2.0 tools at this level. 9 (75%) of the respondents acquired these skills through self-learning and with the help of friends while 3 (25%) were privileged to learn it in their formal learning process.

However, all of them were of the opinion that they were competent to use Web 2.0 technologies as communication tools, and that there was no need for formal training to acquire the required skills for this category. This confirms the widely spread assumption that the 21<sup>st</sup> century students are successful users of 'digital contexts outside curriculum - a perspective which the data from our project supports' (Jones and Lea, 2008, p. 214).

#### **4.3.1.2 Category 2: Educational Tools Conception**

The core meaning of this category as it has been mentioned in the analysis section is to use Web 2.0 tools in educational contexts. This category is the second level of the hierarchical structure of the outcome space as can be seen in Fig. 2. This category encompasses the first

level of awareness, communication tools because DILL students used Web 2.0 tools to communicate with their fellow peers, group members and lecturers for educational purposes. The level of awareness in this category had moved higher from communication tools to educational tools as indicated in Fig. 4 with the arrow showing the progression of awareness level. Usage of Web 2.0 tools in this category is for varied educational contexts, such as, class lectures, class presentations, as learning platform, group collaborations, individual assignments and a feedback from the lecturers as shown in Table 5. This concurs in totality with the submission of Alexander (2006). Alexander described the usefulness of some of Web 2.0 tools for example; he asserted that Wikis were useful for variety of needs such as student group collaboration, collaboration between classes and departments among others.

The findings also revealed that the preference for this category were Skype, Facebook, Youtube, Del.icio.us, Wikis, Blogs, LinkedIn, Flickr, Myspace, Yahoo messenger, iCampus, Twitter and IVA (Tallinn University's Learning Management System) as indicated in Fig.3. In comparison with category 1 preference, the scope was wider and the level of awareness was higher and deeper.

It was discovered that Facebook was widely used in educational context to share information related to studies but MySpace was seldomly used. Youtube was used to get relevant audio and video for their individual or group presentations in the class. iCampus for online course, Wikis and Blogs were used for knowledge sharing and exchange of ideas on any particular topical issues, especially in group collaboration. The findings of previous studies of Franklin and Harmelen (2007), and Cochrane (2008) support the contextual focus of category 2 in the current study.

The most frequently mentioned Web 2.0 based learning platform in this study was IVA, the learning management system (LMS) of Tallinn University (Virkus, 2008). The students testified that this learning platform was easy to use, interactive and an interesting educational tool. The ease of use nature facilitates the usage of IVA by DILL students. Below are comments of two of the respondents as regards to the use of IVA (<http://iva.htk.tlu.ee/>).

**Respondent#2:** I think IVA is a kind of some Web 2.0 tool because I remember one time we had a heating discussion about what is learning? in our

class and then our teacher [...] established a forum on IVA just for people to post their immediate ideas on learning. Just short descriptions, you don't need to have formal thesis, so and then people started to post messages about learning and sometimes only several words are there and you can immediately share with others and you can immediately learn from others and also of course the other functionalities like your weblog, your shelf where we can put your thesis and get feedback from our teacher. IVA is good and easy to navigate through.

**Respondent#7:** .We used IVA, it is an e-learning tool, so it is a product of Web 2.0, IVA is good and I appreciate it and I like it.

Bookmarking was another Web 2.0 tool that was heavily used by DILL students for literature search during studies, research work and also for group project work. Skype was another Web 2.0 tool that was commonly used by DILL students for online group meetings and chatting among peers. The usage of Myspace and Twitter was moderate compared with other tools that were mentioned earlier on. The frequency of use of these tools varied; the respondents used some of the tools daily while some of the tools were used three times a week. Consequently, it was evident that DILL students used Web 2.0 tools quite heavily. It was contrary to the finding of Aharony (2009) who indicated a moderate tendency of the use of Web 2.0 tools by the LIS students in her study. The reason for the disparity in the current study and the previous studies might probably be because DILL students are by their training, designated as digital librarians and so they were already accustomed to use these tools.

However, the most frequently used Web 2.0 tools by DILL students concurred with the most commonly used Web 2.0 tools by LIS students in Aharony's (2009) study except a slight difference in the sense that Flickr was not frequently used by DILL students.

