Impacts of Online Academic Help-Seeking Behaviors on Undergraduate Student Self-Learning

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Abstract—This research concerns how online academic help-seeking behaviors of undergraduate students affect their self-learning. A survey was conducted with 104 undergraduate students from a university in Hong Kong. Six respondents who misconceived that they had learned a topic or concept online adequately but found they actually did not in subsequent assessments were interviewed in order to understand their online learning experiences in depth. An analysis of the results reveals that the availability of abundance of learning resources and the ease of accessibility of those resources on the Internet is a two-edged sword. Students who considered their assignment tasks being mainly skill-based, e.g. engineering students, tend to be associated with a less disciplined use of the Internet in their study and are less likely to be able to achieve higher level learning goals. Potential remedies to the problem are suggested.

Keywords — online academic help-seeking, self-learning, self-regulated learning

I. INTRODUCTION

With the advent of Internet technology, knowledge becomes more accessible to people. Nowadays self-learning is recognized as an important skill to cope with the needs of modern society. Fostering students with independent learning skills has been a popular educational aim of universities since the turn of the last century [1, 2, 3]. Teachers often point out relevant online learning resources to their students for extended learning purposes. An increasing number of students also search for online materials relevant to their learning interests. Due to the abundance of online learning resources and the presence of powerful web search engine, students seem to rely more and more on online resources to learn and less on printed books and traditional libraries. Students also take advantage of online resources to complete course assignments [4] despite the fact that they often receive no formal training in information literacy. In fact, there is a common belief that the abundance of online resources helps improve self-learning. While much of online materials do have educational value, they are often not well designed pedagogically. This study concerns how undergraduates students in a university in Hong Kong use online learning resources to support their academic study. Through a survey and interviews, their help-seeking behavior, which is considered to be an important instrumental behavior in the learning process [5, 6], was analyzed. The results show that most respondents have a habit of searching for solutions of their academic assignments on the Internet. However there are differences regarding how the solutions found on the Internet be used between the group of students who consider the major types of assignments of their programme of study as *skill-based* and those who consider the major types of assignments as *knowledge-based*, as well as the students' year of study.

In the next section, selected research literature related to this study is discussed. The research methodology is detailed in Section III. Key findings, with a focus on the quantitative ones, are described in Section IV. Discussions and conclusions are given in the last section of this paper.

II. RELATED RESEARCH

A. Online Self-Learning for Academic Study

Hiltz et.al [7] suggested that online learning can benefit students by improving their learning experiences and outcomes. Mäkitalo-Siegl and Fischer's [8] found a positive influence of the use of online resources by providing online help to support students' learning. Metzger, Flanagin, and Zwarun [9] reported that students exploit the Internet in solving academic problem. Mäkitalo-Siegl, Kohnle, & Fischer [10] found students use the Internet to look for additional references or even solutions of their assignments.

B. Help-Seeking in Self-Learning

One of the most concerned issues of self-learning is help-seeking. In the old days, students typically seek help for their learning problems from their teachers but teachers' availability is often limited. Puustinen and Rouet [11] considered the application of the Internet in solving academic problems as a type of help-seeking. Researchers have suggested that help-seeking is progressive and advantageous for students [12]. Since the Internet environment enables learners to interact without face-to-face contexts, they have more confidence and chances to share knowledge, ask questions, and search for answers via online learning sources [13]. Najafi et. al. [14] examined MOOC learners' help-seeking experience by conducting content analysis on 441 help-seeking posts in discussion forums of three MOOCs. They found that "*help-seekers had a higher completion rate compared to all other learners who had submitted at least one graded course component.*"

While learners can obtain knowledge about the topics of their interests on the Internet easily, the level of learning that they achieve on those topics has rarely been studied. This study attempts to address this research gap by studying university students' help-seeking behavior and their online self-learning experiences. Such a kind of study is important because many online learning resources may not be designed by professional educators. Many of them focus on content delivery but pay little attention to learning assessment. Learners may think that they have learned a topic they read online but they do not recognize that their understanding is shallow until their knowledge about the topic is formally assessed. This phenomenon is known as Dunning–Kruger effect [15] which highlights that "*our incompetence masks our ability to recognize our incompetence*" [16].

