

Investigating Different Educational Blog Characteristics to Support Collaborative Learning based on Connectivism Learning Theory

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Abstract: Higher education institutions have undertaken some approaches to increase learners' collaboration skills for opening up opportunities for new forms of knowledge formation. The emergence of the social communications tools, particularly Web 2.0 technologies has provided access to the views and opinions of a wide range of learners. Blogs have become one of the most popular social communication tools in the context of Technology Enhanced Learning (TEL). Many educators are using blog for several reasons: the power of self-editorship, the free space provided for learners to present their ideas, the quick and simple updates, the open access to the learning topics and indexes. Connectivism learning theory emphasizes the importance and role of networks and connections between learners. Considering that, the aim of the present research was to investigate the relationship between different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) in order to support collaborative connections among learners. The population of this research consists of blog posts and comments posted on CSlab platform that was designed to introduce and encourage interaction among learners in the "Introduction to Computers" course offered by Fayoum University, Egypt. The results of this study indicate that blogs have positive impact on increasing collaborative learning activities. Moreover, that sequential blogs with concise comments are more influential and facilitates interaction between peer and social communities of learners who received more comments.

1 INTRODUCTION

Connectivism is a learning theory provides new opportunities for knowledge sharing namely, information, skills, or expertise across the social networks that were not possible before the digital age (Siemens, 2017). The central aspect of connectivism is connecting social networks nodes or information sources in different geographic locations. Recently, there has been renewed interest in social network communication such as blogs and wikis in educational context (Christie & Morris, 2019). Blogs serve as a connectivist tool which increased users' interactions in online content creation and reciprocal ideas (Hughes, Swaminathan & Brooks, 2019). A weblog is briefly defined as a personal website that usually provides a free space to create, publish, and discuss topics, ideas, and feedback with historical entries representing a brief rule which often include blogs' summaries and some related links on the blog as well as personal opinions and recommended

resources (Mitchell, Friedrich, & Appleget, 2019; Yousef & Rößling, 2013).

There is a broad consensus among Technology Enhanced Learning (TEL) researchers which recognizes educational blogs as a powerful learning resource in online teaching activities (Sergio & Forsythe, 2018). Indeed, there are several reasons why educators prefer to utilize weblogs with learners. The first reason is to provide a real-time interaction for student communications. Usually, the teacher is the only person who reads participants' submissions, e.g. homework, project report, essays, and other annotated bibliographies; and this reading may focus mostly on form, rather on content. With weblogs, learners can find the free atmosphere for providing opinions and improving their skills. Other common reasons are that learners can share files, materials and notes. Moreover, increasing a sense of community in an e-learning platform may help introverted learners to participate in the in-class activities (Garcia, Moizer, Wilkins & Haddoud, 2019).

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Specifically, educational blogs have many features, such as self-editorship, free space to present learners’ ideas, quick and simple updates, open access to the learning topics and indexes (Smidt, Wheeler, Peralta, & Bell, 2018). Blogs provide opportunities for the learners to present their ideas, feedbacks and discussions on the social communication networks. Moreover, learners can be encouraged to discuss what interests them and can post their personal comments and feedback on other peers’ blogs (Udosen & Upula, 2019).

It has commonly been assumed that, the wide variety of comments on blogs can expand the significant influence of specific blog posts, as the learners not only read the original article, but also the comments written by others (Blom, 2017). However, there have been no controlled studies which studying and assessing students’ engagement and the impact of blogging characteristics on students’ learning. The specific objective of this study was to investigate the relationship between different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) in order to support collaborative connections among learners. The remaining part of the paper has been divided into four parts, begins by research design including question and hypothesis. It will then go on to discuss the methodology used for this study. The design section begins by laying out the theoretical dimensions of the research design and looks at how the educational blogs were designed for this investigation. The final section presents the findings of the research, includes the discussion and conclusion, as well as the limitations and suggestions for further research.

2 RESEARCH DESIGN

Based on the aforementioned TEL literature, blogging can be seen as an interactive social learning environment. However, educational blogs are facing some significant challenges. Quadir et al., (2019) for instance, reported that 40.7% of the learners have never participated in blogging activity, and 70% of all participants shared only one post per week. These findings are in agreement with Stone’s (2012) findings which analyzed 505 blogs and showed that only 57.1% of the total entries (885) were actually posted by learners. This number indicates that not all learners completed each of the 15 blogs task requested of them. Considering this, the current experimental study attempts to enhance learners’ use of blogs in social knowledge construction. The

importance and originality of this study are that it explores *to what degree do different blog design characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) influence learners’ engagement based on connectivism theory?*

2.1 Research Hypothesis

The population of this research consists of blog posts and comments posted on CSlab platform. The system was designed by the researchers to introduce and encourage interaction among learners in the “Introduction to Computers” course offered by Fayoum University. The cohort was divided into four groups according to the different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) as illustrated in table 1.

