INSTAGRAM AS A TOOL IN PHENOMENON-BASED LEARNING: AN EDUCATIONAL DESIGN RESEARCH

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Abstract

The use of Instagram in education consists of technological, educational, and social affordance. Despite positive reports on using social media for learning, there are no reports on using Instagram as a teaching tool in phenomenon-based learning (PhenoBL) for engineering and science courses. This study seeks to understand students' motivation and perception and their perceived learning outcomes using Instagram for PhenoBL. The findings provided empirical evidence that students had a positive perception of the Instagram activity and were motivated to complete the activity, leading to a positive learning outcome. Through these findings, good

practices of using Instagram in PhenoBL to provide better learning motivation and perception in engineering and science courses were proposed.

Keywords

Phenomenon-Based Learning, Social Media, Motivation, Educational Design Research, Instagram

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1. Introduction

Phenomenon-based learning (PhenoBL) is a learner-centric, multidisciplinary instructional approach that relies on a holistic, authentic phenomenon requiring student inquiry and problem solving (Valanne, Dhaheri, Kylmalahti, & Sandholm-Rangell, 2017). PhenoBL, grounded in constructivism theory, requires students to create an understanding of real-world phenomena (Østergaard, Dahlin, & Hugo, 2008) and solve authentic real-world problems (Silander, 2017). Unlike the conventional teaching approach where real-world situations are used as examples of theories taught, teaching using the PhenoBL approach begins with these situations (Østergaard, Lieblein, Breland, & Francis, 2010). As an alternative pedagogical approach, PhenoBL accentuates (i) the phenomenon to the subjects or topics, (ii) the connection between students and the PhenoBL activity, and (iii) the educators' teaching and self-reflection (Østergaard, et al., 2008).

In addition, the traditional teacher-centric didactic approach in science education focuses on the banking model of education and could hinder the development of self-directedness in learning and lack of critical thinking (Freire, 2006). On the contrary, PhenoBL requires active participation and collaboration between students and educators to investigate areas related to the phenomenon that interests them (Silander, 2015). Hence, instead of passively listening to the educator, students participate proactively and learn better (Raahan, 2016). PhenoBL has been shown to improve students' critical thinking, skills development, engagement (Northern, 2018), and deeper learning (Francis, Breland, Østergaard, Lieblein, & Morse, 2013). With these benefits, it is undoubtedly that the Finnish National Board of Education endorses and mandates the use of PhenoBL in Finnish schools (Finnish National Board of Education, 2016).

2. Literature Review

The use of current affairs and local issues was reported to add value to PhenoBL (Tissington, 2019). As PhenoBL requires students to examine real-world phenomena, social media platforms are highly complementary tools to document and discuss these phenomena. Social media

platforms, such as Twitter, Instagram, and Facebook, are popular and commonly used for social interaction among people (Stathopoulou, Siamagka, & Christodoulides, 2019). Amongst the various social media platforms, Instagram is one of the most popular and commonly used. Founded in 2010, Instagram is a social network-based mobile application used mainly as a photo-sharing platform. However, less than 30% of students use Instagram for educational purposes (Bialy & Jalali, 2015; Pizzuti, et al., 2020).

A useful educational system should have high usability and the necessary utility (Kirschner, Strijbos, Kreijns, & Beers, 2004). The educational system (such as Instagram) should consist of technological (usability), educational, and social (utility) functionalities. Instagram as a teaching tool fits both conditions: high usability and necessary utility. Instagram posts allow students and educators to collaboratively create a pool of knowledge (social functionality). It also allows discussion within each post, resulting in sharing of opinions on various topics (educational functionality). With most students already using Instagram in their daily lives, riding on the interest of this social media platform provides an engaging and innovative approach to learning (Kirst, 2016). Students' familiarity with the application also reduces the cognitive load required for a new platform (technological functionality). Since the learning platform is part of their daily lives and easily accessible, learning can happen anytime and anywhere. With learning going beyond the classroom, students can apply and relate concepts learned to real-life environments. This is aligned with the PhenoBL approach.

