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Examining the use of web-based tools in fully online learning community environments

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Abstract

In order to participate in the co-creation of the digital space inherent in Fully Online Learning Community (FOLC) environments (vanOostveen, DiGiuseppe, Barber, Blayone & Childs, 2016), learners must be familiar with the types of web-based tools that are available, and how they can be used to support collaborative learning. Bower (2015) states that educators have a narrow conception of web-based technologies and consequently there are many web-based applications which have not yet been found or utilized. It is suspected that this is also the case for many learners. This paper examines the awareness of web-based tools as well as their use in learning contexts by instructors and students working in FOLC environments. Specifically, the investigation looks to determine if learners and faculty are aware of web-based tools that can help learners to understand concepts, models and theories and how the tools allow for the development of learner autonomy and resilience within fully online learning environments. Participants in fully online courses at a medium-sized Canadian university were asked to respond to a survey as well as participate in a series of repertory grid focus group sessions, held in an audio-video conferencing virtual room. Preliminary results suggest that while awareness of some tools is more prevalent than previously suspected, the use of these types of tools is constrained by a number of factors including a lack of knowledge of how to incorporate the tools into online environments, and a lack of interest in using these tools. The paper includes a full analysis of all collected data.

Keywords: Web 2.0, Web 3.0, semantic web, fully online learning community, online learning, connectivism

Introduction

Online learning becomes more popular with each passing year. In 2013, in the U.S., 33.5% of higher education students were taking at least one online course (Allen et al., 2014). Approximately 360,000 Canadian students, accounting for 29% of all Canadian university students, were registered in an online course (Martel, 2015). It can, however, be challenging for students and faculty to engage and contribute to such an environment. Fully online learning community (FOLC) environments require learners to be active agents in order for collaborative learning to take place.

The FOLC model acknowledges that communities are dynamic, not static, co-creations of space (vanOostveen, DiGiuseppe, Barber, Blayone & Childs, 2016). This model encourages the development and use of employment skills desired by 21st century employers such as, critical thinking skills, technology skills, problem solving skills and communication and cooperation with others (vanOostveen et al., 2016). As community members are actively engaged in the building of the community, they have also reported feeling a sense of trust and safety among their co-creators, where constructive criticism is welcomed as an opportunity for improvement (vanOostveen et al., 2016). This learning environment helps students to be actively engaged and invested in their education and this research aims to prove web-based tools can enrich the FOLC environment further.

This investigation looks to determine if learners and faculty are aware of web-based tools (authoring tools, web-enabled tools and applications) that can help learners to understand concepts, models and theories and how the tools allow for the development of learner autonomy and resilience within fully online learning environments. The focus of this paper is primarily web-enabled tools and apps, although given the advances in analytic and authoring tools, respondents were provided the opportunity to include them in their responses. Having the

knowledge and ability to use web-based tools is important for educators and students. If educators utilize these tools in the classroom they can broaden the classroom experience as well as help to support students. Students should be familiar and comfortable with various web-based tools not only for their own learning experience, but also for their future careers. In a world with ever expanding technology, students need to be able to adapt and use a variety of tools.

This paper will explore these concepts and problems via a review of the literature and through an analysis of survey and focus group data collected.

Literature Review

FOLC

Fully Online Learning Community (FOLC) environments (vanOostveen et al., 2016) aim to co-create the online classroom space, rather than be exclusively a faculty-directed environment. By co-creating the space, instructors and students can work together to define and create the learning space they desire. When students have the opportunity to be an agent in the creation of the learning space, they are given the power to help shape their learning experience. This helps to create a dynamic community within the FOLC environment by incorporating many students' experiences and voices. Having all students helping to build the learning environment helps to broaden the reach of the classroom by utilizing all learning experiences, rather than just the instructor's.

FOLC environments assist learners in engaging them in discourse that meets their learning needs and scaffolding their learning with peers (Chapman, Ramondt & Smiley, 2005). This model asks students to actively construct their own learning, rather than passively accept it,

which allows students to take ownership for their learning (vanOostveen et al., 2016). The FOLC model therefore looks at the need for students and instructors to examine their readiness to adapt to change (vanOostveen et al., 2016) as it is not a typical or traditional online learning environment for most students. A traditional online learning environment may be asynchronous and is typically instructor-led. Co-creating a learning environment gives students agency and the opportunity to take ownership of their learning.

