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Knowledge creation and sharing with Web 2.0 tools for teaching and learning roles in so-called University 2.0

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Abstract

Universities have long been accepted as major social and cultural institutions. They have been taken those responsibilities for centuries by doing research, teaching, learning and publishing in a scholarly manner. These institutions serve developments in various organisational forms such as 'brick and mortar (traditional campus base)', 'click (distance-online)', and 'brick and click (traditional campus base with distance-online)' types.

This study aims to search new opportunities and developments brought by Web 2.0 (Social Web) technologies into university's teaching and learning roles. These innovative communication platforms encourage people to share their thoughts and experiences to collaborate thorough the interactive Social Media. Knowledge as an organizational strategic asset is distributed and created by new way of interactions within groups. Therefore universities can use Web 2.0 services in accordance with their organisational missions and strategies.

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Keywords: Knowledge Management and Sharing, Web 2.0, Social Media Strategy, Higher Education Strategy, University 2.0

1. Introduction

The advancement of educational technologies has brought new opportunities to higher education institutions. The first point is that the universities; as the leader of knowledge production and sharing have new challenges to be successful in. This is precisely important in the competitive education market. The

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changing economy and social developments affect university concept in teaching and learning. The second point is knowledge has been generated outside of the university with the support of open source initiatives contributed by individuals or groups. Knowledge is distributed and created by conversations and interactions within those groups. Technology also helps to leverage improvements at all levels. These innovative communication platforms encourage people to share their thoughts and experiences in order to collaborate thorough the interactive Social Media. The new faces of innovative processes shape to future improvements faster and effective for business use and academia.

2. Literature Review and Research Background

2.1. Knowledge Management: Knowledge Creation and Sharing

Knowledge as a concept has been studied from various disciplines. Kakabadse et al. (2003) argued that the last century became 'the re-discovery of knowledge debate (p.75)'. Tiwana (2002) stated that knowledge, as management tool, started since 1950's. It 'can be seen as information that comes with insights, framed experience, intuition, judgement, and values (Clarke and Rollo, 2001, p.207)'. It is human activity, organised information with having cognitive processes (Laszlo and Laszlo, 2002).

Early studies on Knowledge Management mostly focused on definition of knowledge in organisation content. The most distinguishing approaches could be seen as knowledge generation, production, creation, sharing, learning organisation, technology and blended models of Knowledge Management. The important categorisation of knowledge has been found in literature as 'tacit' and 'explicit' forms (Grover and Davenport, 2001, p.7; Nonaka, 1994). Tacit knowledge is personal, intelligence, believes, ground truth, judgment, values and difficult to formalise, record or articulate (Nonaka and Takeuchi, 1995) while 'Explicit knowledge can be codified […] formulated, abstracted and transferred across time (Lam, 2000, p.490)'. One of the best known models for knowledge creation and sharing is Nonaka (1994)'s, SECI model. Knowledge creation and production is an on-going interactive process of tacit and explicit knowledge conversion among individuals in an organisation.

Recent studies and praxis focused more on innovation, new technologic developments, interactivity, collaboration, competitiveness, global management and internet based approaches (Firestone and McElroy, 2005). Kakabadse et al. (2003) studied knowledge management from historical to contemporary organisational perspectives. The study showed that knowledge management approaches have their own particular ways towards knowledge. The '*philosophical model'* is based on epistemology and constitution of knowledge while the '*cognitive model'* is based on knowledge as valuable strategic asset in organisational context. The *'network model'* is based on knowledge acquisition, sharing and transfer within network organisation. It focuses on how knowledge sharing applied between individuals and groups in centralised or decentralised organisations. The '*community of practise model'* is one of the oldest models that exist in literature. It can be established first with storytelling, which can transfer to be highly detailed and complex learning activities.

