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Linking Math Teachers' Motivations and Beliefs to Learning Mindsets

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Linking Math Teachers' Motivations and Beliefs to Learning Mindsets

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Abstract

Linking Math Teachers' Motivations and Beliefs to Learning Mindsets

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Teacher mindsets are the subject of research due to their importance in understanding teacher retention and success. Building on past growth mindset research, I argue that mindsets are related to a teachers' motivations for becoming a teacher and their beliefs regarding teaching ability. To evaluate these relationships, I use math teacher survey data from the National Study of Learning Mindsets. The math teacher survey collection took place in 2015-2016 with 321 teachers completing the survey. These teachers were chosen because they taught students who participated in the National Study. Results indicate that having additional years of teaching experience and choosing to teach because of the flexible schedule correlates with having a higher fixed mindset. Contrastingly, trust in the school principal correlates with teachers having more of a growth mindset. When comparing low-quality schools to high quality/high minority, the latter schools have teachers with more of a fixed mindset. This finding matters because it shows that low-quality schools are probably attracting teachers who accept that the students at their school are struggling and attribute this to their intelligence or failure to work hard. Future research will examine the relationship between these findings while considering the context of the school by adding in student survey questions in which they report their experiences with these teachers.

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Introduction

Literature in social psychology and education research asserts that “good” teachers have developed a growth mindset approach to their role (Dweck 2008; Blackwell et al. 2017). Growth mindset challenges the notion that intelligence is an unchanging innate trait. Instead, this mindset suggests that teachers feel more positively about student outcomes when focusing on incremental change and encouraging problem-solving to better understand the subject matter. Previous research has focused specifically on math and its relationship to mindset for many reasons: taking higher math courses can have positive implications for later life outcomes such as higher rates of college-going (Long et al. 2012), higher occupational earnings (Rose and Betts 2004; Joensen and Nielsen 2009), and better long-term health (Barr 2015; Datar et al. 2004; Murasko 2015). Despite the benefits of taking math, it remains a subject that requires certain analytical abilities that require practice and do not come easily. Due to this, teachers with fixed mindsets are more likely to believe that math ability is tied to things like brilliance and natural ability (Bian, Leslie, and Cimpian 2017; Meyer, Cimpian, and Leslie 2015), but little is known about math teachers’ beliefs about math *teaching* ability and how this may relate to fixed mindset trait. This paper explores this relationship, as well as the relationship between the teacher’s reasons for being a math teacher and their learning mindsets.

This paper looks directly at the teacher level to identify a clear picture of what aspects of being a teacher appeal to teachers, and to see if their beliefs and motivations relate to their mindsets.

Other research has focused on student outcomes in relation to teacher mindsets (Haimovitz and Dweck 2017; Ramirez et al. 2018; DeLuca, Coombs, and LaPointe-McEwan 2019), or teacher praise and student outcomes (Rattan, Good, and Dweck 2012; Amemiya and Wang 2018). Little research has looked at teacher mindsets without considering outcomes. Teachers have mindsets

and reasons for becoming a teacher that do not necessarily directly translate into student outcomes. Integrating theories of growth mindset, implicit bias, and motivation theories, this paper explores the relationship between a teacher's motivations, trust, and teaching experience to better understand what predicts teacher's learning mindsets.

LITERATURE REVIEW

IMPLICIT MINDSET THEORIES

Researchers have asked questions related to the improvement of student learning for decades, and one possible solution that has gained prominence in education and psychological research is the incremental theory of intelligence (Dweck 1999, Dweck and Sorich 1999, Blackwell et al. 2017). This theory posits that teachers and students in mathematics and science classrooms are likely to evaluate “success” differently based on whether they have a fixed or growth mindset. Research also finds that this mindset can be altered through either teacher growth mindset practices and messaging, or by a short-term intervention where students learn about the malleability of intelligence versus a clear-cut right-versus-wrong style of evaluating their intelligence (Aronson, Fried, and Good 2002).