While engaging in the co-creation of the online learning environment, community members can utilize a variety of tools such as, Open Educational Resources (OER), commercial products and interactive sites with social aspects (Spivack, 2004). These tools are loosely referred to as Web 2.0 and Web 3.0 in this study. In order for students to participate in the co-creation of a digital space for online learning, learners and educators must be able to identify and utilize Web 2.0 and Web 3.0 tools that can support the collaborative learning style used in Fully Online Learning Communities. Bower (2015) states that educators have a narrow understanding of Web 2.0 technologies and, consequently, there are many Web 2.0 tools that are not utilized. Presumably, this can be extended to Web 3.0 also. It is suspected that this is also true for many learners. These could be missed opportunities for an improved online learning community.

Web 2.0

Web 2.0 technologies differ from Web 1.0 in that they require, or offer, opportunities to interact with others, with information, and manipulate data in order to concentrate on higher order thinking skills (i.e. GTCU Framework) (Desjardins, 2005). With the changes to web-based tools and sharing of information online over the past decade, it is necessary to categorize and understand the benefits of use of these technologies so they can be fully utilized (Mulpeter,

2009). Similar to asking students to become creators of the FOLC, Web 2.0 technologies ask users to create the space they occupy online. The web evolved into a collaborative space for all users to exist within. Reviewing the differences between Web 1.0 (static), which was flat and lacked interaction with the users, to Web 2.0 (interactive), which expands into collaborative and connected communities, can help to define Web 3.0 as smart technology.

Web 2.0 tools help users to interact with the tools and one another in ways that Web 1.0 did not. Opening up the web to be a more interactive place allows users to help construct the web; creating a more inclusive and expansive online environment. Users now have the opportunity to help participate in the composition of the web and the information included within it (Boikos, Moutsoulas & Tsekeris, 2014). This helped the web become participatory and encouraged the emergence of new ideas, by encouraging users to contribute and expand on previous information included on the web (Fox & Madden, 2006).

Teaching and learning in itself is collaborative; educators working with other educators, educators working with students, students working with other students. Collaborating and disseminating information is a big part of learning and Web 2.0 tools allow for easier collaboration and communication between these channels. Web 2.0 tools also allow educators to broaden the learning environment through interactive learning activities, online quizzing tools and even course organization tools that act similar to a learning management system (LMS).

Web 3.0

While there is not one universal definition of Web 3.0, it is generally accepted that Web 3.0 tools include algorithms that assist the user in their use of the tool. Web 3.0 is allowing the computer, rather than the person using the computer, to generate new information in a way that assists the user (Wolfram, 2010). Web 3.0 tools are complex in comparison to Web 2.0 tools,

making a clear definition more challenging. Web 3.0 is not a reinvention of the web, but an evolution of technologies that helps people and the web be more connected and smarter (Mulpeter, 2009). These Web 3.0 technologies add meaning to information by expanding the user experience (Bruwer, 2016). This can improve the usability and effectiveness of these online tools to support learning in FOLC environments.

Methodology

Data Collection

A survey was created, using Survey Monkey, with a number of multiple choice and rating scale questions in order to gauge the familiarity and use of Web 2.0 and Web 3.0 tools (see Appendix A). The survey was sent, via email by department administrators, to prospective participants who were registered in fully online courses across a number of programs in a medium-sized university, located in Canada. In addition, an invitation was sent to the same faculties, requesting students and faculty to participate in a focus group to discuss Web 2.0 and Web 3.0 technologies. From this request, 4 student participants took part in the focus group.

Participants

The survey solicited responses from 34 students and 1 faculty member. There were 10 male respondents and 24 female respondents. The majority (24) of the respondents were between the ages of 30-49, with equal remaining respondents in the 18-29 (4) age range and the 50-64 age range (4).

