

Web 3.0 Tools and Knowledge Conversion by Distance Learners

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Abstract

Rationale of Study – The emergence of the Internet has unlocked immense prospects for distance learning. One of the prospects is Web 3.0 tools, a web platform that enables its users to read, write and execute content. Previous studies established the use of Web 3.0 tools in higher education but this author knows of no studies on the use of Web 3.0 tools for knowledge management by distance learners in Nigeria. Therefore, this paper examines distance learners' knowledge conversion using the SECI knowledge management model and identifies appropriate Web 3.0 tools used in each quadrant.

Methodology – A descriptive research design was used for this study. Qualitative data was collected from 16 distance learners from the Distance Learning Centre, the University of Ibadan using interviews. The respondents were purposively selected from the faculties of Arts, Education, Science, and Social Sciences.

Findings – The distance learners at the University of Ibadan went through the four quadrants of knowledge conversion in the course of their distance learning programmes in accordance with the SECI knowledge conversion model. They use Web 3.0 tools such as Google Classroom, WhatsApp, Google Hangout, Facebook, E-library, Semantic Search Engines, and Open Educational Resources, and Google Drive in the four quadrants of SECI knowledge conversion.

Implications – The findings of the study confirmed that Web 3.0 tools are germane to distance learners' knowledge conversion activities.

Originality – This study has a prodigious value because it is the first study to examine the usage of Web 3.0 tools in knowledge conversion by distance learners in Nigeria.

Keywords

Web 3.0 tools, knowledge conversion, SECI, distance learners, University of Ibadan

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1 Introduction

In the 20th Century, knowledge management became the catchword in business, commerce, banking, health, education, and others. Universities are knowledge-concentrated institutions and learners (regular and distance) play an important role in knowledge management. In higher educational institutions, knowledge management is a significant objective since learning is its principal function, while educators are the knowledge workers. The learners, including distance learners, play a dynamic role in creating and sharing knowledge. Distance learners are characteristically matured adults most of whom have families and are working-class citizens. Hence, family and job responsibilities debar them from attending full-time conventional classes (Tucker, 2003). These responsibilities partly inform their choice of distance learning because it suits their circumstances.

Liu (2008) defines distance education as a learning programme that is not bounded by space and time, unlike conventional classroom learning. According to the Commonwealth of Learning (2007), a distance learning system invests and provides structured curricula and materials; flexible learner support systems; and suitable administrative systems to support distance learners, among other things. In a study in Turkey, Yilmaz et al. (2013) submitted that students prefer distance learning because of its flexibility, convenience, time, and cost; and distance education does not pose an obstacle to responsibilities concerning family and business. Distance learners pursue their learning activities such as personal study, collaboration and discussion with their colleagues and facilitators, individual and personal assignments, seminars, research work, and examination in an iterative knowledge management process.

In information science, knowledge is placed on the third level of the knowledge hierarchy. Data is placed at the bottom and information (processed data) on the second level, knowledge ('know-how') on the third level, and wisdom is directly placed above knowledge (Wallace, 2007). Knowledge is an elusive and intangible asset but used by everyone. Knowledge has been defined by Ping (2015) to be information that has been processed and residing in an individual, to be used at an appropriate time. It is a critical part of today's economy, thus, organisations invest greatly in managing it. There are two major classifications of knowledge; explicit and tacit. Explicit knowledge is the knowledge that can be expressed, articulated, recorded, and captured on media and can be shared with others. "Explicit knowledge can be codified, [...] formulated, abstracted

and transferred across time” (Lam, 2000, p. 490). Tacit knowledge is embedded in individuals and hard to articulate, record or formalise.

