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Perceived Usefulness of Web 2.0 Tools for Knowledge Management by University Undergraduate Students: A Review of Literature

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Abstract: This is a review of the extant literature on the types of the Web 2.0 tools available, their use and perceived usefulness by university undergraduate students for knowledge acquisition, construction and management. Some past works revealed that students found the Web 2.0 tools useful for knowledge construction and sharing and that the gainful use of the tools should be encouraged by stakeholders. The main objective of this work is to educate university undergraduate students on the great learning and knowledge management possibilities offer by the Web 2.0 tools and to inform lecturers of the need to consider and enquire into their students' acceptance and perception of usefulness (or otherwise) of these educational tools before integrating them into teaching and learning processes in so much that students will make an optimal and gainful use of them and hence prevent undue resistance to use from them. The authors concluded by making recommendations on how the students and lecturers could be motivated to make more academic use of Web 2.0 tools for veritable learning and teaching outcomes and a furthered perceived usefulness of the tools. It was also suggested that governments and stakeholders should encourage the lawmakers to legislate functional educational technology policies, provide adequate funding (which is always a constraint in developing countries) to procure modern, state of the art ICT infrastructure through which sustainable access to a wider range of the Web 2.0 tools is given and seasonal training of teachers and students in the educational use of Web 2.0 tools and other relevant technologies is promised. Adequate electrical power backup should also be assured so as to successfully, gainfully and sustainably use the Web 2.0 tools for knowledge creation, sharing and management.

Keywords: Web 2.0 Tools, Perceived Usefulness, University Undergraduate Students, Knowledge Sharing, Knowledge Management

1. Introduction

1.1. Web 2.0 and Web 2.0 Tools

Web 2.0 is the second generation of the Web, a graduation from the static Web to the interactive Web. It refers to a collection of web-based technologies, including blogs, wikis, audio-podcasting, video-podcasting, Really Simple Syndication (RSS) feeds, social bookmarking and tagging, photo sharing, among others, useful for social interactions [5, 45]. Web 2.0 encourages users to be more collaborative, share content and interact on the Web [5, 14, 24]. The principles of the concept underlying Web 2.0 are that in the Web 2.0 world, the Web serves as a "platform" [7, 45] or base to support dynamic services delivery [24]. In the Web 2.0 era, the features of the Web have been transformed from "read only" to "read/write" [56] where individuals can contribute and share their ideas with each other [51]. Web 2.0 allows users' participation in more social networking activities on the Web [31]. Students not only search information on the Web for their personal lives and school work but act as creators, sharing information and knowledge, experiences and/or opinions with people on the Web.

Web 2.0 tools are technologies such as Twitter, Facebook, Instagram, LinkedIn, SnapChat, WhasApp, WordPress, Blogspot, Wikipedia, Wikimedia, Podcasts, SecondLife,

Reddit, YouTube, Google applications, and other social networking sites, useful for leisure, entertainment, commerce, networking and recently for knowledge creation and transmission. They are otherwise known as social networking media. Use of Web 2.0 tools in the context of this review is the application of Web 2.0 tools to academic activities by university undergraduate students [5, 41].

Web 2.0 tools facilitate communication and cooperation as well as knowledge management and exchange, enhance fast communication, growth and development of university students. A learning environment, empowered by Web 2.0 technologies substitutes a one-way stream of knowledge and information between a teacher (an expert) and a student (a novice) with exchange of knowledge and information in a learner-network [56]. The Web environments not only provide university students with the possibilities of acquiring new knowledge, but also enable them to express opinions, create knowledge and share it. The birth and development of Web 2.0 tools open new facilities for a student to become an active learning-content-creator as well as knowledge sharer. Consequently, this creates an environment where the student manages the learning process, acquires technology management skills and self-directed learning skills [56].

New technologies, such as Web 2.0 tools, obviously impact learners' choice as to where and what should be studied. It can be observed, therefore that technologies do condition the paradigm shift of learning environments, educational decisions, teaching and learning methods in higher education. The use of Web 2.0 technologies and tools in the process of instruction is distinguished by the following: active learner's participation, the revelation of the collective mind as harnessed, cooperation, interactivity and social interaction among/between learners and teachers as well as the possibility of creating learning networks [7].