The focus group invitation received interest from 4 students within the Faculty of Education at the university. Three students completed the focus group and provided data to the

researchers. There was another focus group, however, this paper is only reporting on one instance.

Focus Group

Each focus group was facilitated by two researchers within Adobe Connect, an audio-video conferencing tool. Using a Repertory Grid methodology (Gaines & Shaw, 2012), participants were asked to develop a list of 10-12 Web 2.0 and Web 3.0 tools (elements) tools for comparison. The participants then proceeded to develop a set of diametrically opposing poles (constructs) by taking 3 randomly chosen elements and determining which two of the elements could be considered to be similar to each other and which element was different from the other two. Brief descriptions for each of these element groups were negotiated by the participants and these descriptions form the poles of the axis that has been created.

Ultimately, the participants had created four constructs against which the generated list of elements were rated. . Following the focus group, the participants sent the researchers a repertory grid matrix with all tools, rated between a scale of 1-7 against the four constructs. These data were entered into the WebGrid (<http://grid.eilab.ca>) online platform, from which the researchers generated cluster plots and pringrids.

Data Analysis

The data analysis was conducted using Grounded Theory method (Glaser, 1992) in different stages, beginning with the survey data, then the focus group data and finally comparing the two sets of data. Grounded Theory looks to categorize the data, making associations and drawing relationships in order to make sense of and understand the information presented in the data (Glaser, 1992). In this way, the survey results were parsed and reviewed for majorities and

commonalities, or categories. The survey data was analyzed by the percentages of responses and determining what trends and results appeared. The results were under a constant comparative analysis as they were reviewed to identify emerging categories and commonalities.

The focus group data was parsed and entered into a web grid online platform (WebGrid Plus, 2017). After all datasets were entered pringrid and cluster plots were created for analysis. The data from the focus group were then compared to the survey results, reinforcing many of the survey data results.

Findings

The preliminary results suggested that while awareness of some tools is more prevalent than previously suspected, the use of these types of tools is constrained by a number of factors including a lack of knowledge of how to incorporate the tools into online environments, and a lack of interest in using these tools. The survey confirmed, by open-ended responses, that there is a lack of knowledge surrounding how to utilize these tools effectively in the learning environment.

Awareness of Web-Based Tools

The awareness of Web 2.0 and Web 3.0 tools, according to the participants' responses, is high. This could be due to the faculties surveyed, specifically by participants from the Faculty of Education, who are exposed to many learning tools in their learning environments. The majority of the tools included in this section of the survey (78%) received at least 80% of respondents stating that they were familiar with the tool. This demonstrates that many of these tools are at least recognizable to many people. The tools that respondents rated with a lower familiarity are social bookmarking (48.5% familiarity) and podcasts/vodcasts (63% familiarity).

By contrast, the respondents' familiarity with Web 3.0 tools was lower, with only two tools (shopping sites at 94% and personalized ads at 83%) reaching an 80% or more response of familiarity. The remaining six tools (open source development platforms, AI interactive broadcasting, smart assistants, simulation environments, real time digital dashboarding/visualizations and online interactive textbooks) ranged from 3% to 57% familiarity by the respondents.

Use of Web-Based Tools in FOLC Environments

Specifically, the investigation looks to determine if learners and faculty are aware of web-based tools that can help learners to understand concepts, models and theories and how the tools allow for the development of learner autonomy and resilience within fully online learning environments. The learner autonomy/resilience will need to be studied in greater detail as this analysis has not yet been completed, and will be presented at the conference in October.

Use of Web 2.0 & 3.0

It is seen from the survey results that a majority of respondents were familiar with the listed tools, to a varying degree, however, their use of the tools in formal and informal learning environments was much lower. All but two of the tools, social bookmarking and podcasts and vodcasts, had an 80% familiarity response (see Figure 1). In contrast, only four tools, social networks in the informal learning environment, video sharing, cloud computing and online discussion forums in the formal learning environment, scored 80% or more in usage by the respondents.