The two types of knowledge (tacit and explicit) pass through a conversion process from time to time to be usable in any context. This process is referred to as the knowledge management. The knowledge management process has been discussed by scholars and most of them categorised knowledge management into four main stages. According to Nonaka and Takeuchi (1995), knowledge conversion passes through four quadrants - socialization, externalization, combination, and internalization (SECI). Alavi and Leidner (2001) stated that the knowledge management process comprises four phases, namely, knowledge creation, transfer, storage/retrieval, and application. Similarly, Gonzalez and Martins (2017) in a literature review of 71 articles on knowledge management argued that the knowledge management process is one that supports the flow of knowledge between individuals and groups within the organisation. They explained that it comprises four main steps: acquisition, storage, distribution, and use of knowledge. The above categorisations (Nonaka & Takeuchi, 1995; Alavi & Leidner, 2001; Gonzalez & Martins, 2017) are the same but use different nomenclature.

The digital environment of the 21st Century has provided web-enabled tools for the knowledge conversion process. Web 3.0, referred to as the “Internet of Everything” by Foroughi 2017, is one of such tools, and it is a series of combined semantic applications and core software technology. These semantic applications, such as Wikis and Blogs are ready tools for interactions and communications in every sphere of human endeavours. Web 3.0 tools are currently explored for knowledge management for both conventional and distance education. There seems to be no study on the use of Web 3.0 for knowledge conversion by distance learners in Nigeria. Therefore, this study investigated the knowledge conversion process with the lens of the SECI model and identified Web 3.0 tools used at the four quadrants of the SECI model by distance learners of the University of Ibadan, Nigeria.

The main objective of this study was to investigate the Web 3.0 tools that are used for knowledge conversion by distance learners of the University of Ibadan, Nigeria. To achieve this, two specific objectives guided the study. These were to identify SECI knowledge conversion activities of distance learners of the University of Ibadan, Nigeria; and examine Web 3.0 tools that are used for SECI by distance learners of the University of Ibadan, Nigeria.

The University of Ibadan was established in 1948 as University College Ibadan, a college of the University of London, and became a fully-fledged university in 1963. It is the oldest university in Nigeria and is popularly known as 'Unibadan' or 'UI'. It has 17 faculties, 6 institutes, 92 academic departments, and 4 centres of excellence. The distance learning programme of the University of Ibadan started as an external degree programme of the Adult Education Department, Faculty of Education in 1988. It changed to External Studies programme and finally, the name changed to Distance Learning programme in 2002 and has graduated over 4,000 students. The Distance Learning Centre at the University of Ibadan offers the same course content to distant learners as that offered for full-time students. The only difference is the mode of delivery. Presently, the University of Ibadan Distance Learning Centre has undergraduate programmes in four faculties; Education, Arts, The Social Sciences, and Sciences.

2 Theoretical Framework

The knowledge management model of Nonaka and Takeuchi, SECI model, guided this study because of its in-built logic and clear description of the types of knowledge and how these types of knowledge get converted between tacit and explicit knowledge. The SECI knowledge conversion model was used in this study to capture distance learners' knowledge conversion stages and activities. The SECI model is relevant to this study because it shows how the two types of knowledge (tacit and explicit) are converted and, importantly, highlights the crucial role of interaction with others in creating new ideas. Interaction with classmates and facilitators is germane in the distance learning programme.

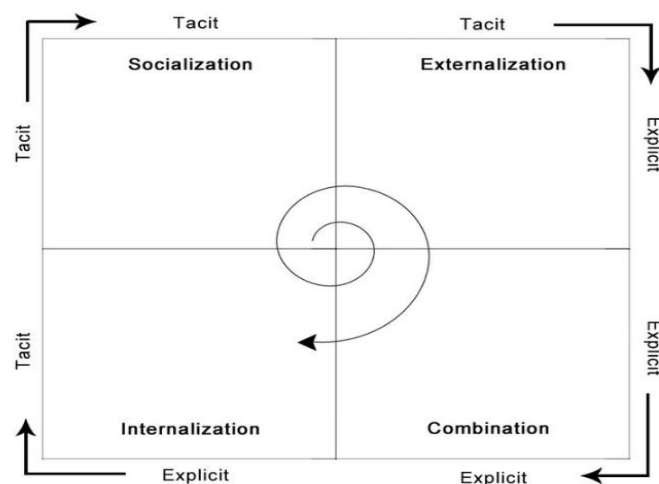


Figure 1: SECI Model

Source: Nonaka and Takeuchi (1995)

Nonaka and Takeuchi (1995) proposed the knowledge conversion model. They proposed that knowledge conversion goes through four quadrants; socialization, externalization, combination, and internalization. This is known as the SECI model.

