PERCEPTIONS OF INDONESIAN GRADE 1-8 EDUCATORS IMPLEMENTING INQUIRY-BASED LEARNING: A DESCRIPTIVE NONEXPERIMENTAL QUANTITATIVE CORRELATIONAL STUDY

Presenting Committee:
Cheryl Peterson, Ed.D.
Mary W. Stout, Ed.D.
Michelle Hill, Ed.D.
Karen Johnson, Ed.D.
PROBLEM AND PURPOSE

Without specific training to teach using IBL strategies, teachers of grades 1-8 feel unequipped to effectively use these strategies in the classroom (DiBiase & McDonald, 2015; Kang & Keinonen, 2016).

The purpose of this quantitative, correlational study was to investigate the degree of relationship between the self-efficacy of grades 1-8 teachers as measured on the self-reported McGill Enactment of Inquiry Questionnaire - Self-Efficacy Teachers (MEIQ - SET) (Chikchekian, & Tabatabai, 2016) and their professed implementation of IBL as measured on the self-reported Promoting Inquiry in Mathematics and Science Education Across Europe (PRIMAS) questionnaire (Maaß & Euler, 2011).
What relationship exists between the self-efficacy of grades 1-8 teachers in teaching IBL lessons in mathematics and science as measured on the MEIQ-SET and their professed implementation of IBL strategies in the classroom as indicated from the PRIMAS Teacher Questionnaire?

H0
No statistically significant relationship exists between the self-efficacy of teachers and their professed implementation of IBL strategies in the classroom.

H1
A statistically significant relationship exists between the self-efficacy of teachers and their professed implementation of IBL strategies in the classroom.
THEORETICAL FRAMEWORK

CONSTRUCTIVISM – INQUIRY BASED LEARNING

• Proposed by Dewey, Piaget, and Vygotsky (Dewey, 1902; Vygotsky, 1978; Mooney, 2013)
• Teacher is guide for student learning
• Student learning is scaffolded to encourage further exploration
• Constructivist theories include a focus on relationship for teacher to know scaffolding steps for students

SOCIAL COGNITION – SELF-EFFICACY

• Proposed by Bandura (Bandura, 1997)
• Self-efficacy is a subgroup of Social Cognition
• Defined as the belief in one's capabilities
• The higher the belief in one's capabilities, more likely an individual would be to take risks, persevere, or achieve success
RELEVANT LITERATURE

- Global education – shift from industrialization to information (Mishra, 2015)
- Inquiry-based learning (IBL) has been suggested as a solution to integrate the necessary skills into teaching and learning to facilitate the needed changes (Yoon, Kim, & Martin, 2016).
- Teachers need to be prepared to use IBL. Research demonstrates that teacher self-efficacy to use IBL affects student outcomes (Zee & Koomen, 2016).
- A gap in research exists specific to preparing multiple subject teachers to implement IBL effectively (Buchanan et al., 2016)
- To facilitate better training for teachers, more research into how teachers implement IBL is necessary (Zhang, 2016)
- Teacher education programs and training lag far behind the expectations (Darling-Hammond, 2012).
- Teachers need to be taught the strategies that they are expected to use in the classroom (Peters-Burton et al., 2015).
DEFINITION OF TERMS

- **Inquiry-based learning**: Keselman (2003) defined Inquiry-Based Learning as “An educational activity in which students are placed in the position of scientists gathering knowledge about the world. Students direct their own investigative activity, completing all the stages of scientific investigation” (p. 898).

- **Self-efficacy**: According to Bandura (1997), this term includes “beliefs in one’s own capabilities to organize and execute the courses of action required to produce given attainments” (p. 3).

- **Instructional strategies**: When lessons are designed for students, either student- or teacher-centered, the procedures by which the lesson is to meet and/or enhance the identified lesson objectives are the instructional strategies (Hunt, Wiseman, & Touzel, 2009).

- **Teacher Capacity**: The skills, whether innate or learned including pedagogical practices, intercultural understanding, content knowledge and ability to educate diverse learners, that a teacher uses in the classroom (Budrow & Tarc, 2018).
RESEARCH METHOD AND DESIGN

- Purpose was to seek relationship between two questionnaires
  - MEIQ-SET
  - PRIMAS
- The quantitative methodology and correlational design allowed the researcher to test the hypotheses and make conclusions about the relationship between teacher self-efficacy and their professed implementation of IBL as associated to the study sample.
- Quantitative method and correlational design were used for this study to provide data for analysis that was used to make evidence-based improvement suggestions to education (Bowers, 2017; Martin & Bridgmon, 2012).
RESULTS:
CORRELATION OF SUMS OF AVERAGED SCORES FOR MEIQ-SET AND PRIMAS (MODIFIED PLAN)