Furthermore, the findings showed that using Web 2.0 tools for educational purposes required some skills, such as, basic computer skills, digital literacy skills, collaboration skills, information literacy skills, time management skills and English language skills as shown in Fig.3. It showed that category 2 requires more skills than category 1 mainly because the intent of use of Web 2.0 tools was higher and deeper in education level than in communication level

(see the contextual focus in Table 5). The level of awareness of the use of Web 2.0 tools in category 1 seemed to be personal and no formal context was attached. The use of Web 2.0 tools in this category was beyond communication, it involved learning, sharing and capturing knowledge and possibly these tools were used also for credit earning purposes, thus, the need for high level skills in addition to basic computer skills and internet skills. Some of these skills were ICT, digital, collaboration, information literacy, time management and English language skills. DILL students were aware of the importance of information literacy and ICT skills by the virtue of their discipline. They confirmed that not all information in Web 2.0 was authentic and valuable for educational purposes.

As regards the acquisition of these skills, the findings showed that 3 (25%) students learnt the basic computer skills through formal learning in their undergraduate programme while the rest 9 (75%) students acquired these skills through self-learning and with the help of their peers.

**Respondent#4:** I learnt some personally, because we are in this field,[...] and some also I learnt from people and some in school. Sometimes you just have to explore it.

However, they all indicated that there was a need for formal training on digital literacy skills and IT skills; this corroborates the findings of the studies of Glass (2008), Al-Daihani (2010) and Cawley (2010). Besides, they requested for the inclusion of Web 2.0 tools in DILL modules, though they were all familiar with Web 2.0 tools, not all DILL students were highly proficient in its use probably because of the different educational backgrounds. These findings were in line with the previous studies; for example, Aharony (2008) and Srivastava (2009) highlighted the need to include skills to use Web 2.0 tools into LIS curricula. Their argument was based on the need to educate future librarians to meet the ever increasingly growing market demands.

One comment from the respondent clearly illustrates this requirement:

**Respondent#:3** Actually, Web 2.0 has big relevance to the programme especially for Digital Libraries Learning students or graduates from this programme. It is expected that we know all these technologies, especially Web 2.0. But the sad thing is that it is not really in-depth, in some lectures it is just

in passing, it is not really taught to students, but if ever given the opportunity, it could be incorporated in the curriculum or in one of the subjects. I say, it could be in IKM or Digital Documents just the basic of these practical skills. Let say in IKM, they are good tools in knowledge management. It is critical to DILL programme and to all DILL students. This thing should be integrated especially in IKM so that we can acquire the skills of using it.

The issue of copyright and authenticity of information retrieved from the Web, highlighted by Srivastava (2009) and discussed in chapter two was also raised in this study.

#### **4.3.1.3 Category 3: Professional Tools Conception**

In this category Web 2.0 tools are seen as beyond communication and educational tools to the level of being used in professional contexts. Table 6 shows that 9 (75%) of the respondents reflected the use of Web 2.0 tools for professional development purposes. These tools were also used to promote the services and products of library profession in particular. The conception derived from what they had experienced in the libraries where they worked and what they were using in their current studies in DILL programme. Many libraries have incorporated some Web 2.0 tools into their routine activities, such as FaceBook, Google Scholar, Blog, Flickr and others (Lihn, 2008). Blog was used to give update on library services, new arrivals and other relevant news to the library users. A good example is the library where the researcher undertook her internship, Loughborough University Library; for example, the Loughborough University Library Blog (<http://blog.lboro.ac.uk/blog/>), Loughborough University Library Facebook (<http://apps.facebook.com/lborolibrary/>) and University Library Flickr (<http://www.flickr.com/photos/loughboroughuniversitylibrary/>). These are just some examples of the use of Web 2.0 tools as professional tools in the library profession. The frequency of use was varied; some of the respondents used the tools daily and while some used the tools three times a week see table 5.

The skills required for the use of Web 2.0 tools in this category were computer and internet skills, collaboration skills, in-depth technical skills. In this category 6 (66%) of the

respondents learnt the skills at work place, in the professional community forum in Web 2.0 platform, while 3(34%) were trained formally. One thing was common that stimulated all the respondents: their interest in the use of technology. The interest was the propelling force that motivated them. However, they all were of the opinion that to really explore Web 2.0 tools to the maximum level there was a need for formal specialized technical training. They already had the skills as consumers of Web 2.0 tools, but to be producers of the Web 2.0 based library services, they would need more training, just as it was indicated earlier on in category 2.