Web 2.0 tools, for instance, Internet blogs, Wikis, content sharing programs, or social networks, generate learner-centered educational possibilities, grant access to expert- or peer- published contents, foster informal communication with group members, and promote dialogue, communication, cooperation as well as creativity. Web 2.0 tools are able to satisfy diverse students' learning needs, expand their study experience, and create possibilities to develop personal learning environments for personal needs' satisfaction, and provide learning materials not only from information sources published on the Web but also from other network participants [7].

With Web 2.0 tools, students post their opinions, interpret and creatively apply the information gathered on the Web for decision making. Information sourced from the Web, together with other network participants', peers' and educators' opinions become the source of learners' comprehension and new knowledge creation [55]. Learning environments enriched by Web 2.0 tools boast individualization, participation and knowledge creation [42]. Learning individualization expresses itself through the choice of media and information sources, learning place and time fit for a learner. Learners are also able to choose technologies and tools which suit them best when applied both in individual learning and in communication and cooperation among network participants. Apart from text sources, video, audio and other multimedia information sources are useful when teaching and learning with technology and this expands the choice of learning strategies and encourages versatile skills development. The enrichment of personal learning environments by Web technologies affirms the student-centered learning approach which considers learners' experience, personally tailored learning strategies, tools and resources [16].

The criteria to describe individualization afforded by Web 2.0 tools are: choice, control, individuality and self-directedness. The use of the increasingly popular Web 2.0 tools and technologies in learning is attractive and motivating; offer possibilities to communicate with other learners, teachers, experts of the subject and a wider Web community. This opens extra possibilities to gain knowledge and develop skills. According to the research [56], the criteria to describe social participation in a university are: communication, cooperation, links and community. The characteristics of social participation manifests itself through an attempt to change a traditional model of a classroom which emphasizes the role of an institution and a teacher together with the teaching of a predetermined educational content into a more open one which is grounded on a teacher-student partnership-based self-directed learning [56].

Using Web 2.0 technologies and tools, the view of the teacher's and student's roles in the educational environment of a higher educational institution, especially a university, changes. A learner acquires more independence and responsibility not only in the search, identification, arrangement and assessment of information and knowledge, he/she takes part in the processes of knowledge creation and sharing. Learning is considered as a social and networked process which provides a learner with a wider freedom in formulating learning goals, in choosing learning resources and strategies. Still, a teacher, aiming at promoting students' self-directed learning which provides autonomy and self-control in learning, is responsible for the provision of relevant help and support [42]. Thus, a teacher is turned from an information provider into an enabler or a facilitator.

However, in the context of an undergraduate student's learning at a university, there is no way we can talk of his/her absolute autonomy and independence as he/she finds him/herself in a situation where, on the one hand, he/she freely selects learning tools and takes learning related decisions, but, on the other hand, is influenced by the environment, as learning is related to other individuals and groups. Moreover, the environment with its culture, social spaces and communities determines the perception and activities of learning, informally. Hence, it has been suggested that formal and informal education should be related in an attempt to optimize learning results [13]. As a matter of fact, this can be done by using Web 2.0 tools officially in university education, since they facilitate the integration of formal and informal learning elements to be

used in the creation of personal student learning environments [42].

When integrating technologies and distance learning elements in the formal educational environment, for instance, at a university (that is, while teaching and learning in a mixed, hybrid way), it is crucial for students to be ready for independent study and learning. In other words, they have to possess self-directed learning skills and technology use skills. The integration of formal and informal learning with the help of Web 2.0 tools enables learners to manage their learning process better, to have more interest in study materials and to lead more active communication and participation in the arranged informal groups. This brings more self-reliance and self-trust to learners; it develops group cooperation and increases group management skills [27].

A number of Web 2.0 tools have been used for educational purposes or at least students and teachers have been aware of them and researchers and educators have shared their experiences and ideas on how to put them into practice in classrooms to enhance teaching and learning. The Web 2.0 tools to be discussed in this review can be categorized as social software, social networking tools, multimedia sharing tools, tagging and social bookmarking tools, RSS feeds, Google applications, among others [5, 10, 45, 54].

