

Measuring and Nurturing Teamwork Competency through a Computer-supported Creative Collaborative Problem-Solving Programme

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KEY IMPLICATIONS

- The formative assessment tool developed can be of use in team-based activities at the Secondary level.
- The digital formative assessment approach has been empirically tested and found to be a pedagogical strategy that is effective for growing students' teamwork competency when it is carried out adhering to the programme's rationales.
- The new knowledge involving the dispelling of possible myths about learners' capabilities with varying achievement scores will be incorporated into teacher professional development workshops and other programmes.

BACKGROUND

In preparing students for productive participation in today's fast-changing knowledge economies, creative collaborative problem-solving (CCPS) can serve as a constructive pedagogical lever to develop students' 21st century competencies. However, student participation in CCPS may not necessarily lead to good teamwork competency. Also, teachers may be unsure of what counts as, and how to facilitate good teamwork.

Past research has highlighted that instructional support, particularly in the form of formative assessment, should be provided to nurture students' teamwork competency.

Furthermore, in recent years, traditional ways of assessment have been complemented by computer-supported methods that are increasingly valid, reliable and practical.

FOCUS OF STUDY

Four research questions were asked:

1. What is a valid, reliable, practical and integrated multi-method micro-profile of teamwork competency in a computer-supported CCPS intervention programme?
2. To what extent and in what ways are the CCPS intervention program effective in developing students' teamwork competency?
3. To what extent and in what ways do teacher involvement influence the effectiveness of the CCPS intervention programme?
4. To what extent and in what ways are teamwork competency influenced by students' academic achievement levels?

KEY FINDINGS

The findings show that it is possible to create a valid, reliable, practical and integrated multi-method micro-profile of teamwork competency in a computer-supported CCPS intervention programme. This tool has been evaluated by students who find them easy to use and valuable in gaining meaningful understandings of their teamwork competency.

Next, the quantitative results from the quasi-experiment revealed that students' self-rated teamwork competency for all dimensions grew. Higher fidelity to the programme's rationales led to gains for students in three of the four peer-rated teamwork dimensions. Qualitative findings similarly indicated the varied ways that students grew in their teamwork.

Thirdly, both quantitative and qualitative findings revealed that teacher involvement encompasses interplays between individual teacher's skills, attitudes, knowledge and the situated school context.

Our final result highlights that students' prior academic achievement has no influence on their teamwork competency.

SIGNIFICANCE OF FINDINGS

This project has made contributions in multi-fold ways. We have developed a theoretically sound four-dimensional teamwork assessment measure using two learning analytics approaches (disposition and discourse analytics).

The digital formative assessment approach is a pedagogical strategy that is effective for growing students' teamwork competency. This provides empirical evidence of the need for theory-informed

developments in learning analytics research as well as highlighting the important instructional mechanisms of teamwork learning.

In addition, this approach was effective with learners from all prior academic achievement levels. This is an important finding to be highlighted to dispel possible myths about learners' capabilities with varying achievement scores. These new knowledges can be incorporated into teacher professional development sessions.

Teacher involvement has been re-conceptualized to be broader and more complex in this study which adds to the theoretical base of teachers as change agents. Also, key skillsets and attitudes of teachers to enact such interventions are identified.

More so, the study discusses an ecological framework that provides insights of enacting successful 21st century competency interventions. For such innovations to be effective, multiple layers including the pedagogical core, school leadership, partners and policy needs to be in concert, establishing cultures of learning, clear understandings of the intervention, and garnering adequate buy-in.

PARTICIPANTS

A total of 452 Secondary 2 students and 26 teachers from three schools participated in the main research design.

RESEARCH DESIGN

The study is designed as a quasi-experiment with an intervention group and a lagged control group, and employs embedded mixed methods.

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This brief was based on the project OER 09/15 EK: Measuring and Nurturing Teamwork Competency through a Computer-supported Creative Collaborative Problem-Solving Programme.

How to cite this publication

Koh, E., Lee, S. S., Caleon, I., Hong, H., Tan, J., Tee, Y. H., Suresh, D., & Lek, H. H. (2020). *Measuring and Nurturing Teamwork Competency through a Computer-supported Creative Collaborative Problem-Solving Programme* (NIE Research Brief Series No. 20-007). Singapore: National Institute of Education.

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