

The Role of Mentoring to Win Science Project Competition in Indonesia

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ABSTRACT

The role of mentors to advice students on their science projects is seldom being discussed in the current STEM literature. Science project competition is a platform for students to expose their scientific work. In completing their science project, schools provide them with mentors. However, there were challenges detected regarding the implementation of the mentoring process in the science project competition in Indonesia. Hence, the purpose of the study was to examine the role of mentoring to win science project competition in Indonesia. Based on Lane model, several sub-constructs such as supervision, relationship, coaching, communication, and role model were used to measure the main construct – mentoring. A survey design was used to collect the empirical data. A sample of 250 participants was selected using a stratified random sampling from 10 science competition sites (N = 700) in Indonesia in 2017. The instruments in this study were a set of questionnaires, open-ended items, and semi-structured interview protocol. Quantitative data were collected from the respondents using a set of questionnaires and qualitative data were collected from the selected participants by interview. The validity of the questionnaires was verified by five experts in the field. The reliability of the questionnaire was tested using Cronbach Alpha and found to be $\alpha = 0.99$ which showed a high internal consistency of the instrument. The quantitative data was analyzed using descriptive and inferential statistics such as frequency, percentage, mean (M), standard deviation (SD), t-test, ANOVA, Pearson correlation and regression analysis. The qualitative data were analyzed using thematic analysis. The questionnaires were distributed to the selected respondents during their participation in science project competitions in 2017 and the jury scores in the competitions were used as a measure for their achievement. The empirical data from the questionnaire showed that the most rated mentoring skill by the students was supervision, followed by coaching, role-model, and communication. Whereas the lowest mean in mentoring is research skills. The findings from the open-ended items showed several positive behaviors of the mentors were expected to reduce the students' stress such as being fun, cheerful, having sense of humor, smiling, sociable, never made fun of the students, and giving hope. In the interview session, the students added patience as a key positive behavior of the mentors. Regression analysis found that the most influencing factors of mentoring were communication and coaching. In conclusion, a new mentoring framework based on the empirical data in this study could be developed. This framework could be used by teachers and students in schools that will participate in future science project competition.

Keywords: Mentoring, science project competition, secondary school students, survey design, Indonesia