1.2. The Concept of Social Software and the Description and Categorization of the Web 2.0 Tools Useful for Teaching and Learning

The concept of social software which covers major components of the Web 2.0 movement can be traced back to "the 1960s and JCR Licklider's thoughts on using networked computing to connect people in order to boost their knowledge and their ability to learn" [3]. In the past few years, applications such as blogs, wikis, podcasting and social networking sites, and such like, have been perceived as social software due to their particular "interactive-collaborative" features [12]. According to Anderson [5], "the term web-log, or blog, was coined by Jorn Barger in 1997 and refers to a simple Webpage consisting of brief paragraphs of opinions, information, personal diary entries, links and posts arranged chronologically with the most recent first, in the style of an online journal" (p. 7). This suggests that a blog is typically formed by "time-stamped entries" posted by the primary author [14].

Most blogs give visitors the right to post a comment below an entry. These posts and comments develop a blogging system for the primary author of the blog to have a conversation with the visitors who add comments. Sometimes visitors communicate with each other, thus these visitors can be treated as a group of secondary contributors to a blog [5]. Typically, the newest post shows on the homepage of a blog, and it can take a while to trace a certain piece of an entry when an individual revisits the site after a period of time. Each subject of the post is usually tagged with at least one key word, which helps bloggers categorize posts when the post content gets older and makes a blog become "a standard, theme-based menu system" [5]. Linking is another main component of blogging to "deepen the conversational nature of blogosphere and its sense of immediacy" [5].

Three features of blogging systems are the permalink, trackback and blog roll. The permalink means that once an entry is posted, the blogging system will generate a permanent particular URL for that post. The permalink remains the same even "if the post is renamed or if the content is changed" [5]. The trackback allows a blogger (blogger A) to give another blogger (blogger B) a notice that blogger B's post has been referenced or commented on. After receiving the notice from blogger A, a trackback will be created and a permalink of the referring post is generated automatically in blog B's system. "The blog roll is a list of links to blogs that a blogger likes or finds useful" [5] (p. 8), which is similar to a blogger's favorite list or bookmarks.

Davis [14] suggested that an instructor can use blogs for many purposes, such as providing answers to questions, creating a forum for peer review, with students posting their drafts of papers so that other students can read and comment on them, and so on. Another example of using a blog for educational purposes is group projects. Students can be engaged in discussions and debates in a flexible learning environment that allows the incorporation of multimedia, such as photos, videos, and audios [47]. A research study showed that implementing blogs effectively in medical education contributes to engaging learners in a cyber-learning environment [6]. Similar to blog as Web 2.0 technologies used by students globally is wikis.

The first wiki was developed by Ward Cunningham in 1995, and the word wiki can be traced to the Hawaiian word, wiki, which "means 'quick' or 'hurry'" [18]. The name actually represents the programming characteristics of wiki software which allows the content to be edited quickly and easily. Anderson [5] stated that "a Wiki is a Webpage or set of Web pages that can be easily edited by anyone who is allowed access" (p. 8). According to him, on a wiki page, an edit button is displayed for users to click in order to access an online editing tool which enables users to change or delete the content of the page. He noted that the popularity of Wikipedia (and Wikimedia), as an online encyclopedias, is a good example representing the concept of Wiki as a collaborative tool to facilitate a productive group work. Nonetheless, he averred that full access for users to edit the contents, can cause the problem of "malicious editing and vandalism"; though, some people, according to him, have argued that such a problem can be justified by the "self-moderation processes" at work [5].

Franklin and van Harmelen [23] stated that wikis can be used in class projects or students can use wikis to produce collaboratively edited materials. Instructors can use wikis to supply writing activities. Page and Ali [47] shared another example of an educational wiki in higher education, Ask Dr. Wiki (available at http://www.askdrwiki.com). Ask Dr. Wiki is a medical wiki dedicated to the development of a free source of medical information. Each individual can "publish clinical notes, pearls, X-ray images, angiograms and many more on the site" (p. 149). Anyone who has medical

knowledge can edit and contribute to the medical articles using wikis. Parker and Chao [48] explored a variety of wiki usages in different higher educational settings and concluded that wikis can engage students in a more collaborative learning environment as there is a need to equip students with collaborative creativity to succeed in the future. Another globally acknowledged useful Web 2.0 tool is podcasting.