Distance learners go through the iterative process of knowledge creation, transfer, storage/retrieval, and application. The first quadrant of the SECI model is socialisation, that is, the conversion of tacit to tacit knowledge. The distance learners socialise as they interact with both the course facilitators, or tutors, and fellow learners to get input from them. In the process, tacit knowledge of distance learners is converted and new tacit knowledge is gained. Externalisation, which is the second quadrant, takes place when distance learners turn in their assignments, project work, seminar presentations, and examination from time to time. Thus, they externalise the knowledge they have gained in quadrant one. In the process of writing the assignments, projects, and examinations, distance learners consult other information sources (explicit knowledge) and then combine it with their existing explicit knowledge to get the assignment completed. This is called quadrant three of SECI, that is, combination. At quadrant four of the model, which is internalisation, it is expected that distance learners have read and digested course materials, socialised with facilitators and colleagues, and have externalised what they have gained during contributions in the class, discussion forum, writing of assignments, and other presentations. In addition, distance learners must have combined explicit knowledge with their explicit knowledge, they now internalise all they have gained from quadrants one to three. It is the conversion of explicit to tacit knowledge because new knowledge has been gained (Ping, 2015).

3 Literature Review

There is a plethora of definitions of knowledge management in the literature. In this paper, however, the definition of knowledge management by Kidwell et al. (2000) is applied. They defined knowledge management as a process of transforming information and intellectual assets into the enduring value of connecting people with the knowledge that they need to take action when they need it. The transformation of information into knowledge and its connection to people for action has to go through a process. Knowledge management process, therefore, is the manner used to acquire and benefit from knowledge resources and capabilities by an organisation (Westbrook et al., 2014). In other words, the knowledge management process is any strategy or method that an organisation employs to capture, manage and use knowledge to achieve its goals.

According to Alavi and Leidner (2001), knowledge management consists of knowledge creation, transfer, storage, and application. Knowledge creation is the stage at which tacit knowledge interacts with explicit knowledge to create new tacit knowledge. This is what Ojo (2016) refers to as the interaction between existing tacit knowledge or personal experience with explicit knowledge to develop new tacit knowledge. Knowledge transfer is the process of making knowledge available to others. In other words, it is the stage of exchanging knowledge with others. The third stage is knowledge storage or retrieval. At this stage, valuable knowledge is stored in organisational memory for future retrieval. According to Scherp et al. (2009), knowledge storage is vital to keep the knowledge persistent for future access. Lastly, knowledge application is when an individual uses internalised tacit knowledge to form new explicit knowledge. Therefore, a successful knowledge management process is based on a logical method of conversion of tacit knowledge into explicit codified knowledge, and there are models for knowledge conversion. A well-known model for knowledge conversion is the SECI model of Nonaka and Takeuchi (1995) which is the framework used in this study.

Web technological innovation has brought changes to human interactions in the past few decades. In 1996, the world experienced Web 1.0 technology which is commonly referred to as “read-only Web” because it allows authors to write and publish while visitors can only read the content (Hussain, 2013). The subsequent Web evolution is Web 2.0 popularly referred to as “read-write Web” because it allows both authors and visitors to contribute content. Web 2.0 is also seen as a communicative, educative, and social networking tool because it allows users to share information, and collaborate in a virtual community (Kwanya et al., 2014; Singh et al., 2011; Virkus & Bamigbola, 2011). A further progression of Web brought in Web 3.0. Naik and Shivalingaiah (2009) described Web 3.0 as a web that represents meanings, connects knowledge, and puts them to work in ways that make people experience the Internet in a more relevant, useful, and enjoyable way. Web 3.0 is something similar to a “read-write-execute”. It is not a replacement for Web 2.0, but it makes Web 2.0 semantic. In essence, Web 3.0 uses Web 2.0 platforms and makes them intelligent and semantic (Amarin, 2015; Foroughi, 2017).