The survey attempted to gain insight into why this disparity exists by asking respondents what their reason for not using Web 2.0 tools in the formal learning environment was. Five

responses were given; two indicated they do not know how to use the tool(s), two indicated they had no interest in using the tool(s) and one responded s/he was not aware of the tool(s).

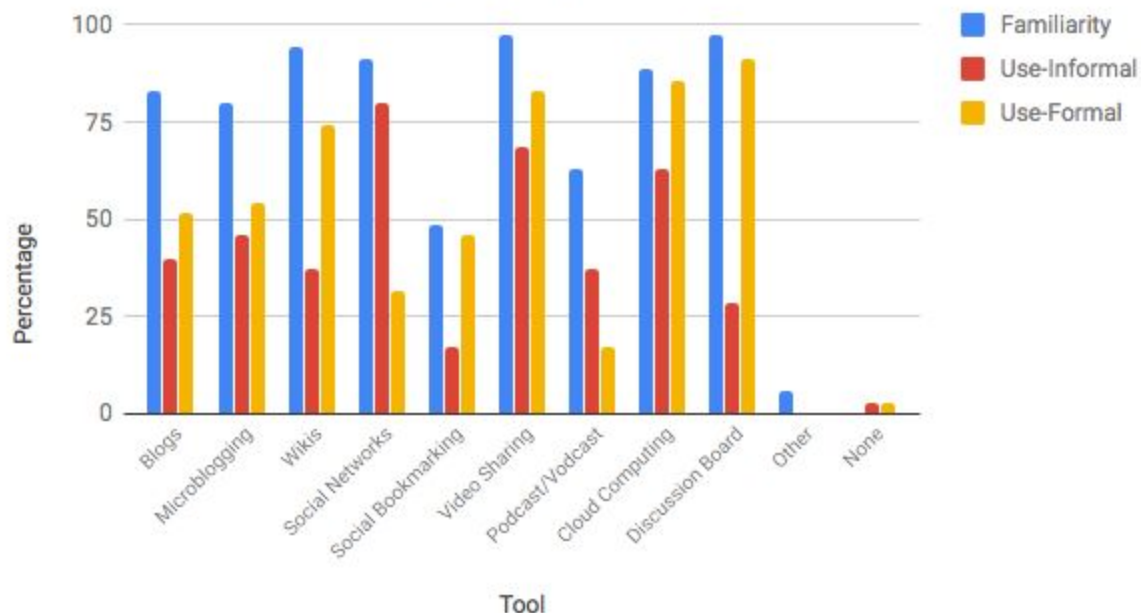


Figure 1. Familiarity & use of Web 2.0 tools. This figure compares the familiarity and use of the listed Web 2.0 tools.

The use of Web 3.0 tools in the formal and informal learning environment is significantly lower than that of Web 2.0 tools. None of the tools rated at 80% or above, with the closest tool, shopping sites in the informal learning environment, coming in at 65.5% (see Figure 2). The other high rankers are smart assistants (40%) in the informal learning environment and personalized ads (43%) in the informal learning environment. The remaining five tools (open source development platforms, AI interactive broadcasting, simulation environments, real time digital dashboarding/visualizations and online interactive textbooks), from both the informal and formal learning environments were ranked at 23% or less.

As with Web 2.0 tools, the survey attempted to gain insight into why the Web 3.0 tools were not being used in the formal learning environment. 45.5% of responses indicated they

were not aware of the tool(s) and 31.5% of responses indicated they did not know how to use the tool(s). Other responses indicated they had no interest in using the tool (14%), instructors have not requested them to use the tool(s), and the time investment needed to implementing these tools (2%).

