DOES ADVANCED DEGREE MATTER? A MULTIPHASE MIXED METHODS TO EXAMINE TEACHER’S OBTAINMENT OF ADVANCED DEGREE AND ITS IMPACT ON STUDENT GROWTH AND SCHOOLS

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IRB Study #16-158 Study #16-223 Study 18-342
- How many teachers in GA have an advanced degree?
- Did the degree change the ways teachers teaching?
- Did the degree change or impact student achievement?
- Did teachers receive a return on their investment of the degree?
- Did school receive a return on their investment of the degree?
Background of the Study

- Research has shown that students who have a teacher with strong rather than weak credentials would offset the adverse effect of racial and socio-economic differences (Clotfelter, Ladd, and Vigdor, 2007).

- However, according to the brief report by Center for Education Compensation Reform (Prince et al., 2011), mixed results have been found with regards to the relationship between teachers with advanced degrees and student performance.

- The state of Georgia spends $800 million a year paying teachers for advanced degrees. In 2010, Georgia changed the rule to tighten the way teachers receive certificate upgrade.

- Districts in GA have began experimenting different models to compensate teachers in the recent years. Pay increase for degrees has been a common practice traditionally, but it has became a question mark for some of the districts.

- A local partner school district contacted our college and asked to study this topic.
Review of Literature

- **Review approach:** Analysis of related literature using science2science.

- **Scope of the review:** Educational policy reports, empirical studies, and meta-analyses were reviewed to provide the foundational understanding of the relationships of teacher’s level of education to student performance.

- **Focus of the review:** Identifies the alignments, trends, and gaps in the literature while acknowledging the tensions in the literature concerning the impact of advanced degrees.
Review of Literature

- **Difficulty Measuring the Direct Impact** (Aaronson, Barrow, & Sander, 2007)
- **Do Master’s Degrees Impact Student Achievement?** A study conducted in N.C. found negative correlation (Ladd, Clotfelter, and Vigdor, 2007).
- **Advanced Degrees Have Little Impact at the Elementary Level** (Betts, Zau, & Rice, 2003; Clotfelter, Ladd, & Vigdor; 2007; Harris & Sass, 2011; Horn & Jang, 2017)
- **Advanced Degree Matters at Higher Grade Levels, Especially in Mathematics (with content degrees)**
  - Example: A meta-analysis of 21 studies in the United States was conducted to quantify teacher characteristics with student achievement. Examining test scores of 10th and 12th graders found little significant effects of teachers’ degrees on student outcomes in Language Arts, science, and social studies (Wayne and Youngs, 2003).
- **Advanced Degree Matters for African-American Students** (Ehrenberg and Brewer, 1994)
Gaps of Literature

- A question that is still unsettled in the literature is the effect of advanced degrees on professional retention and teacher morale which impact student achievement (Klassen & Tze, 2014).
- Very few studies have examined the topic by differentiating levels of degrees: master, specialist, and doctoral degrees.
- More research is needed exploring the impact of content-specific degrees.
- Need more studies deepening in other potential areas of impact that teachers with advanced degrees have in their schools.
- The majority of studies in this literature review are quantitative in nature—the methodology favored by policy and research centers.
- Research published by policy centers not in peer-reviewed journals.
Bridging the Gap of Literature

- For a variety of reasons, there is not a consistent way to measure the impact of a teacher’s education level on student achievement. This topic is important to a wide range of stakeholders. Continued study of this topic needs to be methodical and deliberate using a mixed-method approach.

- This study aims to explore the impact of advanced degree by not just a dichotomous way (advanced vs. not advanced) but differentiate the levels of degree and/or if the degree is in-field or not.

- This study will use year-long data (at two time points) to examine effects of teachers’ degrees on student achievement.

- This study deepens the understanding of potential areas of impact that teachers with advance degrees have in their school.
Purpose and Research Questions

The research team launched a *longitudinal research project* to examine this topic with several facets. In this study, we used *Multiphase Explanatory Mixed Methods* design (Creswell & Plano Clark, 2011) to examine the effects of teachers’ obtainment of advanced degrees.

- **RQ1.** To what extent do levels or types of teacher’s degrees influence student achievement?
- **RQ2.** What impact do teachers’ obtainment of advanced degrees have in other areas besides on student achievement?
Sample and Settings

- A low-income urban school district in the southeastern United States. The school is identified as a **Title I school with 68% of students eligible for free or reduced-price lunch, and a predominantly non-white student population (47.4% African American, 27.1% Latino or Hispanic, and 14.0% White)**.