3. Research Issues

The use of social media for learning was reported to positively impact learning performance (Moorthy et al., 2019; Sanchez-Franco, Villarejo-Ramos, & Martin-Velicia, 2011; Yan, 2008). Specifically, the use of Instagram as a teaching tool has been reported in various disciplines such as languages (Al-Ali, 2014; Handayani, 2017; Listiani, 2016), sciences (Korich, 2016; Ye, et al., 2020), and medicine (Gulati, Reid, & Gill, 2020; Oliveira, da Silva Pilecco, de Souza, de Oliveira, & Zanatta, 2022; Vicdan, 2020). Despite the benefits of social media for learning and the use of Instagram in several disciplines, to the best of our knowledge, there are no reports on PhenoBL for engineering and science courses using Instagram as a teaching tool. In this study, the use of Instagram, as a teaching tool for PhenoBL, was integrated into three engineering and science courses. The combination of PhenoBL with Instagram should have a positive effect

on students' motivation and perception which would potentially increase their perceived learning outcomes.

3.1. Research Questions

This study aims to determine students' motivation, perception, and perceived learning outcomes using Instagram as a teaching tool in PhenoBL. The following research questions (RQ) are addressed in this study:

- RQ1: What are students' motivations and perceptions while using Instagram in PhenoBL?
- RQ2: What are students' perceived learning outcomes after using Instagram in PhenoBL?
- RQ3: What are the good practices of using Instagram in PhenoBL to provide better learning motivation and perception in engineering and science courses?

4. Research Design and Methodology

A total of 262 students took part in this study. These students completed one of the three courses, Environment, Health & Safety (EHS) for a Sustainable Economy, Good Dispensing Practices, and Physical & Inorganic Chemistry, in the academic year (AY) 2019 and 2020. Students complete these courses as part of their diploma programs at Nanyang Polytechnic, Singapore.

An educational design research approach (van den Akker, 1999) was employed in this study. Preliminary research including context analysis, needs analysis, and literature review was conducted, and the authors identified the use of the PhenoBL approach and Instagram as the teaching tool. Next, three courses of different nature were identified to undergo the prototyping process (Table 1). The prototyping process was iterative and included designing, implementing, and evaluating the learning activity. The authors investigated the use of Instagram in PhenoBL through different courses. Finally, good practices of using Instagram in PhenoBL to provide better learning motivation and perception were established.

Table 1: *Summary of Three First-year Courses Involved in the Prototyping Process*

Course title	EHS for a Sustainable Economy	Good Dispensing Practices	Physical & Inorganic Chemistry
Diploma programme(s)	Diploma in Chemical & Pharmaceutical	Diploma in Pharmaceutical Science	

involved	Technology and Diploma in Biologics & Process Technology		
Instagram handle	@ehs_scl	@gdp_nyp	@phy_inorg_chem
What students learn	EHS issues associated with the chemical manufacturing industry	Application of pharmacy-related law in daily lives, and different drug dosage forms to achieve the best treatment plan	Physical and inorganic chemistry concepts such as stoichiometry, kinetics, bonding, and periodicity

(Source: Developed by the authors)

4.1. Prototyping Process

In educational design research, the prototyping process is an iterative cycle of designing, implementing, and evaluating to finalize the best version of the learning activity. In this study, the first cycle involved all three courses mentioned in Table 1. Based on the survey results, the authors narrowed it down to one of the courses and repeated the prototyping process. Finally, the good practices of using Instagram in PhenoBL would be identified.

4.1.1. Designing the Instagram Activity

The Instagram activity was designed with the following objectives:

- to integrate and internalize concepts, values, and/or attitudes acquired from the course using real-world phenomena,
- to develop global perspectives and heighten awareness of current issues related to the course, and
- to cultivate digital literacy, social media etiquette & critical thinking through analysing and evaluating online content.