#### **4.3.1.4 Category 4: Multi-purpose Tools Conception**

This category of description is what can be called ‘all encompassing tools’, because it combined all aforementioned conceptions and the progression of awareness moved through the first three categories to get to this category (see Fig. 4). In this category, Web 2.0 tools were conceptualized as tools to accomplish different purposes in life.

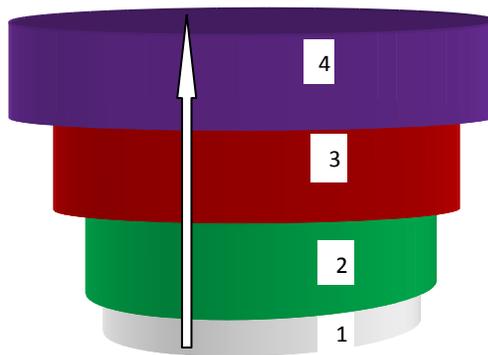
The awareness level moved through communication level to education and professional before it reached multi-purpose level which is the highest level of categories of description in this study as indicated by the arrow in Fig.4.

Though only 7 (58%) of the total number of respondents reflected this level of awareness as indicated in Table 6. The other 5 (42%) did not reflect it during the interviews. These respondents had experienced Web 2.0 tools to the extent that they doubted if they could live without them. Some of the respondents reflected it in this way:

**Respondent #2:** I think my whole life has been greatly influenced by Web 2.0, just think about how much time I spend on Facebook and Blogs. This is really a big part of my life.

**Respondent#5:** Actually I don’t know what to do now without them, because they have made a lot of things so easy in life.

The preferences here combined some that had been mentioned in all the other categories. The purpose or motive of use determines the preference and the same thing goes for the skills required for use of Web 2.0 tools under this category. Notably, basic computer skills and internet skills were common skills for all the categories of descriptions apart from some other specific required skills to each of them see Table 5.



**Figure 4: The progression of the awareness level of the use of Web 2.0 tools by DILL students as indicated with the arrow.**

#### **4.4 Conclusion**

In this chapter attempt has been made to analyze the data from the interview transcripts. Four categories of description were discovered through iterative process of phenomenographic approach. The conceptions were communication tools, educational tools, professional tools and multi-purpose tools. The internal horizon, dimensions of variations and external horizon were used as criteria for the discovery of categories. Besides, outcome space was constructed showing the logical relationship of the four categories. Lastly, discussion section relates the current findings with the previous studies as presented in Chapter two.

## **5.0 CHAPTER FIVE: CONCLUSIONS AND IMPLICATIONS**

### **5.1 Introduction**

This chapter presents the conclusions of the study; it consists of conclusions about the findings in relation to the research questions and the research problem. It also discusses the implications of the findings on theory and practice, and implications for further research.

### **5.2 Conclusions about Research Questions**

The aim of this study was to acquire a deeper understanding of DILL students' conceptions of the use of Web 2.0 tools, and to critically examine their preferences and the required skills to effectively use these tools. In doing that, it led to three research questions which were answered as presented below.

#### **5.2.1 RQ1: How Do DILL Students' Experience Web 2.0 Tools?**

The DILL students' conceptions of Web 2.0 tools were divergent because their levels of awareness differed. Through the phenomenographic approach, four distinctive categories of conceptions were discovered from the respondents' interview transcripts. The conceptions were: communication tools, educational tools, professional tools and multi-purpose tools.

It is evident from these conceptions that DILL students had realized many potentials of Web 2.0 tools. They realized that Web 2.0 tools could be used not only as communication and educational tools but also as professional tools and much more as multi-purpose tools. In chapter 2, previous studies showed that students used Web 2.0 tools for personal purposes as communication tools (Kvavik and Caruso, 2005; Conole, *et al*, 2006; Kennedy, *et al*, 2007) and for educational purposes (Bawden, *et al*, 2005; Glass, 2008; Trinder *et al*, 2008). This study found that DILL students used Web 2.0 tools for other purposes; professional and multi-

purpose apart from communication and educational purposes as analyzed in chapter 4 (sections 4.2.3.3 and 4.2.3.4) respectively.