- The Harper Academy is a charter school, and is an International Baccalaureate Middle Years Program school with around 700 students, that offers distinctive opportunities such as an IB Middle Years Program (MYP), Science Technology, Engineering, Mathematics (S.T.E.M.) Magnet Program, Band, Chorus, Art and Sports programs for middle school level learners, that aims at promoting collective and individual development and growth.
Research Design

- The research design was elaborated using Hopscotch (Jorrín-Abellán, 2016), a theoretical model to guide researchers in the development of solid research designs.

- The model proposes the following nine stages when generating solid and well-informed research designs:
  
  Step 1-Worldview of the researcher; Step 2-Topic and Goals;  
  Step 3-Conceptual framework; Step 4-Research design;  
  Step 5-Research questions; Step 6-Data gathering;  
  Step 7-Data Analysis; Step 8-Trustworthiness and Validity;  
  Step 9-Ethics.

- Figure 1 represents the main components of the conducted multiphase explanatory mixed methods design.
To what extent do levels or types of teacher's degrees influence student achievement?
To what extent do levels or types of teacher's degrees influence student achievement?
**Case Study**

**Phenomenon under Study**
Impact of teachers’ Advanced Degrees on Students Growth in a Title I school in the southeastern US

**Informants**
1 Principal
1 Department Chair
5 Teachers

**Data Gathering Methods**
Interviews
Observations

**Mini-cases**
2 Teachers with advanced degrees whose students are demonstrating high levels of achievement

**Context of the Study**
Low-income urban charter school in the southeastern of the United States

**Strategies**
- Triangulation of sources
- Theoretical Saturation
- Thick description
- Member checking

**Topics**
- Teachers’ areas of impact/contribution, lesson planning, innovation, mentoring

**Issues**
Do teachers with an advanced degree have an impact in student achievement?

**Process Support**
Atlas.ti
Software

**Qualitative Research Question**
2. What impact do teachers’ obtaining of advanced degrees have in other areas besides student achievement?
Quantitative Data

- **Math and Reading Achievement Data.** The school district adopted the MAP as an assessment for students’ math and reading performance. The MAP—a multiple-choice, computer-based assessment administered to students in grades 6–8 in multiple states in the U.S. (The Northwest Evaluation Association [NWEA], 2013-2015).

- **Teacher Degree Information.** The school district provides teacher degree information along scheduling.

- **Degree types** include information regarding levels of the degrees: bachelor degree, master degree, specialist degree, and doctoral degree; as well as the disciplines of the degree obtained.
Math Teacher Degree Levels

- B.A. or B.S. Only
- MA
- EdS
- EdD/PhD

6th, 7th, 8th grade levels
Language Arts Teacher Degree Levels

- B.A. or B.S. Only: 4
- MA: 2
- EdS: 2
- EdD/PhD: 1

6th 7th 8th
Teacher Degree In-Field

![Chart showing the distribution of teacher degrees in-field for Math and English, categorized by subject (Math, LA) and grade level (6th, 7th, 8th). The chart indicates the number of students (n) in each category.](image-url)
# Teacher Degree Info

<table>
<thead>
<tr>
<th>Degree Levels</th>
<th>6th</th>
<th>7th</th>
<th>8th</th>
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<td></td>
<td>Math (n=7)</td>
<td>LA (n=7)</td>
<td>Math (n=7)</td>
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<tr>
<td>B.A. or B.S. Only</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>MA</td>
<td>3</td>
<td>2</td>
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<td>2</td>
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<tr>
<td>EdD/PhD</td>
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<td>0</td>
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<table>
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<tbody>
<tr>
<td>Math or English Related</td>
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<td>2</td>
</tr>
<tr>
<td>Math or English Major</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
RQ1. To what extent do levels or types of teacher's degrees influence student achievement?

Table 2. Multiple Regression Models for 6th, 7th, and 8th Math Achievement

<table>
<thead>
<tr>
<th></th>
<th>Model for 6th Spring Math</th>
<th>Model for 7th Spring Math</th>
<th>Model for 8th Spring Math</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>t</td>
<td>b</td>
</tr>
<tr>
<td><strong>Prior Achievement</strong></td>
<td>.82</td>
<td>33.10***</td>
<td>.71</td>
</tr>
<tr>
<td>Gender</td>
<td>.04</td>
<td>1.58</td>
<td>.05</td>
</tr>
<tr>
<td>SES</td>
<td>-.06</td>
<td>-2.25*</td>
<td>-.07</td>
</tr>
<tr>
<td>Advanced Degree</td>
<td>-.03</td>
<td>-1.07</td>
<td>.043</td>
</tr>
<tr>
<td><strong>Degree Levels</strong></td>
<td>.06</td>
<td>2.68**</td>
<td>-.06</td>
</tr>
<tr>
<td>Degree In-Field</td>
<td>.10</td>
<td>3.42*</td>
<td>.13</td>
</tr>
</tbody>
</table>