Table 1: Describing the characteristics of the sample.

Group ID	Blog characteristics	Comments length
Blog A	Separate	Detailed
Blog B	Sequential	Detailed
Blog C	Separate	Concise
Blog D	Sequential	Concise

According to this sample the current study set out with four main hypotheses as follow:

- H1. The different blog design characteristics are significantly affecting the number of comments.
- H2. There were no statistically significant differences in the parameters of blog post characteristics (separate - sequential $p < 0.05$).
- H3. There were no statistically significant differences in the parameters of comments length (detailed - concise $p < 0.05$).
- H4. There were no statistically significant differences between the groups in the parameters of blog post characteristics and comments length ($p < 0.05$).

2.2 Research Methodology

This investigation takes the form of a case-study to obtain an in-depth analysis of the different types of blog characteristics as illustrated in figure 1.

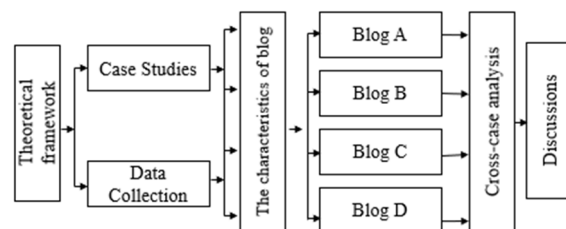


Figure 1: Case study method adapted from (Yin 2017).

3 CSLab DESIGN

The following part of this paper moves on to describe in greater detail how we designed the CSLab as a blog platform to foster an ethos of participation among learners. CSLab was prepared by adapting the procedure of the User Experience (UX) approach according to ISO-13407-1999 schema (Standard, I. S. O., 1999; Hassenzahl, 2008).

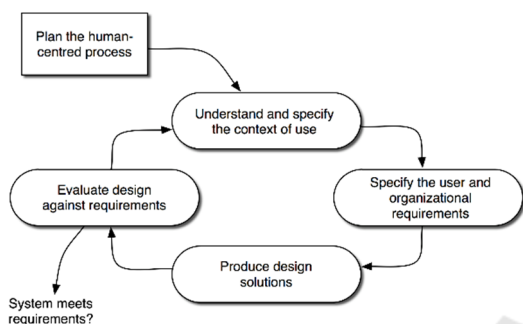


Figure 2: The human-centred design process, ISO-13407-1999 (Standard, I. S. O., 1999).

3.1 CSLab Requirements

In the requirements elicitation for an effective blog platform, we conducted a literature review that considered the broader implications of criteria for designing and delivering the interrelatedness of social and technical aspects, then we conducted a prototype, and interviewed potential users.

3.1.1 Literature Review

Surveys such as that conducted by Kim (2008) reviews prior studies and develops a model for the use of blogs in educational contexts. The review revealed four key requirements including:

- a) Interactivity
- b) Open blog system
- c) Visualization data
- d) Decentralized environment

Furthermore, some cross-sectional studies suggest an association links between pedagogical and technological criteria (Yousef, Rößling, 2013). Their study outcomes include the final list of blog criteria which are classified into 6 domains and 80 indicators, which are relevant to the current study. Including:

- a) Pedagogical dimension (Consists of: Instructional design and Content quality domains).

- b) Technological dimension (Consists of: Usability and Multimedia communications domains).
- c) Administration dimension (Consists of: Authority and Privacy domains).

3.1.2 Paper Prototype

Paper prototyping is a widely method used for the initial design of user interface design (Snyder, 2003). In order to, appropriate allocation of function between user and CSLab system, author visualize concepts and ideas of CSLab system, and share them as a paper prototype with learners to test out its design before moving on to code. Figure 3. illustrates the paper prototype for the user interface and navigation functions.

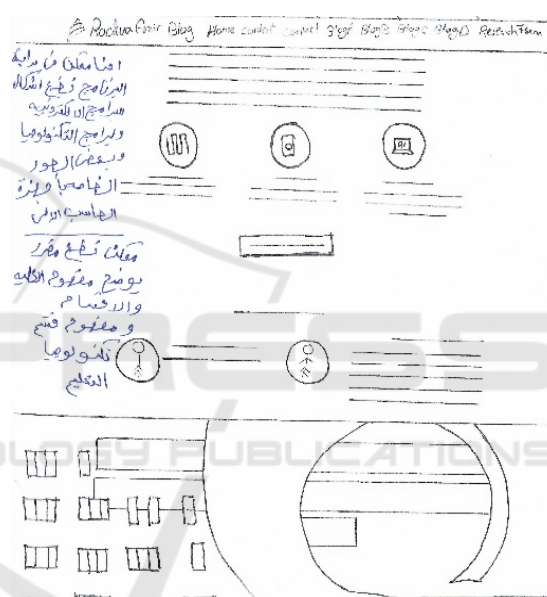


Figure 3: CSLab interface paper prototype.