DILL students were enthusiastic about the use of Web 2.0 tools; this is consistent with the study of Glass (2008). They were heavy users of Web 2.0 tools, as was seen in the frequency of use in Table 5, all of the respondents used Web 2.0 tools daily as communication tools, they used some of Web 2.0 tools daily and some of the tools three times a week as educational tools. Secondly, they advocated for the inclusion of training of Web 2.0 tools in their curriculum as seen in chapter 4 (section 4.2.3.2). However, the findings of this study contrast the findings of the previous studies, for example, Kennedy *et al*, (2007) found that students were not big users of Web 2.0 tools; Aharony (2009) reported that LIS students had a moderate tendency to use Web 2.0 tools.

## **5.2.2 RQ2: What are Students' Preferences of Web 2.0 Tools?**

It was clearly shown that DILL students used a variety of Web 2.0 tools for different tasks. The preferences were Skype, Yahoo messenger, Meebo and Facebook, communication tools as revealed in chapter 4 (section 4. 2.3.1) and in Fig. 3. For educational and professional purposes they preferred Blogs, Wikis, Del.icio.us, Youtube, Facebook, iCampus, Twitter, LinkedIn and others as shown in Fig. 3, in addition to the aforementioned preferred communication tools as listed in chapter 4 (sections 4.2.3.2 and 4.2.3.3) and in Fig. 3. These preferences concurred with the previous literature in chapter 2, such as Alexander (2006), Trinder *et al*, (2008), Aharony (2009) and Al-Daihani (2010).

For the last conception which is multi-purpose tools, all the preferred tools for communication, education and professional development could be used. However, each tool was created for a specific purpose, hence; DILL students used specific tools for specific tasks. This is consistent with the previous findings of the study by Conole *et al*, (2006) as reviewed in chapter 2, that students used specific tools for specific tasks.

### **5.2.3 RQ3: What are the Required Skills to Use Web 2.0 Tools?**

It was discovered that for every category of description there was a set of skills required. Some skills were common to all the categories and some are specific. Skills like basic computer literacy and internet were regarded in this study as common because all the categories need these skills to be able to operate.

From this study, it was obvious that at the communication level, the skills needed are basic computer literacy and internet skills. However, it was emphasized that the moment one is computer literate the internet skills could be acquired through self-learning. Thus, 9 ( 75%) of the respondents learnt the required skills for this category of description through self interaction with Web 2.0 tools; hence, they needed no formal training for using communication tools as revealed in chapter 4 (section 4.2.3.1).

However, using Web 2.0 tools as educational and professional tools required some other skills in addition to basic computer literacy and internet skills. The DILL students mentioned some of the skills as information literacy skills, ICT skills, and collaboration skills as needed for using Web 2.0 tools for educational and professional purposes. The DILL students in this study advocated for formal training on these skills to be able to use Web 2.0 tools effectively in their learning and later in future as digital librarians. This is in agreement with the literature in chapter 2 (for example, Kvavik and Caruso, 2005; Conole *et al*, 2006; Glass, 2008; Al-Daihani, 2010). In particular, Aharony (2009) and Srivastava (2009) emphasized the importance of IT training for LIS students, the future information professionals, to be adequately equipped to face the ever changing information landscape.

## **5.3 Conclusion about Research Problem**

The research problem that guided this study was the exponential rate of the implementation of Web 2.0 tools in HE and its problematic nature. Anderson (2007), Bawden *et al*, (2007) and

Franklin and Harmelen (2007) studies formed background basis for this study. Anderson (2007) highlighted the need to explore students' use of Web 2.0 and the required skills for it. He further lamented that more research should investigate how students use technologies, and their different learning modes among others.

Bawden *et al*, (2007) called for research to investigate students' expectations and preference of Web 2.0 tools and found that use of Web 2.0 tools should be integrated into LIS curricula. Franklin and Harmelen (2007) advocated for further empirical study on the implementation of Web 2.0 tools in HE.

Consequently, this study investigated the aspects of students' experiences which led to their conception of Web 2.0 tools, their preferences and required skills for use of Web 2.0 tools. As a result, this study has provided an empirical data and it is an addition to studies on students' use of Web 2.0 tools in HE.