| Mean Spring Achievement | 226.33 | 226.72 | 227.25 |
| SD Spring Achievement  | 14.42  | 13.52  | 15.783 |

| F       | 290.85 | 126.616 | 211.991 |
| df      | 6      | 6       | 6       |
| p-value | .000   | .000    | .000    |
| adjR²   | .72    | .60     | .66     |

Note:
1. ***p<.001; **p<.01; *p<.05. The dependent variable for all regressions was the MAP math achievement scores in spring term.
2. SES is a dummy variable represented by student’s status of receiving free or reduced-price lunch.
3. Advanced Degree is a dummy variable represented by if teacher has an advanced degree.
4. For 8th grade, because every teacher has an advanced degree, therefore, the variable is not included.
Findings for RQ1. To what extent do levels or types of teacher’s degrees influence student achievement (math)?

<table>
<thead>
<tr>
<th></th>
<th>Model for 6th Spring Math (n=564)</th>
<th>Model for 7th Spring Math (n=495)</th>
<th>Model for 8th Spring Math (n=546)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>t</td>
<td>b</td>
</tr>
<tr>
<td>Prior Achievement</td>
<td>.82</td>
<td>33.10***</td>
<td>.71</td>
</tr>
<tr>
<td>Gender</td>
<td>.04</td>
<td>1.58</td>
<td>.05</td>
</tr>
<tr>
<td>SES</td>
<td>-.06</td>
<td>-2.25*</td>
<td>-.07</td>
</tr>
<tr>
<td>Advanced Degree</td>
<td>-.03</td>
<td>-1.07</td>
<td>.043</td>
</tr>
<tr>
<td>Degree Levels</td>
<td>.08</td>
<td>2.68**</td>
<td>-.06</td>
</tr>
<tr>
<td>Degree In-Field</td>
<td></td>
<td></td>
<td>.10</td>
</tr>
<tr>
<td>F</td>
<td>290.85</td>
<td></td>
<td>126.616</td>
</tr>
<tr>
<td>df</td>
<td>6</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>p-value</td>
<td>.000</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>adjR²</td>
<td>.72</td>
<td></td>
<td>.60</td>
</tr>
</tbody>
</table>
Results for RQ1: Is there any significant differences in student academic growth (in math and reading) between teachers with or without advanced degrees, or teachers with degrees in-field or out-field?

<table>
<thead>
<tr>
<th>Table 3. Multiple Regression Models for 6th, 7th, and 8th Reading Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Prior Achievement</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>SES</td>
</tr>
<tr>
<td>Advanced Degree</td>
</tr>
<tr>
<td>Degree Levels</td>
</tr>
<tr>
<td>Degree In-Field</td>
</tr>
<tr>
<td>Degree English Major</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>df</td>
</tr>
<tr>
<td>p-value</td>
</tr>
<tr>
<td>adj R²</td>
</tr>
</tbody>
</table>

Note:
1. ***p<.001; **p<.01; *p<.05.
2. The dependent variable for 6th grade reading regression was the reading RIT scores in winter term.
   The dependent variable for 7th and 8th grade regressions was the reading RIT scores in spring term.
3. SES is a dummy variable represented by student's status of receiving free or reduced-price lunch.
4. Advanced Degree is a dummy variable represented by if teacher has an advanced degree.
Findings for RQ1. To what extent do levels or types of teacher’s degrees influence student achievement (reading)?

