



## Rendimiento de aprendizaje de los estudiantes y aceptación de tecnologías web 2.0 basadas en propiedades de riqueza de medios

### Students' learning performance and acceptance of web 2.0 technologies based on media richness properties

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#### RESUMEN.

Es probable que la selección de un canal de comunicación para el desempeño de las tareas de aprendizaje afecte la forma en que la información y el conocimiento se pueden transmitir de manera efectiva. Basado en la teoría de la riqueza de los medios, este estudio empleó un diseño cuasiexperimental para examinar la influencia de las propiedades de la riqueza de los medios en el rendimiento del aprendizaje y la aceptación del usuario de las tecnologías web 2.0 como herramientas de aprendizaje. El cuasi-experimento, que tuvo lugar durante ocho semanas, se llevó a cabo con 100 estudiantes de pregrado que fueron asignados a dos grupos experimentales (condición de aprendizaje basada en Facebook y condición de aprendizaje basada en Blogger) y un grupo de control (condición de aprendizaje basada en papel). También se realizó una discusión de grupo focal para revelar las ideas de los participantes después de usar las tecnologías web 2.0 en la realización de las actividades de aprendizaje asignadas. No existieron diferencias significativas entre las tres condiciones de aprendizaje en términos de rendimiento de aprendizaje y entre las dos condiciones experimentales con respecto a la aceptación del usuario. Tales hallazgos indican que el rendimiento de aprendizaje alcanzado al usar las herramientas de aprendizaje se percibió como el mismo, independientemente de las características que ofrecían. Todos los grupos también pueden tener el mismo nivel percibido de utilidad y facilidad de uso que ofrecen los medios de aprendizaje a pesar de las variaciones en sus características.

#### PALABRAS CLAVE.

Tecnologías web 2.0; riqueza mediática; aceptación de usuario; rendimiento de aprendizaje; educación superior.

#### ABSTRACT.

The selection of a communication channel for the performance of learning tasks is likely to affect how information and knowledge can be effectively transmitted. Anchored on the media richness theory, this study employed quasi-experimental design to examine the influence of media richness properties on learning performance user acceptance of web 2.0 technologies as learning tools. The quasi-experiment, which took place over eight weeks, was carried out with 100 undergraduate students who were assigned to two experimental groups (Facebook-based learning condition and Blogger-based learning condition) and a control group (paper-based learning condition). A focus group discussion was also done to reveal the participants' insights after using web 2.0 technologies in performing the assigned learning activities. No significant differences existed among the three learning conditions in terms of learning performance and between the two experimental conditions as regards user acceptance. Such findings indicate that the learning performance achieved from using the learning



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tools was perceived to be the same regardless of the features they offered. All groups may also have equal perceived level of usefulness and ease of use afforded by the learning mediums despite variations in their features.

### KEY WORDS.

Web 2.0 technologies; media richness; user acceptance; learning performance; higher education.

### 1. Introduction and objectives.

The proliferation of a wide range of web 2.0 technologies, particularly social media applications, has spawned a paradigm shift in learning practices. Alongside this shift is the need for new pedagogical approaches that can help learners improve their knowledge and skills. Growing evidence that learners' exposure to a wide range of such technologies has been proven to support their learning even outside of the classroom (Selwyn, 2007).

However, the availability of new technologies presents a challenge to educators in terms of using the appropriate communication media to address the academic needs of their students (Harvard, Du, & Xu, 2008). Employing a particular medium does not necessarily lead to expected positive learning outcomes. There is a possibility that learners may realize that using an online learning tool is no longer beneficial to performing their learning activities (Soumplis, Koulocheri, Kostaras, Karousos, & Xenos, 2011).

A specific trait of media, which is considered relevant in understanding the application of a communication tool for the delivery of learning contents, is richness. Media richness, the key concept of media richness theory (MRT), determines the extent by which communication channels can facilitate understanding of information by removing ambiguity and uncertainty (Daft & Lengel, 1984; Kishi, 2008). By making sense of the media richness perspective, the differences of communication tools in terms of the quality and amount of information they convey become the bases for their potential use. In this regard, the richness property can be classified either rich or lean based on the following attributes: immediate feedback, support for language variety, carrying of nonverbal cues, and conveyance of personality traits (Daft, Lengel, & Trevino, 1987; Kock, 2005).

