# Higher Education Students' Attitude Involving Cognitive Process in Using Social Media

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*Abstract*—The utilization of social media in the learning process has been applied in higher education. In fact, the use of social media is most effective by involving six levels of the cognitive process. This study aimed to provide an overview of the use of social media by the college students for learning purposes as well to measure their cognitive process when using the social media. The quantitative approach was applied in this research using data from the self- assessment questionnaire. The result showed that students mostly used a blog on social media with the involvement of all cognitive domain levels. Nevertheless, it needed to be prepared the strategy to maximize the cognitive process in the level of understanding and evaluating. Utilize social media for knowledge discussion is considered to enhance students' engagement and the instructor has a prominent role in promoting learning through social media.

*Keywords—attitude, student, domain cognitive, cognitive process, social media, learning*

## I. INTRODUCTION

The Internet has shifted the lifestyle. It is accessible for the community due to its affordable price, and many public facilities are equipped with internet access. In addition, various mobile devices (e.g., smartphone, tablet) support internet access and consequently increasing the number of internet user. APJII survey in 2017 [1] showed that 54.68% (143,26 million) Indonesian were internet user. 49.52% of them were 19 to 34 years old, which was the age range of students with the penetration percentage of 74.23%. Among the internet usage, 87.13% were access to social media. The result of this survey indicated that Indonesian has a high dependence on the internet, especially the students. Social media has interesting and collaborative features. Therefore it is most-accessed by the internet user and potential for interactive e-learning [2].

Various studies conducted showed positive roles of social media utilization in learning. Sugimoto in his research argued that social media enables interaction among the students and educators, and facilitates them to express their ideas or opinions [3]. Utilizing social media for learning purposes train the students to develop higher order thinking skills [4] and creativity [5]. The ability of social media (e.g., Twitter, Facebook, Blog) to facilitate broader interaction among the users encourages the implementation of student-centered learning approach in higher education [6][7] through student involvement [8][9] and enhance students' self-confidence in communicating their ideas [10]. Employing social media tools in teaching and learning increase students feedback and build their collaborative

working skills [11], thereby social media becomes an effective tool for collaborative learning [12]. Furthermore, it also improves learning experiences and promotes in-depth learning for learner by involving interaction, critical thinking and collaboration [13][14][15][16].

Social media consists of different categories based on the functions and tools characteristics. In this research, there will be four categories of social media according to Kaplan and Haenlein [17] as follow: Collaborative project (Wikis e.g. Wikipedia, Wikinews and Wikispaces), Blog and Microblogs (e.g. Blogger, WordPress, Twitter), Content Communities (e.g. Youtube, Vimeo, Openfilm, flicker, and SlideShare) and Social Networking Sites (SNS, e.g. Facebook, Myspace, Linkedln, Google+, Ning).

The use of social media is based on the cognitive needs to gain new knowledge and information. There are three processes of learning that happen almost at the same time. They are receiving the new information, transforming the information, and testing the relevance and the accuracy of the knowledge [18]. Those three processes are included in the Bloom and Krathwohl's cognitive domain, which consist of six levels of thinking process or known as Bloom taxonomy [19]. The levels are remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5) dan creating (C6). Churches introduced Blooms' digital taxonomy to explain the application of cognitive domain in the activities of using digital-based media [12].

Currently, most educators in higher education have embedded social media into their teaching include lecturers from a private university in Salatiga, Central Java Indonesia. An observation was conducted in the Faculty of Information and Technology at that university. It reported that social media was used to support the faculty in both academic and non-academic activities. From these fact we can infer that the faculty realized the potential role of social media in promoting the meaningful learning process. Nevertheless, the practical use of social media should facilitate the overall process of thinking proposed by Bloom to gain the advantages as the previous research. Hou *et al*. did a study on the role of social media to construct knowledge and cognitive dimension pattern., in which only used one platform, i.e., Facebook [13]. The result showed that in using Facebook online discussion, the students tended to involve the thinking process of understanding (C2) through information or knowledge sharing.

