# Does CQA Online Platform Increase Academic Performance of Secondary Students in Indonesia

*by* Rahkman Ardi

# Does CQA Online Platform Increase Academic Performance of Secondary Students in Indonesia

Rahkman Ardi[1], Adismara Putri Pradiri[1], Handy Pratama[1] and Dimas Mukhlas Widiantoro[2][3]

[1]*Faculty of Psychology, Universitas Airlangga*
[2]*Brainly, Ul. Dluga 72, Krakow 31-146, Poland*
[3]*Faculty of Economics and Business, Universitas Gadjah Mada*

Keywords:    *Community Question and Answering, E-learning, Learning Style, Big Five Personality*

Abstract:    The effective use of a CQA platform supported by appropriate learning style and specific traits could boost students' academic performance. This research aims to investigate the difference in academic performance between passive and active users of CQA, i.e. *Brainly*; and determine socio-psychological characteristics distinguishing between those users. The participants completed questionnaires related to demographics and psychology scale, i.e. Grasha-Reichmann Student Learning Style Scales (GRSLSS), Big Five Personality Inventory, Academic Self-efficacy, and social interaction scale. Moreover, the students' academic performance was also measured by testing three subjects which are Indonesian (five questions), English (five questions), and Mathematics (five questions) based on the education level of participants. The total number of participants was 757 respondents consisting of 333 CQA active users and 424 CQA passive users. The results of this research show that students having independent, contributive and competitive learning styles tend to be more active in solving the problems of academic subjects. The users with high self-efficacy along with a conscientious personality also tend to be active users. The active users also show higher academic performance scores compared to the passive ones.

## 1 INTRODUCTION

The use of a *Community Question and Answering* (CQA) online service aiming to support the students' learning needs grows rapidly in Indonesia. *Brainly* as a CQA platform and one of the biggest online learning media in the world for high school students, with one fifth of the total users being from Asia (Erlangga, 2015). It has helped millions of high school students in answering questions and doing homework by conducting question and answer interactions through online communities. The Marketing Manager of *Brainly* stated that there are 100 million monthly users from the total of 35 countries, of which 24 million users are from Indonesia (Ryza, 2018).

The rapid use of CQA to help students' learning leads to pros and cons in the community. Bhaskoro (2014) warned that *Brainly* could have two side effects. On one side, this site can provide opportunities for students to learn to understand a problem in various subjects with other users. But on the other side, the misuse problem is also possible as seen in certain students who are too lazy to think and just *copy-paste* for the assignments given by their teacher. The misuse problem of this *e-learning* platform has also been revealed by Barla, Kizlan, and Vit'az (2016). They argue, *"There will always be a group of lazy students"* who simply take the solution given by others without any effort to participate or interpret it.

Based on those assumptions, this study aims to establish how the socio-psychological characteristics of users who are actively involved in CQA activities differ from those who only want to get quick answers through the platform. These socio-psychological characteristics are reflected in daily learning styles, personality profiles and *general academic self-efficacy*. Online interaction patterns and academic performance of CQA active users are also observed as learning process indicators and effective use of an e-learning platform.

Alfonseca, et al (2006) revealed that learning style influences how students select strategy and collaborate with others. This fact refers to Kolb's (1999) findings, which explain that the selection of a particular learning style has an impact on the choice of effective learning strategies based on group

dynamics. However, the study by Alfonseca, et al. (2006) has still been based on learning style used by the Felder and Silverman model. This model categorizes learning style into five elements, which are sensing-intuitive (how to perceive information), visual-verbal (how to present information), inductive-deductive (how to organize information), active-reflective (how to process information) and sequential-global (how to understand information) (Felder and Silverman 1988). Meanwhile Kolb (1999) bases learning style on how someone perceives and processes information.