Before the test starts, we gave learners as the main user target a brief description of the main feature and core idea about the CSLab as an integrated social networking and collaborative learning tool. Then, we asked learners to process concrete tasks with the prototype. We did the paper prototype test with 21 learners from the first-year degree program, were they randomly selected for the purpose of this study.

To get the most reliable answers as feedback we delivered this question to our target users “What’s your overall impression of the interface? The overall response to this question was very positive as can be seen from the data in Figure 4, around 86 % of the respondents answered either “essential” or “useful”. “Useless” was one of the options but no one chose it.

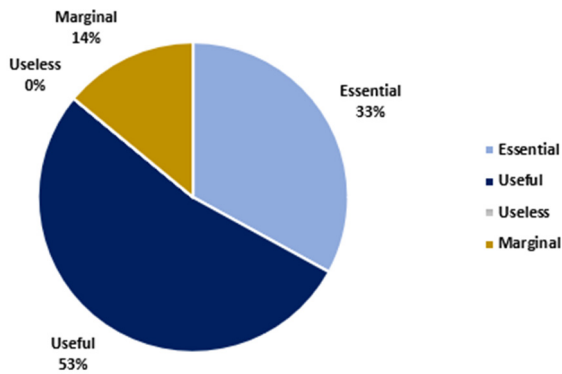


Figure 4: Usefulness of CSLab interface paper prototype.

Nielsen (2001) recommended using a very simple usability measure for target user: Success Rate. This usability metrics is defined as the percentage of tasks users perform properly. For this purpose, we further conducted Interactive Process Interviews (IPI) with target users to determine which functionalities they are expecting from the comment section, sharing buttons plugins, and learning analytics in their blogs. These interviews involved seven female and six male students who were between the ages of 18 and 20 years and all of them had previous experience with web design and social media interactions. In this CSLab prototyping interview we gave five main tasks to the learners:

- Plan your blog post by choosing a topic and post it.
- Write comment on your colleagues' post, either write a draft in a single session or gradually write a few words about its parts.
- Understand all the instruction and be able to select an appropriate button.
- Edit images directly within blog posts.
- Customize your post's layout on mobile so that it looks great on any device e.g. tablet, mobile or computer.

According to Nielsen (2001) the usability metrics test is considered success and can support learners to achieve the objectives of CSLab prototyping if Success Rate > 50 %. In total, we observed 65 attempts from thirteen students to perform the CSLab blog tasks. Of those attempts, 53 were successful, 12 were partially successful, and none was failed. Using Nielsen's user usability measurement, we got Success Rate around, 81.50 %. The most important point which stands out from this usability metrics test is that learners focus more in a method to keep track of interesting articles for later blog posts. Moreover, they highlighted that the blog tool should supports mobile devices like the iPhone, iPad and Android.

3.2 CSLab Implementation

The following part of this paper moves on to describe in greater detail the implementation of CSLab. A presentation of the technologies used in the development of CSLab will be followed by a detailed description of the different modules and their underlying functionalities.

3.2.1 CSLab Interface

The main task is to create the look and feel of the CSLab interface, and to utilize a layout that is in line with the design criteria and requirements defined in section 3. The CSLab uses multiple JavaScript frameworks and the *Node.js* platform for implementing the application's client-side and server-side logic and it makes it possible for learners to create real-time interactions.



Figure 5: CSLab interface.

3.2.2 CSLab Blogging Component

In this study, we designed some blogging component to increase interactivity as instances in which the different blog design characteristics promote learners to comment and share ideas with their peers as shown in Figure 6. The main component that often leads to an increase in traffic is commenting. Thus, CSLab has built-in commenting system in order to engage learners by sharing blog posts and replying to comments and allow learners to freely received feedback by clicking on the "Blog Options" tab and checking the "Comments" box before publishing post. Then, through comments, students can break

down the barriers of shame. The following lines is sample code for the commenting system.

```

}
.blog-detail-comments . comments {
width:100%
}
.blog-detail-comments . comments>span,
.blog-detail-comments . comments>span>iframe {
width:100%!important
}
}
}
    
```

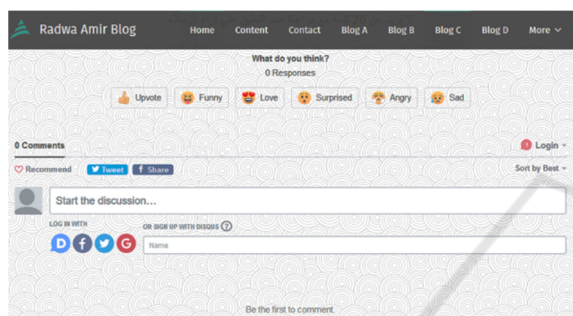


Figure 6: CSLab Blogging Component.

