



# Students' conceptions and experiences of Web 2.0 tools

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## Abstract

**Purpose** – This paper aims to present the results of a study that investigated the Erasmus Mundus Digital Library Learning (DILL) Master programme students' conceptions and experiences of the use of Web 2.0 tools.

**Design/methodology/approach** – The study adopted phenomenography as a research approach to identify DILL students' conceptions and experiences of Web 2.0 tools. Semi-structured interviews with open-ended questions were conducted with 12 students from Africa and Asia within the DILL Master programme.

**Findings** – The data analysis revealed four categories of descriptions of Web 2.0 tools: communication, educational, professional and multi-purpose. For each category of descriptions preferred Web 2.0 tools were identified.

**Research limitations/implications** – The study analyses only conceptions and experiences of the use of Web 2.0 tools of 12 DILL students. This small group of students was from Africa and Asia and, therefore, the results should not be generalized to describe all DILL students' conceptions and experiences of the use of Web 2.0 tools.

**Practical implications** – The results of this study can be taken into consideration when designing and delivering a DILL programme. In order to use technologies to support learning there is a need to understand and know what students do with these new technological tools.

**Originality/value** – This paper supports the idea of integration of information and communication technologies into education and highlights the potential of Web 2.0 tools to support teaching and learning in the higher education setting.

**Keywords** Web 2.0, Students, Higher education, Communication tools, Educational tools, Professional tools, Phenomenography, Librarians, Digital libraries, Individual perception

**Paper type** Research paper

## Introduction

Over the past years there has been an increasing interest in the new generation of web-based technologies, tools and services under the labels Web 2.0 or social software and social media. Social media and Web 2.0 gained popularity around 2004 and these concepts have created confusion and criticism among researchers and practitioners. However, the rapid evolution of Web 2.0 applications is offering new possibilities and perspectives in business, government and health sectors, education and other public domains (Virkus, 2008; Johnston *et al.*, 2008).

A number of higher education institutions have explored the educational use of Web 2.0 in Europe and in the USA and numerous advantages or potentials have been highlighted (Franklin and Van Harmelen, 2007; Hartman *et al.*, 2007; Grosseck, 2009). For example, it is suggested that Web 2.0 tools support constructivist approaches to

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learning and have great potential to socialise online learning to a greater extent than has previously been seen (Bryant, 2007). These tools and services can support much flexibility in the learning processes and allow for easy publication, sharing of ideas and re-use of the study content, add commentaries and links to relevant resources in information environments that are managed by the teachers and learners themselves (Guntram, 2007, p. 23). Thus, Web 2.0 is well suited to active, personalised and meaningful learning and collaborative knowledge building (Virkus, 2008). According to Franklin and Van Harmelen (2007, p. 1) Web 2.0 is “allowing greater student independence and autonomy, greater collaboration, and increased pedagogic efficiency”.

However, incorporation of Web 2.0 tools in higher education has also several challenges and many unresolved issues (Franklin and Van Harmelen, 2007). Some of the challenges surrounding their use in higher education are highlighted as follows:

- how to identify the choice of Web 2.0 tools for effective deployment;
- how to implement Web 2.0 tools successfully into teaching and learning;
- how Web 2.0 tools can support students’ different ways of learning;
- how to facilitate the development of required skills to use Web 2.0 tools;
- how to limit digital exclusion; and
- how to deal with intellectual property rights (Conole *et al.*, 2006; Anderson, 2007; Franklin and Van Harmelen, 2007; JISC, 2009).

Although it is widely assumed that the Net Generation is skilful with the latest technology (Prensky, 2001, 2007; Conole *et al.*, 2006; Foehr, 2006; Jones and Lea, 2008; Trinder *et al.*, 2008), this is not always the case. Some recent studies have found that many students lack the required skills to use Web 2.0 tools efficiently (Bawden *et al.*, 2007; JISC, 2009; Al-Daihani, 2010). Anderson (2007) notes that there is a need for critical understanding of students’ views, ideas and experiences with Web 2.0 in order to implement these tools successfully into teaching and learning in higher education sector. He also warns that lack of understanding of students’ expectations of Web 2.0 tools might cause serious consequences.