2.2. Web 2.0: Social Web, Social Media

The term of Web 2.0 is first mentioned by DiNucci (1999) and was popularised by Tim O'Reilly (Graham, 2005). Internet transforms the knowledge generation with social interactions and information flows at higher levels. Tim Berners-Lee (1999) called the new Web term as 'a collaborative medium'. This allows to individuals to be part of the Web more intensively. Web 2.0 is also called 'social software and social networking (Virkus and Bamigbola, 2011, p.479)'. Sharma (2008) described some of the most

significant characteristics of Web 2.0 as 'user-centred design, crowd-sourcing, collaboration, power decentralisation, dynamic content, and rich user experience'.

According to Internet Society (2012) 'the Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location'. 'Web 2.0 is an upgrade and update of internet conception, which leads to the change of internet control system from the original centralized form to distribution status' (Zhang, 2008, p.210).

Barbier et al. (2012) stated that 'crowdsourced data' effects (p.257)' where Web 2.0 technologies have taken place in social networking in order to share individuals' information all over the world without geographical location constraints. Baxter et al. (2010) studied 'the theoretical link between blogs and organisational learning (p.515)'. Blogs are 'the place to exchange opinions in special interest subjects or content' and therefore 'tacit knowledge' would be shared (p.518). Bennett et al. (2012) conducted a survey showed important challenges of implementing Web 2.0 were developing skills for students very important; participation, user generated content and collaboration were key values; blog creation were sign of knowledge management and sharing. Danciu and Grosseck (2011) studied social aspects of Web 2.0 technologies in teachers' perspective. Results were Google sites, blogging (Wordpress, Blogger, EduBlog), microblogging (Twitter, Edmodo, Turiducate), social networking (Ning, Facebook), wikis (Wikispaces), books (Google books, Amazon Kindle, Android and ipod tablets), academic journals (Mendeley, Connotea, Zotero), media information (TED conferences, TV, radio, micro blogs, other social networking) have been used recently as sharing platforms. There are also similar studies found in literature on microblogging, blog, wiki, social networking, audio/video conferencing, Google docs (Ebner, 2010; Goktalay, 2010; Holotescu and Grosseck, 2010; Kirschner and Karpinski, 2010; Virkus and Bamigbola, 2011), mobile learning and devices (Holotescu and Grosseck, 2011; Idrus and Ismail, 2010).

2.3. University 2.0: Post-Modern New Paradigm in Universities

Higher education's evolution has been influenced by economic and social developments (Siemens and Matheos, 2010). Levine and Sun (2002) suggests that internet configures and shapes three forms of universities which are 'brick (campus based), click (online, distance, mobile, virtual, etc.) and brick-click (based on campus with online programs, blended) institutions (p.3)'. It refers post-modern new university concept that universities need to adapt their programs to meet increasing demands.

There have been various definitions and approaches found in the literature such as open distance (online) learning/education, virtual universities, virtual learning environments, e-learning, mobile learning, social networking and Web 2.0 based education, etc. (also found as learning 2.0; university 2.0; pedagogy 2.0; library 2.0, etc.) (Pearce et al., 2010; Minocha, 2009; Idrus and Ismail, 2010; Nordin et al., 2013; Mazoue 2012; Shrock, 2012; Armellini and Hawkridge, 2012; Wong, 2012; Blackman and Kennedy, 2009; Danciu and Grosseck, 2011).

The increasing demand of student accessibility with information advancement to learning sources has been transforming the education landscape. Mazoue (2012) contributes that 'the emergence of learning sciences, the wikification of knowledge, the unbundling of faculty roles, and the migration of learning online are driving fundamental institutional change toward location-independent alternatives (p.74)'. Therefore internet is becoming the dominant infrastructure for knowledge exchange among people and new generations of students (Tapscott and Williams, 2010). Those students require new forms of learning platforms and communication channels while they already use them in their social life. The 'new generation' (also called net generation, millennia) some students are more technology oriented and

communicate well in digital platform (Kirschner and Karpinski, 2010; Kumar, 2010; Wiebe and McAuley, 2010). New form of education needs to be more student oriented, collaborative and interactive (Danciu and Grosseck, 2011) among students and research groups in postgraduate programs. 'Collaborative classrooms, note taking, lecturing, listening may not disappear but live alongside the other processes based on student discussions' (Tapscott and Williams, 2010, p.2).