Podcasts are audio recording files, "usually in MP3 format" [5] (p. 10), of interviews, audio tours or any format of talks that can be downloaded from the Web to computers or handheld MP3 devices and listened to. Essentially, podcasting is a simple online radio programming that can be created and distributed by amateurs [5, 31, 50]. The process of creating a podcast includes "creating an MP3 format audio file, uploading the file to a host server, and then broadcast this audio file to the world via RSS [5]. Anderson [5] stated that podcasts were "originally called audio blogs and have their roots in efforts to add audio streams to early blogs" [5] (p. 10).

After setting down the standards, the fact that Apple introduced the "iPod MP3 player and its associated iTunes software" to the market helped podcasting become popular [5]. Although at first there was a misunderstanding that only iPods could play podcasts, now podcasts are widely accepted by any MP3 player or personal computer that is equipped with the necessary software. Learners can produce and share information and broadcast much meaningful information through podcasts. They can utilize podcasts to learn from and teach others [47]. Chandra and Chalmers [9] shared the result of a project in which blended blogs, wikis and podcasts were used in the classroom (of a design and technology course) to enhance learning. In this project, not only podcasts were used to capture group presentation digitally and shared with other group members but also social networking sites. They concluded that podcasts and social networking sites provided a different and an easy way to creating and gaining knowledge.

Moreover, social networking sites "allow users to create and customize a personal website (aggregated within a larger Website)" [36] (p. 518). Each user creates a personal profile of interests and activities using text, pictures, videos, music and links to other profiles or websites. Users can easily locate other users with similar interests or link to them as friends. In doing so, they "create networks of people to whom they grant various types of access and updates" [14]. Additionally, depending on the social networking site, a user's page may extend to include other Web 2.0 tools, such as blogs, photos, video sharing, and asynchronous dialogs, among others [14, 35].

Groff and Haas [25] stated that social networking technologies can be used to connect teachers and students and develop a strong learning community to achieve the goal of good learning and teaching. To them, utilizing social networking technologies can extend learning into an additional space where learners can communicate, collaborate and share learning. This space outside the classroom walls, they maintained, is always available to learners and instructors. According to them, social networking application, such as Ning, offers the possibilities of an instructor creating a private social network for the classroom, effortlessly. They explained that on the Ning platform, instructors could set up and manage accounts for students and record and announce class assignments and/or other information. To them, the forum created on Ning would allow students to extend their class discussions and share relevant resources with each other [25].

Furthermore, numerous social networking websites allow users to upload, browse, annotate and share multimedia (photographs, audio and video clips) on various technology devices, such as desktop computers, laptops, MP3 players or mobile phones. In addition, each user can "create playlists of their favorites and subscribe to others' videos" [14]. Anderson [5] reported that multimedia sharing is one of the biggest growth areas among Web 2.0 services. According to him some popular multimedia sharing services such as YouTube for video sharing, Flickr for photograph sharing and Odeo for podcast sharing, represent the 'writeable' web feature of Web 2.0 where the users are not just the consumers but contribute actively to the production of the Web content. Millions of people now utilize these platforms of multimedia sharing or exchange to produce and share their own videos, photographs and podcasts. There are many ways in which multimedia sharing sites can be used in the classroom. For example, students could be asked to search for and download videos, which are related specifically to topics of discussion or research at hand, on YouTube.

Moreover, tagging and social bookmarking is also useful globally. A tag is defined as "a key word that is added to a digital object (for example, a website, picture or video clip) to describe it but not as part of a formal classification system" [5]. Moreover, teachers can "select educational videos from online repositories, post their own videos and incorporate multimedia into students' projects and assignments" [14]. The del.icio.us Website was viewed as one of the most large scale applications of tagging which triggered the 'social bookmarking' phenomenon. Within a social bookmarking system, users can create lists of 'bookmarks' or 'favorites' to store these centrally on a remote service (rather than within the client browser) and to share them with other users of the system (the social aspect). In particular, these bookmarks can be tagged with keywords and belong to different categories which is a feature different from folder-based categorization used in traditional, browser-based bookmark lists [5].

Furthermore, social bookmarking services often allow users to "subscribe to feeds linked to particular tags and/or users" [36] (p. 518). Franklin and Harmelen [23] listed some ideas on how to use social bookmarking in education. According to them, teachers and learners can create collections of resources and reading lists and use tags to structure them into different sub-categories. Groups of users with common interests can work together to use the same social bookmarking site to bookmark items of common interest. Although they may use individual accounts, identical tags could be used to identify the resources.