On the one hand, based on such attributes, a rich medium is compatible with equivocal or ambiguous topics since it permits a full range of cues, opportunity for immediate feedback, use of a high variety of language, and tailoring of messages to address the receiver's needs (Daft & Lengel, 1984). On the other hand, a lean medium is appropriate for simple tasks due to the constraints it sets on the attributes (Heeren & Lewis, 1997). By considering these fundamental differences, it is vital to determine the extent to which the medium's characteristics are matched with the task characteristics. It is because the likelihood of achieving communication efficiency is dependent on whether there is a fit between the medium and the task (Daft, Lengel, & Trevino, 1987).

In the context of social media-based learning using social media applications, the use of a specific online medium becomes a critical issue in the delivery of learning contents, which depends on the compatibility of the learning environment with the learning task (Newman, 2014). For instance, the use of a blog as a learning platform for discussion yields a lower capacity of communication due to text-based interactions; on the contrary, employing a social networking site like Facebook, which is well-suited for collaborative projects, offers various functionalities that are beneficial in achieving richer communication (Dao, 2015). Applying MRT, it can be argued that Facebook may be a better learning tool for analyzing complex information compared to the lean medium of a blog that is appropriate for understanding less complicated information.

Previous academic research using MRT has examined web 2.0-mediated learning with emphases on learning (Balaji & Chakrabarti, 2010; Blau & Caspi, 2008; Sun & Cheng, 2007) and user acceptance



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(Liu, Liao, & Pratt, 2009; Saeed, Yang, & Sinnappan, 2008; Saeed, Yang, & Sinnappan, 2010). By recognizing the differences in the level of richness among social media applications, most of the findings reveal positive perceived effects on learning performance, and technology's usefulness and ease of use. Furthermore, the integration of media richness and learning constructs into a proposed theoretical framework has been advanced based on the argument that using rich media leads to effective learning (Tsadima, Vassilopoulou, Kavakli, & Sofianopoulou, 2012).

However, most of the studies of MRT have only examined media choice through the use of self-reported data, "not performance, which is what MRT actually addresses" (Dennis, 2009, p. 642). The preference for hypothetical media choice and its perceived effects has been the emerging research approach among educational communication researchers who want to test the key proposition of MRT. Hence, there is still a need to investigate whether actual media use leads to performance effects. This study, therefore, applied MRT to determine the influence of a medium's media richness property on performance in the context of learning.

In doing so, this study added to the existing small body of knowledge that had employed experimental designs to determine the influence of media richness property on learning (Blau and Caspi, 2008; Newman, 2014; Sun & Cheng, 2007). As one of the dimensions of learning, learning performance pertains to the extent by which learners have learned within different settings and conditions (Chuang, Bernard, & Ali, 2002). It should include both the learning outcome and teaching quality as integrated into the course design. Furthermore, this learning construct can be measured in either an objective or subjective manner. In educational technology studies that employ experimental design, objective learning performance is usually measured by the use of pretest and posttest consisting of multi-choice questions (Roman, Popescu, & Selisteanu, 2013; Yang, Hwang & Yang, 2013; Wu, Hwang, & Tsai, 2013). It implies that actual learning performance can be used as an objective measure to determine learning effectiveness.

Moreover, this research combined learning performance with another variable, which was user acceptance, that had been incorporated in most MRT studies employing survey research designs. The two components of user acceptance, perceived usefulness, and perceived ease of use, are considered critical in influencing a learner's attitude towards using specific technology for learning (Saeed, Yang, & Sinnappan, 2008). The use of specific technology is dependent on how a user perceives a technology's usefulness and ease of use. As defined by Davis (1989), perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). The usage of an application is primarily dependent on whether it is useful to the accomplishment of a specific task. Hence, a higher level of perceived usefulness means a better relationship between the acts of using the system and performing an activity (Yussof, Muhammad, Zahari, Pasah, & Robert, 2009).

As the other determinant of the user's intention to use technology, perceived ease of use is the "degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). When a user perceives that operating or using an application requires minimum effort, then there is a higher chance that it can be adopted. The attitude towards an application still lies on its perceived ease of use. An individual can only decide that technology is useful if he or she believes that it is easy to use and more benefits can be gained from using the system than from just merely exerting effort in using it (Bradley, 2009; Davis, 1989). For instance, a rich medium that facilitates interactivity is more likely to lead to a belief among users that it only requires minimum effort (Hung, Chen, Hung, & Ho, 2013).