A fixed mindset is considered less productive for student learning because teachers holding a fixed mindset tend to evaluate success based on innate intelligence and they ascribe that intelligence to factors that are not in a student’s control (i.e. skin color and sex). For example, teachers are more likely to attribute higher math scores for girls as the result of these students simply working harder than their male peers (Espinoza et al. 2014). This belief is harmful for both boys and girls in these classrooms because it assumes that boys are naturally gifted in math and that if they do poorly it is a result of them “not trying hard enough”, and that girls are not gifted so if they do poorly it is a confirmation of this fact (Bian, Leslie, and Cimpian 2017; Meyer, Cimpian, and Leslie 2015). Other research finds some explanation of the race gap when analyzing teacher biases that relate to fixed mindset beliefs (McGrady and Reynolds 2013). Similar to assumptions that boys are better at math than girls, implicit theories of intelligence also preference white and Asian student’s natural math intelligence. These beliefs have real-

world consequences when teachers give feedback to students regarding their success. Teachers who hold implicit beliefs are more likely to say things like “it’s okay, you are just not a math person” to a struggling student, or to praise the “hard work” of students they see as gifted (De Kraker-Pauw et al. 2017; Rattan, Good, and Dweck 2012). These classroom experiences affect students’ engagement in math for many years to come.

TEACHER MOTIVATIONS FOR BEING A TEACHER

Teachers choose their careers for reasons such as enjoyment of the subject, want for holidays and a flexible schedule (Chiong et al. 2017; McDonald 2017) and want to build positive relationships with students (McDonald 2017). Self-efficacy, or beliefs that they are good at teaching, are not only a strong reason that teachers list as a reason for their career choice, but also a strong predictor of whether a teacher stays or leaves the field over time (Hong 2009). Research finds that extrinsic reasons such as vacations/flexible schedule and relationships with other teachers in the school are correlated with a teacher’s decision to stay (Chiong et al. 2017; Hong 2009).

Deciding to become a math teacher is a different choice than deciding to become another type of teacher (Hodgen and Askew 2007; McCulloch et al. 2014). Layers of gendered and racialized mathematics identities influence whether one feels qualified to teach math. Math is known to be stressful for female students, and students of color, and it elicits stronger emotional reactions from students compared to other subjects (Moller et. al 2013; Beilock et al. 2010; McCulloch et al. 2014; Espinoza 2014; Catsambis 1994; Chestnut and Markman 2018). Research investigating emotional ties to math, and early experiences finds that teachers’ self-perceptions are tied to defining moments when teachers were first learning math (Hodgen and Askew 2007; McCulloch et al. 2014; Prieto and Dugar 2017). Many teachers, especially those from underrepresented backgrounds such as women and people of color reported that early failures to understand math

concepts made them feel negatively toward the subject for years to come. Math teachers with a positive emotional connection to mathematics are likely to perceive classroom experiences as positive and filled with potential for growth (Hodgen and Askey 2007). Research by McCulloch et al. (2014) finds that many women and teachers of color have a moment that defined their beliefs about their mathematics ability. These beliefs are not necessarily unchangeable, but many teachers mentioned that these experiences stayed with them throughout their career.

TEACHER ENVIRONMENT AND ACADEMIC EXPECTATIONS OF STUDENTS

Studies find that that students make significant learning gains when teachers perceive their school environment as collaborative and supportive (Moller et al. 2018). Research finds that trust in school administrators relates strongly to a sense of support and collaboration for teachers (Berkovich 2018; Tschannen-Moran 2014). Work by Kraft and Papay (2014) found that heterogeneity among teachers is due to differences in professional environments of the school, with more supportive environments helping teachers become more effective over time. This organizational context of a school is not necessarily measured in all research, and for this study, it will be approximated by answers to a question which asks teachers to report the amount that they trust that the principal cares about teacher success in their school. Research by Berkovich (2018) states that trust in a school principal or other leader can simplify the social interactions of teachers which enables both teachers and principals to devote more time to students and less time on detailing intentions or monitoring the behavior of one another. This improves morale and provides teachers with a better environment to improve both their skills and their classrooms.

ALTERNATIVE METHODS OF MEASURING LEARNING TO COMBAT FIXED MINDSET

Not all ways of measuring intelligence have a fixed mindset approach. Some research into alternative methods found promising results. Some alternatives to measuring improvement

through multiple-choice tests include emergent learning techniques (Dios and Russ 2016), and formative assessment (Ducker Holmberg Becker 2017). Emergent learning techniques look for proof that students understand the concepts taught to them through essays and a qualitative rubric. This is meant to allow for more freedom for teachers to evaluate student responses. Those with a growth mindset may focus less on test scores naturally, but for those who have lower growth mindset scores, these techniques may prove useful as it looks for different qualities in an explanation of a concept rather than just picking out an answer from a list. These alternatives may promote the norm for both teachers and students to pay less attention to grades and more attention toward mastery of the material.