Another Web 2.0 tools is the Really Simple Syndication (RSS) which is described by the author [5] as a family of formats which allow users to find out about updates to the content of RSS-enabled websites, blogs, or podcasts without actually having to go and visit the site. Instead, information from the website (typically, a new story's title and synopsis, along with the originating website's name) is collected within a feed (which uses the RSS format) and 'piped' to the user in a process known as syndication (p. 10-11). Before using a feed, users have to install software known as an aggregator or feed reader onto their computers. Once the aggregator has been installed, users then decide which RSS feeds they would like to receive and subscribe to.

RSS-enabled websites generate a feed of Extensible Markup Language (XML) data summarizing the content of the site which can include news headlines, abstracts of new postings, and so on [38] (p. 312). The aggregator (feed reader) will check periodically for updates to the RSS feed and keep the user informed of any changes [5, 37]. In particular, in the earliest stage, RSS was defined as Rich Site Summary. For the records, there are different formats of RSS, such as "RSS 0.91, RSS 0.92, RSS 1.0, RSS 2.0" [5] (p. 11) and compatibility has been an issue ever since. Anderson [5] noted that RSS 2.0 is not the second generation of RSS 1.0; rather, they are different formats. After being largely used for "blog content syndication", the later version of RSS became acknowledged as "Really Simple Syndication" [5] (p. 11).

Lee, at el. [38] argued that the affordance of RSS and content syndication can be used to provide learners rich, active and social learning experiences. RSS can be used for personal learning which enhances learner and provides flexibility of learning. For instance, a university can offer a feed that distributes university-wide information. Nevertheless, they indicated that implementing RSS in higher education has certain barriers because students have habitual ways to access the Internet and browse the Web. They opined that most students used to browse websites manually to search for information they need and do hesitate to use RSS feeds.

Another Web 2.0 technology of note useful to students globally is Google applications (Google Apps for short). Several Google Apps are counted as Web 2.0 tools, including Google Docs, Google Sheets, Google Slides, Google Forms, Google Calendar, Google Image, Google Map, Google Drive, Google Photos, among other Google Apps [15, 1]. Google-Docs, Sheets, Slides, and Forms "are online word-processing, spreadsheet developing, presentation-generating and survey-creating tools that include free storage space ([1], p. 98). For users who do not have access to Microsoft Office applications or who are not allowed to install open source software on their computers, these Applications can be used for free from any computer with Internet access. Their 'share' feature "encourages collaboration and peer editing" and teachers can also grade inside them [1]. Google Calendar is an online multiuser calendar application in which "events can be scheduled indefinitely" and the "calendar can be shared in 'read' or 'read and write' mode and owners/authors can invite other users to events". Teachers can use Google Calendar to share the class schedule (time-table) with students. Another idea of how to use Google Calendar is that collaborators can share in 'read and write' mode in such a way that co-teachers, for instance, can change and browse the calendar at any time [1]. Teachers could deploy Google Image to source for images to explain or illustrate any idea or topic under discussion while contents generated in the class or during personal studies or research could be saved or backup on Google Drive. Institutional, group and/or personal photographs could be sourced from or saved to Google Photos. Information on geographical locations, directions, boundaries, borders, navigations, tracking/tracings, and such like are also sourced from Google Map.

Having gone through the description of the types of Web 2.0 tools usefulness for knowledge creation and sharing by teachers and students, this work further reviewed relevant literature on how useful or otherwise university undergraduate students perceived Web 2.0 tools for knowledge creation and management.

2. Literature Review

2.1. Perceived Usefulness of Web 2.0 Tools by University Undergraduate Students

Perceived Usefulness (PU) as used in this context is the extent to which university undergraduate students believe that using a particular Web 2.0 tool would enhance their learning, knowledge creation, sharing and management. PU has been defined as the user's subjective probability that using a specific application system will increase his or her performance [52]. From the extant literature reviewed, PU was also applied to non-academic but technological contexts such as in Internet banking, online shopping and mobile communication services. In Technology Acceptance Model (TAM), it is posited that PU affects the behavioral attitude and the intention to use a technology [35].

PU in the context of this review is the perceived usefulness of Web 2.0 tools in maintaining relationships, connecting with people, creating contents, sharing information and knowledge materials and doing research, among others. Burkšaitienė and Selevičienė, in their study [8], stressed that perceived usefulness is the extent to which university students believe that using a particular Web 2.0 tool would enhance their learning.