Students’ experiences and conceptions of the use of Web 2.0 tools have been given little attention in the research literature (Sharpe *et al.*, 2005). Anderson (2007) highlighted the need for further exploration, research and analysis of the uses, benefits and limitation of Web 2.0 in higher education. Kennedy *et al.* (2007) underlined the need to have evidence of how various technologies and tools in higher education could improve students’ learning outcomes prior the incorporation of Web 2.0 tools. Conole and Alevizou (2010, p. 6) note that the “learner voice research is giving valuable insights about the experiences and expectations that learners have about using technologies to support learning”. Therefore, the study was conducted to explore students’ conceptions of and the preferences of the use of Web 2.0 tools in higher education (Bamigbola, 2010).

### Methodology

Phenomenography, based on the ideas of Ference Marton, was chosen as a research approach to acquire a deeper understanding of the group of DILL students’ perceptions, experiences and preferences of the use of Web 2.0 tools. The intention was to bring out a holistic variation of the experience of this group of students and the structural relationship between the different ways of experiencing Web 2.0 tools.

Phenomenography is a qualitative research approach to study “the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of, and phenomena in, the world around them” (Marton, 1986, p. 31). Marton (1994, p. 4424) notes:

These differing experiences, understandings, and so forth are characterised in terms of “categories of description”, logically related to each other, and forming hierarchies in relation to given criteria. Such an ordered set of categories of description is called the “outcome space” of the phenomenon or concept in question.

Phenomenography as a term is derived from two Greek words *phainemenon* and *graphein* which mean appearance and description (Edwards, 2007, p. 87). Phenomenography was developed by Ference Marton and his colleagues at the University of Göteborg in Sweden during the early 1970s. It has become a very popular research approach especially in educational research (e.g. Marton and Dahlgren, 1976; Laurillard, 1979; Dall’Alba *et al.*, 1989; Prosser, 1994) and among information literacy researchers in library and information science in Europe and Australia (e.g. Bruce, 1997; Limberg, 1999; Parker, 2001; Edwards, 2005; Andretta, 2007; Boon *et al.*, 2007; Williams and Wavell, 2007; Lupton, 2008).

A total of 12 students of the Digital Library Learning (DILL) Erasmus Mundus joint Master’s programme were purposefully selected for this study; six students from Africa and six students from Asia. The sample included six male and six female students from the two DILL sets (2 and 3) population. The population for this study was DILL students from sets 2 and 3. DILL students from Africa and Asia were selected because a large number of students originated from these regions. Prior to their admission into DILL programme, many of the students had a faint idea about Web 2.0 tools, just few had experienced the use of Yahooemail, Yahoo Messenger and Facebook, hence many had their first time experience with Web 2.0 tools during their DILL programme. The variation in their experience of Web 2.0 tools could be as a result of the international nature of the programme and the fact that most of the students were from developing countries where these emerging Web 2.0 tools were still new at the time of this study.

A joint international Master’s programme in DILL is a two-year programme for information professionals who intend to work in the complex world of digital libraries. It is a joint programme between Oslo University College (Norway), Tallinn University (Estonia) and Parma University (Italy) which was supported in the framework of the European Union (EU) Erasmus Mundus programme in 2007. The students acquire a joint Master’s degree (120 ECTS) which is recognised by all three partners.

DILL students will be future digital librarians and, therefore, it was believed that they are using Web 2.0 tools in their studies as well as in their future workplaces. Semi-structured interviews with open-ended questions were conducted with those students.

### Data analysis

In phenomenography the data analysis aims at developing categories of descriptions representing different ways of understanding a phenomenon (Marton, 1994). In this study the interview transcripts were analyzed manually using Marton’s (1981) phenomenographic data analysis approach. Each interview was transcribed verbatim and the categories of description were discovered. A category is a description of what is the common meaning of the meanings of a phenomenon grouped together (Svensson, 1997, p. 168). Edwards (2005, p. 92) describes categories of description as the written or

graphical representation of conception. 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.

The next phase in the analysis tackled the identification of the structural aspects of each expressed conception. The framework for this phase of the data analysis was based on referential components, the dimension of variation and the 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. For this research, the core meaning that DILL students gave to the use of Web 2.0 tools.

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 *et al.*, 2007, p. 214). Three dimensions of variations were identified in this study, and these were the:

- (1) contextual focus;
- (2) preferential focus; and
- (3) skills focus.

The variation focuses on the context within which Web 2.0 tools are experienced by the DILL students; the students’ preferences among Web 2.0 tools; and the skills required and its acquisition to use Web 2.0 tools. However, this paper presents only the contextual focus and the preferential focus of the dimensions of variation. The skills focus was related to the second research question and is not presented in this paper, but is discussed by Bamigbola (2010).