The key characteristics of Web 3.0 tools found in the reviewed literature include personal assistance learning, artificial intelligence, multimedia information, interoperability, and semantic nature (Rajiv & Manohar, 2011; Amarin, 2015; Foroughi, 2017). In Web 3.0 platforms, during diverse activities, such as information processing and search, users

normally supply some personal information such as interests, preferences, and affiliation. The computer customises personal information and subsequently provides information to users that suit their interests. Thus, user profiles act like a virtual avatar that represents the users' interests online (Foroughi, 2017). Web 3.0 uses artificial intelligence to enable programmes and applications to understand higher logic and reasoning. This means that an application based on Web 3.0 can directly do intelligent analysis and output results without the intrusive intervention of a human user. Similarly, documents in different languages can be intelligently translated into other languages on Web 3.0 platforms. In addition, Web 3.0 enables the use of multimedia information by providing users with links to relevant information. An example is Second Life (SL) that facilitates real-time collaboration and interaction to support a variety of human activities (Faroughi, 2017). It is a social virtual platform and a medium for instructors and students to communicate, socialise, and interact in a globalised, networked world (Elis & Anderson, 2011).

Web 3.0 is interoperable because the applications are easy to customise and can separately work on different kinds of devices such as different types of computers, mobiles, hand-held devices, automobiles, TVs, and microwave devices, among others (Rajiv & Manohar, 2011). Semantic nature of Web 3.0 is another key characteristic. It means that machines now can read Web content like human beings and follow human directions. In addition, it provides an efficient and easier way to share, find and combine data and information from distinct sources. Web 3.0 enables learners to create their avatars on the Web; interact with each other like in the real classroom environment; as well as conduct class sessions, group work, meetings, seminars, presentations, digital exhibitions, role-play, simulations, and 3D modelling. It makes learning more interesting and interactive (Rajiv & Manhar, 2011). Some examples of Web 3.0 tools are semantic e-mail, semantic blog, semantic tagging, semantic bookmarking, semantic social networking, semantic wiki, and others (Ivanova & Ivanova, 2009).

Previous studies (Lis, 2014; Krumova, 2018) have attested to the use of Web 3.0 tools for knowledge conversion. Lis (2014) examined the knowledge conversion process of the military organisation using SECI and submitted that the major tools used were web-based. Similarly, Krumova (2018) reported that Web 3.0 tools were used by Bachelor's degree students of the Technical University, Sofia for knowledge creation, sharing, and process. Distance learning's mode necessitates the use of Web-based interactive tools.

Thus, this study examines the use of Web 3.0 tools for knowledge conversion activities by distance learners of the University of Ibadan, Nigeria.

4 Methodology

This study adopted a qualitative research approach. This approach was considered appropriate for this study because it enabled the researcher to integrate the real-life situation of the respondents in the research data. Creswell (2003) submitted that qualitative research takes place in the natural setting and enables the researcher to develop a level of facts about the individual or place and to be highly involved in the actual experiences of the participants. The study purposively sampled 449 students in 400-level in four faculties; Arts, Education, Sciences, and the Social Sciences of the Distance Learning Centre, University of Ibadan, Nigeria. Level 400 students were selected to participate in the study because they are conversant with using Web 3.0 for learning activities having spent three sessions on the programme. Four (4) distance learners were selected randomly from each of the four faculties totalling 16 learners. The sample size of 16 distance learners was considered adequate because of saturation due to the homogeneity of the sample (Guest et al., 2006). A semi-structured interview was used to collect data from the students. A digital recorder was used to document the interview process. The interview sessions were transcribed and thematised based on the SECI model of knowledge conversion.

