Applying Computational Thinking in Unsera Students used Online Calculus Training

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Abstract. The effectiveness and efficiency of the Computational Thinking mindset is very useful to improve the level of education and mindset of the Indonesian people so that they can compete at the international level. Every student must have the ability to computational thinking, namely Decomposition, Pattern Recognition, Abstraction, and Algorithm Design. The application that is used to train computational thinking is given the name "GANCANG" practical. This learning activity is carried out by utilizing the Google Forms application for Calculus course exercises at the Faculty of Information Technology at Serang Raya University. After implementing this exercise, the confidence of each student will increase. This confidence is needed to overcome problems, strong communication skills, to facilitate collaboration and presentations, and general curiosity in all disciplines that makes them ask and answer correctly so that they can help students achieve the learning goals that have been identified.

1. Introduction

Virtual classes are online classes that allow participants to communicate with each other, view presentations or videos, interact with other participants, and engage with resources in work groups. The newest addition to the virtual class is Google Forms. Google announced Classrooms in May 2014 as a new tool in Google Apps for Education. More than 30 teachers from Daffodil International University have started using Google classrooms since September 2014. The aim of the study is to report on the overall views of Google classes adopted in different classes. This paper presents a brief feature of Google Forms. Roger's innovation diffusion theory has used a theoretical framework for this paper. In addition, several factors of adoption (such as organizational, social, personal and technological) have been reassessed for research purposes. The research question is: a) What factors influence teachers to use Google Forms? b) How do teachers use Google Forms in their teaching? c) What are the obstacles to using Google Forms? d) What is the response of students to Google Classes? Analysis of the results of the questionnaire shows that this study can be effective in understanding and evaluating the perceptions of teachers and students to ensure quality teaching and learning through Google classes. This research also presents some new evidence about the potential of Google's classrooms in teaching. Finally, some suggestions about students' expectations are also provided for teachers from various disciplines who want to use Google Forms.

Over the past decade, many changes have taken place that have promoted and supported teachers to adopt technology in Indonesia's education. The study of Martin, F and Parker, M. A. (2014) say that many online courses are offered; at the same time the faculty adopts synchronous virtual classrooms that allow them to interact with students in real time[6]. Virtual classrooms, a synchronous form of e-learning have been adopted by many organizations in their efforts to promote workforce learning trying to cut travel time and costs associated with instructor-led training [7]. The latest addition to the virtual classroom is Google Classroom which is a learning management system for schools that aims to simplify the creation, distribution and grading of assignments. More than 30 teachers from Daffodil International University began using Google classrooms in September 2014. The aim of this study is to report on the overall views of Google classes adopted in different English Literature classes by linking Roger's theories about the diffusion of innovation. This paper finds out what are the factors for adopting classrooms, how teachers use them, what works best and their effectiveness and limitations.

2. Decision-Innovation Process

Rogers (2003) describes the decision-innovation process as "information seeking and information processing activities, in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation" [16]. For Rogers (2003), the decision-innovation process involves five steps: knowledge, persuasion, decision, implementation, and confirmation. These stages usually follow each other in chronological order [16]. This process is shown in Figure.1.
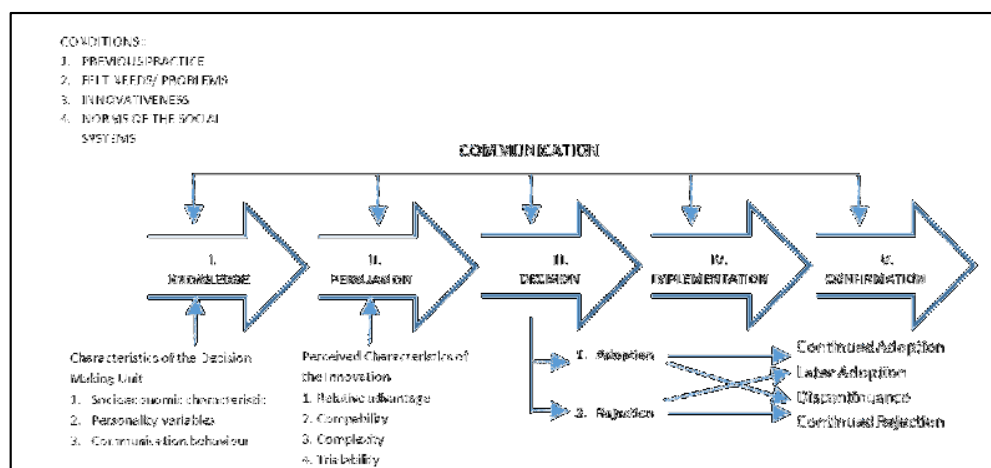

Figure 1. Decision Innovation Process

According to Rogers (2003), individuals in social systems do not adopt innovation at the same time; certain percentages of individuals are relatively early or later in adopting new ideas. Based on innovativeness criteria, the extent to which an individual is relatively early in adopting new ideas than other members of the social system, the distribution of various adopters of categories forming a bell-shaped normal curve that describes the Innovator (2.5%), the Early Adopter (13.5%), Early Majority (34%), Late Majority (34%), and Laggards (16%). Rogers (1995) states that the relative superiority, suitability, complexity, ability of trials and observability affect an individual's decision to adopt or reject an innovation. The relative advantage is how to improve an innovation more than the previous generation. Compatibility is the level at which innovation must be assimilated into an individual's life. Complexity is how likely it is to be adopted by someone based on how difficult it is to use. If innovation is too difficult to use, an individual will not possibly adopt it. Trialability determines how easily an innovation is experimented with when

adopted. Can be observed is the extent to which innovation is seen by others. An increasingly visible innovation will encourage communication among individual peers and personal networks and in turn will create more positive or negative reactions.