4.1.2. Implementing the Instagram Activity

Before the start of the semester, the lecturers, who are also the researchers, each created an Instagram account. The lecturers created posts related to the topics in the course to inspire students, spark interest, and demonstrate examples of posts with captions (Figure 1). At the beginning of the course, students were briefed on the Instagram activity. Participation (5 to 10% of the overall

course grade depending on the course) marks are allocated to this activity to encourage students to create quality and thoughtful posts. During the briefing, the lecturer explained the objectives and instructions of the activity. The lecturer also ensured that students understood the purpose of the activity, which was to use concepts learned in the course to explain the real-world phenomenon. Ground rules to ensure social media etiquette were also mentioned during the briefing.

Students were told to follow the course Instagram account created by the lecturer. Fortnightly, students are to create a post (e.g., screenshots of news articles/ scientific journals, trending documentaries/videos, or an original photo) of a phenomenon related to what they learned in class (Figure 2). The post will be accompanied by a minimum 50-word reflective caption that demonstrates their application of concepts and/or knowledge learned in the course. The captions and comments must be written in their own words and proper English. The source of the news articles or non-original content must be credited. Also, they are encouraged to leave a comment on a peer's post and offer alternative views or insights on the phenomenon.
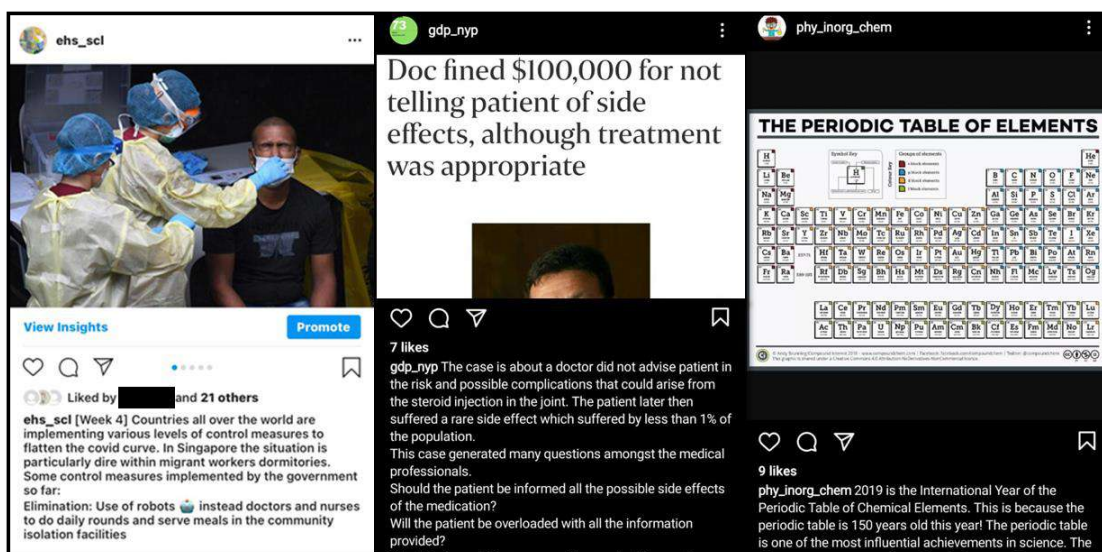

Figure 1: *Examples of lecturers' posts from the three courses*
(Source: From authors' course Instagram account)

Figure 2: *Examples of students' posts*

(Source: From students' course Instagram account)

4.1.3. Evaluating the Instagram Activity

The Instagram activity was evaluated at the end of the semester through a survey. Students took part in the survey voluntarily. Based on the survey results, the authors went through the prototyping process again by modifying how the activity is designed and implemented again in the following semester.