The 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 “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 “thematic field”, these are other associated and relevant themes and “margin” other irrelevant themes but present at the time of the awareness.

Bruce (2003) explained that the structure of awareness 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 relates with one another (Marton, 1994).

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## Results

The results to the question, how DILL students experience the use of Web 2.0 tools, are described in this section. The results present four distinct categories of descriptions of Web 2.0 tools as conceptualized by the respondents. The conceptions were: communication tools, educational tools, professional tools and multi-purpose tools. However, the results should not be generalized to describe the entire DILL students' conceptions of Web 2.0 tools.

### Categories of descriptions of Web 2.0 tools

#### *Category 1: Web 2.0: communication tools conception*

The first category of description was a communication tool conception. DILL students experienced the use of Web 2.0 tools as means of communication with families, friends, professional colleagues and professors. These tools kept them connected and sustained their relationships. For example:

I see them as social network tools, I use them mostly to communicate with people; mostly with my friends, families and colleagues to be in touch with people, to make new friends [...] it can help in relationships, they become closer, they know more about each other. Maybe you see a person once, you make friendship on the Facebook with each other, you can follow the relationship you make, otherwise you don't hear of him/her again (Respondent 1).

In this category of description the focus was on communication. Web 2.0 tools were perceived as means of chatting, talking and sending messages to family members, friends, colleagues and reading their profiles:

I think that 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 when I am far away 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 (Respondent 9).

The preferential focus was on Skype, Yahoo! Messenger, Facebook and Meebo:

I use Skype every day, Yahoo! Messenger every day to communicate, and Facebook, not often, maybe once or three times a week (Respondent 11).

#### *Category 2: Web 2.0: educational tools conception*

The second category of description of Web 2.0 tools as conceptualized by DILL students was educational tools. Their experiences with Web 2.0 tools for educational purposes varied in both formal and informal learning contexts.

Oh, I use them in learning. I use them for bookmarking, like I am doing right now. You can also use Facebook and other things in collaborating with your colleagues and your lecturers. The lecturers can put their presentations on YouTube, and the students can follow and the students can put their presentations on YouTube and others can follow. I have also used Delicious, 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 10).

The internal horizon in this category was education. Web 2.0 tools were explored in many educational contexts. The contextual focus as experienced by DILL students was

on presentation of lectures, personal assignments, group collaborations, e-learning courses and for doing their master thesis.

The preferential focus in this category was on Facebook, MySpace, Skype, Yahoo! Messenger, Blogs, Wikis, iCampus, IVA, YouTube, Google Scholar, iGoogle and social bookmarking tools as indicated by the participants. The frequency of use of Web 2.0 tools for educational purposes varied: some of the tools were used on daily basis while some were used two or three times a week:

I use Skype every day, Yahoo! Messenger every day, Wikipedia, not every day but for references, Facebook, maybe, once or twice in a week (Respondent 6).

*Category 3: Web 2.0: professional tools conception*

This category conceptualized Web 2.0 tools as means of building one's profession or business in order to generate income or promote services. Respondents saw Web 2.0 tools as means of professional development. They use these tools in their professional community to update their knowledge on the trends in their professional field:

[...] I realize that LinkedIn is more or less a sort of professional network which I think is really good for students, when you tend to get in touch with your other professional colleagues. If you want to develop yourself professionally, get to know what is the new development/trend in a particular specialized field; for instance, in LinkedIn I joined the IFLA group. You are kind of updated on what is going on, like new things happening in information world, and all that, [...] and you can use it to market your products and all that, it could broaden one's knowledge (Respondent 8).

The internal horizon here was the professional use of Web 2.0 tools with particular focus on LIS field. The contextual focus was on promotion and marketing of library services, communicating with clients, collaboration among professional communities and professional development training:

Web 2.0 is changing people's lives, business models, economy, it changes the revenue of people, and how business can generate the revenue. People use it for advertisements on the web site [...] 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. For the small and medium size enterprises, small businesses that just start their business, they 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 advertisements on those big advertisement companies or big traditional media like TV or radio. But with Web 2.0 they can use Facebook or Twitters or other social web that can help them to promote their products and services (Respondent 2).