QUESTIONS

Do teachers with prosocial (i.e. wanting to help others) versus practical reasons for choosing to teach have less fixed mindset beliefs about math ability?

Is there a relationship between teachers' beliefs about the innateness of teaching ability and their expectations about the nature math ability in general?

EXPECTED FINDINGS

I posit that growth mindset teachers exist in many schools but are present in higher numbers at high quality/high minority schools due to the quality of their teaching and expectations that students from all backgrounds can improve. Also, I expect that teachers who indicate higher agreement that some people are born good math teachers will also have a higher likelihood of possessing a fixed mindset. This item differs from traditional measures of mindset which focus on student abilities. It is also possible that having a fixed mindset leads to a higher risk of attrition from the field if teachers feel that they are not making a difference. In addition to this, holding a fixed mindset may be discouraging for math teachers because in a way it negates the idea of teaching. Teaching is, at its best, a profession for growth seekers who want to help the next generation of learners to gain knowledge and skills that they will take into their careers. For these reasons, having a growth mindset may improve teacher retention because these teachers can look past setbacks and connect to the bigger goal of improvement for all students in their classroom. This may not directly relate to student outcomes, but teacher retention remains a chronic problem that must be addressed.

DATA AND METHODS

ANALYTIC SAMPLE

The National Study of Learning Mindsets (NSLM) is a longitudinal, double-blind, randomized trial survey and intervention administered in 76 public, non-charter high schools across the United States. The math teacher survey collection took place in 2015-2016 with 321 of the teachers from the total population of schools completing and submitting the survey. These teachers were a subsample of the population that were teaching the students being surveyed. Teachers responded to a 51-question survey which asked about their demographics, teaching history, education, and probed for information about their views regarding math intelligence. The math teacher portion of the NSLM is designed to be representative of 9th-grade math teachers in the United States. The sample is 63% female and mainly white (88%). Just over 51 percent of the sample had a master's degree versus a bachelor's degree. The teachers in this sample were split into school categories which were determined by the quality of the school (based on grades and test scores of the school) and racial minority percentage. Around 12 percent of teachers were in low-quality schools, 29 percent were in medium quality/low minority schools, 22 percent were in medium quality/high minority schools, 14 percent were in high quality/low minority schools, and the final 23 percent were in high quality/high minority schools. The average years of teaching experience in the sample was 13 years with a standard deviation of 9.44 years.

For the scale variables, both the mean and the median values. The mean score of those who reported wanting a flexible schedule as a reason for being a math teacher was 2.11 with a standard deviation of 1.09. The median value for this variable was 2. Those who indicated that wanting to help others had a mean of 4.21 with a standard deviation of .81. This variable indicates a prosocial reason for teaching. The median value was 4. The mean value of those who

indicated that loving math was the reason they are a teacher was 3.61 with a standard deviation of 1.04 and a median value of 4. The mean value for teachers believing that some people are born good math teachers is 2.04 with a standard deviation of .94 and a mean of 2. Belief about math teaching ability may translate in some way to beliefs about student abilities, but more importantly, if a teacher believes that some people are born good teachers and they then encounter struggles in their classrooms they may be less likely to make changes. Instead, these teachers might quit the profession altogether or keep making the same choices. Lastly, the mean value of the measure of trust in the school principal was 3.79 with a standard deviation of 1.15 and a median value of 4 on a scale from 1 (strongly disagree) to 5 (strongly agree). Trust in the principal is a proxy for the teachers' overall feelings of satisfaction and support within their school. Teachers who have a higher level of trust are likely also more embedded in their school as well (Berkovich 2014).

DEPENDENT VARIABLE

The dependent variable for the following analysis is a measure of teachers' mindsets. Two questions make up the scale for measuring mindset, which as Dweck noted (2008), appropriately predict mindset. Specifically, this indicator combines the means of the following questions: 1) "to be a top math student you have to have special talent," and 2) "there is only one way to solve a math question". Response options to both questions were measured with scales ranging from 1 (strongly disagree) to 6 (strongly agree). Responses to these items were such that higher values indicate a higher association with a fixed mindset. When these variables have a positive relationship with the dependent variable (a continuous measure ranging from low (growth mindset) values to high (fixed mindset). Thus, positive values in table 1 are associated with a

higher fixed mindset, whereas a negative relationship suggests a growth mindset. This variable has an α value of .63.