III. RESEARCH METHODS

The study adopted a mix-method approach to investigate undergraduate students' help-seeking behavior and their online self-learning experiences. Quantitative data were collected through an online survey. Semi-structured interviews were conducted with selected respondents who believed that they had already learned some concepts well from the Internet but yet failed to answer related questions in an assessment task so as to understand their online help-seeking behavior in depth.

A. Sampling

The target population is all undergraduates of a Hong Kong university. The study intended to adopt stratified sampling based on students from various faculties but deviations existed due to practical constraints. Invitations to participate the survey were sent to 120 students through the second and third authors' personal network towards the end of the academic year. 104 students from nine out of the ten faculties of the university completed the questionnaire. Despite the imperfect sampling, the Pearson correlation coefficient between the number of samples and student enrolment on faculty basis is 0.669, indicating a large strength of association.

B. Questionnaire

A questionnaire with 15 questions was designed to collect information from the respondents in the following aspects:

- *Academic background* such as academic discipline, year of study, and cumulative grade point average range.

- *Help-seeking behaviors* such as from whom the respondents would ask for help in different occasions, whether they would try to search solutions for assessment tasks on the Internet, and if answers are found, how would they use those answers, etc. Cheng and Tsai [12] identified three types of academic help-seeking behaviors, including searching for information to solve academic problems on Google or relevant websites, seeking teachers or tutors for academic help, seeking peers or unknown experts for academic help

- *Level of learning* that students perceive they need to demonstrate in their study and whether they are confident to achieve such levels. Terminology of

Bloom's Revised Taxonomy, which classifies learning into six levels with increasing depth as *remember*, *understand*, *apply*, *analyze*, *evaluate* and *create* [17], was used to craft the relevant questions.

The respondents were also asked whether they prefer online learning, face-to-face learning, or a hybrid of them, as well as whether they had ever misconceived that they learned a topic or concept online adequately but found they actually did not in subsequent assessments.

C. Interviews

After collecting the response data from the online survey, a brief analysis was conducted. Six respondents who tended to search the Internet for solutions once they have problems on their home assignments and had the experience of failing to answer questions on knowledge that they once perceived they had already learnt online were selected for interviews. Individual face-to-face interviews, in semi-structured format, lasted 15-20 minutes, were conducted to facilitate in-depth investigation of the respondents' self-learning experiences and the factors contributing to their self-learning performance.

D. Results Analysis

As the collected data from the questionnaire are essentially categorical or ordinal in nature, non-parametric statistics like Kruskal–Wallis and Mann–Whitney U tests were adopted to analyze those data. If applicable, effect size was computed too. SPSS V25 was used to conduct those analyses. Interview data were mainly used for triangulation purpose.

IV. FINDINGS AND DISCUSSIONS

A. Skill-Based vs Knowledge-Based

It was described in one of the survey questions that assignments which tend to have different answers being classified as *knowledge-based* questions whereas those assignments that tend to have one or few answers being classified as *skill-based*. Among the 104 respondents, 41 of them viewed the assignments they needed to complete mainly knowledge-based. They were mainly *arts* (80%), *law* (80%), and *social sciences* (70%) students. The remaining 63 respondents regard their assignments mainly skill-based. Most students from faculties of *engineering* (86%), *medicine* (80%), *architecture* (75%), *business and economics* (70%), *dentistry* (67%), and *education* (67%) belong to that group.

B. Perceived Skills / Abilities to Demonstrate in Assignments Between Skill-Based vs Knowledge-Based Groups

Respondents were asked to rate how often they need to demonstrate the kinds of knowledge and intellectual skills, described in Bloom's Revised Taxonomy of cognitive domains [18] in their assignments in a 4-point Likert scale with 1, 2, 3, 4 representing *never*, *rarely*, *sometimes*, and *always* respectively. Mann-Whitney U test were applied to analyze their responses. The results in Table I show that the skill-based group perceived they were assessed mainly on the four basic categories of the taxonomy with the greatest emphasis on recalling facts and basic concepts, i.e. *remembering*, and least emphasis on

evaluating and *creating*. For the knowledge-based group, they believed that they needed to demonstrate skills and abilities mainly in *evaluating* and *creating* with least emphasis on *remembering*.