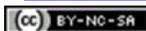


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## 2. Objectives.

Considering the preceding statements, the general objective of this study was to determine how media richness influenced college students' learning performance and user acceptance of web 2.0 technologies as learning tools. Specifically, it aimed to find out the students' levels of user acceptance of social media applications as regards perceived usefulness and perceived ease of use. The following hypotheses were tested in this study: (1) There is no significant difference in learning performance between students who are exposed to web 2.0-based learning tasks and students who are exposed to paper-based learning tasks; and (2) There is no significant difference in perceived usefulness and ease of use concerning web 2.0 technologies between students who are exposed to social media-based learning tasks and students who are exposed to paper-based learning tasks.

## 3. Materials and methods.

### 3.1 Research design.

This study employed a mixed-methods research design. The first stage of the study used the quasi-experimental method. This method allowed the researcher to establish a causal relationship between the experimental treatment or independent variable and observation or dependent variable (Cresswell, 2012). In particular, this study utilized the pretest-posttest non-equivalent control group design. This design used groups that are similar in terms of the measurement done on the dependent variable but different as regards the treatment employed (Gliner, Morgan, & Leech, 2009). It was preferred over the other designs due to the comparison of intact groups of participants. During the second and last stage of the study, a focus group discussion (FGD) was conducted with selected participants from the two experimental groups. The use of this qualitative method offered a richer understanding of the experiences of students in utilizing web 2.0 applications as learning tools.

### 3.2 Participants.

This study was conducted over eight weeks in a Philippine public university, which was chosen as the setting of the study due to its adoption of outcomes-based education that supports student-centered learning that can be mediated by web 2.0 technologies. This study was carried out with students enrolled in Society and Culture with Family Planning course. The students came from three sections of Teacher Education students who meet three hours per week and are taught by the researcher-instructor. Of the original sample of 113 students (36 in the Facebook-based learning condition, 43 in the Blogger-based learning condition, and 34 in the paper-based learning condition), only 100 participants were able to complete the learning tasks, pretests, and posttests. In the Facebook condition, a student withdrew before the conduct of the experiment, and another student dropped out from the course after the midterm period. In the Blogger condition, two students dropped out, and six students did not complete the learning activities. Three participants from the paper-based condition were also not able to complete all the experimental tasks. Hence, the final sample consisted of 34 participants in the Facebook condition, 35 in the Blogger condition, and 31 in the control group. Almost three-quarters (73%) of them were female. A majority (60%) of them belonged to the 18 and below age bracket. A quarter (25%) of them was between 19 and 20 years old while the rest were 21 years old and above. For the FGD, eight participants from the Facebook condition, and eight participants from the Blogger condition were selected.

### 3.3 Research instruments.

This study utilized three sets of research instruments: pretest and posttest questionnaires, questionnaire, and interview schedule. Prior to and after their exposure to the learning tasks for each topic, a 20-item test was carried out with the participants to measure their learning performance. The

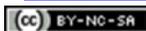


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questions were based on the course instructional materials. After the experiment, the participants answered a questionnaire on user acceptance composed of items on perceived usefulness and perceived ease of use adapted from Davis (1989). The items, which were measured on a 5-point Likert scale that ranges from 1 or “strongly disagree” to 5 or “strongly agree,” were reworded to fit the context of the study. They were arranged based on the similarity of the definitions of each variable or construct, following the order by which they appeared in the author’s published articles. Furthermore, an interview schedule consisting of 10 open-ended questions was developed to gather insights from the selected participants.

### **3.4 Data collection procedures.**

This quasi-experiment, which consisted of three stages, took place over an eight-week period. Prior to the experiment, written informed consent was secured from the participants. Each section was assigned to one of the three groups: the first experimental group utilized Facebook, a commonly used social networking service, as part of a blended learning approach; the second experimental group used Blogger, a free blog publishing tool from Google, as part also of a blended learning approach; and the control group used paper-based learning tools as part of a classroom-based face-to-face learning. Facebook is considered a rich social media application while blog is regarded as a lean social media application (Dao, 2015). The participants of the experimental groups were given orientation regarding the social media-based learning technologies that they will be using. The activities in the first stage took place during the first week.