#### **5.4 Implications for Theory and Practice**

Srivastava (2009) revealed that there was lag between curriculum and professional requirement of LIS profession. He argued that LIS courses were falling short of practical skills. Besides, Aharony (2008) made it clear that Web 2.0 tools are critical to LIS education because LIS students are the future information professionals and these tools would equip them to cope with ever changing information landscapes. Importantly she advocated for its inclusion in LIS curricula.

The case study carried out by Glass (2008) was an example of the inclusion of Web 2.0 tools in LIS course both at undergraduate and postgraduate levels in Information and Communication Department at Manchester Metropolitan University (UK). Also, the study of Al-Daihani (2010) confirmed that MLIS students needed more training to acquire the needed skills for optimal use of Web 2.0 tools. The current study is in agreement with these studies seeking for the inclusion of Web 2.0 tools in LIS curricula, in particular, its inclusion in DILL curriculum is recommended. Though some of the DILL students are proficient in the use of

Web 2.0 tools because of diversity and different educational backgrounds of DILL students, the inclusion of Web 2.0 tools into DILL curriculum would be necessary.

The DILL Master Course developers' expectations might be too high if they expect all DILL students to have acquired all the required skills to use Web 2.0 in their lower educational level, because in reality not all of them are proficient. However, the results and conclusions are connected with the sample of this research and may not be generalized to the whole groups of DILL students.

This study, therefore, suggests that the diagnostic analysis survey conducted at the beginning of each DILL course should be more precise and should seek to find out the level of dexterity of the students. This would determine which Web 2.0 tools to be included in the DILL curriculum because their dexterity level differs from year to year due to the heterogeneous nature of the intakes.

## **5.5 Implication for Further Research**

This study examined DILL students from Africa and Asia, further research could investigate DILL students from other continents to confirm if the findings are applicable. Secondly, further research could combine LIS students and students from other disciplines to explore similarities and differences in the use of Web 2.0 tools.

This study used a phenomenographic approach, other research approaches, for instance, mixed methods would also be appropriate for data triangulation.

In addition, other aspects of Web 2.0 tools in HE are of importance to research into. Such as, issues of IPR and copyrights, privacy and visibility, and preservation as listed by Franklin and Harmelen (2007).

## **5.6 Conclusion**

This study had investigated DILL students' conceptions of the use of Web 2.0 tools. Focus was on the DILL students' experience of the use of Web 2.0 tools, their preferences and required skills to use these new tools.

Chapter one gave the background and context of the study with research aim and objectives, it also presented the research questions, briefly discussed the justification for the study, methodology used, limitations and scope and gave a brief definition of the core terms in this study.

An examination of the related literature that informed the context for the study was presented in Chapter two. Chapter three gave a detailed description of research methodology, while, Chapter four presented the data analysis and discussion and finally, the conclusions of the study were presented in Chapter five.

Finally, it is hoped that the results of this study would be useful to DILL programme planners, in particular and LIS educators in general. Also, it is anticipated that it would add to the body of knowledge.

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# APPENDICES

## Appendix 1: Summary of the Reviewed Literature

Author	Title	Date	Main Issue	Organization	Methodology/Sample	Findings
Kvavik and Casuro	Convenience, Communications and control: How students use Technology	2005	Aims to know the kinds of information technologies that students use, their preferences and the level of their skills.	EDUCAUSE (Centre for Applied Research (ECAR)	Mixed methods: Survey and Interview.  4,374 students from 13 Institutions in 5 states in United State of America	*Students use technologies for educational, communication, pleasure and games purposes. *A bell curve with a preference for a moderate use of technologies in the classroom. *There is gender differences in the use of technologies; *Students proved to have the needed skills especially basic office suite but they lack in-depth applications knowledge skills; There is need for information literacy skills development and technical skills.
Sharpe, R. Benfield, G. Lessner, E., DeCicco, E.	Scoping study for the pedagogy strand of the JISC e-learning programme	2005	To investigate learners' current experience of e-learning and their needs and expectations. To provide the background and methodology for a study on learners' experiences of e-learning	JISC	Contextual analysis of 80 published studies on e-learning.	*Several studies focus on the value of particular e-learning course designs, teaching methods, tutor interventions.  *The perspectives have been on teacher and course or programme at the expense of the students.
Conole et al	Students' experiences of technologies (Final	2006	The general assumption is that in all subjects'	JISC LXP	Mixed Methods *Wider contextual review	*Students see technology as central learning tool; *They use it for different purposes-