Table 1: Descriptive Statistics of Independent Variables

	% or Mean (SD)	Median
<i>Gender</i>		
Male	37.33	
Female	62.67	
<i>Race</i>		
White	88.33	
Non-White	11.67	
<i>Level of Education</i>		
Masters	51.88	
No Masters	48.13	
<i>School Stratum</i>		
Low Quality	11.88	
Medium Quality/Low-Minority	29.38	
Medium Quality/High-Minority	21.88	
High Quality/Low-Minority	13.75	
High Quality/High-Minority	23.13	
<i>Motivations for being a teacher (Scale 1-5)</i>		
Flexible Schedule	2.11(1.09)	2
Want to help others	4.21(.81)	4
Love Math	3.61(1.04)	4
<i>Teacher Beliefs (Scale 1-6)</i>		
People are born good math teachers	2.04(.94)	2
Slow Learners	1.55(.88)	4
Remedial Students Together	1.95(.96)	1
Trust in Principal (Scale 1-5)	3.79(1.15)	4
Total years teaching	12.84(9.44)	
Note: $N \sim 320$		

COVARIATES

Covariates were math teachers' age, dummy variables indicating gender (male as the reference group), and dummy variables for racial/ethnic group (white/Asian as the reference group), total

years of teaching experience, trust that the principal cares about a teacher's success. Questions asking about teachers' motivations for being a teacher were reverse coded on a 5-point Likert scale. After re-coding, scales ranged from 1 (not at all true) to 5 (extremely true). The distribution of several key variables skewed toward one end of the Likert scale. This is important to consider when interpreting the results. The last variables included as covariates are part of a concept that I will call "teacher environment feelings" which is a composite variable that takes the mean values of three Likert-scale questions hypothesized to relate to how a teacher feels within their school environment. These three variables are, trust in the principal, teaching at this school stresses me out, and the demands at this school are unreasonable. These three variables are highly correlated with an alpha value of .74. Stress has been shown to predict teacher attrition, and I believe it may also relate to a teacher's perception of their classroom and work environment.

ANALYTIC PLAN

This research used Ordinary Least Square regressions to predict teacher's mindset while controlling for various demographics and mindset indicators. Each model investigates potentially significant relationships discussed below. Each model controls for a set of the previously mentioned variables. Demographic indicators were included to assess any potential connection with these variables which are known to affect classroom management and stress (Lee 2017; Williams et al. 2009; McGrady and Reynolds 2013; McCulloch et al. 2013; Beilock et al. 2010). Total years of teaching was included because there is an established relationship between teacher tenure and desire for extrinsic benefits which are hypothesized to be related to a fixed mindset. This is measured by the agreement/disagreement with the item "some people are born

good math teachers”. Higher scores on these items indicate a higher association with fixed mindset beliefs.

Model 1 isolates the relationship between trust after controlling for teacher demographics. The next model adds in the next key predictor variable to see if the relationship between trust changes. The addition of this variable slightly strengthens the relationship between trust and mindset. Model 3 adds in the prosocial reasons for teaching which are hypothesized to be less directly related to mindset since most teachers agree with these sentiments, and the relationships of other variables are not strongly affected by the addition of these two variables. Model 4 includes the next key variable, teachers’ beliefs about teaching ability. This is hypothesized to predict teacher mindset because teachers who think their ability to teach math is fixed may also feel that there is only one way to solve a math problem and that special talent is related to math ability. These beliefs align with the fixed beliefs about teaching ability in some way, although they are not clearly related. The addition of this variable increases the explanation of the variance in teacher mindset by 20 percent. Model 5 adds a new variable that I hypothesize is related to a teacher’s mindset because they are psychological indicators of a teacher’s ability to handle stress. Growth mindset teachers approach situations as opportunities for growth, so their responses to these stress-related questions are likely tied to these feelings. I next add in the individual variables that make up the teacher stress variable to show that they are not individually related to teachers’ mindsets. It is the amalgamation of these three factors, teacher stress, demands the school places on teachers, and trust that brings out this important predictor. The final model adds in an indicator of school stratum after all other variables have been explored to see if there remains variance to be explained by these categories of school stratum. The relationships between school stratum and mindset are messier to disentangle due to their multifaceted nature. I

cannot isolate racial makeup of the school or income level through these categories, but I chose this set of variables because I think the combination of race and income in this instance explain more than they explain individually.