During the second stage, the students in the experimental groups were instructed to participate in learning tasks mediated by social media applications, while those in the control group were asked to participate in learning tasks without the use of such technologies. The learning tasks specific to the experimental groups happened during the free time of the students; hence, the participants engaged in self-directed learning. The following course topics were included in the learning design (Appendix II): Culture (Weeks 2 and 3), Socialization (Weeks 4 and 5), and Social Groups and Organizations (Weeks 6 and 7).

Prior to the online discussion of each content area or topic, the participants were given pretest composed of 20 multiple-choice items to test their level of prior knowledge of the fundamental course concepts. After two weeks, the students took the posttest consisting of the same multiple-choice items but presented in a different order.

The contents of the learning tasks and materials designed by the researcher-instructor were identical for all groups. For instance, learning tasks included discussion questions that were posted on the social media-mediated learning environment (experimental groups) or encoded on a sheet of paper (control group) on a weekly basis to guide the students in accomplishing the learning goals. The activities in this stage were conducted for the succeeding six weeks.

The last stage required the students to answer a questionnaire in the last week of the experimental period. Furthermore, eight participants from Facebook-based and eight from Blogger-based learning conditions were selected to participate in focus group discussions to draw insights regarding their use of social media applications as learning tools and participation in the learning tasks.

### **3.5 Data analysis.**

To investigate the influence of media richness of Web 2.0 technologies on learning and user acceptance, independent-samples t-test and one-way analysis of variance (ANOVA) were conducted. The parametric statistics of t-test and ANOVA are considered preferred statistical tests in most experimental research in terms of comparing two groups or more than two groups, respectively, and testing for the differences in their means categorized by one independent variable (Creswell, 2012;

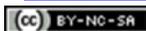


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Witte & Witte, 2001). The responses obtained from the FGD were transcribed and organized to uncover insights that lent complementary support to the quantitative results.

#### 4. Results.

##### 4.1. Quantitative results.

##### 4.1.1. Students' level of learning performance.

For each experimental week, the participants were instructed to take a pretest and a posttest to measure their actual learning performance. The pretest and posttest scores for each experimental week are given in Table 1. It was during the first two experimental weeks that the participants from all groups gained the highest mean scores. In particular, the highest pretest mean score was obtained by the learners exposed to learning tasks using the Facebook-based learning medium ( $M = 9.29$ ) while the highest posttest mean score was achieved by Blogger-based learning medium participants ( $M = 13.23$ ). During the third and fourth experimental weeks, the Blogger condition participants ( $M = 7.06$ ) obtained the highest pretest mean score while the Facebook condition participants ( $M = 8.44$ ) acquired the highest posttest mean score. For the last two experimental weeks, it was only the Blogger condition participants who achieved the highest pretest ( $M = 7.69$ ) and posttest ( $M = 8.77$ ) scores.

Table 1. Weighted mean scores of the participants' learning performance

Statement	Facebook-based learning medium		Blogger-based learning medium		Paper-based learning medium	
	<u>M</u>	<u>Interpre-tation</u>	<u>M</u>	<u>Interpre-tation</u>	<u>M</u>	<u>Interpre-tation</u>
Content Area: Socialization						
Pretest No. 1	9.29	Average	9.20	Average	8.39	Low
Posttest No. 1	11.88	Average	13.23	High	11.42	Average
Content Area: Socialization						
Pretest No. 2	6.65	Low	7.06	Low	6.39	Low
Posttest No. 2	8.44	Low	7.74	Low	7.84	Low
Content Area: Social Groups and Organizations						
Pretest No. 3	6.74	Low	7.69	Low	5.68	Low
Posttest No. 3	8.62	Average	8.77	Average	8.39	Low

As observed from Table 2, the descriptive statistics for learning performance show that the participants from the Blogger condition ( $M = 7.56$ ,  $SD = 2.44$ ) had higher pretest mean scores than those from Facebook-based ( $M = 7.98$ ,  $SD = 2.12$ ) and Paper-based conditions ( $M = 6.82$ ,  $SD = 2.29$ ). The same group ( $M = 9.91$ ,  $SD = 3.35$ ) achieved higher posttest scores than the two groups.





Table 2. Means and Standard Deviations for Learning Performance by Experimental Condition

	Facebook-based learning medium (N = 34)		Blogger-based learning medium (N = 35)		Paper-based learning medium (N = 31)	
	M	SD	M	SD	M	SD
Pretest	7.56	2.44	7.98	2.12	6.82	2.29
Posttest	9.65	2.94	9.91	3.35	9.22	2.65

A one-way ANOVA was conducted to examine the differences in learning performance. As shown in Table 3, the posttest scores obtained by the three groups did not vary significantly,  $F(2,297) = 1.35$ ,  $p = .262$ . The participants' learning performance, through their exposure to social media-based learning conditions, was equal to that with the traditional paper-based learning condition. Regardless of the learning mediums used, all groups improved similarly.