Research has shown that academic dishonesty spreads on campuses, with the majority of students involved at some point during their college careers. Depending on the type of survey used, reported percentages of undergraduate and graduate students who claimed to have cheated ranged from 9% to as high as 90% [4][9][12][13][17][18]. In some environments, cheating has become so common that students may not even view their behavior as dishonest [2][3].

Students often have different views about what constitutes cheating [1], and have various levels of tolerance towards it [1]. He is persistent and permeates problems that remain a source of concern, not only in education but also in other aspects of society. Students who cheat in high school are more likely to cheat in college and those who cheat as scholars are also more likely to cheat in post graduate school [12][13]. Can we expect anything less from students once they finish their education and move into their careers?

3. Review

Respondents who have participated in Calculus Training are 1 (one) class with a total of 31 respondents from Serang Raya University, Faculty of Information Technology. The problem of calculus exercises done online which is spread among respondents is 10 multiple choice questions.

Before starting to answer the exercise, students fill in the form of respondents' identity consisting of :
1. Student's email
2. Student's name
3. Student's ID number
4. Faculty
5. Class

Furthermore, after students work on the exercises, students input answers on multiple choice questions that have been provided online. Calculus practice questions with multiple choice forms of 10 calculus questions.
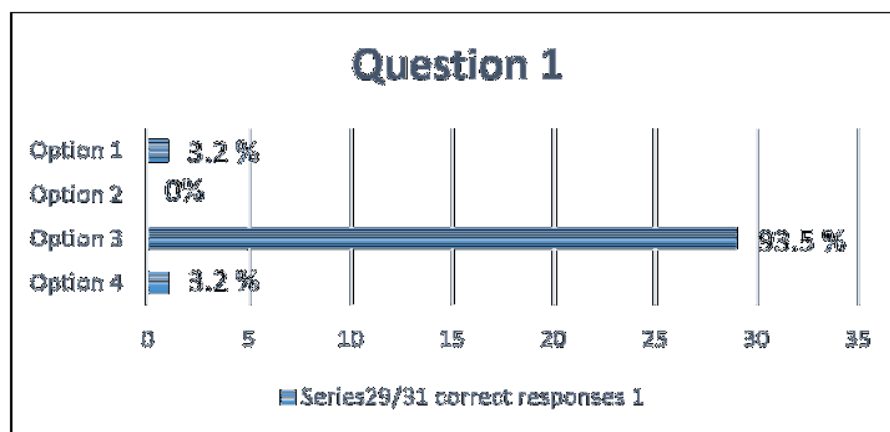

Figure 2. Practice questions1

4. Result

The results of calculus exercises that have been done by students can be seen in tabel1.

Table 1. Data Processing Respondents

Value	Respondents	Percentage	Color
100	16	51.61%	Light Blue
90	11	35.48%	Orange
80	2	6.45%	Grey
70	1	3.23%	Yellow
30	1	3.23%	Dark Blue
Total	31	100.00%	

The graph of the results of calculus exercises using Google Forms can be seen in figure 3.
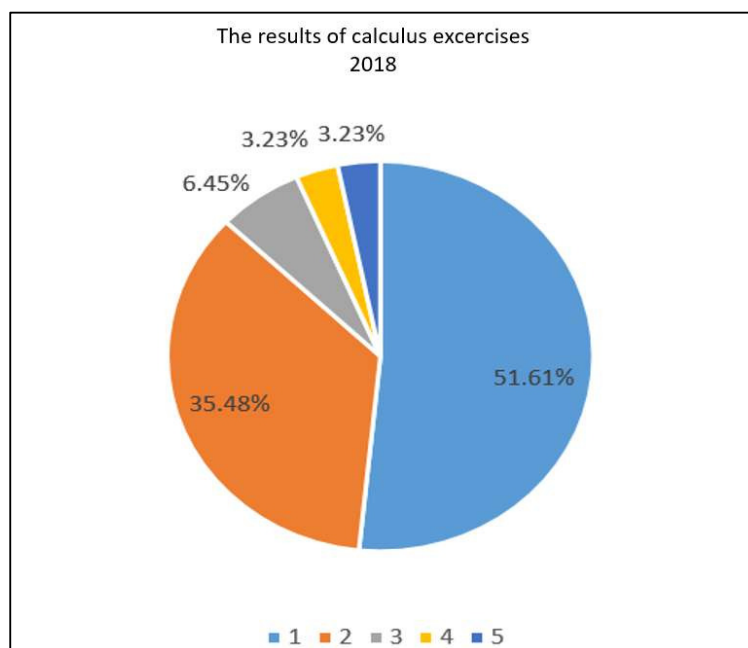

Figure 3. Percentage Results of calculus training values

The final results of the processing of respondents' data that has been obtained that:
1. As many as 96.77% of 31 respondents (students) scored more than 70.
2. A total of 51.61% of 31 respondents received 100 out of 10 questions.
3. As many as 35.48% get a value of 90, as many as 11 respondents
4. Respondents who get a score of 80 are 2 people.
5. Only 1 respondent gets a score of 70 out of 31 respondents.
6. Only 3.23%, namely as many as 1 respondent who scored 30.

5. Conclusion

The final result that can be concluded from this activity is that the confidence of each student will increase. This confidence is needed to overcome problems, strong communication skills, to facilitate collaboration and presentations, and general curiosity in all disciplines that makes them ask and answer correctly so that they can help students achieve the learning goals that have been identified.

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