5 Findings of the Study

Data in Table 1 reveals that the respondents consisted of 8 males and 8 females, the majority of them (37.5%) were in age range 26-30; and 4 (25%) respondents were selected from each Faculty.

Table 1: Demographic profile of the respondents

Demographic characteristics	category	Frequency (N=16)	Percentage (%)
Gender	Male	8	50
	Female	8	50
Age	21 -25	4	25
	26-30	6	37.5
	31-35	4	25
	36 and above	2	12.5

Faculty	Arts	4	25
	Education	4	25
	Social Sciences	4	25
	Science	4	25

Research Question 1: What are the SECI knowledge conversion activities of the distance learners of the University of Ibadan, Nigeria?

The result is presented in Table 2.

Table 2: SECI model activities of distant learners of the University of Ibadan

KM SECI Model	Activities
Socialisation (Tacit to Tacit conversion)	Attending tutorial classes, participating in discussion forums with course mates and tutors/facilitators.
Externalisation (Tacit to Explicit Knowledge)	Contribution at lecture and other discussion forums, writing and presentation of seminars, projects, assignments and examinations.
Combination (Explicit to Explicit knowledge)	Consultation of other materials and combination with explicit knowledge of the learners in order to carry out the assignments.
Internalisation (Explicit to Tacit knowledge)	Reading of course materials, and other explicit knowledge, digestion and internalisation.

Table 2 reveals the various activities of distance learners of the University of Ibadan at the four SECI quadrants. At the socialisation quadrant, the distance learners were asked how they socialise? They responded that they socialise during the face-to-face interaction, online discussion forums, WhatsApp, Google mail and Facebook. Some of the responses are as reported below:

Distance Learner 4:

“I socialise with my course mates and lecturers face to face during two weeks’ physical interactive sessions, tutorial periods and discussion forums on open-threaded discussion”.

Distance Learner 6:

“Hmmm as a distance learner, I interact and socialise with course mates during discussion and tutorial classes and even when working on our group assignments both physically and online.”

At the second quadrant, which is externalisation, they were asked to explain how they expressed or externalised their knowledge. They expressed their explicit knowledge during tutorial, class works, writing and presentation of seminars, projects, assignments and examinations. Some of the verbatim responses are hereunder.

Distance Learner 10:

“In my own little understanding of externalisation, I think during tutorial classes I contribute to discussion, and even during seminar presentation I am able to voice out what I understood and, in the examination too.”

Distance Learner 5:

“Activities such as presentation of my assignment, discussion with my course mates at the discussion forum and examination.”

In the combination quadrant, they were asked to explain the materials they use for their academic work. The participants stated that they consult textbooks and e-resources from the library. Some verbatim responses are as indicated below.

Distance Learner 3:

“I normally use our course materials, and consult other textbooks, and online articles in order to prepare for my class work, assignments and examinations.”

Distance Learner 7:

“We have course materials for all our courses and I use other relevant materials from the library, e-resources and course materials to be able to answer assignments and even for my examination.”

In the internalisation quadrant, they were asked to explain what they do to show they have gained new knowledge. They explained that they make contributions when they participate in discussions in the class and group forum. They asserted that this demonstrated that they have gained explicit knowledge. Some verbatim responses are as provided hereunder:

Distance Learner 1:

“I gain new knowledge through reading the expressed knowledge of other people; be it during the tutorial class or reading books. The richness of my contribution or participation shows that I have added to threaded discussion.”

Distance Learner 12:

“I listen to my classmates when they contribute and I also read to gain knowledge that I digest to form my own knowledge. Subsequently, the density of my participation shows that I have internalised the topic in question.”

Research question 2: Which Web 3.0 tools are used for each of the quadrants of SECI model by distance learners of the University of Ibadan, Nigeria?

The results are presented in Table 3.