Table 3. Analysis of Variance Results for Post-test Scores by Experimental Condition

Source	df	SS	MS	F
Between Groups	2	24.37	12.18	1.35
Within Groups	297	2689.22	9.06	
Total	299	2713.59		

#### 4.1.2. Students' level of perceived usefulness.

An independent-samples t-test was conducted to compare perceived usefulness in Facebook and Blogger learning conditions. In Table 4, with regard to their perceptions of the perceived usefulness of social media applications as learning mediums, no significant difference was found between the two groups of learners,  $t(67) = 1.17$ ,  $p = .245$ . However, a slight difference is reflected in the way both groups rated their perceived usefulness of the applications. The Facebook condition participants reported higher level of perceived usefulness of the application as a learning medium as compared to that of the Blogger condition participants. However, this result was not significant enough to lend support to the null hypothesis.

Table 4. Group Differences for Perceived Usefulness by Experimental Condition

Dependent Variable	Facebook-based learning medium (N = 34)		Blogger-based learning medium (N = 35)		df	t
	M	SD	M	SD		
Perceived usefulness	4.06	0.68	3.90	0.55	67	1.17

#### 4.1.3. Students' level of perceived of use.

As shown in Table 5, as determined by an independent-samples t-test, the mean scores for perceived ease of use did not significantly differ between Facebook condition group and Blogger group,  $t(67) = 0.24$ ,  $p = .815$ . Although Facebook condition participants appeared to have higher rating than the other experimental group did, the difference was not significant enough. Thus, the use of social media applications as learning tools did not have a significant influence on perceived ease of use, indicating a lack of support for the null hypothesis.





Table 5. Group Differences for Perceived Ease of Use by Experimental Condition

Dependent Variable	Facebook-based learning medium (N = 34)		Blogger-based learning medium (N = 35)		df	t
	M	SD	M	SD		
Perceived ease of use	4.00	0.72	3.96	0.62	67	0.24

## 4.2. Qualitative results.

### 4.2.1. Learning performance.

The focus group participants acknowledged that using social media applications as learning mediums influenced their learning performance. They were able to review the concepts by gaining insights from the answers of their classmates and conducting further research regarding the topics covered in the learning tasks. These practices only showed that they exerted more effort in posting their insights, which they considered helpful in obtaining higher posttest scores. As explained by two participants:

“I became confident in giving my answers and replying to the comments of my classmates. It helped that I gained new ideas and insights from my classmates’ answers regarding the topic or question.” (Participant 6, Blogger condition)

“It helped that I was also able to see the answers of my classmates, helping me develop new learnings about the topic.” (Participant 7, Blogger condition)

In two of the learning tasks during the second experimental week, the Facebook condition participants were asked to watch a shared video and participate in a group discussion. It was then during this period when the Facebook condition group obtained the highest mean posttest score, suggesting that a rich learning environment suitable to course contents with high uncertainty and equivocality may have contributed to improved learning performance. For Facebook learning condition participants, the ‘comment’ box allowed them to acquire more ideas on the topic. As shared by the participants:

“Using Facebook as a learning tool allowed us to access additional information about the topic through the Internet, and it also allowed us to view the answers of our classmates, which was of big help in gaining new knowledge and performing well in our post-tests.” (Participant 7, Facebook condition)

“We gained knowledge from the online discussion, which helped us in getting improved scores in our post-tests.” (Participant 6, Facebook condition)

Furthermore, the participants mentioned that Facebook’s interface was appropriate for visual learners since they could easily view the comments, pictures, and videos posted in the group. These features or characteristics offered participants an online platform for interacting with their fellow students either in real-time or in an asynchronous manner. As two participants said:

“Facebook’s features are for visual learners. They allowed for better recall of what had been posted there.” (Participant 1, Facebook condition)

“There were posts which were mostly pictures. There were also those in textual forms, which helped me broaden my understanding of a topic.” (Participant 3, Facebook condition)