The other contributions about collaboration and collectivism found in Wissema (2009)'s "Towards the Third Generation University" and Tapscott and Williams (2008)'s "Wikinomics" books. While Wissema concentrates on the new university could change from science-based to third generation institutions which university-industry collaboration at the highest level, open innovation is the new paradigm and focuses on technology-driven initiatives; Tapscott and Williams concentrates the new Web 2.0 based developments and its contribution on user-generated media, social networking, crowdsource effect and peer production. Mass collaboration is a new form of online collectivism.

3. Methodology and Discussions

3.1. Research Aims and Research Questions

This study has focused on the content sharing and knowledge creation aspects of using Web 2.0 in Higher Education. This study aims to search the new opportunities, developments, and challenges brought by digital technologies into university roles. Universities as the leader of knowledge production and sharing, have challenges to be successful in. This is precisely important in the competitive higher education market. They need to set their corporate strategies in order to reach mass market. Web 2.0 technologies have opportunities and threaten for their positions.

This research also aims at addressing the questions below to structure Web 2.0 strategies in knowledge creation and sharing processes in a future so-called University 2.0 concept;

- What are the requirements of Web 2.0 for a university?
- How new knowledge created and shared with web 2.0 usage?
- How Web 2.0 based collaborative tools affects activities in Teaching and Learning Process?
- What are the benefits and barriers of Web 2.0 in Teaching and Learning activities?

3.2. Data Collection and Scope of Research

This study was inspired by some scholarly researches such as Nonaka (1994)'s Knowledge Conversions Model, Kakabadse et al.(2003)'s study and JISC (2010 and 2011) sponsored studies in the UK higher education. The recent studies in the literature also have been reviewed to answer research questions. The research was dependent on published and online form of academic journals, conference papers, research reports, books, case studies, etc.

The research area is on primarily a university and specifically the UK higher education institutions. The study supported with the visibility of universities in Social Media in their websites (Table.1). This has been done by comparing the top 50 UK institutions and the top 50 World institutions (Table.2) ranked by Thames Higher Education (2012). The aim of the website search is to find out "If the universities use these tools and show as the communication medium in their Home Pages". This would shows that existence of their Social Media usage and which tools most commonly accepted and applied by the institutions and users.

4. Analysis and Discussions

4.1. Findings for Requirements and Visibility of Web 2.0 in Universities

The delivery methods of knowledge (within research and teaching) and content creation would be important concerns for academic institutions. There are some common requirements and drivers need to be considered when implementing projects to best fit the strategies.

Those requirements and drivers are not limited, but some of social media usage perspectives would be said as technology and changing expectations, content production and distribution, legal and social issues (privacy and safety, identity, trust, ownership, control), accessibility (face-to-face campuses, open access sources), versioning and preservation, externally and internally hosted services, integration along with security (personal and system network) and system capacity terms, students (learning, skills and motivations), and management (curriculum needs, enhancing teaching methods), personal initiative, need for speed, communicating peers (outside or in the same institution) (Franklin and Harmelen, 2007; Eijkman, 2010; Pearce et al., 2010; Wong, 2012; Lee and Ge, 2010).

The technologic developments are an initial part of implementing Social Web. While the technology is an enabler with wireless access, higher internet broadband, software, processing speed, storage capacity, online sources, e-learning systems, social networking services provide to higher education institutions even more opportunities. Technologic innovations and devices have directly impacted on education and those 'gives to individuals' greater control over information creation and sharing (Siemens and Matheos, 2010, p. 4)'.

It should be acknowledged that changing paradigm has forced universities to adapt new technologies and enable social visibility in Web 2.0 platforms. Some evidence could indicate that most youngsters rely on social networks, 'the universities expected to be active on their websites to share content on social networks (Joepen, 2012)'. From this perspective university management should decide to implement suitable technology with their content delivery strategies. Even though the Social Web is not in maturity level but some tools have been extensively used by universities. The top 20 institutions of the UK (Russel Group Universities) have approximately '207,900 links every week posted on Facebook (80.25%), Twitter (19.28%), LinkedIn (0.11%), Google+ (0.35%) and social bookmarking sites StumbleUpon and Delicious (Joepen, 2012)'.