On top of sharing your content, learners can share their comments and discussions through social media e.g. Facebook, Twitter. Moreover, in respect to privacy criteria, CSLab accept comments only from registered learners or those who are sinning in with their Google account because Google validates the accounts it creates. Thus, allowing learners who have Google accounts leave comments can help ensure that we get comments from humans rather than spammers. Furthermore, CSLab is supported by learning analytic component to track student activities and generate statistics of comments traffic with the purpose of continuously improving the learning environment.

3.3 CSLab Usability Evaluation

According to the International Standards Organization (ISO) web site, usability is defined as "the extent to which a site can be used by a specified group of users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (Nielsen, 2001). The purpose of blog usability in this study is how educational blog layout looks like? As well as, how learners can easily find information on blog content?

Usability evaluation refers to a scientific procedure undertaken to make a discovery, test of

CSLab by representative users. We conducted a thorough usability evaluation of CSLab in terms of loading speed and functionality.

3.3.1 CSLab Speed

This section has analysed the CSLab speed from multiple locations around the globe using real browsers (IE, Firfox and Chrome) and at real consumer connection speeds as shown in Figure 7.

Web Page Performance Test for

<https://www.cslab-app.com/>

From: Dulles, VA - Chrome - Cable
11/11/2019, 8:59:33 PM

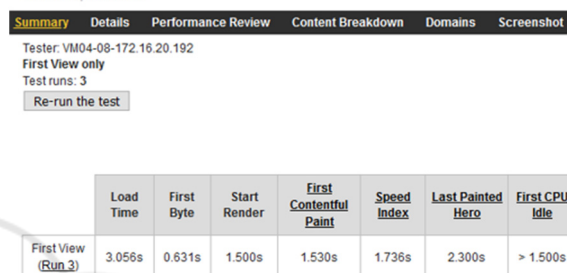


Figure 7: CSLab performance evaluation.

The most interesting aspect of this figure is that CSLab is well designed and total loading time is around only 3s which refers to high speed of its elements (pages, images, other file formats etc.) which are downloaded or displayed on the learner's web browser.

3.3.2 System Usability Scale (SUS)

User-focused design helps us to prioritize the learners experience to help make the CSLab platform as usable as possible. The System Usability Scale (SUS) is a 10-item questionnaire that can be answered on a five-point Likert scale of "Strongly Disagree" to "Strongly Agree." (Brooke, 1996). We used this questionnaire as a general usability evaluation for the CSLab. By the end of the survey period, data had been collected from 21 individuals, are summarised in Figure 8. The result refers to the high acceptance rate around 80%.

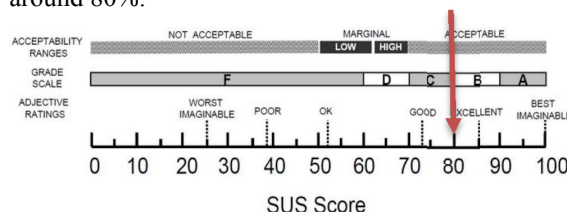


Figure 8: SUS Interpreting Scores.

4 CASE STUDY

The main goal of the current study was to investigate the relationship between different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) to foster student collaboration in “Introduction to Computers” course offered by Fayoum University, Egypt. This course provides a general introduction to computers, operating systems, software applications, hardware and data communications.

4.1 Learning Strategy

Teaching team are applied connectivist blog learning model within a blended learning method which combines, online educational blogs where learners would work together to complete different activities and had the chance to comment and interact with their peers as illustrated in figure 9 (Garcia, Brown, & Elbeltagi, 2013). With opportunity for weekly face-to-face lectures. This learning strategy enables learner's control of the learning environment as they post and create their own connections, and the shift in the role of the teacher as students become accountable to one another (Garcia, Elbeltagi, Brown, & Dungay, 2015).