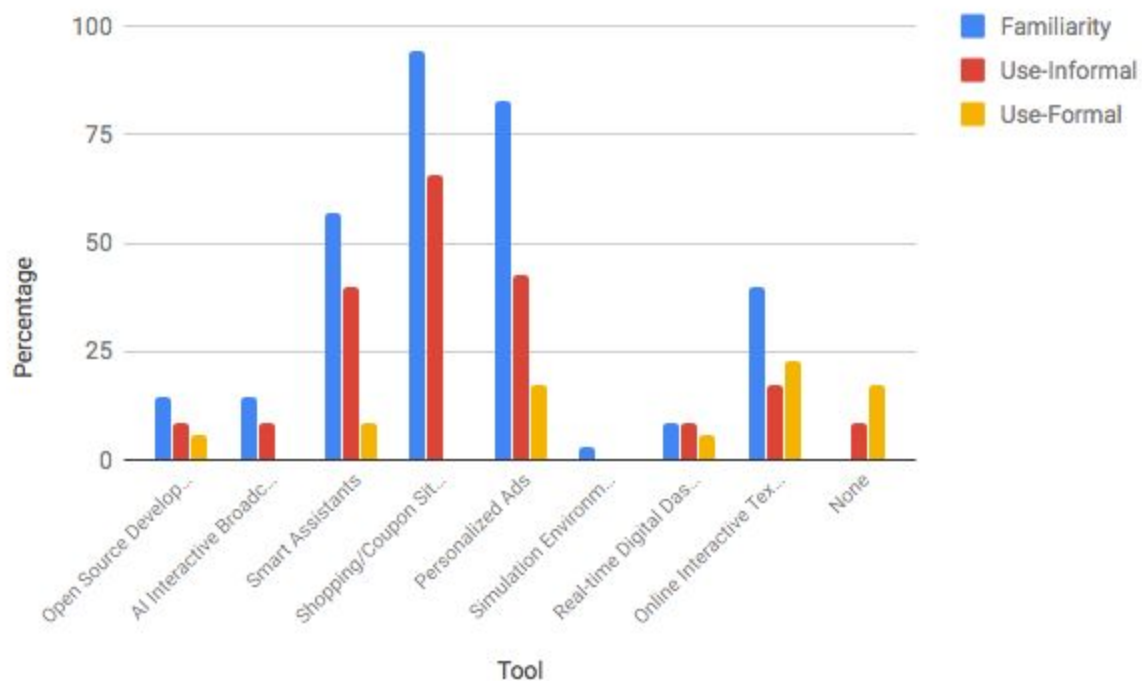


Figure 2. Familiarity & use of Web 3.0 tools. This figure compares the familiarity and use of the listed Web 3.0 tools.

Conclusion

Collaborative learning and co-creation of FOLC environments can help to fully engage students in their learning, providing a more fulsome and enriching learning opportunity. Utilizing Web 2.0 and Web 3.0 tools can help expand that learning environment by providing interactive and community-building experiences. This study provides a good initial review of FOLC

students' familiarity and use of Web 2.0 and Web 3.0 tools. The data collected shows that while students are more familiar with Web 2.0 tools they are not often using them in the formal learning environment. Web 3.0 tools, however, are not as familiar to the surveyed students and even less utilized in the formal learning environment. It is suspected that utilizing these tools more frequently in the formal learning environment would enrich students' learning experience, allowing them to be more involved in the community-building process.

This paper provides data that can be expanded upon in further studies to review why Web 2.0 and Web 3.0 tools are not being used as often as we suspect they could be. This study also provides information on how these tools can be useful to educators and learners in a fully online learning community (FOLC) environment. Future work will be conducted on this study, including re-examining the survey, getting more data sets and researching surveyed students' and faculty's comfort with the terminology. Finally, this study provides further areas to expand on the research that has been started in this paper.

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Appendix A

Web 2.0 and WEb 3.0 Survey

1. Which of these Web 2.0 tools are you familiar with?

- Blogs
- Microblogging
- Wikis
- Social Networks
- Social Bookmarking
- Video Sharing/Streaming
- Podcasts/Vodcasts
- Cloud Computing/Collaborative Documents
- Discussion Board
- None
- Other (please specify)

2. Which of the listed Web 2.0 tools do you use within your formal learning environment for course activities and/or within the information learning environment for personal use?