In this study, the definition of learning style refers to the student's interaction with teachers and peers in their daily lives (Grasha, 1996). This definition is more related to social perspective on learning style rather than on how students perceive information (auditory, visual, kinesthetic and tactile). This learning style, based on social interaction, consists of six indicators which are 1) independent which means individuals who tend to learn alone; 2) dependent which means individuals who depend on the teacher; 3) collaborative which means individuals who engage in working with others; 4) competitive which means individuals who compete with others; 5) participative which means individuals who learn by joining in an activity; 6) avoidant which means individuals who avoid and are not interested in learning (Grasha, 1996).

The interaction in CQA is based on group dynamic activity and relationships among its members. Therefore, preferences and learning strategies in e-learning are also assumed to be representations and reflections of the daily learning interactions in the classroom between students, teachers and peers. In this case we assume that CQA users actively involved in answering questions also represent a learning pattern in the classroom that tends to be independent, collaborative, competitive or participatory.

The study conducted by Chen and Caropreso (2004) indicated that personality influences online discussion in which students with higher extraversion, agreeableness and openness tend to be more involved in online collaborative learning. Furthermore, Zhang (2003) revealed that neuroticism predicts a superficial learning approach rather than an in-depth learning approach. Students with high neuroticism avoid risk in activities involving trial-and-error experiences. It can be assumed that students with high neuroticism tend to engage as those who like to raise questions rather than being those who like to answer the questions. Conscientiousness and openness to experience also

become the most influential predictors in in-depth learning strategy and achieving approach (Zhang, 2003). Thus, it can be concluded that students with a tendency to four high personality traits (conscientiousness, openness, extraversion and agreeableness) will tend to engage in collaborative and in-depth strategies. One of those strategies can be manifested in answering/solving other users' questions in a CQA.

In addition, Bates and Khasawneh (2007) have stated that self-efficacy is a predictor in the use of e-learning indicated in outcome expectations, mastery perceptions and time spent per week in accessing online learning technologies. Although the study only describes self-efficacy in online learning, it should be applicable in general academic self-efficacy. Consequently, academic self-efficacy driven by mastery perceptions of academic lessons is assumed to be able to influence user activity on the online learning platform, especially in active participation relationships to answer community questions.

The relationship between academic performance and the type of users (both active and passive) is also investigated in this study. Davies and Graff (2005) stated that the quality and dynamics of interaction could be the important factor of academic performance. Cho, et al. (2007) pointed out that a collaborative learning environment on social networks has a significant effect on academic performance. A study conducted by Agudo-Peregrina, et al. (2014) revealed a significant relationship between the type of interaction and academic performance in *e-learning*. More specifically, an experiment conducted by Nestojko, et al. (2014) showed that students who are asked to learn with instruction to teach others achieve better academic performance than those who only learn to prepare for the exam. Therefore, in this study we assume that users who interact actively through answering activities or solving the problems of academic subjects achieve better academic performance.

In addition, level of satisfaction and interaction forms shown among fellow active CQA users were also investigated in this study. The forms of interaction consist of collaboration, conflict, competition and accommodation. Exploring the type of interaction between active and passive users is believed to be useful for CQA designers to create features that support social and hard skills improvement through collaboration and competition, as well as conflict resolution through

accommodation so that online learning can work more effectively.

Overall CQA users are divided into two categories: 1) passive users, those who browse the *Brainly* content and those who use *Brainly* only to ask questions; 2) active users, those involved in the activities of answering questions/solving problems. Based on those categorizations, this study aims to answer the following hypotheses (H) and research questions (RQ):

H1. Personality profiles (i.e. extraversion, agreeableness, conscientiousness, neuroticism and openness to experience) affect user type. Individuals with extraversion, agreeableness, conscientiousness and openness tend to be active users. In addition, individuals with high neuroticism tend to be passive users.

H2. Active users show higher academic self-efficacy than passive users.

H3. Active users achieve better academic performance than passive users.

RQ1. Are there any differences in learning styles (independent, dependent, competitive, collaborative, participative, avoidant) between active and passive users?

RQ2. How do active users interact with each other, especially in the form of interactions, satisfaction levels and the desire to continue the interaction.

