Chapter 19

Synergistic Teacher Preparation: The Winding Road to Teaching Science and Mathematics in Rural Schools

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ABSTRACT

Rural schools face unique challenges in recruiting well-trained STEM teachers for grades 6-12. Working with teacher education institutions, rural school districts can inform pathways to teacher licensure and therefore assist in crafting ones that better align to rural contexts. This chapter explores synergistic relationships among various STEM teacher pathways including graduate certificates in STEM education, the Robert Noyce scholarship program, licensure-only and lateral entry programs, and online vs. face-to-face teacher pathways. Institutional barriers to change in teacher education and ways of overcoming these challenges are also described.

INTRODUCTION

Talented and qualified teachers are necessary to prepare a nation’s citizens to live educated and healthy lives and to prepare the nation to compete in a globalized economy. Communities must be able to recruit and retain teachers generally and, in particular, science, technology, engineering, and mathematics (STEM) teachers. As researchers explore the supply pipeline for STEM teachers, in the U.S. and internationally, they find that there are complex social, cultural, and economic factors in play determining who chooses to become a teacher. Dolton and Marcenaro-Gutierrez (2013) continued their prior work concerning the relationships between teacher salaries and student achievement (2011), by investigating how various nations viewed the status of teaching—surveying 1000 respondents across 21 nations. They created a Global Teacher Status Index that sought to:

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1. Rank primary school teachers against other professions
2. Rank secondary school teachers against other professions
3. Rank teachers according to their relative status based on the most similar comparative profession
4. Rate perceived pupil respect for teachers (p. 12).

Dolton and Marcenaro-Gutierrez described that understanding the complex relationships involved in how different nations and societies value teaching may be organized under the three themes of: teacher status, perceptions of teacher reward, and teacher agency and control (p. 6). While they did not find a specific correlation between teacher status, as defined through the Index score, and student achievement outcomes, they did note some interesting differences among nations. Table 1 summarizes the themes explored in this study, the significant indicators under each theme, and selected notable results.

Table 1. Summary of information from the 2013 global teacher status index

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<th>Study Themes</th>
<th>Significant Indicators for Theme</th>
<th>Key Results</th>
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| Teacher Status | Explores the profile of primary, secondary, and head teacher status. |● China, South Korea, Egypt and Turkey hold the most respect for teachers.  
● Most of European countries and the U.S. rank in the middle.  
● Israel, Brazil and the Czech Republic hold the least respect for teachers.  
● In France, China, Turkey and the U.S. primary teachers are regarded more highly than secondary teachers.  
● In China and Greece head teachers (principals) are ranked below primary and secondary teachers. This may be related to the form of administrative role played by a head teacher.  
● Of all the countries surveyed, the U.K. has the highest respect for head teachers (principals). |
| | Analyzes teaching as a sought after profession, in terms of parental encouragement for their children to become teachers. |● There are significant contrasts between countries over the extent to which they would encourage younger generations to become teachers.  
● While 50% of parents in China provide positive encouragement, only 8% do so in Israel.  
● Parents in China, South Korea, Turkey and Egypt are most likely to give encouragement to children to become teachers. |
| | Creates a contextual understanding of teacher’s social status relative to other professions. Teaching is most like this profession in my country:  
● Social worker  
● Nurse  
● Librarian  
● Local government manager.  
● Doctor |● In a majority of the countries (two-thirds), the social status of teachers is judged to be most similar to social workers.  
● In the U.S., Brazil, France and Turkey people thought teachers were most similar to librarians.  
● Only in China do people think of teachers as being most closely compared to doctors. In the U.K., fewer than 5% of respondents thought teachers had an equivalent status to doctors. |
| | Examines views on perceived pupil respect for teachers. |● In China 75% of respondents believe that students respect teachers, compared to an average of 27% per country.  
● Turkey, Egypt and Singapore have a high level of belief that pupils respect teachers that averages at 46%.  
● Across Europe there are higher levels of pessimism about students’ respect for teachers than in Asia and the Middle East. In most European countries surveyed, more respondents thought that pupils disrespect teachers than respect them.  
● Those surveyed in the U.S. are 10% more likely to think that pupils respect teachers than those in Europe. |

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