4.2. Data Collection

At the end of the semester, a survey with a four-point Likert scale was administered to determine students' intrinsic motivation to work on the Instagram activity, as well as their perceived learning outcomes. Survey items are adapted from the Intrinsic Motivational Inventory (Ryan & Deci, 2000) and Extrinsic Incentives (Cerasoli, Nicklin, & Ford, 2014). The items are classified into five variables: Interest/intrinsic motivation, extrinsic motivation, perceived competency, value, and relatedness (Table 2). The survey also included questions to determine students' perceived learning based on cognitive category according to the revised Bloom's Taxonomy (Anderson & Krathwohl, 2001). The survey also included qualitative questions to gather further feedback on specific benefits and difficulties faced by students. In the survey, the analyze and evaluate categories under Bloom's Taxonomy were combined as one item because

students need to concurrently analyze and evaluate the article before creating the post. Other than the survey, lecturers' observations were also obtained.

Table 2: *Survey Items*

Variables	Items
Interest/ intrinsic motivation	I would describe this activity as very interesting.
	This activity was an interesting way to learn.
	I thought this was a boring activity.
	This activity was fun to do.
	I thought this activity was quite enjoyable.
Extrinsic Motivation	This activity helped me to improve my grade.
	I want others to know that I am a good student if do this activity well.
	I want to do this activity well so that my effort will be recognized by my classmates.
Perceived competency	I think I am pretty good at this activity, compared to other students.
	I am satisfied with my performance on this task.
	This was an activity that I could not do well.
Value	I would be willing to do this again because it has some value to me.
	I believed doing this activity could be beneficial to me.
	I believed this activity could be of some value to me.
Relatedness	I felt close with my peers when doing the activity.
	I felt distant from my peers when doing the activity.
	I like to do the activity with my peers because we could achieve something together.
	Doing this activity provided more chances to interact with my peers.
Cognitive category of learning	This activity improved my ability to remember the facts and concepts learned in the course.
	This activity improved my ability to understand and explain concepts learned in the course.
	This activity improved my ability to apply the ideas and concepts learned in the course, to solve problems.

	This activity improved my ability to analyse and evaluate an issue or problem related to the course.
	This activity improved my ability to create meaningful content related to the course on online platforms.

(Source: Ryan & Deci, 2000 and Cerasoli et al., 2014)

5. Results and Discussion

The survey administered at the end of the course provided insights to RQ1 and RQ2 on students' motivation, perception, and perceived learning outcome of the Instagram activity. The same survey was administered over three semesters.

5.1. Academic Year 2019 Semester 1

In AY 2019 semester 1, three courses integrated the Instagram activity as a teaching tool (Table 1). 65 pharmaceutical science (PS) students and 57 chemical technology (CT) students completed the survey. The survey items were grouped into five variables. For each variable, the total mean scores and standard deviation were reported (Table 3). Results were encouraging for both groups of students. Comparing the two groups of students, students' motivation from the CT group was higher compared to the PS group in all five variables.

Table 3: *Student Motivation Survey Results for AY 2019 Semester 1*

Variable	Pharmaceutical Science (N=65)	Chemical Technology (N=57)
Interest/ Intrinsic motivation	11.75/20.00 (SD=3.85)	15.85/20.00 (SD=2.64)
Extrinsic motivation	6.49/12.00 (SD=2.30)	8.30/12.00 (SD=2.06)
Competency	6.92/12.00 (SD=2.04)	8.04/12.00 (SD=1.87)
Value	7.03/12.00 (SD=2.38)	9.63/12.00 (SD=1.42)
Relatedness	8.65/16.00 (SD=2.63)	11.58/16.00 (SD=2.51)

(Source: Tabulated by the authors)

From Table 3, results from PS students were lower across all five variables. Both CT and PS students were required to create a post on alternate weeks for each course. However, because the same group of PS students worked on the activity for two courses in the same semester, they

were creating a post every week (i.e., even weeks for the Good Dispensing Practice course and odd weeks for the Physical & Inorganic Chemistry course). The poorer result from PS students could be attributed to weekly posting for PS students resulting in posting fatigue.

In the survey administered to the PS students, an additional qualitative question (Which course(s) do you think is suitable to use Instagram to teach?) was included. The result shows that 34% of the students indicated that both courses should not include the Instagram activity. A possible reason could be that students find it challenging to obtain suitable content for the chemistry course which was reflected by students' comments on the qualitative question. This could be due to the technical nature of the course. This is supported by the results that only 4% of the PS students indicated that Instagram activity should be included in the chemistry course.