## 2 METHODS

The participants were high school students who became the visitors and *Brainly* users aged 12 to 18. They varied from grade 1 junior high school to grade 3 senior high school. They were then divided into 2 groups which were active users (users involved in question and answer activities) and passive users (users who only seek answers and ask questions). During the period from June to October 2017, we obtained 757 respondents consisting of 333 active users involved in answering questions and 424 passive users and visitors ranged from grade 1 junior high school to grade 3 senior high school. However, there were 27 respondents who needed to be excluded because they were doing academic performance tests outside their grade so that there were 730 respondents to be analyzed. The gender proportions in this research were 349 women and 381 men. 44% of participants were active on the Internet for more than four hours per day, while 49% used the Internet for one to four hours per day, and

only 6% were active on the Internet for less than an hour.

Research sampling was done by sending invitations to all users of *Brainly* Indonesia either through an account or through a pop up on the *Brainly.co.id* web page. The participant involvement in this study is voluntary.

Participants completed demographic related questionnaires (age, gender, internet access at school and home, the amount of time spent online per day and the amount of time to access *Brainly*). Furthermore, this study also measured students' academic performance scores on specific subjects based on their grade levels. The tested subjects were Indonesian (five questions), English (five questions) and Mathematics (five questions). Those subjects were selected, as they became three main subjects in the evaluation of national examinations held by the Ministry of Education and Culture.

Participants completed the questionnaires of the socio-psychological dimensions i.e. *Grasha-Reichmann Student Learning Style Scales* (GRSLSS), academic self-efficacy, Big Five Personality Inventory and social interaction scale. The translation of GRSLSS, academic self-efficacy scale, and Big Five Personality Inventory from English to Indonesian was done by using forward translation. GRSLSS was created by Grasha and Reichmann (Grasha, 1996). This scale is used to explore students' learning styles based on interaction with teachers and peers. This scale consists of six categorizations which are 1) independent ($\alpha = 0.61$); 2) dependent ($\alpha = 0.67$); 3) collaborative ($\alpha = 0.84$); 4) competitive ($\alpha = 0.75$); 5) participative ($\alpha = 0.81$); 6) avoidant ($\alpha = 0.65$). In each category the used learning styles are 3 items only.

The next psychological scale is the short version of the Big Five Personality Inventory adapted from Rammstedt and John (2007). This scale measures the personality types on extraversion, agreeableness, conscientiousness, neuroticism and openness to experience. In each personality type there are two questions.

Academic self-efficacy is modified from the general self-efficacy scale created by Schwarzer and Jerusalem (1995). One example of this item is "I can remain calm when facing academic difficulties because I can rely on my coping abilities." This scale consists of 5 items with Cronbach alpha of 0.85.

The social interaction scale is constructed for the purpose of this study. This scale consists of six dimensions with each having three items which are 1) desire to interact ("I do not mind to continue my

friendships with other *Brainly* users", α = 0.50); 2) satisfaction to interact ("I enjoy interacting with others at *Brainly*", α = 0.72); 3) teamwork ("I do not mind working on a team to solve learning problems with other *Brainly* users", α = 0.44); 4) competition ("I answer the difficult question to be the best user of *Brainly*", α = 0.78); 5) conflict ("I have no doubt arguing and defending my statements or answers in *Brainly* forums if I am criticized by other users", α = 0.77); 6) accommodation ("I bridge some of the responses that spark the debate among the *Brainly* answerers", α = 0.76).

# 3    RESULT

Table 1 presents the statistical analysis result of *independent t-test* among participant categories in Big Five Personality Scale, learning style, and self-efficacy. That table answers H1, H2 and RQ1. Hypothesis 3 (H3) is presented in Table 2 with the statistical analysis result on each level of education. Table 3 presents the statistical analysis result of social interaction scale which answers RQ2.

Based on the analysis of independent t-test, the active users showed a conscientiousness score higher than the passive users ($t$ (639.70) = -4.29; $p <$ .001, $d = 0.32$). However, the level of extraversion ($t$ (728) = -1.30; $d = 0.09$), agreeableness ($t$ (728) = -1.60; $d = 0.12$) and openness to experience ($t$ (728) = 0.72; $d = 0.05$) were not different significantly between both user groups. The level of neuroticism was also not different significantly ($t$ (728) = -0.08; $d = 0.01$).