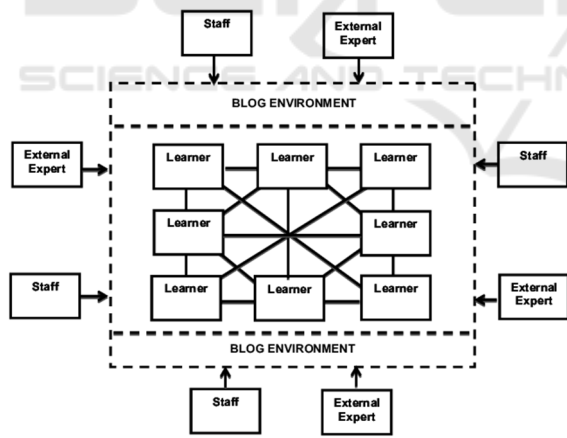


Figure 9: Connectivist educational blog model (Garcia, Brown, & Elbeltagi, 2013).

4.2 Study Sample

The initial sample consisted of 200 students, and they were divided into four groups equally (refer to Table 1). Each group collaborated with a different method and practice as we will discuss in detail in the following sections.

4.2.1 First Group: Blog A

The first group of 50 students was interacted through “**Separate blogs with Detailed comments**”. In this group comments were restricted to 100 words and learners are asked to post their comments separately as standalone posts, as shown in Figure 10.



Figure 10: Separate blogs with detailed comments.

4.3 Second Group: Blog B

The second group of 50 students was interacted through “**Sequential blogs with Detailed comments**”. In this group comments were restricted to 100 words and learners are asked to respond to comments by posted by their peers. Peer response is a form of collaborative learning in blogs where learners can respond to specific parts they don't understand in the original post or comments as presents in Figure 11.



Figure 11: Sequential blogs with detailed comments.

4.4 Third Group: Blog C

The third group of 50 students was interacted through “**Separate blogs with Concise comments**”. In this group comments were restricted to only 20 words and learners are asked to post their individual comments separately as standalone posts, as shown in Figure 12.



Figure 12: Separate blogs with concise comments.

4.5 Forth Group: Blog D

The fourth group of 50 students was interacted through “**Sequential blogs with Concise comments**”. The comments were restricted to only 20 words and learners were asked to interact to their peer’s post and comments as shown in Figure 13.



Figure 13: Sequential blogs with concise comments.

5 RESULTS AND DISCUSSIONS

This section presents the results of this investigation. The first part of this section describes the sample and shows the correlations between the independent variables. Section 5.2 introduces the data of learning analysis. Section 5.3 describes the analysis in this study, namely the relationship between different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise).

5.1 Sample and Independent Variables

The population of this study consists of blog posts and comments posted on various CSLab blogs. The initial sample of this investigation consisted of 200 learners, while only 53 learners who completed all tasks and

were interactive throughout the 21-day period and involved in this analysis as described in table 2.

Table 2: Describing the characteristics of the final sample.

Group	Blog characteristics	comments length	N
Blog A	Separate	Detailed	13
Blog B	Sequential	Detailed	13
Blog C	Separate	Concise	10
Blog D	Sequential	Concise	17

5.2 Learning Analytics

In order to evaluate the objective evidence for students’ collaborative engagement in their blogging, the authors applied learning analytics for reporting data about learners’ activities for purposes of understanding and optimizing collaborative learning. For the purpose of research ethics, all data analyzed is used only for this study and will not be used for other purposes. The authors ensured that the collection of such information is done without breaching the right to privacy.

It was hypothesised that, H1. The different blog design characteristics are significantly affecting the number of comments.

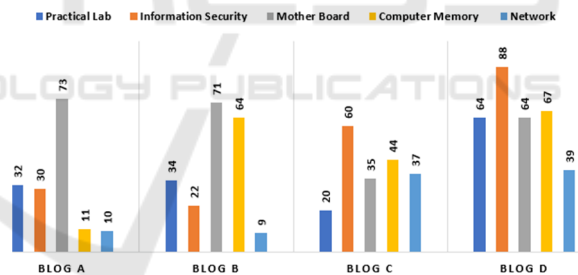


Figure 14: The number of comments on the blog post.

The chart above shows results obtained from the system regarding number of comments in each blog. Closer inspection of the chart indicates that, Group D, which interacted through “**Sequential blogs with Concise comments**” has more comments and engagement. Further learning analysis statistics are shown in Table 3.

What is interesting about the data in this table is that, Blog D, obtained high average score at (64) comments with low standard deviation at (17.38). This indicate that, there was a significant positive correlation between sequential blogs characteristics with concise comments in attracting more follower and increase learner’s engagement rates and make them post more comments. Thus, we can confirm that

there is a negative correlation indicates that separate blog posts are more negative and sequential blog posts are more positive in connection with shorter comments.