There would be several social media which were commonly used by students involved in this cognitive

domain research. The research aimed to provide an overview of the students use social media for their learning needs, as well as to measure students' cognitive domain involved in their attitudes when using the social media. The research result was expected to be the faculty's input when choosing and designing the utilization of social media in learning to facilitate students in developing their high order thinking skills and increasing collaboration in learning.

The rest of this paper is organized as follow: Section II describes data used and proposed research method of this work. Section III presents the obtained results and following by discussion in section IV. Finally, Section V concludes this work.

## II. Material and Proposed Method

This section describes data used and proposed research method.

### A. Partisipants

The research design of this study was using the quantitative approach with survey method to measure the students' attitude in using social media for learning. The respondents were students of the Faculty of Information Technology who were still academically active during the year of 2013, 2014 and 2015, with a total of 1500 active students. The sample was 299 students. They were taken randomly by considering the proportion of students in four study programs: Visual Communication Design (DKV) 18%, 23% Information System (SI) 23%, Informatics Engineering (TI) (53%) and 6% Informatics and Computer Engineering Education (PTIK).

### B. Data Collection and Analysis

A Questionnaire was used as the instrument to collect data in this study. It consisted of several parts to capture students' attitude in using social media, social media usage. Attitude measurement using self-assessment questionnaire consisted of 18 items of statements that described the attitude in using social media to represent the cognitive domain of digital Bloom taxonomy. The response was recorded in the Likert scale of 1 to 5. The questionnaire items recorded the type of social media in the form of a checklist. The questionnaire also recorded the purpose of using the social media in the form of a fill in the blank and open-ended questions.

Descriptive analysis was conducted by calculating the mean score of students' attitude, using the standard deviation of every questionnaire item. The mean score was converted to criteria of very high category ($x>4$), high ($3.4<x<4.2$), fair ($2.6<x<3.4$), low ($1.8<x<2.6$), and very low ($x<1.8$). This criterion used to describe the level of students attitude toward cognitive domain in using the social media for educational purposes. The quantitative data for the use of social media type was presented in percentage to picture the usage composition.

## III. Result

### A. The Use of Social Media

The survey showed that 97.2% of students used social media in everyday life. Based on the study program, students using social media were 92.7% in DKV, 92.9% in PTIK,

98.1% in SI, and 93.4% in TI. 93.9% of social media user accessed tools for learning needs while 86.6% of them specifically utilized social media to accomplish the assignment. This data indicated a high number of social media utilization for learning purposes.

The open-ended answer showed that social media was used as a medium of interaction between students and with the professors outside of the classroom through a group that established in SNS and microblog such as Facebook, twitter, Line, and WhatsApp. The groups accommodated sharing information (e.g., announcement, assignment and quiz) or learning materials and discussion. Students commonly used Blog and Wikis to search for information and find references for assignment and also to gain particular knowledge while YouTube and Slide Share provide information in the form of video. In addition, students publish their digital product (e.g. paper, video, audio and animation product) through social media.
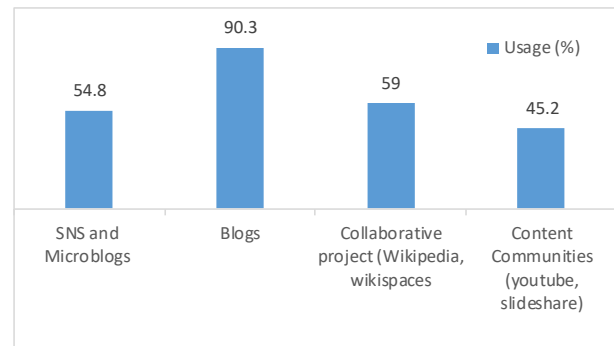


Fig. 1. The use of social media in learning

The graph in Figure 1 present the highest usage of social media was Blog. Social Networking was in the lower level compared to Wikis. This result implied that students utilized social media tools mostly searching for information rather than discussing or sharing. The Blog was the most favorable social media tools for searching information than other tools.