Table 1. The visibility of Social Media tools in universities home pages

Institutions Rank	Facebook	Twitter	Blog	RSS	LinkedIn	iTunes	YouTube	Foursquare	Google +	Stumbleupon	iPhone App	Flickr
Top 50 World	41	42	4	15	3	16	30	6	3	1	1	7
	82%	84%	8%	30%	6%	32%	60%	12%	6%	2%	2%	14%
Top 50 UK	40	41	2	12	7	8	33	3	3	2	1	13
	80%	82%	4%	24%	14%	16%	66%	6%	6%	4%	2%	26%

Table 2. Number of Top 50 University by country

Top 50 World University by country	Number of University	Top 50 World University by country	Number of University
USA	21	Austria	1
UK	10	Belgium	1
Germany	5	Hong Kong	1
Australia	3	New Zealand	1
Canada	3	Singapore	1
Netherlands	3		

4.2. Findings for Knowledge Management Practices with Web 2.0 in Teaching and Learning

Social Web technologies are a key point to supply teaching-learning and allows for virtual classes which contain blogs, social networking, video, audio, wikis, podcasts, and presentations with sharing to other students around the world.

Traditional teaching and learning in the universities are based on 'pre-packaged learning materials, fixed deadlines, assessment tasks and criteria defined by teachers' (McLoughlin and Lee, 2008). While Tapscott and Williams (2010) contributed that 'the old traditional pedagogy (in the industrial model of student mass production, teacher is the broadcaster) needs to be changed', collaborative learning approaches change the university as 'teacher-lecture centred to student centred model'.

Grosseck (2009) contributed that 'we need to interpret Web 2.0 technologies from a pedagogical perspective, so that students can become digitally fluent and ready for the challenges of the knowledge society (p.481)'. Rosen (2006) also contributes that 'the people formerly known as the audience' in media usage. Students in this age are not 'passive learners, they are active producers of knowledge (Klamma et al., 2007)'. New developments also shape the new learning landscape (McLoughlin and Lee, 2008) which was called as 'Pedagogy 2.0' (Dron, 2006). It combines with Social Web tools to share knowledge among individuals and even group of students. Pedagogy 2.0; 'uses social software tools to enable the development of dynamic communities of learning through connectivity, communication and participation (McLoughlin and Lee, 2008)'.

Tapscott and Williams (2010) also argued that the new shape of university has two important characteristics such as 'collaborative learning' and 'collaborative knowledge production'. Following the collaborative learning has some characteristics such as 'social learning', 'student-focused and self-paced', and 'embraces discovery'. Collaborative knowledge production process requires from a university to change their structure to more open type then traditional ways. They established the model of "Global Network for Higher Learning"; the model consists of five stages as, 'course content exchange', 'course content collaboration', 'course content co-innovation', 'knowledge co-creation', and 'collaborative

learning connection'. It expresses the ideas of how knowledge created and shared in Teaching and Learning Processes of a university.

The other study conducted by UCL-CIBER (2008) about 'information behaviour of the researcher of the future'; it was aimed to investigate whether today's children will be the next generation of information seekers, in key areas of 'Google Generation' media rich younger generation also called 'Net Generation', 'Digital Natives', 'Millennials' were examined and results found were as;

> They are more competent with technology, and have very high expectations of ICTs […] They are expert searchers and prefer interactive systems and are turning away from being passive consumers of information […] They have shifted decisively to digital forms of communication: texting rather than talking […] They prefer quick information in the form of easily digested chunks, rather than full text (CIBER-UCL, 2008)

McLoughlin and Lee (2008); argued that peer-to-peers interactive sharing the ideas engaged some students 'in creative authorship, producing and manipulating digital images and video clips, tagging them with chosen words and making content available through Flickr, MySpace, YouTube', and other social networking tools like Facebook, Friendfeeds, Twitter, etc. Few students prefer personal publishing, open their blog pages, and contribute to Wiki pages to collaborate to their networks.