5.2. Academic Year 2019 Semester 2 and Academic Year 2020 Semester 1

With the survey results and feedback obtained from AY 2019 semester 1, the authors decided to continue with the study, and the second cycle of the prototyping process, with only the CT students taking the EHS for a Sustainable Economy course in AY 2019 semester 2. As mentioned, one of the possible reasons for the lower motivation from the PS students was posting fatigue as they were creating weekly posts. To test this hypothesis, the lecturer increased the intensity of the posting from biweekly in AY 2019 semester 1 to weekly in AY 2019 semester 2. The same survey was administered to the CT students at the end of semester 2. Compared to results obtained in AY 2019 semester 1 (Table 3), lower motivation results in all variables were obtained in AY 2019 semester 2 (Table 4). It is also worth noting that the AY2019 semester 2 results for CT students were similar to those of AY 2019 semester 1 PS students. To ensure that the hypothesis is correct, in AY 2020 semester 1, the lecturer teaching the EHS for a Sustainable Economy course converted the frequency of posting back to biweekly. The results improved compared to AY 2019 semester 2 and are similar to those of AY 2019 semester 1 where students create posts biweekly. These results supported the hypothesis, indicating the decrease in motivation is highly likely the result of fatigue due to the increased intensity of posting.

Table 4: *Student Motivation Survey Results for Chemical Technology Students for AY 2019 Semester 2 and AY 2020 semester 1*

Variable	AY 2019 semester 2 (N=65)	AY 2020 semester 1 (N=75)
Interest/ Intrinsic motivation	11.68/20.00 (SD=2.36)	15.30/20.00 (SD=2.92)

Extrinsic motivation	5.89/12.00 (SD=2.35)	8.09/12.00 (SD=2.08)
Competency	6.45/12.00 (SD=2.16)	7.76/12.00 (SD=1.71)
Value	6.86/12.00 (SD=2.16)	9.16/12.00 (SD=1.94)
Relatedness	8.65/16.00 (SD=2.50)	10.00/16.00 (SD=2.59)

(Source: Tabulated by the authors)

5.3. Students' Motivation and Perception of the Instagram Activity

Based on the results in Tables 3 and 4, student motivation is generally positive, especially for CT students in both AY 2019 and 2020 semester 1. These results are encouraging as increased motivation leading to higher engagement has been previously reported (Hew, 2018). These results concurred with students' qualitative comments obtained from the survey when they were asked to describe benefits gained by completing the Instagram activity.

Students were able to relate the course content to their daily lives as "I am (they are) able to see how the content of this (the) course is applied in real-life context". They also felt that the activity made them think creatively as "I (they) get to learn more about different situations and how the concepts apply to (their) daily activities". The Instagram activity also "helps me (them) to be creative and think of ways the concept can be seen". Northern (2018) also had similar observations that PhenoBL improves students' critical thinking. With higher perceived competency, students are likely to increase their cognitive engagement and thus demonstrate more effort in understanding the subject content (Mahatmya, Lohman, Matjasko, & Farb, 2012; Rotgans & Schmidt, 2011).

To promote social interaction and collaborative learning in a remote learning environment, students were encouraged to read and comment on their peers' posts (Silander, 2015). Besides being able "get to see how others (their peers) do their (the) activity and learn from them", they were also "able to share and exchange ideas, broadening our (their) knowledge." Social interaction is important for online learning as it decreases the transactional distance between peers and lecturers (Moore, 1997). Being able to interact virtually with their peers encourages participation, resulting in greater behavior engagement (Jang, Reeve, & Deci, 2010; Skinner, Furrer, Marchand, & Kindermann, 2008). One student mentioned that "looking at other students' posts spurs my curiosity to find out more. All in all, I learn more about what is happening in this world through this activity". It motivated students to want to learn more about the content.