### 4.2.2. Perceived usefulness of web 2.0 technologies.

The FGD participants associated their perceived usefulness of these online learning mediums with the features it offered. It helped that Facebook tools and applications such as buttons for editing their answers, attaching images, and sharing videos could be utilized without difficulty to accomplish an activity. Using Facebook as a learning tool provided participants opportunities to gain insights from the shared posts of their classmates, allowing them to easily and quickly work on the learning tasks. Three participants remarked:



“Yes, it helped, especially in our activities that required us to upload pictures and watch videos.” (Participant 8, Facebook condition)

“You can already search for pictures and upload them. With just one click, you can immediately reply.” (Participant 1, Facebook condition)

“I clicked on ‘edit’ few times to check for my grammar mistakes.” (Participant 4, Facebook condition)

The Blogger condition participants also recognized the advantages of using an uncomplicated text-based interface, which enabled them to become more focused on finishing every learning task. In addition, they mentioned Blogger’s accessibility and capacity to provide a venue for social interaction as its positive attributes that made it easier for them to work on the activities. As shown in the following comments of the participants:

“I am okay with text-based features since they are pleasing to the eyes. It makes use of light color. The texts can be easily understood. Your focus is only on the text-based answers.” (Participant 3, Blogger condition)

“There are no pictures that you have to pay attention to. You give more attention to the text, to the answers of your classmates.” (Participant 1, Blogger condition)

“I believe it is a useful tool because it offers a kind of interaction between the teacher and the students that does not usually exist in a real classroom setting.” (Participant 2, Blogger condition)

#### **4.2.3. Perceived ease in using web 2.0 technologies.**

Most of the FGD participants experienced convenience in using Facebook and Blogger as learning tools. The participants assigned to the Facebook condition experienced convenience in utilizing the learning medium’s user-friendly features. They stated again that its video and image-sharing functionalities made it easy for them to use it as a learning tool. As verbalized by three participants:

“My experience in using this tool was that I easily learned the terms and the given tasks. I also easily answered each task.” (Participant 2, Facebook condition)

“It was convenient for me to use it since I could maximize the use of Facebook’s features like watching a video.” (Participant 5, Facebook condition)

“The features that allow us to put pictures and to watch videos are capacities provided by Facebook that are of big help in accomplishing our learning tasks.” (Participant 4, Facebook condition)

For Blogger condition participants, the convenience afforded by an online learning medium could also be attributed to its user-friendly features. They had a clear way of interacting with the medium as they did not encounter difficulty in accessing all of its features. They mentioned that due to Blogger’s simple interface as a text-based medium, they only had to open the website and click on the activities’ links to instantly view the learning activities. Despite the lack of multiple features that could help them engage in an interactive learning experience, the participants still found Blogger as an easy-to-use tool which could then be attributed to the minimum effort required for them to use it.

“It was easy to use since you just have to search for the blog site, everything will appear. You can easily view the activities since they are arranged properly.” (Participant 7, Blogger condition)

“You just have to click on the link, look for the activity, and you can already give your comment. Afterwards, you can publish your comment right away.” (Participant 3, Blogger condition)

“Blogger’s interface is not that complicated. Once you go to the site, you can instantly use its features, which helps in accomplishing every learning task. (Participant 4, Facebook condition)

## 5. Discussion.

This study determined the differences between the three learning conditions on learning performance. The t-test results for the dependent variables showed insignificant differences, which were not enough to suggest that the media richness of web 2.0 learning tools is responsible for significantly improved and positive level of user acceptance as well as learning performance.

The results indicated that a learning design that utilized either rich or lean medium could promote more significant levels of perceived usefulness and perceived ease of use. This may be attributed to the participants' continuous exposure to the learning tasks, allowing them to consider the potential value of social media applications as useful and easy to use learning tools. As such, this confirms the participants' perception that the usefulness of a particular medium allows them to accomplish a specific learning outcome (Wong et al., 2013).

The qualitative findings indicated that the richness properties of both Facebook and Blogger could have led to learning effectiveness and productivity among the participants as they perceived such applications as useful learning platforms. Moreover, the variety of functionalities found in Facebook or the simple text-based interface of Blogger may have been a critical factor in the development of new skills as the participants experienced ease in navigating and interacting with the learning site. As set forth by Sun and Cheng (2007), course contents that possess low levels of uncertainty and equivocality require the use of low richness media. In contrast, those with high levels of uncertainty and equivocality are appropriate for rich media.