TABLE I. HOW OFTEN THE KINDS OF SKILLS AND ABILITIES IN BLOOM'S REVISED TAXONOMY OF COGNITIVE DOMAINS NEED TO BE DEMONSTRATED IN THE ASSIGNMENTS. (RANK: 1 – NEVER, 2 – RARELY, 3 – SOMETIMES, 4 – ALWAYS)

Level of Learning (Bloom's Revised Taxonomy)	Knowledge-based group (rank) $n = 41$	Skill-based group (rank) $n = 63$	p-value	Effect size (r)
Remembering	41.02 (6)	59.97 (1)	0.000**	0.359
Understanding	54.28 (5)	51.34 (2)	0.550	*N/A*
Applying	58.05 (3)	48.89 (4)	0.071	*N/A*
Analyzing	56.90 (4)	49.63 (3)	0.169	*N/A*
Evaluating	75.44 (2)	37.53 (5)	0.000**	0.672
Creating	77.74 (1)	36.07 (6)	0.000**	0.703

There are highly significant differences ($p < 0.001$) between the knowledge-based and skill-based groups in their perceptions of how often the skills and abilities in the *remembering*, *evaluating*, and *creating* categories of the Bloom's revised taxonomy be demonstrated in their assignments. The corresponding effect sizes for the three categories are *medium* ($r = 0.359$), *large* ($r = 0.672$) and *large* ($r = 0.703$) respectively. In short, the skill-based group reckoned low-level learning (i.e. *remembering*, *understanding*, and *applying*) being more relevant to their assessment needs but the knowledge-based group found high-level learning (e.g. *evaluating* and *creating*) more relevant to them.

C. Help-Seeking from Internet

Respondents were asked to indicate their preferred ways of help-seeking when encountering difficulties in understanding learning materials, and in completing assignments.

When encountered difficulties in understanding learning materials, 74% and 17% of the respondents considered the Internet as their first and second preferred help-seeking sources respectively. Other choices included *re-reading the materials*, *searching supplementary materials such as books and journals*, *consulting classmates*, *consulting teachers*, or simply *giving up*. When encountering difficulties in completing assignments, most respondents opted for re-reading assignment details, and searching the Internet for clues for completing assignments. 45% and 46% of them considered the Internet as their first and second preferred help-seeking sources respectively. In short, the Internet was coined as the most preferred source of help-seeking for self-learning by the respondents.

D. Searching Solutions for Assignments from Internet

When asked of whether they had ever searched solutions on the Internet for their assignments, only 10 percent of the respondents said never. 46 percent of them expressed that they always did that. 21 percent and 23 percent indicated that they often did that and seldom did that respectively. These results suggest that a large proportion of students would attempt to look for assignment solutions on the Internet.

E. Managed to Achieve Expected Learning Outcome by Learning Online or Not

Among the 104 respondents, 50 of them had the experience that they failed to answer some questions in an assessment exercise such as examination even though they thought they had already learned the relevant knowledge and skills from the Internet. The remaining 54 respondents did not have that kind of experience. For ease of reference, the former group of respondents is referred to as *negative experience group (NEG)* whereas the latter group is referred to as *positive experience group (PEG)*.

F. How Assignment Solutions Found on Internet be Used

Respondents were asked what they would do if they managed to find out a solution of an assessment tasks on the Internet. Seven ways to use the solutions, namely W1 to W7, were listed. Those choices were arranged in an increasing order of effort required to accomplish them. Respondents were asked to indicate how often they adopted those ways of use of the Internet. Mann-Whitney U test was applied to analyze for any behavioral differences between the negative experience group and positive experience group.

TABLE II. MEAN RANKS OF THE SUCCESS AND FAILURE GROUPS . (RANK: 1 – NEVER, 2 – RARELY, 3 – SOMETIMES, 4 – ALWAYS)