Table 3: Descriptive data analysis.

Group ID	Comments Statistics				
	Sum	Min	Max	Average	Std.Dev.
Blog A	156	10	73	31	25.5284
Blog B	200	9	71	40	26.7301
Blog C	196	20	60	39	14.5499
Blog D	322	39	88	64	17.3868

5.3 Effectiveness Evaluation

The second aim of this study was to investigate the effects of different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) on collaborative learning. For the purpose of analysis, this research has designed its own questionnaire for user evaluation. This questionnaire contains of 24 sentence concerning collaborative learning activities e.g. teamwork learning, communication and shared knowledge acquisition. A 5-point Likert scale was used from (1) strongly disagree to (5) strongly agree as shown in Appendix A.

Items of this questionnaire are based on relevant studies and discussions with TEL scholars (Yousef, 2015a). Considering reliability of the questionnaire, we used statistical item analysis of Cronbach's alpha to identify which items can be retained and which need to be discarded. This result was significant at the procedure output has an overall raw alpha of .78 (rounded from .77615 and N = 12 expert) which is good considering that .70 is the Cronbach's alpha value for being acceptable.

5.3.1 Hypothesis Verification

Statistical analysis was performed using SPSS software (version 20) to test the research hypothesis. The statistics used are:

- Parametric statistics for calculating statistical differences between averages.
- The Significance of F-test shows that whether all independent variables (free) have a combined effect on the dependent variable (bound).

- The two-way ANOVA compares the mean differences between groups that have been split on two independent variables on the dependent variable (Girden, 1992).

Of the study population, 53 subjects completed and returned the questionnaire. The overall response to this questionnaire was very positive as described in Table 4.

Table 4: Statistical averages for collaborative learning.

Collaborative Learning		Blogs Characteristics		Sum	
		Separate	Sequential		
Comments Length	Concise	Average	105.6	104.2	104.9
		Std.Dev.	6.6	5.3	5.95
		N	10	17	27
	Detailed	Average	15.5	103.07	104.3
		Std.Dev.	6.09	9.1	7.59
		N	13	13	26
Sum	Average	105.5	103.6	104.5	
	Std.Dev.	6.3	7.2	6.75	
	N	23	30	53	

In response to the question “to what degree do different blog design characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) influence learners’ engagement based on connectivism theory?” It can be seen from the data in Table 4 that, a majority of learners (86%) indicated that CSLab blogs has been useful in their learning and communications. Specifically, blog discussions support the core concepts of *trust*, *sharing*, *belonging* and *respect* (refer to Appendix A).

Moreover, the ability to post questions and notes provides more solutions to increase the interactivity with learning and encourage learners in collaborative learning by creating threaded discussions around common points of interests.

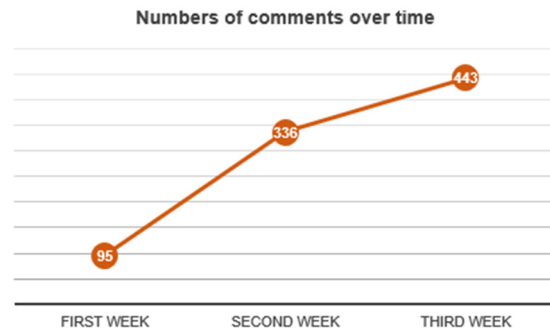


Figure 15: Number of comments overtime.

In Figure.15 there is a clear trend of increasing comments in CSLab over time. This also accords with our earlier observations, which showed that, stakeholders become more engaged when they are feeling comfortable to the system (Yousef, 2015b).

Furthermore, debate continues about the best strategies for knowledge construction in different learning contexts from varying perspectives. Figure 16. Shows the distributed comments and links among learners in four groups. As can we recognize CSLab blogging system as a behavior of social knowledge construction, and the use of blogs in online educational settings has the potential to encourage knowledge sharing activities among students.

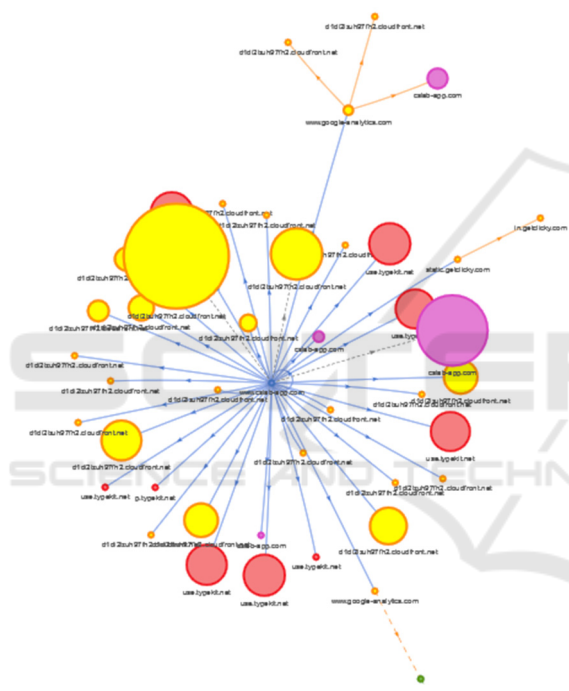


Figure 16: Distributed comments and links in CSLab.