<table>
<thead>
<tr>
<th></th>
<th>Model for 6th Spring Reading (n=161)</th>
<th>Model for 7th Spring Reading (n=493)</th>
<th>Model for 8th Spring Reading (n=495)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>t</td>
<td>b</td>
</tr>
<tr>
<td>Prior Achievement</td>
<td>0.698</td>
<td>14.239***</td>
<td>0.668</td>
</tr>
<tr>
<td>Gender</td>
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<td>-0.865</td>
<td>0.034</td>
</tr>
<tr>
<td>SES</td>
<td>-0.031</td>
<td>-0.629</td>
<td>-0.092</td>
</tr>
<tr>
<td>Advanced Degree</td>
<td>0.165</td>
<td>3.296***</td>
<td>0.255</td>
</tr>
<tr>
<td>Degree Levels</td>
<td>0.194</td>
<td>3.524***</td>
<td>0.276</td>
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<tr>
<td>Degree In-Field</td>
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<td>3.319**</td>
<td>0.397</td>
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<tr>
<td>Degree English Major</td>
<td></td>
<td></td>
<td>-0.083</td>
</tr>
<tr>
<td>F</td>
<td>80.294</td>
<td>134.297</td>
<td>91.711</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>p-value</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>adjR²</td>
<td>.619</td>
<td>.62</td>
<td>.563</td>
</tr>
</tbody>
</table>
Summary of Findings from Phase I

- For math achievement, teacher’s degree level (B.S., M.A.T. or M.Ed., Ed.S., Ed.D.) seemed to be a better predictor than a dichotomous variable (with advanced degree or without) to examine the effects of advanced degree, particularly for 6th and 8th grades. In addition, teachers’ possession of a math or math-ed major was a positive predictor of student achievement. In the model, teacher’s degree types appeared to be a stronger variable than student’s SES background.

- For reading achievement, we found adverse effects of advanced degree when using a dichotomous variable (with advanced degree or without) to examine its effect. It was a positive predictor for 6th grade, but negative for 7th & 8th grade. However, degree level (B.S., M.A. or M.Ed., Ed.S., Ed.D.) appeared to be a better predictor and positive influence on student achievement. In addition, teachers’ possession of an English or related major was a positive predictor of student achievement. Similar to math achievement, teacher’s degree types appeared to be a stronger variable than student’s SES background.
Context of the Study
Low-income urban charter school in the southeastern of the United States

 Phenomenon under Study
Impact of teachers’ Advanced Degrees on Students Growth in a Title I school in the southeastern US

Strategies
- Triangulation of sources
- Theoretical Saturation
- Thick description
- Member checking

Issues
Do teachers with an advanced degree have an impact in student achievement?

Topics
- Teachers’ areas of impact/contribution, lesson planning, innovation, mentoring

Informants
- 1 Principal
- 1 Department Chair
- 5 Teachers

Data Gathering Methods
- Interviews
- Observations

Mini-cases
- 2 Teachers with advanced degrees whose students are demonstrating high levels of achievement

Process Support
- Atlas.ti
- Software

Qualitative Research Question
2. What impact do teachers’ obtainment of advanced degrees have in other areas besides student achievement?
Table 4. Background Information of Informants

<table>
<thead>
<tr>
<th>Informants</th>
<th>Years of Exp.</th>
<th>Advanced Degree</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Principal</td>
<td>18</td>
<td>M.A.</td>
<td>Science Teacher</td>
</tr>
<tr>
<td>1 Department Head</td>
<td>12</td>
<td>Ed.S.</td>
<td>English/LA teacher Working towards her Ed.D. during the time of interview</td>
</tr>
<tr>
<td>5 Teachers</td>
<td>16.2</td>
<td>1 B.A., 2 M.A., 1 Ed.S., 1 Ed.D.</td>
<td>Teacher 1: English/LA Teacher 2: English/LA Teacher 3: Math Teacher 4: Math Teacher 5: Math</td>
</tr>
</tbody>
</table>
Density of the conducted Qualitative Analysis
Themes Emerged in the Qualitative Analysis

Positive Values – 19

Negative Values – 3

Tensions - 12
Emerged Themes on Negative Impact of Advanced Degrees
Evidences on Negative Impact of Advanced Degrees

Interviewed teachers and leaders reported very few (3) drawbacks or negative aspects regarding the impact of advanced degrees.

1. Interviewees believe there is not a direct relationship between student achievement and teacher academic level.

2. Interviewees did not think there is a direct relationship between teaching quality and advanced degrees.

3. Interviewees believe that because of the two previous findings, some states do not recognize the value of advanced degrees.
Emerged Themes on Positive Impact of Advanced Degrees