- Blogs- formal
- Blogs- informal
- Microblogging- formal
- Microblogging- informal
- Wikis- formal
- Wikis- informal
- Social Networks- formal
- Social Networks- informal
- Social Bookmarking- formal
- Social Bookmarking-informal
- Video Sharing/Streaming- formal
- Video Sharing/Streaming- informal
- Podcasts/Vodcasts- formal
- Podcasts/Vodcasts- informal
- Cloud Computing/Collaborative Documents- formal
- Cloud Computing/Collaborative Documents- informal
- Discussion Board- formal
- Discussion Board- informal
- None
- Other (please specify)

3. Select your most frequently used tool (from the list) and provide an explanation of how you use it within the formal learning environment.

4. If you use Web 2.0 tools in the formal learning environment, how often do you use them for sharing/reading course content?

- Daily
- Once a week
- Once a month
- A few times a year
- Rarely
- Never

5. If you rarely or never use Web 2.0 tools for formal learning, what has/have been the reason(s)?

- I wasn't aware of the tool(s)
- I don't know how to use the tool(s)
- I have no interest in using the tool(s)
- Other (please specify)

6. Do you agree/disagree with the below main advantages of using Web 2.0 tools in the formal learning environment?

- They help me work collaboratively
- They help me to share ideas/results/content
- They help me to communicate with others in the class
- They help me to build a learning community
- They help me to get/give more timely feedback
- They are simple to use/integrate
- They are free tools
- They help me to keep up to date in the field of study
- They help me to connect without time and/or geographic limitations

7. Do you agree/disagree with the below main reasons for not adopting Web 2.0 tools in the formal learning environment?

- I am busy and it takes too long to learn how to use the tool(s)
- I do not trust online platforms
- I am concerned about the lack of privacy
- The tools are not professional enough to be used in a formal learning environment
- The quality of the tool(s) is/can be poor
- The tool(s) is/are not affordable
- The tool(s) is/are not accessible to me

8. Which of these Web 3.0 tools are you familiar with?

- Open Source Development Platforms (e.g. GitHub)
- AI Interactive Broadcasting (e.g. Twitch)
- Smart Assistants (e.g. Siri, Google Assistant, Amazon Echo, Google Home)
- Shopping/Coupon Sites (e.g. Amazon, Groupon, PC Points App)

- Personalized Ads (e.g. Google ads, Facebook ads)
- Simulation Environments (e.g. Praxar)
- Real-time Digital Dashboarding/Visualizations (e.g. iDashboards, Tableau)
- Online Interactive Textbooks
- None
- Other

9. Which of these Web 3.0 tools do you use within the formal learning environment for course activities and/or within the informal learning environment?

- Open Source Development Platforms (e.g. GitHub) - Formal
- Open Source Development Platforms (e.g. GitHub) - Informal
- AI Interactive Broadcasting (e.g. Twitch)- Formal
- AI Interactive Broadcasting (e.g. Twitch)- Informal
- Smart Assistants (e.g. Siri, Google Assistant, Amazon Echo, Google Home)- Formal
- Smart Assistants (e.g. Siri, Google Assistant, Amazon Echo, Google Home)- Informal
- Shopping/Coupon Sites (e.g. Amazon, Groupon, PC Points App)- Formal
- Shopping/Coupon Sites (e.g. Amazon, Groupon, PC Points App)- Informal
- Personalized Ads (e.g. Google ads, Facebook ads)- Formal
- Personalized Ads (e.g. Google ads, Facebook ads)- Informal
- Simulation Environments (e.g. Praxar)- Formal
- Simulation Environments (e.g. Praxar)- Informal
- Real-time Digital Dashboarding/Visualizations (e.g. iDashboards, Tableau)- Formal
- Real-time Digital Dashboarding/Visualizations (e.g. iDashboards, Tableau)- Informal
- Online Interactive Textbooks- Formal
- Online Interactive Textbooks- Informal

10. Select your most frequently used Web 3.0 tool (from the list above) and provide an explanation of how you use it within the formal learning environment.

11. If you use Web 3.0 tools in the formal learning environment, how often do you use them for sharing/reading course content?

12. If you rarely or never use Web 3.0 tools for formal learning, what has/have been the reason(s)?

- I wasn't aware of the tool(s)
- I don't know how to use the tool(s)
- I have no interest in using the tool(s)
- Other (please specify)