Yu-Li [62] investigated how technologies could enhance productivity and effectively reconstruct the curricula in order to meet students' needs and expectations. His study was basically focused on combining both technology and curriculum design. He concluded that a virtual reality learning environment ought to be useful and relevant to student learning. On his own, Tarhini [55] conducted a study to understand the factors that affect the adoption of *Really Simple Syndication* (*RSS)* feeds on a Blackboard learning environment using *TAM*. The results of the structural model showed that perceived ease-of-use was not found to be a

significant predictor of perceived usefulness and attitude. However, perceived usefulness had a direct positive effect on both the learners' attitude and behavioral intention towards using *RSS* feeds on the *Blackboard* environment. Moreover, the learners' attitude had a direct effect on their intention to use *RSS feeds*. These results yielded practical and theoretical insights that could be helpful for university policy makers and also for academics.

Quite a number of publications by foreign authors are available on the application of Web 2.0 for teaching and learning using TAM as a Conceptual Model. Web 2.0 tools are perceived as acceptable and preferred among university undergraduate students for enhancing their learning [8]. In the study of Farmer, Yue and Brooks [22], university students perceived Web 2.0 tools such as blogs, Facebook or wikis to be useful for group discussion and other forms of communication that could qualify as online forums. Thus, perceived usefulness of Web 2.0 technologies among undergraduate students for learning is found to cut across disciplines [21, 26, 30, 37, 39, 49]. Web 2.0 tools are technologies that provide a very effective web-based collaborative system in university education. With Web 2.0 technologies students can create collective knowledge through social interactions. To buttress this, the findings [43, 50] revealed that Web 2.0 social computing tools and application in education and training enhances participatory learning, collaboration, knowledge and information sharing and interaction in learning. Xia and Sharma [61] found that undergraduate students' thinking levels were increased as they updated their blogs weekly and implemented what has been learnt by exploring other media. They advised that in order to achieve a better learner-centered approach, there is need for higher education and training institutions to adopt the 21st-century technologies that improve learner engagement, among other benefits. Thoughts similar to this were propounded by Hernandez [28].

2.2. Perceived Usefulness of Web 2.0 Tools for Knowledge Management by University Undergraduates

On the use of Web 2.0 tools for knowledge creation and management, Kane and Fichman [34] averred that the usefulness of Web 2.0 tools have revolutionized business practices, though helpful in education, they opined that researchers have engaged in comparatively little discussion on whether or how these emerging technologies can influence the educators' practice of their craft as academicians. The authors believe that the situations of things would have changed now, more than a decade later; though, there are still a lot of concerns on this in third world countries such as Nigeria.

With regards to students, [61] found the use of Web 2.0 tools beneficial in providing closer connections to students and promoting knowledge sharing and creation. However, they, as well as [59], advised that the usage of Web 2.0 tools should be based on solid theoretical underpinnings, reflections and research for a gainful and sustainable digital transformations in the educational sector. Still on connections, Web 2.0 technologies were found as enablers of social networking site users, who are mostly young people, in creating profiles and building personal networks that connect them to each other for a variety of academic, professional and personal reasons [50, 58]. Validating this, [32] opined that Web 2.0 tools are very effective in the sharing of learning experiences by students, exchanging of information about the subjects being taught and in determining assessment requirements and providing moral support. In other words, Web 2.0 technologies provide opportunities for undergraduate students to construct and share knowledge with each other. They concluded that there are four main factors that determine the adoption of social network usage in higher education: academic service support; student support; social and cooperative learning and achievement representation.

Hemmi, Bayne and Land [27] noted that Web 2.0 tools have gained a lot of attention and started to be used in educational settings. This interest according to them comes from the fact that the principles Web 2.0 is based on, are in line with modern educational theories such as socio-constructivism which maintain that knowledge cannot be transmitted but has to be constructed by the individual by means of collaborative efforts of groups of learners. Similarly [29], writing on knowledge management orientation behaviors and academic innovations of the Indonesian creative economy sector's adoption of technology, concluded on the educational usefulness of technology.