<table>
<thead>
<tr>
<th>Sum of Averaged Scores for MEIQ-SET</th>
<th>Spearman’s rho Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Averaged Scores for PRIMAS</td>
<td>.555**</td>
<td>0.000</td>
<td>81</td>
</tr>
</tbody>
</table>

Correlation of Sums of Averaged Scores for MEIQ-SET and PRIMAS (modified plan)
Note: **. Correlation is significant at the 0.01 level (2-tailed). Data computed by dissertation author.
## ADDITIONAL RESULTS: CORRELATION OF AVERAGED SCORES FOR MEIQ-SET AND PRIMAS SUBSETS

<table>
<thead>
<tr>
<th></th>
<th>Average of PEXE</th>
<th>Average of PAPP</th>
<th>Average of PDIE</th>
<th>Average of PINT</th>
<th>Average of PHON</th>
<th>Average of PINV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average of MEF1:</strong> Collecting and Analyzing Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spearman’s rho Correlation Coefficient</td>
<td>.479**</td>
<td>.580**</td>
<td>.479**</td>
<td>.540**</td>
<td>.243*</td>
<td>0.207</td>
</tr>
<tr>
<td>Sig. (2-tailed) 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.029</td>
<td>0.064</td>
</tr>
<tr>
<td>N                81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td><strong>Average of MEF2:</strong> Linking Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spearman’s rho Correlation Coefficient</td>
<td>.533**</td>
<td>.493**</td>
<td>.536**</td>
<td>.559**</td>
<td>.243*</td>
<td>.231*</td>
</tr>
<tr>
<td>Sig. (2-tailed) 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.029</td>
<td>0.038</td>
</tr>
<tr>
<td>N                81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td><strong>Average of MEF3:</strong> Communicating Findings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spearman’s rho Correlation Coefficient</td>
<td>.595**</td>
<td>.479**</td>
<td>.504**</td>
<td>.621**</td>
<td>.255*</td>
<td>.296**</td>
</tr>
<tr>
<td>Sig. (2-tailed) 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.021</td>
<td>0.007</td>
</tr>
<tr>
<td>N                81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td><strong>Average of MEF4:</strong> Engagement and Problem Finding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spearman’s rho Correlation Coefficient</td>
<td>.367**</td>
<td>.299**</td>
<td>.277*</td>
<td>.388**</td>
<td>0.179</td>
<td>0.167</td>
</tr>
<tr>
<td>Sig. (2-tailed) 0.001</td>
<td>0.007</td>
<td>0.012</td>
<td>0</td>
<td>0</td>
<td>0.109</td>
<td>0.136</td>
</tr>
<tr>
<td>N                81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
<td>81</td>
</tr>
</tbody>
</table>

Note: **. Correlation is significant at the 0.01 level (2-tailed). Data computed by dissertation author. *. Correlation is significant at the 0.05 level (2-tailed).
CONCLUSIONS & IMPLICATIONS

The research demonstrated in this study using MEIQ-SET and PRIMAS aligns with Lotter et al. (2018) as it validates that by improved understanding of teachers’ self-efficacy and their implementation of IBL strategies, professional development can be better executed.

Teachers and administrators need to find strategies to increase both teacher self-efficacy and implementation to improve student achievement, not just assume that improving one will inevitably positively affect the other.

Recognizing that teachers teach using methods modeled for them, this research team believes that:

1. using IBL methods when teaching or training teachers in content areas is a crucial strategy
2. preparing teacher trainers to use any IBL method may be one of the most financially sound strategies for better preparing our teachers to teach students
POTENTIAL STUDY LIMITATIONS

• Study Sample ~
  • Single school in private, international setting
  • Vocabulary issues as teachers that took questionnaire were not necessarily native English speakers
  • Political and social implications of an international school

• Teacher Background ~
  • Prior Teacher Training: Teacher preparation courses that demonstrated that incorporating course elements using hands-on learning and IBL teaching strategies to teach future teachers improved their self-efficacy and their implementation of IBL strategies in their future classes (Menon & Sadler, 2018)
  • Teacher Bachelor’s Degree: Two major factors, the self-efficacy in inquiry skills and the ability to provide an IBL environment were affected by their bachelor level major (Wu, Chao, Cheng, Tuan, & Guo, 2018)
Replicate the study adding two questions of years of experience teaching content and time allotted to IBL training.

Replicate the study in other schools to compare results and investigate alignment amongst other school samples and subset groups.

Seek pre/post replication of the questionnaire for specific IBL teacher professional development or preservice teacher training.
REFERENCES


REFERENCES CONTINUED