Consequently, H1 was confirmed partially in which the conscientious personality dimension of active users was higher than the passive ones. Meanwhile, the other four personality dimensions, which are extraversion, agreeableness, openness to experience and neuroticism were not different significantly between both user groups.

H2 was confirmed through the result showing that academic self-efficacy of the active users tends to be higher than the passive ones ($t$ (728) = 0.72; $p$ < .05, $d = 0.17$).

There was a significant difference between the active and passive users on academic performance ($t$ (703) = -4.16; $p <$ .001, d = 0.32) which explains that the active users showed higher

Table 1: The Analysis Results of Big Five Personality, Self-efficacy, and Learning Styles.

| Dimension | df | Mean (SD) of Active Users | N Active users | Mean of Passive Users | N passive users | t | p | Cohens'd |
|---|---|---|---|---|---|---|---|---|
| Extraversion | 728 | 5.16 (2.18) | 314 | 5.36 (2.00) | 416 | 1.30 | 0.19 | 0.09 |
| Agreeableness | 728 | 5.81 (1.45) | 314 | 5.63 (1.54) | 416 | -1.60 | 0.10 | 0.12 |
| Conscientiousness | 629.70 | 5.80 (1.63) | 314 | 5.29 (1.49) | 416 | -4.29 | 0.00*** | 0.32 |
| Neuroticism | 728 | 4.91 (1.58) | 314 | 4.90 (1.54) | 416 | -0.08 | 0.93 | 0.01 |
| Openness to Experience | 728 | 5.52 (1.22) | 314 | 5.59 (1.15) | 416 | 0.72 | 0.47 | 0.05 |
| Self-efficacy | 728 | 5.02 (1.12) | 314 | 4.83 (1.13) | 416 | -2.28 | 0.02 | 0.17 |
| Independent | 709.76 | 5.71 (0.85) | 314 | 5.50 (0.96) | 416 | -3.06 | 0.00** | 0.23 |
| Dependent | 728 | 4.88 (1.22) | 314 | 4.70 (1.21) | 416 | -1.87 | 0.06 | 0.14 |
| Participative | 728 | 5.41 (1.20) | 314 | 5.13 (1.25) | 416 | -3.03 | 0.00** | 0.23 |
| Competitive | 728 | 5.86 (1.09) | 314 | 5.26 (1.17) | 416 | -2.77 | 0.00** | 0.53 |
| Collaborative | 728 | 5.29 (1.22) | 314 | 5.23 (1.30) | 416 | -0.61 | 0.54 | 0.05 |
| Avoidant | 728 | 3.74 (1.28) | 314 | 4.32 (1.36) | 416 | 5.83 | 0.00 | 0.44 |

*$p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 2: The Analysis Result of Academic Performance at each level of education.

| Grade | df | Mean (SD) of Active Users | N Active Users | Mean of Passive Users | N Passive Users | t | p | Cohens'd |
|---|---|---|---|---|---|---|---|---|
| Total Score | 703 | 8.48 (2.74) | 308 | 7.58 (2.87) | 397 | -4.16 | 0.00*** | 0.32 |
| 1 junior high school | 50 | 7.90 (3.16) | 22 | 8.20 (3.57) | 30 | 0.30 | 0.76 | 0.09 |
| 2 junior high school | 67 | 10.19 (2.68) | 36 | 8.60 (2.88) | 33 | -2.37 | 0.02* | 0.57 |
| 3 junior high school | 96 | 8.54 (2.59) | 57 | 7.17 (2.98) | 41 | -2.42 | 0.01* | 0.49 |
| 1 senior high school | 113 | 9.02 (2.95) | 50 | 7.73 (3.36) | 65 | -2.13 | 0.03* | 0.40 |
| 2 senior high school | 152 | 8.00 (2.29) | 57 | 8.23 (2.33) | 97 | 0.61 | 0.54 | 0.09 |
| 3 senior high school | 215 | 7.87 (2.60) | 86 | 6.77 (2.56) | 131 | -3.07 | 0.00** | 0.42 |

*$p < 0.05$ **$p < 0.01$ ***$p < 0.001$

scores (M = 8.48, SD = 2.74) than the passive ones (M = 7.58, SD = 2.87). Specifically, the score between those users differed significantly on grade 2 junior high school, grade 3 junior high school, grade 1 senior high school, and grade 3 senior high school (see Table 2). The insignificant difference could be seen in grade 1 junior high school and grade 2 senior high school (see Table 2). However, generally, this analysis indicated that H3 was confirmed.