Way of Using Assignment Solutions Found on the Internet	NEG (rank) $n = 50$	PEG (rank) $n = 54$
W1: Copy the solution to complete exercise / assignment	68.04 (7)	38.11 (1)
W2: Read and try to understand the solution before copying it to complete exercise / assignment	59.66 (6)	45.87 (2)
W3: Copy the solution to complete exercise / assignment only if you manage to understand it	52.98 (5)	52.06 (3)
W4: Look for other solutions and choose the best one for the exercise / assignment	39.04 (2)	64.96 (6)
W5: Look for questions that are similar to the exercise / assignment and read the suggested answers	39.42 (3)	64.61 (5)
W6: Look for questions that are similar to the exercise / assignment and try to work out the solution before checking the suggested answers	40.86 (4)	63.28 (4)
W7: Complete the exercise / assignment without referring to the solution first, and then compare your answer with the suggested solution as a correctness check	38.88 (1)	65.11 (7)

According to the mean ranks shown in the first four rows of Table II, respondents in the negative experience group tend to finish their assignments by copying the solutions found on the Internet. As reflected by the results displayed in the first three rows in Table II, those from the positive experience group appear to be much less likely to copy solutions found on the Internet to finish their assignments. The last four rows of the table suggest that students of the positive experience group tend to use the Internet in a more disciplined manner.

Results from Table III show highly significant differences in how information retrieved from the Internet was used between the positive experience and negative experience groups in six out of seven occasions, with effect sizes varying from medium $(0.3 \leq r < 0.5)$ to large $(r \geq 0.5)$.

TABLE III. BEHAVIORAL DIFFERENCES IN HOW ASSIGNMENT SOLUTIONS FOUND ON THE INTERNET BE USED BETWEEN POSITIVE EXPERIENCE AND NEGATIVE EXPERIENCE GROUPS.

Way of Using Assignment Solutions Found on the Internet	p-value (p)	Effect size (r)
W1: Copy the solution to complete exercise / assignment	0.000**	0.519
W2: Read and try to understand the solution before copying it to complete exercise / assignment	0.000**	0.347
W3: Copy the solution to complete exercise / assignment only if you manage to understand it	0.864	NA
W4: Look for other solutions and choose the best one for the exercise / assignment	0.000**	0.473
W5: Look for questions that are similar to the exercise / assignment and read the suggested answers	0.000**	0.454
W6: Look for questions that are similar to the exercise / assignment and try to work out the solution before checking the suggested answers	0.000**	0.409
W7: Complete the exercise / assignment without referring to the solution first, and then compare your answer with the suggested solution as a correctness check	0.000**	0.463

TABLE IV. MEAN RANKS OF THE SKILL-BASED AND KNOWLEDGE-BASED GROUPS. (RANK: 1 – NEVER, 2 – RARELY, 3 – SOMETIMES, 4 – ALWAYS)

Way of Using Assignment Solutions Found on the Internet	Skill-based (rank) n = 63	Knowledge-based (rank) n = 41
W1: Copy the solution to complete exercise / assignment	59.81 (7)	42.65 (1)
W2: Read and try to understand the solution before copying it to complete exercise / assignment	54.07 (5)	50.09 (3)
W3: Copy the solution to complete exercise / assignment only if you manage to understand it	53.77 (4)	50.55 (4)
W4: Look for other solutions and choose the best one for the exercise / assignment	54.83 (6)	48.91 (2)
W5: Look for questions that are similar to the exercise / assignment and read the suggested answers	49.94 (3)	56.43 (5)
W6: Look for questions that are similar to the exercise / assignment and try to work out the solution before checking the suggested answers	47.80 (2)	59.72 (6)
W7: Complete the exercise / assignment w/o referring to the solution first, and then compare your answer with the suggested solution as a correctness check	47.40 (1)	60.33 (7)

TABLE V. BEHAVIORAL DIFFERENCES IN HOW ASSIGNMENT SOLUTIONS FOUND ON THE INTERNET BE USED BETWEEN SKILL-BASED AND KNOWLEDGE-BASED GROUPS.