The rich learning environment of Facebook became suitable to course contents with high uncertainty and equivocality, which had also contributed to improved learning performance. Facebook's interface was appropriate, especially for visual learners who gained more knowledge about the topics by looking at its rich features. Such features or characteristics offered participants an online platform for interacting with their fellow students either in real-time or in an asynchronous manner. According to Basu, O'Steen, and Allan (2011), this advantage of a social networking site facilitates immediacy of feedback, which is one of the key attributes of a rich medium.

Furthermore, as reflected in the responses of the FGD participants, using social media applications helped gain knowledge and skills. This was consistent with the finding of Balaji and Chakrabarti (2010) that employing an online discussion forum, which was a vital feature of both Blogger and Facebook, resulted in a positive effect on perceived learning performance. The participants considered Facebook as a supplementary learning medium, which let them learn with and from their classmates and thus supported their learning performance. In particular, they noted that they became more proficient in writing since most of the learning tasks required them to not only post their opinions but also reply to the posts of their classmates. These responses were in line with the contention of Kitchakarn (2016) that Facebook provides a platform for engaging students to share their ideas, gain insights from their classmates' feedbacks, and offer them opportunities to process skills.

## 6. Conclusions.

In comparing the experimental conditions in terms of learning, this study revealed that both social media applications appeared to provide the higher levels of learning performance. The results showed that the lean properties of Blogger became beneficial in creating a shared meaning of the learning tasks, explaining how the participants assigned to a text-based learning medium obtained higher pretest and posttest mean scores than the Facebook and paper-based group participants. This only indicates that a lean medium could be utilized for generating shared ideas in the context of the fit between communication channel and tasks (DeSanctis & Monge, 1999). In contrast, the rich properties of Facebook facilitated immediate feedback through an interactive learning experience, contributing to higher positive ratings of perceived learning performance and perceived learning satisfaction. This



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result concerning immediacy of feedback was highlighted by Basu et al. (2011) as a feature with the most promising potential for a more engaging use of social media in higher education.

The findings of this study also showed the advantages and disadvantages of each social media application when utilized as a learning medium. For instance, a Blogger-based learning platform did not possess high media richness capacities but offered a satisfactory learning experience free from distracting features. On the contrary, a Facebook-based learning tool facilitated both immediacy and language variety but was regarded prone to distractions. The capacity to come up with a shared understanding or meaning may be attributed to the participants' use of multiple cues found in Facebook which, in turn, creates a positive attitude towards using an online learning tool. Such particular finding of this study was in line with that of Hung et al. (2013) who concluded that a rich medium enhanced a user's perceived ease of use.

In general, Facebook was regarded by participants as a more acceptable learning tool than the other learning platforms. Its capacities for immediate feedback and language variety specifically contributed to such positive attitude. Therefore, the integration of Facebook-based learning tool in a blended learning environment appeared to be a suitable instructional approach, especially for learners who may opt to work with a system or site with minimum effort. Such results established previous studies' findings that an online learning platform that carries multiple cues is likely to be perceived as a useful and easy-to-use learning tool (Karahanna & Limayem, 2009; Lee & Cheung, 2007). In addition, Lee and Cheung (2007) stated that a richer medium is most likely to minimize the amount of effort needed by the users in using it due to the presence of less uncertainty and equivocality.

As hypothesized, the t-test and ANOVA results for all the dependent variables show insignificant differences, which are not enough to suggest that the media richness of learning tools are responsible for improved learning and user acceptance. Hence, the findings drawn from this quasi-experimental study do not lend support to the media richness theory, particularly in predicting that a lean medium will be less effective than a rich medium in delivering communication efficiency. Matching a specific learning medium or tool to the learning tasks does not necessarily mean that it would lead to better performance in a rich medium as compared to that of a lean medium, vice-versa.

With such non-significant differences, the participants' levels of learning performance and user acceptance of the learning tools, Facebook-based learning could be considered as effective as Blogger-based learning in the same way that social media-based learning could be regarded as effective as paper-based learning. Hence, this finding contradicted results contradicted the "prediction that a lean medium will result in a worse performance relative to a rich medium" (Blau & Caspi, 2008, p.22). Facebook, although considered a rich medium for communication, may not be considered a better learning medium. It could be that its features satisfy only certain aspects of media richness suitable for learning outcomes when matched with learning tasks (e.g., activities that require the use of videos and images).

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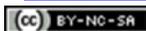


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