The preferential focus was on Facebook, Skype, Yahoo! Messenger, Blogs, Wikis, LinkedIn, Twitter, YouTube, Google site and social bookmarking. The frequency of use in this category varied: some of the respondents used these tools on daily basis while some of them used them two or three times a week for professional purposes:

I think that Web 2.0 tools are really very good. I think it's something the library can really use, like YouTube, you can use it maybe for library instructions, maybe you are introducing a new service [...], you can just upload the video to show to the users how to use it themselves, you know, you can advertise your library through YouTube, or through 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 by 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 10).

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.

*Category 4: multi-purpose tools conception*

Web 2.0 tools were seen as multi-functional or multi-purpose tools of the twenty-first century; they were used for many purposes ranging from personal communication, to entertainment, health, religious, political and economical purposes. In fact these were called as “all-weather” tools:

Oh! I use Web 2.0 tools for many things, for entertainment, especially YouTube, now when I am here in abroad. I also use these tools 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 this is not really available yet in their presentations, then I can check it online, in YouTube or in SlideShare 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 (Respondent 4).

The internal horizon was a multi-purpose potential of Web 2.0 tools which was central in this category:

I would say that Web 2.0 tools are part of life that affect social and educational aspects of life because people can use these for educational purposes, social purposes and for entertainment, politics, religion and recreational purposes. Let me just say, for everything you want to do in this era, you can use Web 2.0 tools (Respondent 2).

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 American election, how Obama used Facebook to generate income and to campaign his election, and even some other things, just to name it (Respondent 7).

The contextual focus was on multi-dimension. For example:

- communication: link up with people;
- religious purpose: fellowship with online Church services;
- travelling purpose: booking travelling tickets and for hotel reservations;
- health-related issues: reading online articles on health;
- entertainment: listening to music and watching of movies;
- educational issues: lectures and presentations;
- political issues: watching political campaigns, for example, Obama's election issue and Iran war instances; and
- sport: watching different types of sport such as football.

The preferential focus in this category was on Facebook, YouTube, SlideShare, Skype, Blogs, Yahoo! Messenger, social bookmarking and Wikis. The frequency of use in this category was not definite; it depended on the purpose of use at a particular point of time. The external horizon in this category focused on the usage of Web 2.0 tools at the

global community, not only as students or information professionals but seeing it at all levels of the society:

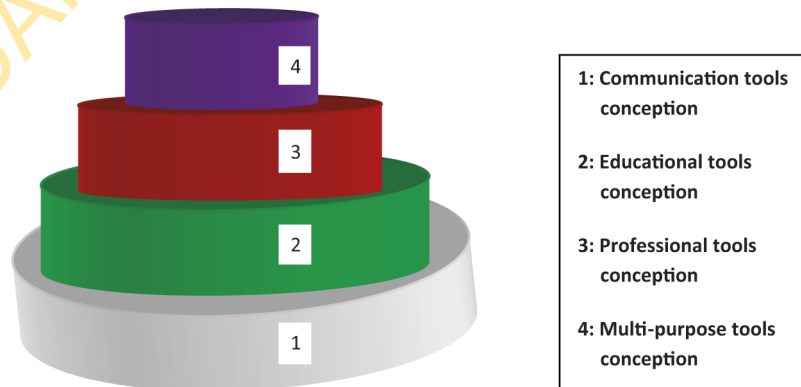
It is also, [...] a way to connect to the whole world, via the internet to make the whole world become a village. Web 2.0 makes the world become a community where everybody is a member of it [...] we are like a team, and we can do things together to achieve some goals together (Respondent 1).

### Outcome space

Outcome space is the articulation of a comprehensive expression of the researched phenomenon and it is often presented in a hierarchical way (Marton, 1994). In this study, it depicts how an individual category of experiencing Web 2.0 tools is related to the whole range of different categories. It is important to mention that individual students represent 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 Figure 1.

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

Previous studies have shown 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.*, 2007; Glass, 2008; Trinder *et al.*, 2008). This study found that DILL students used Web 2.0 tools also as professional and multi-purpose tools.



**Figure 1.**  
Graphical outcome space showing the four categories of description of Web 2.0 tools of DILL students



## Conclusion

It was shown that the degree of experience of a phenomenon would determine the conceptualization of such object or phenomenon. The study revealed that DILL students' experiences of Web 2.0 varied and that resulted in the four different categories of descriptions: communication, educational, professional and multi-purpose. It was apparent from these conceptions that DILL students had realized various potentials of the 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 multi-purpose tools. In addition, as numerous as Web 2.0 tools might be, there are preferred tools for specific function or usage as highlighted in the results. However, the preferred tools that dominated in each category were Skype, Yahoo! Messenger and Facebook.

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