Way of Using Assignment Solutions Found on the Internet	p-value (p)	Effect size (r)
W1: Copy the solution to complete exercise / assignment	0.005**	0.276
W2: Read and try to understand the solution before copying it to complete exercise / assignment	0.317	NA
W3: Copy the solution to complete exercise / assignment only if you manage to understand it	0.560	NA
W4: Look for other solutions and choose the best one for the exercise / assignment	0.282	NA
W5: Look for questions that are similar to the exercise / assignment and read the suggested answers	0.244	NA
W6: Look for questions that are similar to the exercise / assignment and try to work out the solution before checking the suggested answers	0.030*	0.213
W7: Complete the exercise / assignment without referring to the solution first, and then compare your answer with the suggested solution as a correctness check	0.023*	0.223

The behavioral differences between the skill-based group and knowledge-based group were analyzed in a similar way. Results from Tables IV and V show significant differences in how the two groups used information retrieved from the Internet for completing assignments in three occasions, with small effect sizes. In brief, the skill-based group tend to opt for copying the solution found on Internet to complete their assignments whereas the knowledge-based group seems to be more willing to spend more effort on their assignments. This finding is coherent with the results displayed in Table I.

G. Correlation Between Help-Seeking Behavior on Internet and Academic Performance

In the survey, respondents were asked to choose one of the five cumulative grade point average (CGPA) range (3.60-4.30, 3.10-3.59, 2.40-2.99, 1.70-2.39, and 1.00-1.69) to indicate their overall academic performance. Spearman's Rho was applied to study whether there is any correlation between the respondents' help-seeking behavior on the Internet and their academic performance. Among the seven ways that the respondents used the Internet to look for solutions for completing their assignments, weak correlation exists in five occasions ($n = 104$). A weak positive correlation exists between W1 and CGPA ($\rho = 0.22$, $p = 0.025$), meaning that respondents who copied solutions from the Internet tend to have low CGPA. A similar correlation is found between W2 and CGPA ($\rho = 0.231$, $p = 0.018$). However, a weak negative correlation is found between W7 and CGPA ($\rho = -0.248$, $p = 0.018$), meaning that respondents who did not copy solutions found on the Internet for their assignments but used them to check the correctness of their work tend to have higher CGPA. A similar correlation is

found between W6 and CGPA ($\rho = -0.195$, $p = 0.048$) and between W4 and CGPA ($\rho = -0.231$, $p = 0.018$). A conjecture from the results is that a disciplined use of the Internet can help students improve their academic performance but using the Internet unruly can hamper learning. Further investigation is needed to study the validity of this conjecture.

H. Correlation Between Help-Seeking Behavior on Internet and Year of Study

In order to study whether there is any correlation between the respondents' help-seeking behavior on the Internet and the respondents' year of study (Y1, Y2, Y3, Y4 and Y5 or above), Spearman's Rho was used again. Among the seven ways that the respondents used the Internet to look for solutions for completing their assignments, weak correlation exists in five occasions ($n = 104$). A weak negative correlation is found between W1 and year of study ($\rho = -0.236$, $p = 0.016$), indicating that freshmen and sophomores tend to complete their assignments by copying solutions from the Internet more often when compared to the juniors and seniors. Weak positive correlation is found between W7 and year of study ($\rho = 0.200$, $p = 0.042$), meaning that juniors and seniors tend to use the solutions found on the Internet to help verify the correctness of their work more often when compared to the freshmen and sophomores. Similar findings are found between W6 and year of study ($\rho = 0.214$, $p = 0.029$), W5 and year of study ($\rho = 0.256$, $p = 0.009$), and W4 and year of study ($\rho = 0.236$, $p=0.016$). These results offer basic evidence that some positive behavioral changes of the students in the use of the Internet as a help-seeking tool for completing their assignments exists during their undergraduate study.

I. Self-Efficacy in Answering Questions of Different Natures

Self-efficacy refers to a personal judgment of "*how well one can execute courses of action required to deal with prospective situations*" [19]. It has been coined as a highly effective predictor of students' motivation and learning [20]. Is there any link between learners' help-seeking behavior on the Internet and their self-efficacy in learning? To answer this question, respondents were asked to indicate their confidence in completing assignment tasks corresponding to various layers of Bloom's Revised Taxonomy correctly in a Likert scale of 1 to 4, with 1 for *very unconfident* and 4 for *very confident*.