The analysis result of RQ1 shows that there was a significant difference in learning styles between the active users (N=314) and the passive ones (N=416) on independent ($t$ (709.763) = -3.06; $p < .01$, $d = 0.23$), competitive ($t$ (728) = -2.77; $p < .01$, $d = 0.53$), participative ($t$ (728) = -3.03; $p < .01$, $d = $ 0.23) and avoidant ($t$ (728) = 5.83; $p < .001$, $d = 0.44$) strategies, but there was no significant difference on dependent strategy ($t$ (728) = -1.87; $d = 0.14$) and collaborative strategy ($t$ (728) = -0.61; $d = 0.05$).

The analysis of RQ2 showed that there was a significant difference in all interaction patterns between *Brainly* active and passive users. The score of collaboration ($t$ (715) = -6.73; $p < .001$, $d = 0.51$), competition ($t$ (714) = -5.75; $p < .001$, $d = 0.44$), conflict ($t$ (713) = -2.84; $p < .01$, $d = 0.22$) and accommodation ($t$ (711) = -2.71; $p < .01$, $d = 0.19$) was higher and owned by the active users (see Table 3). The higher satisfaction level of interaction was also shown by the active users

Table 3: The Analysis of Social Interaction Scale on Active and Passive Users.

| Dimension | df | Mean (SD) of Active Users | N Active Users | Mean of Passive Users | N Passive Users | t | P | Cohens'd |
|---|---|---|---|---|---|---|---|---|
| Interaction satisfaction | 718 | 5.79 (1.04) | 313 | 5.35 (1.07) | 407 | -5.51 | 0.00** | 0.41 |
| Desire to continue interaction | 718 | 5.31 (1.09) | 313 | 4.69 (1.02) | 407 | -7.88 | 0.00** | 0.59 |
| Competition | 714 | 4.75 (1.24) | 310 | 4.16 (1.44) | 406 | -5.75 | 0.00** | 0.44 |
| Conflict | 713 | 4.53 (1.40) | 310 | 4.21 (1.50) | 405 | -2.84 | 0.00* | 0.22 |
| Collaboration | 715 | 5.43 (1.01) | 310 | 4.92 (0.98) | 407 | -6.73 | 0.00** | 0.51 |
| Accommodation | 711 | 5.02 (1.16) | 309 | 4.78 (1.24) | 404 | -2.71 | 0.00* | 0.19 |

*$p < 0.01$ **$p < 0.001$

($t$ (718) = -5.51; $p$ < .001, d = 0.41) compared to the passive ones (see Table 3). The *Brainly* active users were also more interested in continuing further interaction ($t$ (718) = -7.88; $p$ < .001, $d$ = 0.59) than the passive ones (see Table 3).

# 4    DISCUSSION

As stated in the first and second hypotheses, the psychological variables indicate that someone who has a level of self-efficacy and a high level of conscientiousness will tend to become an active user. Self-efficacy refers to a person's level of confidence regarding his or her ability to perform and to complete academic tasks. Conscientious personality is a personality dimension, which indicates the focus and control to achieve a specific purpose. Users who have a low level of those psychological variables tend to become passive users/visitors. Instead, this fact indicates that people who become active users in *Brainly* tend to have confidence in solving the problems of academic subjects and have an orientation and control to achieve certain purposes. This statement is in line with the results of the study by Bates and Khasawneh (2007), which reveals that activities indicating academic mastery of e-learning correlates positively to self-efficacy. Zhang (2003) also stated that the conscientious personality type is a purposeful and strong-willed individual. Referring to this fact, it is not surprising that individuals with high personality conscientiousness tend to be more active in answering problems and providing solutions in CQA.

