In-service Teacher Efficacy

Madgerie Jameson-Charles Ph.D.
And
Sharon Jaggernauth M.Ed.
School of Education
The University of the West Indies
St. Augustine Campus
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Introduction

The brave little engine pushes its way to the hilltop, with a high sense of efficacy for doing so.

I think I can!
I think I can!
I THINK I CAN!
A construct arising out of self-efficacy, refers to teachers’ “belief in their capability to perform specific teaching tasks at a specified level of quality in a given specified situation” (Dellinger, Bobbett, Olivier, & Ellett, 2007, p.2).
Why Teacher Efficacy?

Research links teachers’ beliefs about their capabilities to influence student motivation and achievement to their

- effort on the job
- persistence in overcoming obstacles
- resilience in the face of failure
- levels of stress/depression experienced in managing demanding situations

all of which change over the course of their careers as their experiences grow (Bandura, 1977).
Dimensions of Teacher Efficacy

Teacher Efficacy

- Instruction
- Classroom Management
- Student Engagement
Teacher efficacy for Instruction

Teachers’ perceived ability to

• create classrooms conducive to learning
• gauge students’ comprehension
• adjust questions, strategies, explanations, and assessment
to meet students’ needs, particularly struggling students

Teacher efficacy for Classroom Management

Teachers’ perceived ability to

- respond to and manage disruptive student behaviour
- establish expectations and rules to guide classroom behaviour

Teacher efficacy for Student Engagement

Teachers’ perceived ability to

• develop relationships with students and their families

• motivate students to think creatively and to value learning

• improve student understanding and self-efficacy, and to help struggling students

Research Findings about Teacher Efficacy

Efficacious teachers

- plan more (Allinder, 1994)
- persist longer with struggling students (Ashton & Webb, 1986; Gibson & Dembo, 1984; Woolfson & Brady, 2009)
- are less critical of student errors (Ashton & Webb, 1986)
- willingly accept risks of negative feedback from a supervisor (Ross, 1992)
- decisively improve practice using feedback from parents and administration (Tschannen-Moran & Hoy, 2007)
- effectively managed their classrooms (Saklofske, Michayluk, & Randhawa, 1988; Sridhar and Javan, 2011).
Social Cognitive Theory

Bandura (1977) proposed two components of efficacy beliefs:

- **efficacy expectation** – individual’s conviction that he/she has the ability, knowledge and skills to perform the desired goals/outcomes.

- **outcome expectancy** – individual’s belief that a given behaviour or action will indeed lead to expected outcome(s).
Social Cognitive Theory

Teachers with both high efficacy expectations and high outcome expectancy are more likely to be successful than teachers with high efficacy expectation and low outcome expectancy, even if professionally qualified (Bandura, 1977; 1979; 1999).
Teachers who anticipate failure with certain pupils put less effort into preparing and delivering instruction, giving up easily at the first sign of difficulty, even if they know of alternative strategies that can assist these pupils. Self-efficacy beliefs become self-fulfilling prophesies, validating beliefs either of capability or of incapacity (Tschannen-Moran & Woolfolk Hoy, 2007).
The aim of this study was to examine in-service Diploma of Education teachers’ perception of their teaching efficacy before and after training.
Background

- The UWI, St Augustine Campus, School of Education.
- In-service Postgraduate Diploma in Education programme (blended).
- Secondary teachers (content knowledge).
Research Questions

- What is the relationship among the three dimensions of teacher efficacy?
- Are there differences among the three dimensions of teacher efficacy regarding teacher demographics such as, curriculum area, age, gender and years of service?
- Are there changes in teachers’ perception of efficacy post training?
Methodology

Quantitative

Survey Design: Two Phases

- Phase 1: First week of training after a lecture on teacher efficacy (July).
- Phase 2: At the end of the training (April following year).
Hypotheses

$H_0$: There are no relationships among in-service teachers’ efficacy for classroom management, student engagement, and instructional practices.

$H_0$: There is no difference in in-service teachers' perception of teacher efficacy by gender.