TABLE VI. MEAN RANKS INDICATING RESPONDENTS' CONFIDENCE IN COMPLETING ASSIGNMENTS THAT REQUIRE DEMONSTRATION OF VARIOUS LEVEL OF LEARNING SKILLS & ABILITIES IN BLOOM'S REVISED TAXONOMY (1 – V. UNCONFIDENT, 2 – UNCONFIDENT, 3 – CONFIDENT, 4 – V. CONFIDENT)

Level of Learning (Bloom's Revised Taxonomy)	Select 'searching the Internet' as the #th help-seeking source when having difficulties in finishing assignments						
	1st n=47	2nd n=48	3rd n=2	4th n=7	5th n=0	6th n=0	All n=104
Remembering	3.81	3.71	2.00	3.86	---	---	3.73
Understanding	3.72	3.83	3.00	3.86	---	---	3.77
Applying	3.06	3.08	2.00	3.71	---	---	3.10
Analyzing	2.26	2.94	3.00	3.71	---	---	2.68
Evaluating	1.55	2.96	3.00	3.86	---	---	2.38
Creating	1.60	3.31	4.00	3.71	---	---	2.58

According to the results shown in Table VI, respondents who opted for *searching the Internet* as their first help-seeking source when having difficulties in completing assignments had low confidence in completing tasks requiring demonstration of high-level learning skills. Those who selected other help-seeking sources as their first choice were obviously more confident in completing tasks corresponding to the upper levels of Bloom's Revised Taxonomy. Specifically those respondents who considered *searching the Internet* as a low priority help-seeking means tend to be more confidence in completing assignments of different natures.

J. Interview Results of Selected Respondents

Six respondents were interviewed on their experiences of using the Internet in their study. All of them had experienced at least one occasion that they failed to meet the assessment requirements even though they thought they had learned the related topics well on the Internet. However all of them found the Internet helpful to their study. Three of the interviews are described below.

Tommy was a final year student from Faculty of Business and Economics. His CGPA range was 2.40-2.99. He used the Internet when working on assignments for the purpose of time saving. His originally purpose of use of the Internet was "*looking for useful information*" but it was gradually changed to "*finding the exact question and its solution*". Although he saved time on doing the assignment, he was final in self-efficacy achievement:

> *"I think I have good information literacy skills. For example, I can distinguish which piece of information found is correct and which is not. Usually I google the keyword(s) and then I will click on the first few results to check whether using those keywords to search is appropriate. The Internet helps me to find additional information to solve problems. Sometimes I can even find the exact question and its solution. It can save my time of doing the assignments."*
>
> *(Tommy)*

Jimmy was a final year student from Faculty of Business and Economics. His CGPA range was 2.40-2.99. Jimmy claimed that he usually searches assignment questions using web search engines. If a solution could be found, he just copied it without evaluating its correctness. Sometimes, he briefly read the solution and paraphrased some wording for the sake of passing the plagiarism check. He liked that but he admitted that it was a bad habit.

> *"I would say that I don't think I could pass the courses without googling. It really helped me a lot. To be honest, I always skip lessons and I am always unable to keep up with the progress of the course. Whenever I encounter problems on my assignments, I just google the whole question and usually the solution comes out. Sometimes the questions may not be exactly the same, like some numbers or words have changed, then I will find it very difficult to understand and this will take me lots of time. So I will get the solution from my classmates instead. I know this way of learning is not really learning because I didn't learn anything at all, but it saved my efforts and*

I can do other work like part time. However, this way of learning may not work for some courses, I have failed two courses since I skipped the lectures and I could not keep up with the courses. I couldn't answer the questions in examination."

(Jimmy)

Vivian was a final year student from Faculty of Arts. Her CGPA range was 3.60-4.30. She believed that online learning source was helpful to her self-learning. She would not just copy the solution retrieved from Internet. Instead, she often looked for questions that are similar to her assignment question and tried to work out the answers before checking the suggested solutions. She expressed in the survey that she was confidence in solving questions belonging to the upper levels of Bloom's Revised Taxonomy of cognitive domain, indicating a high self-efficacy.

"I don't think I need a high level of information literacy. I seldom use Internet to find references, and I would prefer some traditional resources instead. The traditional resources are more authoritative and reliable. From the traditional resources, I can get the most accurate information that I need but the information online is so difficult to evaluate its accuracy. I would rather use traditional resources. However, as I am majoring in translation, I always use online dictionaries and online translators. It is so convenient for me to do my home assignments and saves me a lot of time!"