Table 3: Web 3.0 and knowledge management by Distance Learners of the University of Ibadan

KM SECI Model	Activities	Web 3.0 Tools for KM
Socialisation (Tacit to Tacit conversion)	Tutorial classes, discussion forum with course mates and Tutors/Facilitators	WhatsApp, Google Talk, Google Classroom, Google Hangout and Facebook.
Externalisation (Tacit to Explicit Knowledge)	Contribution at lecture and other discussion forum, writing and presentation of seminars, project, assignments and examinations	Google Classroom, designated Google Mail, WhatsApp group platform and Continuous Assessment Portal.
Combination (Explicit to Explicit knowledge)	Consultation of other materials and combination with explicit knowledge of the learners in order to carry out the assignments	Open Educational Resources (OER), E-Library and Google Search Engine, Google Drive
Internalisation (Explicit to Tacit knowledge)	Participation and contribution during class and in the group.	WhatsApp, Blog, LMS, Online Google Classroom, Discussion Forum

Socialisation quadrant: At the socialisation quadrant the participants were asked to identify the Web 3.0 tools they use for interaction. The participants said they used WhatsApp, Google talk, Facebook, Google classroom, Google Hangout and Google Drive to interact and share files. Some of the verbatim responses are shown below.

Distance Learner 1:

“I generally interact with my colleagues through WhatsApp, Google talk, and Facebook. My colleagues and I interact with our course facilitators through Google classroom, Google hangout for video interaction, Gmail, WhatsApp, Facebook and during two weeks face to face interactive section.”

Distance Learner 8:

“At the University of Ibadan ODL, we interact with our course facilitators and colleagues with the use of WhatsApp application, Google Hangout and Google Classroom.”

Distance Learner 13:

“Apart from Google Classroom, I interact and share documents and files with my colleagues using Google Drive.”

Externalisation quadrant: In this quadrant, the participants were asked about the Web 3.0 tools they use to submit assignments, make presentations and hand in term papers. They responded that they use Google Classroom, dedicated Gmail, and Continuous Assessment (CA) Portal as shown in their verbatim responses below.

Distance Learner 2:

“Due to the fact that our programme is tagged Open Distance Learning (ODL), we submit our assignments and presentations through Google Classroom and dedicated Gmail.”

Distance Learner 5:

“The submission of our assignments is through the school recognised Continuous Assessment (CA) Portal for a proper record keeping and the sake of time management to avoid manipulation and repetition.”

Combination quadrant: At the combination quadrant, the participants were asked about the Web 3.0 tools they consult and use for their assignments and other academic works. They consult open educational resources, virtual library of the University, Google search and Google Drive. Below are their verbatim responses:

Distance Learner 1:

“Apart from the course materials, our facilitators recommend textbooks which are on open educational resource (OER); also there is the online library which is linked to our university library website. I also use Google search to get other materials.”

Distance Learner 6:

“I use Google Drive to store my documents and it synchronizes files across devices, and share files with my colleagues.”

Internalisation quadrant: At this quadrant, the participants were asked about the Web 3.0 tools they use to show that they have internalised the topics of discussion. The Web 3.0 tools they identified are WhatsApp, Blog, LMS, Online Google Classroom, Facebook and Discussion Forum.

Distance Learner 4:

“Well at the end of each module, I know I have gained something, that is, my level of understanding has changed and I am able to add it to my initial knowledge.”

Distance Learner 15:

“Personally, when I know that I have mastered the topic in question, I make it evident by contributing on the same topic in groups on WhatsApp, Facebook and other media.”

Distance Learner 12:

“I use Google classroom and our LMS to contribute to trending issues and my contributions show that I have gained new knowledge.”

6 Discussions of Findings

The study has identified activities of distance learners in the four quadrants of the SECI knowledge conversion model. It has demonstrated how tacit and explicit knowledge are converted iteratively during the course of study of distance learners. It is not surprising that distance learners pass through the four quadrants as they pursue their educational programmes since knowledge acquisition involves the conversion of tacit and explicit knowledge. No doubt knowledge conversion is important because learning cannot take place without tacit and explicit knowledge conversion. Also, as new ideas (tacit knowledge) are generated, there will always be opportunities to share or express them as explicit knowledge.