However, in this study openness to experience, neuroticism, agreeableness and extraversion dimensions do not show significant differences between the active and passive users. In contrast to Zhang's research (2003) stating that openness to experience positively influences deep learning activities and deep strategy, in this study learning activity is limited and specific to answering questions. In answering the questions, a person can apply inventive and creative ways and be open-minded (high openness to experience) or a person can be cautious, dogmatic, and also closed-minded (low openness to experience).

The insignificant relationship to the dimensions of neuroticism, as found in this study, might be explained by considering the accuracy level of responses/answers given by users who also require moderation from the *Brainly* moderator. This fact shows that the problem-solving activity in CQA

done by the users is not always accurate. This accuracy indicates that individuals actively involved could have high self-control and confidence (low neuroticism) or even be reactive (low emotional control) in answering.

Furthermore, the non-significant relationship between the type of active and passive users on the agreeableness dimension is thought to be due to the *Brainly* reward given to active users. The reward means that activities of answering questions are not only driven by altruism but also transactional. Individuals with high agreeableness, who base their attitude on altruism, sympathy and teamwork will tend to find difficulties being involved in learning activities that are achievement oriented (Zhang, 2003). The motive of a person when answering a question is not only based on altruism but also the transactional motive in the hope of getting the reward as promised by *Brainly*.

*Extraversion* personality types also cannot be distinguished significantly only by looking at which users tend to be active and which tend to be passive. Users with high extraversion type - who are often regarded as individuals who are attention seeking and domineering or low extraversion types - who tend to shy away from social relationships have opportunity to be both active or passive users. The nature of CQA online, which is relatively anonymous can cause a person, regardless of their extraversion level, to engage intensely in the activity of asking or answering questions.

This study also confirms the hypothesis that users who are actively involved in solving the problem of academic subjects at CQA will tend to achieve better academic performance when compared to passive users. This confirms an experiment conducted by Nestojko, et al. (2014) stating that students who study with the goal of teaching it to others will achieve better academic performance than those who are just learning to prepare for the exam. They will have better and complete memory when they are asked to teach it to others. This study finds there is a significant difference in learning scores between active and passive users at various levels of education, especially for students in grade 2 junior high school, grade 3 junior high school, grade 1 senior high school, and grade 3 senior high school. In those levels of education, the average score of students who become active users is higher when compared to those who become passive users. The difference between active and passive users is not significant enough for grade 1 junior high school and grade 2 senior high school. For grade 1 junior high school

that result might be obtained due to active users who join in this research being too few (22 users). While in grade 3 senior high school, the proportion between active ($N = 57$) and passive ($N = 97$) users who joined was not balanced.

In the first research question (RQ1), it can be concluded that the learning styles which are *independent, competitive, participative* and *avoidant* affect the type of users in *Brainly*. Students with *independent, participative* and *competitive* learning styles tend to be the type of user who is active in answering questions in *Brainly. Independent* learning style is indicated by the independence to consider academic problems more deeply. *Competitive* learning style is a learning model driven by the competition to get better results. *Participative* learning style could be seen from the level of student participation in the activities conducted in the classroom. *Avoidant* learning style is characterized by students who do not show interest in the classroom learning activities. The passive users tend to perform *avoidant* learning style when they are in class.

Interestingly, collaborative learning style does not show a significant difference between passive and active users. This result may be because of the reward system in CQA. Although, the CQA platform could stimulate collaborative action between users, rewarding every individual answer to the question may lead the users to be not only driven by the pleasure of sharing or collaborating with others, but certain action of users might be driven by the transactional motive of competition to obtain certain personal reward or recognition.