$H_0$: There are no differences in in-service teachers' perceptions of teacher efficacy by curriculum area of specialisation, years of service or age of teachers.
The Sample

The participants from two cohorts, $n = 335$

- Cohort 1 (2011-2012), $n = 157$
- Cohort 2 (2012-2013), $n = 178$. 
Data collection instrument

Questionnaire comprising two sections

- **Section A – demographic data**
- **Section B - The Teacher Efficacy Scale (Long form)** (Hoy & Woolfolk, 1993)
Preliminary Findings: Phase One
### Demographic Data

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Sex</th>
<th>Age</th>
<th>Years of service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>20-30</td>
</tr>
<tr>
<td>2011/2012</td>
<td>43</td>
<td>113</td>
<td>60</td>
</tr>
<tr>
<td>2012/2013</td>
<td>31</td>
<td>160</td>
<td>58</td>
</tr>
</tbody>
</table>
## Demographic data

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Years of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>35.4</td>
<td>9.97</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>7.592</td>
<td>6.667</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>37</td>
<td>29</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
<td>59</td>
<td>30</td>
</tr>
<tr>
<td><strong>Missing Data</strong></td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>
Demographic Data
Subject Area

![Bar chart showing subject area distribution for two cohorts (2011/2012 and 2012/2013) with different colors for each category: Mathematics, Science, Modern Language, Educational Administration, English, Social Studies, Visual and Performing Arts, and Information Technology. Each bar represents the count for each subject area in the respective cohort.](chart.png)
Data Reduction

- Principal Components Factor Analysis
- Eigenvalues greater than 1
- Varimax rotation
- Absolute values less than .30 suppressed.
Scree Plot
Data Reduction: Factor Analysis

Four factors solutions accounting for 61% of the total variance among the 329 responses to the 24 Likert-type item questionnaire.

Absolute values ranged from .499 to .817

- factor 1, .499 - .794;
- factor 2, .499 - .804;
- factor 3, .499 - .817;
- factor 4, .562 - .597.

Slight variations in factors demonstrated by Hoy and Woolfolk (1993).
<table>
<thead>
<tr>
<th>Factors</th>
<th>Items</th>
<th>Hoy and Woolfolk</th>
<th>Items: Factors from Factor analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy in Classroom</td>
<td>3, 5, 8, 13, 15, 16, 19, 21</td>
<td>3, 5, 13, 15, 16, 19, 21</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacy in Student</td>
<td>1, 2, 4, 6, 9, 12, 14, 22</td>
<td>1, 2, 4, 6, 9, 12, 14, 22</td>
<td></td>
</tr>
<tr>
<td>Engagement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacy in Instructional</td>
<td>7, 10, 11, 17, 18, 20, 23, 24</td>
<td>7, 8, 11, 17, 20</td>
<td></td>
</tr>
<tr>
<td>Practices</td>
<td></td>
<td>10, 18, 23, 24</td>
<td></td>
</tr>
</tbody>
</table>
The items in the 4th factor also had absolute values greater than .401 in factor three.

Subscales were computed for the three factors identified by Hoy and Woolfolk (1993).
Central tendency

Nine-point Likert Scale

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Engagement</td>
<td>6.253</td>
<td>1.05</td>
</tr>
<tr>
<td>Instruction</td>
<td>6.778</td>
<td>1.28</td>
</tr>
<tr>
<td>Classroom Management</td>
<td>5.908</td>
<td>1.028</td>
</tr>
</tbody>
</table>
## Central Tendency

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age-Range</th>
<th>Number of years teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>F</td>
<td>20-30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.10)</td>
<td>(.90)</td>
</tr>
<tr>
<td>Instruct</td>
<td>6.93</td>
<td>6.49</td>
</tr>
<tr>
<td></td>
<td>(1.65)</td>
<td>(.88)</td>
</tr>
<tr>
<td>Manage</td>
<td>5.99</td>
<td>5.69</td>
</tr>
<tr>
<td></td>
<td>(1.11)</td>
<td>(.87)</td>
</tr>
</tbody>
</table>
## Central Tendency

<table>
<thead>
<tr>
<th>Curriculum Area</th>
<th>M</th>
<th>S</th>
<th>E</th>
<th>SS</th>
<th>ML</th>
<th>EA</th>
<th>IT</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(.835)</td>
<td>(1.821)</td>
<td>(.948)</td>
<td>(.948)</td>
<td>(1.031)</td>
<td>(.945)</td>
<td>(.907)</td>
<td>(1.055)</td>
</tr>
<tr>
<td></td>
<td>(.931)</td>
<td>(.923)</td>
<td>(.990)</td>
<td>(1.047)</td>
<td>(921)</td>
<td>(2.331)</td>
<td>(1.798)</td>
<td>(1.197)</td>
</tr>
<tr>
<td>Manage</td>
<td>5.567</td>
<td>5.590</td>
<td>5.990</td>
<td>5.856</td>
<td>5.913</td>
<td>6.870</td>
<td>6.091</td>
<td>5.904</td>
</tr>
<tr>
<td></td>
<td>(.769)</td>
<td>(.103)</td>
<td>(.023)</td>
<td>(1.069)</td>
<td>(1.291)</td>
<td>(.781)</td>
<td>(.818)</td>
<td>(1.033)</td>
</tr>
</tbody>
</table>
Hypothesis one

$H_0$: There are no relationships among in-service teachers’ efficacy for classroom management, student engagement, and instructional practices. Significant positive correlations among all dimensions of teacher efficacy, at the 0.01 level (2-tailed).