	report)		students made extensive use of personally owned technologies. The study investigates students' experience of technologies.		<ul style="list-style-type: none"> <li>*Case studies</li> <li>*On line survey</li> <li>*Audio log</li> <li>*Interview</li> </ul> 85 students for audio log diaries 8 student interviewed 14 case studies	communication, finding of information, personal individual needs, travelling and entertainment purposes, tools to support their learning, institutional tools and resources. Students find technologies easy to use, fast, multi-functional and accessible. *Specific tools are used for specific tasks. *Students need different skills , such as information literacy and IT literacy.
Anderson, P	What is Web 2.0? Ideas, technologies and implications for education	2007	To investigate the substance behind the hyperbole surrounding Web 2.0	JISC Technology and Standard Watch	<ul style="list-style-type: none"> <li>*Debate</li> <li>*Interview of Conference Attendees (ALT-C Conference )</li> </ul>	<ul style="list-style-type: none"> <li>*. Issues of : identify, digital divide and skills.</li> <li>*Learners are not interested in accessing and manipulating on the Web.</li> <li>*There is techno-centric assumptions: lack of motivation to engage technologies in education</li> </ul> Implication: <ul style="list-style-type: none"> <li>*Lack of understanding of students' different learning modes as well as the social dimension of social software.</li> <li>*More work is required to understand the students usage of technologies.</li> <li>*Further exploration, research and analysis of the uses, benefits and limitation of Web 2.0</li> <li>*Students are IT literate but not academically e-literate.</li> <li>*They lack the necessary skills to make appropriate critical use of information.</li> </ul>
Franklin, T. and Harmelen,	Web 2.0 for content for learning and teaching in higher	2007	*Content sharing aspects of Web 2.0 tools in HE	JISC	<ul style="list-style-type: none"> <li>*Content analysis of existing studies.</li> <li>*Interview of Staff of 4</li> </ul>	<ul style="list-style-type: none"> <li>*Web 2.0 is a relatively young technologies</li> <li>*Many unresolved problems and issues in its use in HE</li> </ul>

M.	education				Universities * Web based seminar with Experts	*Issue of IPR, appropriate pedagogies to use, choice of types or system for institutional use, control over content, information literacy issues and students training among others.
Kennedy , et al	The Net generation are not big users of Web 2.0 technologies: Preliminary findings	2007	Aims to understand characteristics of the Net generation especially with regards to their use of Web 2.0 technologies and their preferences for the use of new technology as learning tools		Quantitative approach *Survey of 2588 first year students from 3 universities; -University of Melbourne -University of Wollongong and -Charles Sturt University	*Greater diversity in frequency of use of technology than it has been suggested. *Use of collaborative and self-publishing 'Web 2.0' technologies that have been associated with net generation is quite low. *Further research is needed to provide evidence of whether and how various technologies and tools in HE actually improve students' learning outcomes.
Trinder, K., Guiller, J., Margaryan, A., Littlejohn, A., Nicol, D.	Learning from digital natives:bridging formal and informal learning	2008	Examines ways in which students use the e-tools. *How tools and processes used in the informal setting could be harnessed to support the formal activity of learning and teaching in higher education. *how e-tools could improve the quality of students' experiences of learning in higher education		Mixed methods *Desk study *Survey of 160 Engineering and Social work students (2 Scottish universities) *Interview -8 students from the two subject areas; -8 members of staff	*Students make extensive use of a variety of e-tools(mobile phone, MSN, digital cameras and games console) *Students use social networking tools (Bebo, Myspace, Wikipedia, Youtube). *They use them for informal socialization, communication, information gathering and content sharing alongside with institutionally provided technologies and learning environments. *Students information searching seems adequate. *Students ability to use the power of social networking tools and informal processes for their learning was low. *Subject differences showed in both students and staff perceptions; -Engineers focus was on reliability and inoperability issues;