### B. Attitudes in Using Social Media Based on Cognitive Domain

The data on students' attitude in using social media for the remembering level is present in Table I.

TABLE I. Students' in the Remembering Level (C1)

| No | Attitude | Mean | SD* |
|---|---|---|---|
| 1 | Find information through social media | 4.51 | 0.55 |
| 2 | Information is stored to favorite or bookmark | 3.89 | 0.92 |
| | Average | 4.2 | 0.73 |

*SD (deviation Standard)

In the C1 level, social media was highly used to find information. Adding information to favorite or bookmark was highly done for the more comfortable future usage. Students found information through social media providing links to specific sites or personal blogs and comments or ideas. However, bookmarking to facilitate student to retrace

the sources for future use was not applied to all students. Overall, the use of social media for the remembering process was very high.

TABLE II.    STUDENTS ATTITUDE IN THE UNDERSTANDING LEVEL (C2)

| No | Attitude | Mean | SD* |
|---|---|---|---|
| 1 | Choose information needed | 4.23 | 0.75 |
| 2 | Use keywords to find the information needed | 4.29 | 0.75 |
| | Make conclusion or personal creation based on gathered information | 3.61 | 0.88 |
| | Publish conclusion or creation to personal social media | 3.12 | 1.04 |
| | Publish comments and questions to clarify the meaning | 2.93 | 1.10 |
| | Average | 3.64 | 0.90 |

*SD (deviation Standard)

In general, students' attitude in using social media at level C2 was very high (see Table II) . The number of students who used keywords to find information was very high. By using keywords, students found expert profiles, blogs, videos, or links to share with others as a source of information as needed.  However, the number of students who published comments when concluding or questioning deeper information from social media has the lowest score.

TABLE III.    STUDENTS' ATTITUDE IN THE APPLYING LEVEL (C3)

| No | Attitude | Mean | SD* |
|---|---|---|---|
| 1 | Using collected information as needed | 4.13 | 0.62 |
| 2 | Following the instruction to find information to complete a specific assignment | 4.06 | 0.7 |
| | Average | 4.10 | 0.66 |

*SD (deviation Standard)

Data in Table III showed a very high average score of attitudes in using social media in applying level, whereas in using information for learning as well as using instruction available in social media to accomplish the specific assignment.

TABLE IV.    STUDENTS ATTITUDE IN THE ANALYZING LEVEL (C4)

| No | Attitude | Mean | SD* |
|---|---|---|---|
| 1 | Choose and combine information of the same function | 4.19 | 0.61 |
| 2 | Choose related information only as needed | 4.04 | 0.9 |
| | Average | 4.12 | 0.76 |

*SD (deviation Standard)

Based on the data in Table IV, the use of social media in C4 was very high. Students chose information as needed as well as relating the information of the same function.

TABLE V.    STUDENTS' ATTITUDE IN THE EVALUATING LEVEL (C5)

| No | Attitude | Mean | SD* |
|---|---|---|---|
| 1 | Crosscheck with other sources to check the accuracy of the information | 4.16 | 0.79 |
| 2 | Provide comments (feedback) about information considered to be more accurate | 3.2 | 1.12 |
| No | Attitude | Mean | SD* |
| | Average | 3.68 | 0.96 |

*SD (deviation Standard)

From Table V, in cognitive level C5, students' attitude scored high in confirming the accurate information of the social media by comparing with other sources. Students' attitude scored high in sharing evaluation to the accurate information through comments in the social media.

The use of social media in developing the high-order thinking in the creating level scored very high as shown in Table 7.

TABLE VI.    STUDENTS' ATTITUDE IN THE CREATING LEVEL (C6)

| No | Attitude | Mean | SD* |
|---|---|---|---|
| 1 | Design or create a product based on the information available in the social media | 4.34 | 0.61 |
| | Average | 4.34 | 0.61 |

*SD (deviation Standard)

Students used information from the social media to create a product as a hobby or course final assignment. The examples are chair, food, origami ornaments, short movie, documenter, game, game controller, advertisement, laptop installation, the video for elder people, simple website, blog, educative video, syllabus, lesson plan, curriculum, learning tutorial, simple networking, application, android application, and root application. The ideas of the products' creation came mostly from the social media.