Much of the existing academic research on Web 2.0 tools, especially Facebook, has focused on identity presentation and privacy concerns. Looking at the amount of information Facebook participants provide about themselves, the relatively open nature of the information and the lack of privacy controls enacted by the users may put the users at the risk of stalking and identify theft both offline and online. Other recent Facebook research examines student perceptions of instructor presence and self-disclosure, temporal patterns of use and the relationship between profile structure and friendship articulation [20, 46]. Silius, et al. [47], in a study on "students' motivations for social media enhanced studying and learning" revealed that Web 2.0 based social media services were efficient tools for higher education students. The results of the study show that when the content of a social network is useful for the user, he/she takes an advantage of it and informs other users about it. Students generally thought that social networking sites and other online technologies in the context of reading, writing and studying should meet some specific educational purpose and this added value must become clear to every user or visitor to the sites [40, 53].

There is a need for Nigerian students to know why they should use Web 2.0 tools and other open educational resources for knowledge sharing and management as the use of these tools for academic activities are majorly from developed countries across the world going from most of the literature reviewed [33]. For instance, researchers have identified several studies on the perceived usefulness of Web

2.0 technologies to students in higher education [3, 19]. Farmer, Yue and Brooks [22] reported that blogs encourage university students to read and provide peer feedback and also enhance reflection and higher-order learning skills. Parker and Chao [48] found that wikis have not only improved students' writing skills but engage students and facilitate collaborative learning in various disciplines. Chinnery [11], Duke University [17], Miller [44] and Woodward [60] maintained that podcasting has been used successfully in institution-wide and specific disciplines like language learning, chemistry or psychology in higher education, especially in universities. Again, Ajjan and Hartshorne [2] surveyed 136 university instructors in order to determine their perceptions of the pedagogical usefulness of Web 2.0 technologies. The instructors reported that, in addition to (a) being easy to integrate into the classroom, both blogs and wikis were perceived to (b) improve students' overall learning, (c) improve students' writing skills and (d) increase student-faculty interaction. In addition, both social networks and wikis were perceived to be useful for (a) increasing student-student interactions and (b) increasing students' satisfaction with the course.

The authors end this review with the survey [4] of fourteen instructors who due to their extensive use of Web 2.0 tools in the classroom were deemed "Web 2.0 experts" (p. 41). These instructors reported four primary usefulness of integrating Web 2.0 technologies into their instruction and learning environments. The first benefit, reported by the majority of the participating instructors, was that the use of Web 2.0 tools increased students' feeling of being members of a learning community by increasing interaction, communication, and collaboration. Approximately half of the participating teachers also noted that the use of Web 2.0 tools helped create an environment where the teacher could act as a facilitator of student knowledge creation, rather than a distributer of content. A third benefit reported by the instructors related to the flexibility and ease-of-use of Web 2.0 technologies, which made them suitable for students and instructors who did not necessarily have advanced technical skills. A fourth major benefit observed by the surveyed instructors was improvement of the students' writing skills and similarly improvement in the students' ability to apply and use technology [4].

In sum, this work reviewed the types of Web 2.0 tools available, their use for knowledge creation and sharing by students and teachers and their perceived usefulness for knowledge construction and management by undergraduate students of higher institutions of learning, especially university, as posited by past researchers. The authors believe that the review of extant literature on the use and perceived usefulness of Web 2.0 tools will be useful not only in educating undergraduate students on the great learning possibilities inherent in the Web 2.0 tools discussed herein but in also informing the lecturers of the need to consider and enquire into students' acceptance and perception of usefulness of any of the Web 2.0 tools they intend to use before integrating it into their teaching practices in order for both of them to make an optimal and gainful use of the tools and prevent undue resistance from students.

3. Conclusion

The educational benefits of different Web 2.0 tools both to the teachers and learners, especially undergraduate students, have been clearly highlighted in this study. The authors suggest that governments and stakeholders should encourage the lawmakers to legislate functional educational technology policies, provide adequate funding (which is always a constraint in developing countries) through government subventions and attract grants from donor agencies to procure modern, state of the art ICT infrastructure through which sustainable access to a wider range of the Web 2.0 tools is given and seasonal training of teachers and students in the educational use of Web 2.0 tools and other relevant technologies is promised and well implemented. Adequate electrical power backup should also be assured in Nigerian universities so that staff and students could successfully, gainfully and sustainably use the Web 2.0 tools for knowledge creation, sharing and management.

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