Turning now to the experimental evidence on the correlation between different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise). Thus, a two-way analysis of variance (ANOVA) is used to determine if two different factors have an effect on a measured variable or not as shown in Table 5.

With respect to the second research hypothesis, the results obtained from table 5, shows that, $F = 0.653$ for blog characteristics averages as can be seen in the first line. That means we accepted the research hypothesis, there were no statistically significant differences of blog post characteristics (separate - sequential $p < 0.05$). Further, we applied Eta squared

of the total variance in a blog post characteristic (separate - sequential $p < 0.05$) associated with one or more main effects, errors or interactions in ANOVA. To confirm this, (ETA squared) was calculated as its value reached (0.163) and this expresses the absence of a strong influence of the independent variable blog post characteristics (separate - sequential) on the dependent variable (collaborative learning) and thus accepts the second hypothesis.

Table 5: The two-way ANOVA compares the mean differences between groups.

Variance	TSS	DF	F	Sig	h2
Blogs Characteristics	148.53	-	0.653	Not Sig	0.163
Comments Length	686.66	-	0.313	Not Sig	0.111
Relationship	53.049	3	0.376	Not Sig	0.150
Error variance	2306.08	49	-	-	-
total variance	2359.13	52	-	-	-

Turning now to the experimental evidence on the effect of comment length on increasing collaborative learning, as the third hypothesis states that, there were no statistically significant differences in the parameters of comments length (detailed - concise $p < 0.05$). The results from table 5, shows that $f = 0.313$ with ETA squared at 0.111, which indicated no significant difference between the two groups was evident.

In the final part of this analysis we investigated whether, there any statistically significant differences between the groups in the parameters of blog post characteristics and comments length ($p < 0.05$). The results from table 5, it can be seen that by far that $F = 0.376$ and its ETA squared = 0.150. This confirms the absence of an interaction effect between blog post characteristics and comments length in developing collaborative learning. Thus, authors are accepted all research hypothesis.

A possible explanation for this might be that, the connectivism learning theory, which are recognize learning as an active process of creating meaning from different experiences. this learning theory provide a useful account of how information can be simply transmitted to learners through blogs and other social media interaction, regardless the characteristics of it.

In addition, another possible explanation for this is that, learning in such systems using blogs are becoming increasingly decentralized and more open. Hendrick and Kleiner (2001) labelled the decentralized open system as “a work system has permeable boundaries exposed to the environment in

which they exist". The advent of Web 2.0 underlines this trend, by increase interaction among users via external tools (e.g. blogs, wikis, and forums). Downes (2004) reviewed the literature of educational use of blogs and determined some social benefits and opportunities for learners such as: a) reflect on their posts, b) engage in writing for significant time intervals, and c) trigger long dialogue with their readers leading to new writing cycles.

5.4 Study Recommendation

There are several limitations to this study. First, the most important limitation lies in the fact that, we only choose 200 learners as participants in a limited learning time. Secondly, the results of the current research have shown that the rate of effective blogging participation did not exceed 27% as shown in Figure 17. Despite its exploratory nature, this study offers some insight into how to improve educational blogs design. In the following lines we will give some recommendations based on lessons learned in this investigation.

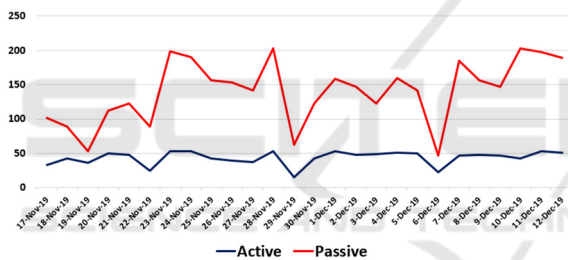


Figure 17: Active Vs. Passive participation in CSLab.

In general, therefore, it seems that information presented in blogs is one of the important content aspects that influence learners understanding. Therefore, blog content should be free from spelling, grammatical, syntax errors. Moreover, lessons should be organized and presented in logically manner. Blogs must be written at a level appropriate to the normal reader and content should be informative (Conole 2013; Ong and Cheung, 2015; Rieh 2002).