The result of this study also indicates significant differences in interaction forms between active and passive users. The active users understand the importance of mutual interaction between users. These active users do not only work together to give the best answer, but they can also engage in conflict situations, competition and accommodating action to solve the conflict. Understanding the principle of reciprocity and collaborative action taken by the active users is not surprising if found in active users because this *platform* is based on *mutual exchange* among users so that they can help each other in solving the problems of academic subjects. However, competitive relationships in answering other users' questions are also felt by active users. They are competing to achieve higher status regarding their membership in *Brainly*. This fact exists since the users' activeness in answering questions will obtain reward from *Brainly* whether it is status promotion or rewards in the form of

souvenirs and certificates. Conflict in the form of mutual refutation and debating answers in *Brainly* is also common among the active users. However, accommodating interactions are also prominent. *Brainly* becomes a medium in which they can also mediate discussions, compromise and revise answers that are already shared.

*Brainly* active users indicate their satisfaction in using the platform as a medium for interaction and sharing among users, rather than those who are passive users/visitors. They do not object to continuing their interactions outside of CQA activities either face-to-face or online through other social media.

The results of this study generally show that CQA users such as those on *Brainly* are able to obtain the benefits if they are actively involved in answering questions. These users obtain high scores in academic performance compared to passive users. This indicates that exercise and courage in solving the problems of academic subjects in *Brainly* can improve students' academic performance. It also does not close the possibility for teachers to use *Brainly* as a means of training for their students to answer questions.

Another benefit from using *Brainly* is the increased peer interaction among users. This social interaction is not only a mutual reciprocal, but also a relationship that requires *soft-skill*, especially with the ability to manage conflict and accommodate any discussions that occur within the platform.

The limitation of this study is related to the degree of generalization. The sampling was based on voluntarily participation instead of random sampling. The proportion of the sample number of passive and active users in grade 1 junior high school was too small and grade 2 senior high school was not balanced.

Although the study was funded by *Brainly* so that it raises the presumption of possibility of conflict of interest, the potential bias has been prevented using scientific methods and admitting the limitation of the study. It is realized from the beginning that any e-learning platform including *Brainly* can be used positively to increase academic understanding related to their academic subjects, but the misuse problem is potentially present for those who only look for instant answers without any effort to understand the academic subjects. Therefore, future studies need to explore deeply the traits and the motives in passive and active users, especially those associated with self-regulation and instant gratification motives in completing academic task. In addition, the in-depth study, whether the behavior

and academic achievement in the classroom are directly proportional to the activity undertaken in CQA, needs to be explored. It could be by comparing their CQA activities with GPA. Identification of these facts could also be useful for CQA designers to provide features that can prompt students to learn optimally.

## ACKNOWLEDGEMENTS

## REFERENCES

Alfonseca, E., Carro, R.M., Martin, E., Ortigosa, A. and Paredes, P., 2006. The impact of learning styles on student grouping for collaborative learning: a case study. *User Modelling and User-Adapted Interaction*, [e-journal] 16 (3-4), pp. 377-401. 10.1007/s11257-006-9012-7

Agudo-Peregrina, Á. F., Iglesias-Pradas, S., Conde-González, M. Á. and Hernández-García, Á., 2014. Can we predict success from log data in VLEs? Classification of interactions for learning analytics and their relation with performance in VLE-supported F2F and online learning. *Computers In Human Behavior*, [e-journal] 31, pp. 542-550. 10.1016/j.chb.2013.05.031

Barla, M., Kislan, M. and Víťaz, M., 2016. *QUERY: Interactive SQL Learning and Assessment*. In D. Chudá, L. Rothkranz, A. Smrikarov, T. Vassilev, S. Smrikarova. Y. Aliev, eds. 2016. *Proceedings of the international conference on e-Learning (e-Learning'16), Bratislava, 8-9 September 2016*. Bratislava: Slovak University of Technology in Bratislava. pp. 60-66.

Bates, R. and Khasawneh, S., 2007. Self-efficacy and college students' perceptions and use of online learning systems. *Computers In Human Behavior*, [e-journal] 23, pp. 175-191. 10.1016/j.chb.2004.04.004

Bhaskoro, A.T., 2014. Brainly Sediakan Wadah Online Tanya Jawab Tugas Sekolah Antar Pengguna. *Daily Social id,* [online] 05 August. Available at: <https://dailysocial.id/post/*Brainly*-sediakan-wadah-online-tanya-jawab-tugas-sekolah-antar-pengguna-2> [Accessed 2 June 2018].