The results in this study also confirm that Web 3.0 tools can be used as platforms for knowledge conversion in the educational sector. It is not a coincidence that Web 3.0 tools are educational tools because literature has it that even though Web tools are a social network, they are also educational tools (Singh et al., 2011; Virkus & Bamigbola, 2011). Krumova (2018) revealed that Web 3.0 tools such as LMS, cloud-based tools, and open-source software were used for the knowledge conversion process of learners. Similarly, Lis (2014) submitted that Web-based learning, e-learning, and computer-based tools were major tools used by the military in their SECI knowledge conversion activities. This is a welcome development in Africa, and it will expand the horizon of distance learning education and make it more open as Web-based platforms are used.

7 Conclusion

This paper examined the knowledge conversion process using the SECI knowledge management model by distance learners at the University of Ibadan, Nigeria. The paper identified all the activities of knowledge conversion stages/phases of the distance learners of the University of Ibadan in the context of the SECI knowledge conversion model. At the socialisation quadrant, they interact in the tutorial classes and on discussion forums with course mates and tutors/facilitators. The externalisation takes place at the presentation of seminars, project writing, writing of assignments, and examinations. They consult different sources of information and combine them with their explicit knowledge to carry out their projects as well as write assignments, and examination. Lastly, at the internalisation quadrant, they digest explicit knowledge gained to form new knowledge as it reflects in the level of their contributions in class and other discussion forums. Subsequently, they use Web 3.0 tools such as WhatsApp, Google Talk, Google Classroom, Google Hangout, and Facebook for socialisation quadrant; and Google Classroom, designated Google Mail, WhatsApp group platform, and Continuous Assessment Portal at the externalisation quadrant. Similarly, Open Educational Resources (OER), E-Library, Google Search Engine, Google Drive are used at the combination quadrant while WhatsApp, Blog, LMS, Online Google Classroom, Discussion Forum are applied in the internalisation quadrant. Conclusively, this study has demonstrated that Web 3.0 tools are suitable knowledge conversion tools.

8 Implications of the Study

The findings of this study can contribute to the elucidation of the use of Web 3.0 tools by distance learners in the knowledge conversion process of the University of Ibadan,

Nigeria. It shows that Web 3.0 tools are ready platforms for distance learning education in this dispensation. Thus, this study recommends that other universities in Nigeria should use Web 3.0 tools for distance learning and do away with physical interaction. In addition, the conventional learning programme could also use these tools especially now that educational institutions are going virtual in the post-Covid-19 era.