Furthermore, reading through computer is tiring and about 25 % differently than reading from books (Nielsen 2003; 2004). Thus, instructional designers should focus on scan ability criteria such as paragraph which should be preferably not more than six sentences. Also, the typography and skim layout should be used, for example, bold fonts and highlighted words (Powell 2000).

According to Andergassen et al (2009) learners have decided not to blog because of feeling that their privacy is invaded. To protect learners' privacy in

online blogs Gongola et al. (2014) gives an account of using private blog sites; Cetto et al. (2014) supports the idea of raising privacy awareness among users. In addition, we argue that integrated blogs in the university learning system can find the key to protect learners and provide a safe learning environment.

The World Wide Web provides an open access to a wide range of information in variety of domains than ever before (i.e. traditional print world). TEL researchers used its documents and media that are useful for their teaching and learning. However, ensuring quality and authority of Web information has been a big challenge due to the lack of quality control mechanism for the Web resources (Yousef and Sunar, 2015). The question now arises as to how learners as well as teachers ensure the quality and authority of education blogs content. The following recommendations might help in differentiating good learning resources from those that are not (Papaconomou and Zijlema 2008; Rieh 2002; Yousef and Rößling 2013).

- Learner/teacher must reference their blog information.
- Comments should be reviewed in order to verify its information.
- Use Open Educational Resources (OER) from trusted providers.
- Use learning materials under the Creative Commons licenses to avoid copyright issues.

Finally, many learners attached hyperlinks to their blogs to share web sites that have good content related to the discussion topic. However, many links may make the blog more complex. In addition, it is important that learners be able to find the navigation feature easily (i.e., button, menu, search box). Thus, from the usability perspective the navigation tools should be located in the same position on each blog page.

6 CONCLUSIONS

In the past decade, a number of studies have sought to focus on the use of social network communication such as blogs and wikis in educational context. Connectivism is a learning theory that explains learning as a network of interactions through social tools e.g. blogs, wikis and forums. One purpose of this research was to examine the effect of different blog post design on the number of comments. The second aim of this study was to investigate the

relationship between different types of blog post characteristics (e.g. separate - sequential) and comments length (e.g. detailed - concise) in order to support collaborative connections among learners. CSLab platform was designed to host course blogs and provided learners with a free space to create, publish, and discuss learning topics.

One of the more significant findings to emerge from this study is that, that sequential blogs with concise comments are more influential and receive more comments. The second major finding was that the four groups obtained high level of collaborations during their learning. Which indicate that blog interaction increasing the collaboration among learners regardless its characteristics.

If the debate is to be moved forward, a better understanding of the relationship between learning style and blog post characteristics needs to be investigated. Moreover, a further study is suggested into understand through in-depth qualitative analysis on how students perceive their construction of knowledge while using their blog discussion.

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APPENDIX A

No	Item
1	Blogs helped me to gain the skill to collaborate with my colleagues.
2	Blogs helped me to gain effective communication skills by exchanging information between individuals
3	Blogging helped me to gain some negotiation and persuasion skills
4	Blogging helped me to respect the opinions of my colleagues
5	Blogging has helped me to develop a sense of responsibility to others
6	Blogging helped lower selfishness among team members
7	Blogging helped me freely express my opinions and beliefs
8	My opinion contributed to the enrichment of the panel discussions
9	Blogging helped to reinforce the teamwork concept of team members
10	My active blogging posts helped me acquire and reformulate brainstorming skills
11	Participants (interactive interactions) with blogs contributed to a flow of ideas between colleagues and enriched solutions to the problems raised.
12	Course blogs helped me carry out group assignments during hands-on training by preparing well for them.
13	Participating in discussions during the study helped me build social relationships with new colleagues.
14	Discussions helped increase interaction between you and your colleagues.
15	Blogs helped break the barrier of shame for some students by sharing and exchanging ideas and opinions
16	Blogs helped to develop higher-order thinking skills such as analysis, synthesis, and evaluation
17	Blogs of free discussion helped to develop self-confidence and sense of self
18	My active blogging post helped me gain technical error recognition skills in my colleagues' writings
19	The blogs helped evaluate the opinions of my peers and discuss their ideas.
20	My colleagues' opinions during the discussion made it possible to discover alternative solutions to their problems themselves
21	Blogging helped to understand the different aspects of the course.
22	Positive comments among colleagues helped to acquire positive behaviors for teamwork
23	Participations among students across blogs contributed to the development of their initiative values in social situations
24	Blogs contributed to encouraging students to exchange ideas about specific paragraphs to understand them adequately