						<p>-Social workers focus on communication and professional needs</p> <p>*Staff use few of Web 2.0 social software but they are less familiar with how to use it for teaching and learning.</p> <p>*Staff expressed fear about security and invasion of personal space</p> <p>*The institutions are reluctant to incorporate these tools because of cost of implementation and time to develop staff skills.</p>
JISC	Higher education in a Web 2.0 world	2009	Inquiry into the strategic and policy implications for HE of the experience and expectations of learners in the lights of their increasing use of the newest technology	JISC	Interview	<p>*HE need to be informed in the choice of Web 2.0 tools for effective deployment</p> <p>*Digital divide from the students perspective</p> <p>*There is need to ensure access to technology for all and the development of practical skills in its use.</p> <p>*Soft skills such as networking, teamwork, collaboration and self direction</p> <p>Need to help HE student to build on their current skills and help them on their negative habits, that is insufficient critical attitude to information</p>
Minocha S	A study on the effective use of social software by further and HE in the UK to support Students learning and engagement	2009	To examine the use of social software in the UK further and HE sectors. *To collect evidence of the effective use of social software in enhancing students learning and engagement.	JISC	Case study method *Data from 26 initiatives *Interview of educators and students	<p>*Social software support a variety of ways of learning;</p> <p>*Students gained transferable skills of team working, online collaboration and communication</p> <p>*Students have concerns about privacy and public nature of the tools for their academic activities,</p> <p>*Students concerns about privacy and ethics issues</p> <p>*They are not sure of how to use these</p>

			To provide insights about the educational goals of using social software tools			tools *They preferred individualistic learning rather than collaborative learning
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Literature on Web 2.0 in LIS Education

Author	Title	Date	Objective	Organisation	Methodology	Findings
Bawden, D., Robinson, L., Anderson, T., Bates, J., Rutkauskiene, U., Vilar, P.,	Towards curriculum 2.0: Library/Information education for a Web 2.0 world	2007	To examine the impact of the communication and social networking features of Web 2.0 on LIS curricula.		Thematic analysis of 5 case studies (Australia, Ireland, Lithuania, Slovenia and UK)	<p>*LIS educators are recognizing the importance of Web 2.0 in LIS education</p> <p>*Inclusion of Web 2.0 as content and method of teaching.</p> <p>*Introduction of Web 2.0 in LIS education must be done carefully</p> <p>from perspective of both the students and academic staff.</p> <p>*Students have a natural enthusiasm for it.</p> <p>*Students expectations and</p>

						<p>preferences should be sensitively managed</p> <p>*Evaluation of the use of Web 2.0 tools for LIS education is highly desirable</p>
Aharony N.	Web 2.0 in LIS schools: Are they missing the boat?	2008	To examine US LIS situation and to determine the degree of adoption of courses in Web 2.0		Survey of 59 LIS programmes in US	<p>*Majority of LIS in US were not adequately prepared'</p> <p>*LIS programme not yet internalized the importance of Web 2.0.</p> <p>*LIS programme planner may assumed it is rather technical and is meant for other profession like computer science.</p>
Glass	Using Web 2.0 technologies to develop a sense of community for emerging LIS professionals	2008	To examine the use of Web 2.0 tools in Information and Communication department		Review of 5 Web 2.0 based strategies adopted in IC department at Manchester Metropolitan university (UK)	<p>*IC department use Wiki, SecondLife, Blog for learning purposes.</p> <p>*finds steep learning curve which depends on the individual IT competencies.</p> <p>*Students were enthusiastic to use it but technically they lack the competencies.</p> <p>*Web 2.0 offer rich opportunities</p>

						<p>for network development and interactivity for both staff and students.</p> <p>*Bu the students experiences were much frustration and disappointment as pleasure and success.</p>
Virkus, S	Use of Web 2.0 technologies in LIS education: experiences at Tallinn University, Estonia	2008	<p>*Aims to describe the experiences of the Institute of Information Studies of Tallinn University in introducing ICT, including Web 2.0 technologies, in library and information science education.</p> <p>*To explore the role that these can play in new models of learning and teaching.</p>		<p>Case study:</p> <p>*Review of Web 2.0 applications in the Institute of Information studies, Tallinn, Estonia</p>	<p>*Web 2.0 is influencing the way in which people learn, access information and communicate with one another.</p> <p>* Experiences with open and distance learning and e-learning have transformed teaching and learning, provided new alternative delivery modes, and helped to reach new target groups.</p> <p>*The staff have been experimenting with Web 2.0 technologies and a few have successfully adopted them in teaching and learning.</p>
Aharony, N.	The influence of LIS students' personality characteristics on their perceptions towards Web	2009	<p>To examine whether:</p> <p>* LIS students are familiar with</p>		<p>Quantitative approach</p> <p>Survey –</p>	<p>*A moderate tendency of LIS students to use Web 2.0 applications.</p>