Chen, S.J. and Caropreso., 2004. Influence of Personality on Online Discussion. *Journal of Interactive Online Learning,* [online] 3 (2). Available at: <https://www.learntechlib.org/p/158289/> [Accessed 2 June 2018].

Cho, H., Gay, G., Davidson, B. and Ingraffea, A., 2007. Social networks, communication styles, and learning performance in a CSCL community. *Computers & Education,* [e-journal] 49, pp. 309-329. 10.1016/j.compedu.2005.07.003

Davies, J. and Graf, M., 2005. Performance in e-learning: online participation and student grades. *British Journal of Educational Technology,* [e-journal] 36 (4), pp. 567-663. https://doi.org/10.1111/j.1467-8535.2005.00542.x

Erlangga, M., 2015. Pengguna Brainly di Asia Hampir Mencapai Seperlima Dari Total Pengguna i Seluruh Dunia. *Daily Social id,* [online] 05 February. Available at: <https://dailysocial.id/post/*Brainly*-asia> [Accessed 2 June 2018].

Felder, R.M. and Silverman, L.K. (1988). Learning styles and teaching styles in engineering education. *Engineering Education,* [online] 78(7), 674–681. Available at: <http://winbev.pbworks.com/f/LS-1988.pdf> [Accessed 22 June 2018].

Grasha, A. F., 1996. *Teaching with style; A practical guide to enhancing learning by understanding teaching and learning styles*. Pittsburgh: Alliance Publishers.

Kolb, D.A., 1999. *The Kolb Learning Style Inventory*. Boston: Hay Resources Direct

Nestojko, J. F., Bui, D. C., Kornell, N. and Bjork, E. L., 2014. Expecting to teach enhances learning and organization of knowledge in free recall of text passages. *Memory & cognition,* [e-journal] 42 (7), pp. 1038-1048. 10.3758/s13421-014-0416-z

Rammstedt, B. and John, O. P., 2007. Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality,* [e-journal] 41 (1), pp. 203-212. http://dx.doi.org/10.1016/j.jrp.2006.02.001

Ryza, P., 2018. Akuisisi Bask, Brainly Siapkan Platform Tanya Jawab Berbasis Video. *Daily Social id* [online] 25 January. Available at: <https://dailysocial.id/post/*Brainly*-bask-platform-tanya-jawab-video/> [Accessed 2 June 2018].

Schwarzer, R. and Jerusalem, M., 1995. Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, eds. 1995. *Measures in health psychology: A user's portfolio. Causal and control beliefs*. Windsor: NFER-NELSON. pp. 35-37

Zhang, L., 2003. Does the big five predict learning approaches?. *Personality And Individual Differences*, [e-journal] 34, pp. 1431-1446. 10.1016/S0191-8869(02)001

# Does CQA Online Platform Increase Academic Performance of Secondary Students in Indonesia

Feelings", Computers in Human Behavior, 2021
Publication

8  Yang Liu, Tingting Wang, Kun Wang, Yu Zhang. "Collaborative Learning Quality Classification Through Physiological Synchrony Recorded by Wearable Biosensors", Frontiers in Psychology, 2021
Publication                                                                <1 %

9  bip.ur.edu.pl
Internet Source                                                            <1 %

10  forumonpublicpolicy.com
Internet Source                                                            <1 %

11  www.scribd.com
Internet Source                                                            <1 %

12  www.tandfonline.com
Internet Source                                                            <1 %

13  pure.uva.nl
Internet Source                                                            <1 %

| Exclude quotes | Off | Exclude matches | < 10 words |
|---|---|---|---|
| Exclude bibliography | On | | |

# Does CQA Online Platform Increase Academic Performance of Secondary Students in Indonesia

FINAL GRADE

## /100

GENERAL COMMENTS

**Instructor**

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8