## IV.  DISCUSSION

Faculty of Information and Technology students had used social media to support learning. According to previous research conducted by Liu, the most popular tools for learning are Facebook, Wikipedia, and YouTube [20]. It was contrary to the data present in table 1 where the percentage of blog usage is higher than SNS, Wikis and Content Communities. However, the finding was parallel with Moran *et al.* research that showed blog and wikis as the favorite tools for learning purpose and SNS mostly for the personal purposes [12].

The data showed that the attitude of using social media scored between high and very high in all levels of Bloom's taxonomy. It showed that social media had involved all levels of thinking process with an almost even of attitude quality. The average of every level showed the lowest score was in understanding level in publishing ideas and questioning to gather more information. The score was similar in evaluating level of thinking process where students provide comments from justifying the truth of information in the social media. Although students could evaluate the truth of information, they should have more efforts to share their justification. Publishing and commenting on social media posts were among the strategies to receive inputs and find valuable information. In the activity, students socialized with experts like practitioners, professors, or other students to build interaction and better understanding [21]. By using social media of social networking, students had the opportunity to involve in social interaction by being in community groups or as the follower of professional groups that actively share ideas in the social media.

The use of social media involved high-order thinking. It was different with Hou [22] finding where discussion affects the cognitive process only in the level of understanding. This research aligned with Peretz, *et al.* where social media helped students to use high order thinking to lead them experiencing profound learning [4]. Interaction by commenting or posting pros or cons ideas developed students' analytical skills in considering information deeper from a different point of views and led those students to involve in knowledge discussion. The discussion provided the students with the everchanging concept of thinking when facing a problem. Synchronous and asynchronous discussion were available in the features of some social media that gave participants' different criteria to get involved in the discussion. Hence social media facilitated its user to express their ideas, it supported students to increase their comfort and self-confidence in communication compare to face to face interaction in the classroom. It was aligned with other researchers' argument that the use of social media for online discussion increase the university courses quality [6], peer learning and knowledge discussion [10][23]. Although social media was potential in building social interaction as the unifying element of learning with the perspective of social interaction, teachers should strategically involve social media in the university courses to develop students' integrity and interactivity [24]. When educator integrates social media in the learning process, they required to identify the student's attitude in utilizing social media for learning purposes [5]; evaluate the tools and ensure the tools are comfortable and supporting student to communicate and collaborate with other [25]. Therefore, Students could experience the advantage of using social media for learning through their attitude involving higher order thinking process to gain knowledge and information.

## V. CONCLUSIONS

Based on the results of this study, it can be concluded that students have a very high awareness of utilizing social media to construct knowledge and skills. Their attitude also involved six levels of cognitive process in Bloom's taxonomy. However, students' attitude in understanding level showed that they did not fully share ideas or comments to SNS discussion forum. They also didn't provide comments or feedback related to their justification about the information on social media which is the attitude in evaluating level. It implied that students' engagement and participation in knowledge discussion through SNS need to be improved. In fact, the debate was the most significant contributor to construct knowledge and learning. In addition, features for discussions and online forums are the main characteristics of social networking. Therefore, lecturers need to consider improving the use of online forum features or discussion boards on social media for discussion activities. The lecturers or instructors required to engage as a facilitator in each online forum for directing the discussion and encouraging students' involvement. Furthermore, those instructors should be able to recognize appropriate tools and organize an effective strategy in employing social media for supporting learning experiences.

The future research would be a study to include each cognitive domain to find out the most dominant cognitive process when using social media and measure the cognitive process differences in utilizing social media of different categories. In addition, it is also important to explore the barrier of involving high order thinking in utilizing social media and the strategy to employ social media for the effective learning environment

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