Another benefit of using Instagram as a teaching tool provides soft-spoken students an opportunity "to share my (their) views, opinions, points, and even information with my (their) peers in a way (that) my (their) voice is heard." This could be challenging in a physical classroom discussion as outspoken students could dominate the discussion. The Instagram platform "provided chances for me (students) to show what I (they) had learned." Given the autonomy, students were more likely to enjoy the activity leading to higher affective engagement (Skinner, Furrer, Marchand, & Kindermann, 2008).

5.4. Students' Motivation and Perceived Learning Outcome

The mean scores of students' perceived learning outcomes based on the questions related to the cognitive categories of learning (Table 2) are shown in Table 5. According to the results, students felt that the learning outcomes were achieved through the Instagram activity. Mean scores across each cognitive category for each group of students were consistent and encouraging. Comparing students' perceived learning outcome and their motivation (Tables 3 and 4), it is worth noting that higher motivation leads to a higher perception of learning as students "understand and remember more about what I (they) had learned in lecture and tutorial lessons" because "the (Instagram) platform (provided) chances for me (them) to show what I (they) learned." These results were also consistent with previous studies indicating that the use of social media in teaching and learning positively impacts learning performance (Moorthy et al., 2019; Sanchez-Franco, Villarejo-Ramos, & Martin-Velicia, 2011; Yan, 2008).

Table 5: *Mean Scores (out of 4.00) of Students' Perceived Learning Outcome*

Cognitive category	PS AY 2019 Semester 1 (N=65)	CT AY 2019 Semester 1 (N=57)	CT AY 2019 Semester 2 (N=65)	CT AY 2020 Semester 1 (N=75)
Remember	2.52	3.15	2.62	3.28
Understand	2.54	3.19	2.60	3.42
Apply	2.65	3.32	2.71	3.33
Analyze and Evaluate	2.55	3.43	2.71	3.47
Create	2.69	3.17	2.49	3.44

(Source: Tabulated by the authors)

5.5. Lecturers' Observations

Lecturers' observations concurred with students' motivation results with most of the students completing the activity days before the given due date. Students also "took quite a lot of time to (re)search (for) the articles and to type down my (their) captions as I (they) wanted the activity to do (go) well."

Students observed social media etiquette when devising the captions and commenting on others' posts. Students' news articles or photo posts were from credible sources and most of the posts included the application of concepts learned and provided thoughtful insights on the phenomenon. Each post gets approximately 5 to 15 likes from their peers suggesting that there was a good amount of motivation to read posts made by their peers, possibly to learn from them, gain more knowledge about the real-world phenomenon, and avoid repetition of content.

Although there were no instructions where a student cannot post a news article or topic that others have posted, it was observed that most of them took it upon themselves to post a unique topic, which suggests a heightened sense of commitment and ownership of this activity. One student specifically mentioned the following: "I was having some difficulties trying to post new content and not copy from my friends as I want something new and refreshing may be something that others may not have thought of which was difficult to find as everyone was very creative and smart, but I managed to put some contents that are relevant to the topic of the week while posting new contents others have yet to touch on."

The lecturers also faced a major challenge while implementing this activity. It was time-consuming to review and provide individual feedback, especially for courses with high enrolment. Providing a clear rubric to students and allowing peer- and self-assessment could potentially alleviate the problem.

6. Implications

The SAMR (Substitution, Augmentation, Modification, Redefinition) framework describes the extent to which technology is integrated into teaching and learning (Puentedura, 2009). Substitution and augmentation enhance learning while modification and redefinition transform learning. With Instagram as an active learning teaching tool, it enables the collaborative creation of knowledge through Instagram posts, discussions amongst students and educators, and learning beyond the classroom. Learning beyond the classroom used to be challenging, but Instagram made it possible and highly accessible which fundamentally transformed students' learning at the "redefinition" level (Al-Ali, 2014; Terada, 2020). This indicates that the use of Instagram as a teaching tool is on the highest level in the SAMR framework.