On the other hand, while the open-content is famous in the student groups and increases recently, many higher education students could be found that lack of the competencies (Katz and Macklin, 2007). The quality of data and information seeking is not known by some of them. Lorenzo and Dziuban (2006) also contributed that 'students must blend skills in finding information, using technology, and thinking critically in information-rich environment (p.1)'.

4.3. Findings for Benefits and Barriers of Web 2.0 in Teaching and Learning

As discussed previously, Social Web usage shapes the new teaching and learning functions. So we need to review potential benefits and barriers of implementation processes. It is certain that today's young generation use technology more than their predecessors. Student's effort in knowledge creation and sharing depends on obtaining new changing paradigm for their study and research programs.

The benefits of Social Web usage would be said as; increase student's motivation, improves student learning, meets current pedagogic goals, changes the nature of learning boundaries, provides new functionalities, ease of use-ready to access, provides new virtual spaces with no time constraints, supports wider educational practices, multitask skill development, collaborative working, etc. (Franklin and Harmelen, 2007; CIBER-UCL, 2008; Tapscott and Williams, 2010).

As a matter of fact that Web 2.0 has brought new dimensions to teaching and learning. However there is not enough evidence to show how individual learning has been positively affected by Web 2.0 tools in all disciplines. It needs to be examined in further scholarly researches. Therefore the barriers of Social Web usage also various among institutions. Some of them would be listed as; institutional/administrative (policies, ICT restrictions, student numbers, accessibility, changing demand, not yet user friendly platform, risks), student involvement (inequity for accessibility of students, risk or uncertainty of success with students, difference in skill base, literacy levels) academic's adoption (degree of their involvements,

different values and lack of knowledge and skills), time restraints (overload and development), uncertainty (software and tools, pedagogy), privacy and confidentiality, etc. (Franklin and Harmelen, 2007; CIBER-UCL, 2008; Phillips 2011).

5. Conclusion

Today individuals join the groups, interact with peers over social networking tools and follow news from the internet commonly. Knowledge sharing is not only verbal or written forms with various communication channels. There are no barriers for information flow. The new technology is also very fast and internet allows people to upload and share large files within a few seconds with personal computers and mobile devices. The majority of higher education students is aware of Web 2.0 and commonly uses those in their life. The growing amount of interests for using those tools help universities to adapt as supplementary communication and collaboration medium.

According to findings (Table.1) Facebook, Twitter, YouTube, RSS are common tools in higher education institutions in the UK while the same figures have been found for the world however iTunes and photography sharing (Flickr) is also significant. Some social networking tools such as Blog, Foursquare, Google+, Stumbleupon are less favourable among the group in the UK. LinkedIn is also another important tool for professional purposes.

Web 2.0 has not changed the knowledge creation and sharing process itself radically. However the content of the different types of sharing structure has been transformed and information flow increased. Therefore those developments have in addition increased teaching and learning activities. Academics are more flexible to content creation and they can reach to all sources. This study also shows that Web 2.0 tools bring many opportunities to develop students and researchers skills, in order to gather information rapidly, it is essential to be collaborative during class work and in research era.

Therefore we might ask that if Social Web could change the university's structure radically. The answer would probably be, unless future developments bring different approaches, Social Web tools are not change agents for any university at the moment. It could be proposed that those tools assist and support Higher Education institutions in terms of curriculum building and delivering service strategies.

This study also aims to address that if so-called University 2.0 exists in constructive form. Even though there is no consensus in definition of University 2.0, but all types of universities can use Web 2.0 services in accordance with their missions and strategies. University 2.0 -is not a new university form or model- would be best defined as an institution of having Web 2.0 systems and practices without any specific organisational boundaries.

For future developments and research suggestions

The higher education institutions should be aware of the structure and must follow the future developments in order to be competitive. The future technological developments for Web would bring new opportunities to strengthen their position in academic market and knowledge as strategic assets.

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