(Vivian)

The above cases illustrate that while the Internet can be a valuable source for self-learning, it can also be a threat to learning if its users are unable to use it in a controlled manner. Vivian made a disciplined use of the Internet and seems to benefit from it. Jimmy failed to exercise a controlled use of the Internet and seem to put completing assignments above learning. Tommy was also tempted to use the Internet in an undisciplined manner due to the availability and ease of accessibility of abundance of learning resources on the Internet. These results are in line with the quantitative findings.

V. DISCUSSIONS AND CONCLUSIONS

Many universities anticipated their students be an effective self-learner by the time they graduate. The Internet has been widely used to support self-learning. University students use it to search information to support their academic learning including for completing their assignments. The study reveals that the Internet is generally considered by undergraduates as the most favorable help-seeking source, outshining traditional sources like books, their classmates and teachers. This can be accounted for by the "principle of least effort" in human information seeking that people try to minimize effort in finding information [21]. People found ease of access and ease of use mattered more to them than the quality of the information they found [22]. However, the availability of abundance of learning resources and the ease of accessibility of the Internet may also put one's learning at risk. This is due to the fact that teachers are tempted to look for suitable tasks from the Internet for assessment purposes but such tasks can be identified by their students easily. If suggested solutions for those tasks are also on the Internet, students may be tempted to finish the tasks by copying those solutions. In the current study, almost a quarter of the respondents opted to simply copying the solutions to complete their assignments. Learning did not happen at all. Understanding is classified as a low-level of cognitive learning in Bloom's Taxonomy but it helps interconnect lots of disparate things [23]. Only when disparate things are connected, more knowledge can be developed. In the event that students cannot understand a basic concept but they do not take actions to catch up with the progress, they are likely to fall behind. To address the problem, teachers have to restrain from using assessment tasks that can be easily found on the Internet. Alternatively, sufficient changes have to be made to those tasks before they are released to students to work on. Teachers are recommended to introduce self and peer assessment activities to help students reflect on their learning. Through the mandatory self-evaluation tasks, students must focus on assessing their own ability, then compare it with other students'. This kind of assessments can enhance their learning and develop higher level self-regulated learning [24].

Universities are supposed to prepare students the skills and knowledge for handling situations in the unknown future [25]. Students should be required to achieve all learning goals in Bloom's Revised Taxonomy. However, respondents of the skill-based group found they were seldom asked to accomplish high level learning goals like *evaluating* and *creating* in their assessment tasks. The same group also tends to be associated with a less disciplined use of the Internet in their study when compared to the knowledge-based group. Teachers should reflect to ensure high-level learning goals be incorporated in the design of assessment tasks and forewarn their students about the potential problem of undisciplined use of the Internet. Engineering teachers must note that in particular as most engineering students identified themselves in the skill-based group who tend to be more susceptible to an inappropriate use of the Internet in their study.

Students who are used to copying solution from the Internet for the purpose of completing the assignment are more likely to mistakenly conceive that they have already learned the concept through online self-learning. This is the result of the students' low-level self-regulated learning which only focus on learning in the earliest phase – planning. A good self-regulated learning should be able to complete the general linear structure consisted of planning, monitoring, controlling and reflecting in which planning is considered as basic learning and the other phases allow students to exhibit practical actions of supervising, regulate and evaluate their learning processes and outcomes [26]. Students can be better prepared for self-regulated learning if they are introduced to the process when they join the universities.

Despite there are some researches suggests that the online environment facilitates students to seek for additional references and assistance [10, 27], this study reveals that whether it is beneficial to the students' learning depends on their self-learning behavior. Over-reliance on searching solution on the Internet appears to be an obstacle for students to develop their learning capability. One interviewee did realize his over-reliance on solutions found online for finishing his

assignment but he could not resist to not doing so. The reason for students to have this behavior repeatedly is probably because of the habitual response that related with the goal system [28]. The goal in this case is to solve the assignments while there are external factors such as stress and distraction influencing the process.

This study offers some preliminary evidence that students appear to exhibit some positive behavioral changes in the use of the Internet as a help-seeking tool for completing their assignments during their undergraduate study. Would it be related to the difference in the natures of the assignments given to students of different years of study? Or would the freshmen and sophomores have learned from their experiences or teachers' feedback that copying solutions cannot guarantee good academic performance in their study? The reasons that conduce those positive behavioral changes are worth further investigating.

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