<table>
<thead>
<tr>
<th>Relationship</th>
<th>$r$</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student engagement and classroom management</td>
<td>.708</td>
<td>.49</td>
</tr>
<tr>
<td>Student engagement and instructional strategies</td>
<td>.587</td>
<td>.345</td>
</tr>
<tr>
<td>Instructional strategies and classroom management</td>
<td>.614</td>
<td>.36</td>
</tr>
</tbody>
</table>
Hypothesis two

H₀: There is no difference in perception of teacher efficacy by gender among in-service teachers.

Independent samples t-test revealed no gender differences in teachers perceptions of efficacy.

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engagement</td>
<td>.278</td>
<td>323</td>
<td>.781</td>
</tr>
<tr>
<td>Instruction</td>
<td>1.097</td>
<td>329</td>
<td>.274</td>
</tr>
<tr>
<td>Classroom management</td>
<td>.824</td>
<td>325</td>
<td>.410</td>
</tr>
</tbody>
</table>
Hypothesis Three

$H_0$: There are no differences in perceptions of teacher efficacy among in-service teachers by curriculum area of specialisation, years of service, and age of teachers.

Three-way ANOVA $3 \times 3 \times 8$ factorial design was conducted for each dependent variable:

- Engagement
- Instruction
- Classroom management
**Student Engagement Efficacy**

- **Overall analysis:** \( F = 2.013, p = .001 \)

- **Main Effects:**
  - Only the main effect for curriculum area was significant \( F(7,317) = 4.949, p = .0001 \).
  - The small effect size (\( \eta^2 = .111 \)) indicates a small mean-scores difference across curriculum areas.

- **No difference** in engagement efficacy for age and years of service.
Student Engagement: Mean Curriculum Area
No significant interaction effects indicated:

- Curriculum*age (F = 1.282, p = .229)
- Curriculum*years of service (F = 1.383, p = .173)
- Age*years of service (F = .084, p = .919)
- Curriculum*age*years of service (F = .065, p = .937).
Instruction Efficacy

- **Overall analysis:** $F = 1.857$, $p = .002$

- **Main Effects:**
  - Only the main effect for curriculum area was significant $F(7,322) = 2.261$, $p = .030$.
  - The small effect size ($\eta^2 = .051$) indicates a small mean-scores difference across curriculum areas.

- **No difference** in instruction efficacy for age and years of service.
Instruction Efficacy: Curriculum Area

![Line graph showing the mean of instruction across different curriculum areas. The graph peaks in Educational Administration and has a generally positive trend across most areas.](image-url)
No significant interaction effects indicated:

- Curriculum*age (F = .600, p = .842)
- Curriculum*years of service (F = 1.269, p = .237)
- Age*years of service (F = .315, p = .730)
- Curriculum*age*years of service (F = .233, p = .792).
Classroom Management Efficacy

- **Overall analysis:** $F = 2.062$, $p = .0001$

- **Main Effects:**
  - Only the main effect for curriculum area was significant $F(7,318) = 3.126$, $p = .003$.
  - The small effect size ($\eta^2 = .021$) indicates a small mean-scores difference across curriculum areas.

- **No difference in classroom management efficacy for age and years of service.**
Classroom Management Efficacy: Curriculum Area
Significant interaction effects indicated:

- Curriculum*age ( F = 2.655, p = .002)
- Curriculum* years of service ( F= 2.240, p = .010)

No significant interactions indicated:

- Age*years of service ( F = .052, p = .949)
- Curriculum*age*years of service ( F= .145, p = .865).
Research Conclusions:

- The results indicate
  - Positive relationship among the different dimensions of teacher efficacy.
  - There is no gender difference among the different dimensions of teacher efficacy as reported by the in-service teachers.
  - Mathematics and science teachers reported lower teacher efficacy among the different dimensions.
Conclusion

- Educational administration students reported greatest efficacy among the different dimensions.
- No age difference in teacher efficacy among the different dimensions.
- No difference in teacher efficacy based on years of service among the different dimensions.
Phase Two: Focus

- Is there a difference in teacher efficacy post training?
- What factors impact on low efficacy in Mathematics and Science Teachers?
- Would pedagogical knowledge/skills improve the efficacy of Mathematics and Science Secondary Teachers?
QUESTIONS???