References

- Alavi, M., & Leidner, D. E. (2001). Knowledge management and knowledge management systems: conceptual foundations and research issues. *Management Information Systems Quarterly*, 25(1), 107-136. <https://dx.doi.org/10.2307/3250961>.
- Amarin, N. Z. (2015) Web 3.0 and its reflections on the future of E-learning. *Academic Journal of Science*, 4(2), 115-122.
- Commonwealth of Learning (2007). *Knowledge management strategies for distance education: Knowledge Series West Hastings*. Vancouver: Canada.
- Creswell, J. W. (2003). *Research design: qualitative, quantitative and mixed methods*. 2nd Edn. Thousand Oaks: Sage Publications Inc.
- Ellis, M. & Anderson, P. (2011) Learning to teach in second life: a novice adventure in virtual reality. *Journal of Instructional Pedagogies*, 6, 1-10.
- Foroughi, A. (2017) Web 3.0 How the “Internet of Everything” will impact higher education. <https://decisionsciences.org/wp-content/uploads/2017/11/p671855.pdf>.
- Gonzalez, R.V.D & Martins, M. F. (2017) Knowledge Management Process: A theoretical-conceptual research. *Gest. Prod. Sao. Carlos*, 24(2) 248-265
- Guest, G., Bunce, A., & Johnson, L. (2006) How many interviews are enough?: An experiment with data saturation and variability. *Field Methods*, 18, 59-82.
- Hussain, F. (2013). E-learning 3.0 = e-learning 2.0 + web 3.0? *IOSR Journal of Research and Method in Education (IOSR-JRME)*, (3) 3, 39-47.
- Ivanova, M. & Ivanova, T. (2009) Web 2.0 and Web 3.0 environment: Possibilities for authoring and knowledge representation. *Revista de Informatica Sociala* 7(12), 7-21.
- Kidwell, J. J., Vander Linde, K., & Johnson, S. L. (2000). Applying corporate knowledge management practices in higher education. *Educause Quarterly*, 4, 28–33.
- Krumova, M. (2018) Knowledge creation and sharing process enhanced by cloud-based tools, annotation technology and open data. *Journal of E-Technology*, 9(3), 73-81.
- Kwanya, T., Stilwell, C., & Underwood, P. (2014). *Library 3.0: intelligent libraries and apomediation*. Elsevier.
- Lam, A. (2000). Tacit knowledge, organizational learning and societal institutions: An integrated framework, *Organization Studies*, 21(3), 487-513.
- Lis, A. (2014) Knowledge creation and conversion in military organization: How SECI Model is applied within Armed Forces. *Journal of Entrepreneurship Management and Innovation (JEMI)*, 10(1), 1, 57-78.
- Liu, S. (2008). Student interaction experiences in distance learning courses: A phenomenological study. *Online Journal of Distance Learning Administration*, 11(1): 1933, <https://www.westga.edu/distance/ojdl/spring11/Liu111.html>.
- Naik, U. & Shivalingaiah, D. (2009). Comparative study of Web 1.0, Web 2.0 and Web 3.0. *International Caliber*, 499-507.
- Nonaka, I. & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press.
- Ojo, A. (2016). Knowledge management in Nigerian Universities: A conceptual model. *Interdisciplinary Journal of Information, Knowledge and Management*. 11, 331-345.
- Ping, C. T. (2015) Knowledge management and open distance learning. In Li, K. C and Yuen, K. S (Eds.) *Studies and Practices for advancement in Open and Distance Education Proceedings of 28th Annual Conference of Asian Association of Open Universities*. (October, 2014) Hong Kong.

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- Rajiv, M.L. & Manohar, L. (2011). Web 3.0 in Education and Research. BIJIT-BVICAM's *International Journal of Information Technology*, 3(2), 335-340.
- Mustapha, S.S. (2016). Towards Building Monolithic Computational Platform for SECI Model. *International Journal of Intelligence Science*, 6, 29-41. <http://dx.doi.org/10.4236/ijis.2016.64004>.
- Scherp, A. Schwagereit, F. & Ireson, N. (2009). Web 2.0 and traditional knowledge management process. In *Wissensmanagement*, 222-231.
- Singh, K., Debi, & Gulati, D. (2011). Technological March from Web 1.0 to Web 3.0: A Comparative Study. *Library Herald*, 49(2), 146-157.
- Tucker, S. Y. (2003). A portrait of distance learners in higher education. *Turkish Online Journal of Distance Education*. 4(3), 1-9.
- Virkus, S. & Bamigbola, A. A. (2011). 'Students' conceptions and experiences of Web 2.0 tools', *New Library World*, 112(11), 479-489.
- Wallace, D. P. (2007). *Knowledge management: Historical and cross-disciplinary Themes*. Libraries Unlimited, Zeleny.
- Westbrooks, B. McCaffery, R. & Scott, C. (2014). Knowledge management process. INSIGHT Initiative https://www.mindtools.com/pages/article/newISS_87.htm.
- Yilmaz, B. Kulca, O. Unal, Y. & Cakmak, T. (2013). Distance education on digitization: evaluation of an application in Turkey. *Aslib Proceedings: New Information Perspectives* 65(4), 336-357.