RESULTS

The following models in table 2 investigate different factors which are hypothesized to be related to teachers' mindsets. Model 1 is a simplified model that includes controls for race, gender, teaching experience, education, and teachers' trust in the principal. After controlling for demographic variables, teachers who report a higher agreement that they trust their principal have lower values on the mindset scale indicating a more growth-oriented mindset. Model 2 adds a 5-point Likert-scale item "wanting a flexible schedule" to the regression. A one-unit increase in agreement with this statement is associated with a .13 unit increase on the mindset scale indicating a more fixed oriented mindset. Model 3 adds two additional 5-point Likert-scale item motivation statements for teaching, "wanting to help others" and "loving math". Neither of these indicators are significantly related to growth or fixed oriented mindset. Model 4 includes 6-point Likert-scale item "some people are born good math teachers". A one-unit increase in agreement with this statement is associated with a .44 increase in the mindset scale indicating a higher fixed mindset. Model 5 includes a "teacher feelings" variable. According to this model, teachers who report higher levels of agreement that teaching at this school does not cause them stress, that the demands of their school are not unreasonable, and that they do trust their principal are .17 points lower on the mindset scale indicating that they have more of a growth mindset. Model 6 includes these three variables as separate items, and none of them are significant when they are not combined. The final model includes indicators of school stratum with a base category of low-quality schools. The only significant difference in these strata is between the high quality/high minority school stratum in which teachers have a more fixed oriented mindset.

Table 2: Models Predicting Teacher Learning Mindset

VARIABLES	1	2	3	4	5	6	7
Non-White or Asian	0.282+ (0.160)	0.307+ (0.162)	0.294+ (0.162)	0.154 (0.144)	0.159 (0.143)	0.156 (0.144)	0.0261 (0.154)
Female	-0.0580 (0.0533)	-0.0577 (0.0529)	-0.0741 (0.0538)	-0.0621 (0.0475)	-0.0728 (0.0478)	-0.0654 (0.0481)	-0.0571 (0.0481)
Total Years Teaching	0.0195*** (0.00567)	0.0164** (0.00576)	0.0150* (0.00580)	0.0115* (0.00514)	0.0112* (0.00514)	0.00945+ (0.00531)	0.0111* (0.00513)
Master's Degree	-0.149 (0.108)	-0.146 (0.107)	-0.145 (0.107)	-0.109 (0.0949)	-0.101 (0.0947)	-0.117 (0.0953)	-0.111 (0.0955)
Trust in Principal	-0.119** (0.0455)	-0.136** (0.0456)	-0.132** (0.0458)	-0.101* (0.0406)		-0.0911+ (0.0463)	-0.107* (0.0413)
Want Flexible Schedule		0.126** (0.0482)	0.124* (0.0497)	0.102* (0.0439)	0.1000* (0.0437)	0.105* (0.0439)	0.0993* (0.0443)
Want to Help Others			-0.0991 (0.0650)	-0.0408 (0.0578)	-0.0482 (0.0576)	-0.0480 (0.0578)	-0.0358 (0.0588)
Love Math			0.0636 (0.0523)	0.0839+ (0.0463)	0.0933* (0.0466)	0.0938* (0.0466)	0.0891+ (0.0464)
People are Born Good Teachers				0.438*** (0.0488)	0.442*** (0.0486)	0.435*** (0.0488)	0.444*** (0.0487)
<i>School Stratum (base low quality)</i>							
Medium Quality/Low Minority							0.297+ (0.172)
Medium Quality/High Minority							0.135 (0.174)
High Quality/Low Minority							0.354+ (0.192)
High Quality/High Minority							0.375* (0.173)
Unreasonable Demands						0.109+ (0.0581)	
School Stress						-0.0393 (0.0612)	
Feelings about Environment					-0.166** (0.0570)		
Constant	2.463*** (0.239)	2.275*** (0.250)	2.501*** (0.362)	1.353*** (0.345)	0.972** (0.329)	1.197** (0.397)	1.184*** (0.360)
Observations	290	290	290	290	290	290	290
R-squared	0.072	0.093	0.103	0.303	0.308	0.313	0.320