Comparing Instagram with learning-specific platforms (e.g. discussion forums) in a Learning Management System, the use of Instagram has its benefits. Ye et al. (2020) reported that

students asked more questions on Instagram compared to a discussion forum. Their study revealed that students preferred Instagram as it is less formal and easily accessible. Compared to a learning-specific platform, Instagram creates a fun and casual environment which could increase motivation to participate (Parrish, 2020). However, in the study conducted by Ye et al., several teachers were concerned with students mixing their private lives with studies. This is a potential disadvantage of using Instagram over learning-specific platforms but can be easily resolved by creating an Instagram account specifically for learning.

The results from this study extended our understanding of students' motivation, perception, and perceived learning outcomes on the use of social media, specifically Instagram, as a teaching tool in PhenoBL for engineering and science courses. It showed that the Instagram activity redefined teaching and learning by transforming students' learning experience.

6.1. Good Practices of the Instagram Activity in PhenoBL

Through this educational design research, some good practices of the Instagram activity were proposed to provide students with a positive learning experience which in turn increases motivation and perceived learning outcome (RQ3). Educators could employ Instagram as a teaching tool by adapting the proposed good practices into their activity.

6.1.1. Characteristic 1: Providing Students with a Theme Each Week

Despite lecturers creating sample posts and providing the flexibility to look for content that relates to any concepts taught in the course, students found it challenging to search for relevant content to post. They felt "stressed to find a picture /article/ news and it takes a long time for me (them) to complete the post as (they are) unsure whether the news/ article is suitable." Hence, support is given by providing a "Theme of the Week" on the profile of the course's Instagram page. A one-liner sentence, such as "using any environmental issues reported in the news, apply the concepts of at least one of the environmental laws learned", was provided direction and helped students focus on a specific topic of interest.

6.1.2. Characteristic 2: Providing Timely Feedback

Students taking the three courses are aged between 17 to 22. Being exposed to social media from a young age, most of them are accustomed to receiving instant gratification. Providing the same level of instant and timely feedback to the posts made by a large class can be time-consuming for the lecturer. A simple way for the lecturer to inform students that the post has been positively viewed is by clicking the "heart" button, similar to the "like" button on the Facebook platform. In

this way, students felt assured that their post met the expectations of the lecturer and would be more motivated and confident to make the next post. For posts that did not meet expectations, the lecturer will make a comment guiding the student to improve by providing elaborations or a more balanced perspective. An example of a comment is "great post on the massive oil leakage in Russia, but can you explain further how this article is related to what you have learned?"

6.1.3. Characteristic 3: Giving recognition to exemplar posts

The social learning theory proposes that through observing and imitating others, new behaviours can be acquired (Bandura, 1971). One of the key tenets of the social learning theory is vicarious reinforcement where learning involves observation of behaviours, rewards, and punishments (Grusec, 1992). While the lecturer provided additional comments to guide students who have room for improvement, giving positive reinforcement to students who performed the task well can motivate them and inspire other students. The lecturer would share high-quality posts on Instagram stories as exemplars. It was previously reported that exemplars are desired by students (Newlyn, 2013) and improve students' performance (Rashid-Doubell, O'Farrell, & Fredericks, 2018).

7. Limitations and Future Directions

Despite the encouraging results obtained, there are limitations as the study focuses on students' perception of their motivation and learning outcomes. Future work could investigate the effect of students' motivation and their actual learning outcomes and track students' improvement in the quality of their posts to provide a better understanding of the effect of the activity.

Next, the research is limited to Nanyang Polytechnic students, and a quantitative approach based on survey responses was employed. Future work could extend the study to students from other institutes of higher learning and in-depth qualitative data could provide a deeper understanding of how the Instagram activity affects students' learning.

8. Conclusion

This study demonstrated the use of Instagram, as a teaching tool for PhenoBL, in three engineering and science courses. An educational design research approach was employed to design, implement, and evaluate the Instagram activity through an iterative process. The study suggested that students were motivated and had a positive experience while completing the activity. Students' motivation in completing the activity also led to a higher perceived learning

outcome. Educators could utilize the proposed good practices while implementing the Instagram activity to provide a positive learning experience for students.

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