	2.0 use.		<p>technology changes and innovations.</p> <p>*They use the different Web 2.0 applications.</p> <p>* personality characteristics (learning strategies, resistance to change and cognitive appraisal), as well as learning facilitators such as motivation, capacity and importance of studying and integrating different applications of Web 2.0 in the future, influenced LIS students' perceptions towards Web 2.0 use</p>		<p>questionnaire</p> <p>*160 Israeli students from 3 LIS programme</p>	<p>*Personality characteristics as well as learning facilitators influenced LIS students' perceptions towards Web 2.0 use.</p>
Srivastava, R.	Web 2.0 in LIS curriculum: A preliminary study	2009	<p>Aimed to:</p> <p>* Study the meme map of Web 2.0 created by O'Reilly.</p>		<p>Survey of 15 librarians (Mumbai India)</p>	<p>*Librarians are aware of hidden potentials of Web 2.0.</p> <p>*Libraries are reluctant to develop Web 2.0 services because of "lack of sustained contribution from</p>

			<p>*Find the extent of application of Web 2.0 tools in libraries.</p> <p>*Investigate students' competencies in handling Web 2.0 applications as expected by their prospective employers.</p>			<p>staff).</p> <p>*Librarians are hesitant to use the resources because of “authenticity of the content”.</p> <p>*LIS courses are falling short of practical skills.</p> <p>*Lag between curriculum and professional requirement.</p> <p>*Inclusion of Web 2.0 on LIS curriculum is supported.</p>
Al-Daihani, S.	Exploring the use of social software by Master of Library and Information Science students	2010	Aimed to explore the perceptions of master of library and information science (MLIS) students of social software		<p>Survey: web-based questionnaire.</p> <p>132 MLIS students from Kuwait University(KU) and University of Wisconsin Milwaukee (USA)</p>	<p>*Students from the 2 universities are aware of social software applications.</p> <p>*They use Blogs, Wikis</p> <p>*MLIS students' perception of social software in education were high.</p> <p>*They need training to acquire needed skills for optimal use of Web 2.0 tools.</p>

## Appendix 2: Consent and Demographic Information Form

Students' Conceptions of the Use of Web 2.0 Tools

Interview for MDILL Students (Sets 2 and 3)

Purpose of the interview: The research seeks to investigate conceptions of students' experiences of the use of Web 2.0 tools, their preferences and, the required skills to effectively use the tools.

Your cooperation would be appreciated. All the information would be solely used for the purpose of this research. Identity of the respondent and confidentiality of the information provided will be maintained.

Demographic Information

Name:.....

Gender

( ) Male ( ) Female

Age group

( ) 20 and under ( ) 21 – 25 ( ) 26 – 30  
( ) 31 – 35 ( ) 36 – 40 ( ) 41 – 45  
( ) 46 and above

Country of Origin:.....

Class: DILL 2  DILL 3

I agree to allow Alice A. Bamigbola to use my comments for her current research. I agree on the condition that these comments remain strictly confidential.

.....  
Signature

.....  
Date

Thank you.

Alice A. Bamigbola

### **Appendix 3: Interview Questions**

#### Students' Conceptions of the Use of Web 2.0 Tools

1. What do you think Web 2.0 tools are all about?
2. How have you used Web 2.0 tools?
3. What other things do you think they can be used for?

#### Preferences and frequency of usage of Web 2.0 tools

1. Which of them do you use?
2. How often do you use them?
3. In what ways do you think they can be used in academics?

#### Skills for Web 2.0 tools

1. In your own opinion what skills do you think would be required to use these tools?
2. In your own case how did you acquire or develop these skills?
3. What skills do you think you still require to optimally use Web 2.0 tools?
4. How relevant is Web 2.0 tools to DILL programme?

#### General

1. What other comments will you like to make on the use of Web 2.0 tools generally?

Thank you for your time and cooperation.