*** p<0.001, ** p<0.01, * p<0.05

DISCUSSION

This study represents a preliminary look into factors which may predict math teachers' mindsets. Current results demonstrate that higher trust in a principal reflects a lower score on the mindset scale which indicates that a teacher who trusts their principal also has a growth mindset. Out of available options that teachers could choose as the reason they teach math, those who reported that they chose this career because of the flexible schedule have higher scores on the mindset scale which indicates that they have a fixed mindset. This relationship is interesting because it is the only significant relationship between motivation and a teacher's mindset. Research does support that reasons similar to perks like the "flexible schedule" of teaching are more related to whether a teacher stays in their job, but the lack of a relationship between loving the subject of math seems to suggest that merely loving math does not predict a teacher's mindset. An important limitation of the current study is its one-dimensional look at these predicting variables. Future research will investigate multidimensional factors which may affect teachers' mindsets. For example, knowing that years of experience are related to extrinsic reasons for being a teacher could prompt investigation into different profiles of teachers who have different years of experience, and different reasons for being a teacher. According to other mindset studies, gender is significant on the student level and may relate to teacher mindset as well (Riegle-Crumb and Humphries 2012). None of the models show gender to be a significant independent variable. A strong relationship warranting further investigation is that between a teacher's beliefs about innate teaching ability, and teachers having a fixed mindset. This relationship is different than traditional measures of teachers' mindsets because it is not asking about students. Most other studies look at how teachers' beliefs about their students relate to their mindset. This relationship

shows that beliefs about teaching ability are also significantly related to teacher responses to mindset questions about students.

The last relationship that was investigated for this study looked at whether the quality and minority makeup of a school relate to teacher mindsets. The only difference in school strata was found between low-quality and high quality/high minority schools. The nature of this relationship was the opposite of what I expected, with high quality/high minority schools having teachers with a fixed mindset compared to low-quality schools because high quality/high minority schools should also attract higher-quality teachers who want to work with minority students. It is also plausible that the opposite is true, and that at high minority schools of high quality, teachers fixed mindsets about math ability are not challenged. These teachers may see their high performing students of color as “hard-working” which does not contradict their fixed mindset beliefs. Because this relationship is still unclear, I plan to dive deeper into the magnitude of these findings to better understand what this relationship means.

An important area of further inquiry is that of the direction of causal inference that cannot yet be determined through this OLS regression. Potential unmeasured confounds such as teacher salary, previous schooling before college, teacher training, and many other possible additional factors are not measured in this study and can therefore not be investigated. I have proxies for some of these variables such as master’s degree/no master’s degree, and years of teaching experience, however, it remains that much of the relationship predicting teacher mindset is currently unknown. Another issue from this type of research is reverse causality where teacher learning mindset may also be predicting responses to other mindset related questions. It may be possible to add in a component of sensitivity analysis into multivariate models to see whether the results are resistant to changes in components of the model. However, dealing with the issue of

endogeneity will require additional testing and theoretical framing once multivariate modeling is introduced.

I also intend to look further into relationships between different “sets” or “bins” of teachers in a way that captures their multidimensional differences. For example, perhaps the relationship between teachers beliefs about teaching ability do not predict mindset in a solely linear fashion, but rather teachers of a specific age group, with masters degrees, who are not white, and who have prosocial reasons for teaching have a unique predictive relationship with mindset. These data may exist in relationships with each other that could not be captured in a regression framework. Future analysis using latent class analysis or additional factor analysis considering multiple dependent variables can test these theories in detail.

This work is important for many reasons. School-level or policy-level changes can use these findings to keep growth mindset teachers from leaving their positions and to attract them to schools where they would not typically be or help teachers develop a growth mindset approach to teaching to improve not only their experience of teaching but also to improve their classrooms. This may help retention but will also help teachers understand the importance of embracing the growth mindset practices rather than just following them blindly because they are required to. Employing teaching practices when one does not buy into the reasoning behind them is likely not satisfying. Some fixed mindset teachers may not care that they are doing “extra work” by letting students turn in work again or by putting different ability students together in a group, but some teachers are likely frustrated by these actions because they seem futile. Helping math teachers develop a growth mindset and see the value in these growth mindset teaching practices will improve their overall enjoyment of teaching and help them to embrace the process of helping all students reach for success.

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