- Positive Value of Advance Degree: Teachers with AD take greater roles in the school.
- Positive Value of Advance Degree: Teachers with AD mentor new teachers.
- Positive Value of Advance Degree: Teachers with advanced degrees are more innovative, creative, etc.
- Positive Value of Advance Degree: Teachers with AD are more confident.
- Positive Value of Advance Degree: Teachers with AD are able to back up their teaching methods.
- Positive Value of Advance Degree: Teachers with advanced degrees are more open to ideas and new research findings.
- Positive Value of Advance Degree: AD fosters understanding of the context and the students.
- Positive Value of Advance Degree: AD promotes reflective, critical practice.
- Positive Value of Advance Degree: Teachers with AD are more involved in professional development.
- Positive Value of Advance Degree: Teachers with AD are more involved in activities to disseminate their work.
- Positive Value of Advance Degree: AD enhances strong teachers.
- Positive Value of Advance Degree: AD impacts students' growth (Achieve).
- Positive Value of Advance Degree: AD helps teachers contact with other teachers from other schools and districts.
- Positive Value of Advance Degree: AD impacts teachers' impact in leadership positions.
- Positive Value of Advance Degree: AD impacts on content-area students well prepared for college.
- Positive Value of Advance Degree: AD influences impact in classroom practice.
- Positive Value of Advance Degree: AD promotes evidence-based leadership.
Evidences on Positive Impact of Advanced Degrees

Interviewed teachers and leaders identified 19 positive benefits of teachers with advanced degrees. The ones that got stronger triangulation are:

✓ They believe advanced degrees make them stronger teachers
✓ They believe teachers with advanced degrees are more confident and usually back up their teaching in evidence-based practices

“What I learned in that program...I put it to use immediately in my classroom. You know, it revolutionized my practice...it has caused me to think differently about why I do what I do.”

✓ They also believe they are more open to new ideas and innovative instructional strategies
✓ They believe that teachers with advanced degrees usually mentor other teachers
✓ They believe teachers with advanced degrees are more elective and reflexive professionals
Emerged Tensions Regarding the Impact of Advanced Degrees

- Tension: Leaders unaware of teachers getting an advanced degree
- Tension: Education advanced degree easier than content degree
- Tension: Between Specialists and Leadership
- Tension: Value of Advance Degrees Depends on Type Degree
- Tension: Teachers with Specialist Degrees resistant to new pedagogies
- Tension: Teachers with advanced degrees teach advanced courses
- Tension: Institutions were teachers get their degree matter
- Tension: Personal vs institutional profit
- Tension: Teachers with a specialist degree not necessarily good teachers
- Tension: Reason to get an advance degree
- Tension: Advance Degree Modality
- Tension: Impact of Advanced degree vs Maturity of the teacher
Evidences on Tensions Regarding the Impact of Advanced Degrees

Interviewed teachers and leaders identified 12 issues or points of tension that influence the impact teachers with advanced degrees have. The main ones are:

- They question the quality of some advanced degrees based on their modality (face-to-face vs. online), and the quality of the institution awarding them.
  
  "One of my teachers got his degree online, and not all online programs are bad, ... and he said it was a joke! So he just got it for the pay bump... and I think that is a reality for some teachers."

- They mention that sometimes teachers with advanced degrees get better student achievement scores, because they usually teach advance courses.

- They also question the reason why so many teachers are getting advanced degrees, They believe many of them do it to get a personal benefit (salary bump) rather than to get an institutional benefit (increase the quality of their teaching).

- They also see that some teachers with specialist degrees are more resistant to new pedagogies.

- They also acknowledge some tensions between teachers who got a content specialist degree and those who got a leadership one.
Summary of Findings from Phase II

- Interviewed teachers and leaders reported very few (3) drawbacks or negative aspects regarding the impact of advanced degrees.
- Interviewed teachers and leaders identified 19 positive benefits of teachers with advanced degrees.
- Interviewed teachers and leaders identified 12 issues or points of tension that influence the impact teachers with advanced degrees.
Conclusion & Implications

- The benefits of teacher's obtainment of advanced degrees are evident through our mixed-methods investigation. Teachers with advanced degrees generally make positive impacts on student achievement, teacher growth, and the learning community in schools.

- While positive effects are identified from the present study, the subject areas we examined are limited due to the constraint of availability of data. It is important for such studies conducted with deliberate and rigorous methodology, such as the mixed methods employed here.

- Close collaboration with school district to ensure the interpretation of the data is meaningful and unbiased.

- Although mixed results and tensions still exist, policy makers need to be cautious when making adjustments regarding teacher certificate upgrade or teacher compensation policies.

- American teachers are under-paid comparing with other developed countries, the recent headlines regarding teacher under-paid post a negative image of how teachers are undervalued. Efforts should be made to promote the public recognition of the teacher workforce.
Future Directions

- Examine quality of program, such as examining the coursework and degree requirements.
- Larger scale of state-wide data to include more subject areas.
- Case study to examine effects of degree on teacher practice, not just on student achievement.
Selected References