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Questioning What We Know: Evaluating Predictability of Candidate Data

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Abstract: As teacher educators, it is our aim to support the production of caring, thoughtful educators who inspire children. We strive to equip our candidates to teach and connect with all learners. As a part of preparation, we promote data to drive decision-making in classrooms; but, what does the data we collect tell us? Is our data useful or predictive? In this study, we examined typically-used candidate data (e.g., GPA, student teaching data, test scores) and correlated these with completer scores on future outcome measures (e.g., teacher effectiveness). We found that some of our most trusted data was not as predictive as we had hoped. The resulting data has propelled us to change how we promote and target specific skills and attributes within the context of teacher education. We aim to continue to use our data to improve our program offerings and support our candidates on their road to growth.

Key words: teacher preparation, teacher effectiveness, reflective practice, dispositions, candidate qualifications

1. Introduction

As a college of teacher education, it is our aim to support the production of caring, thoughtful educators who inspire children. Upon leaving our programs, we want candidates to be well-equipped to teach and connect with all learners and constituents. Thus, we use and promote the use of data to drive decision-making in our educational preparation programs in addition to teaching in the classroom. As a teacher preparation program, it is our aim to make decisions and produce outcomes based on supportive data; but, what can the data we collect tell us? Is our data useful or predictive? As we teach our teacher-candidates, we, of course, need to think with the end in mind to determine what factors are most important in order for our candidates to have positive outcomes. Our data can help us to continually improve our program offerings and systems, emphasizing the factors that will lead to the greatest impact and eliminating those factors that provide minimal return to candidates.

This is not new news. Education is not a rookie in the sport of data-based findings. In short, education is evaluation-centric. Of course, outcomes are both positive and negative. However, it has gotten to the point that many educators feel that they are being targeted or attacked (Ganga, Ramaswamy & Nicosia, 2015; Network for Public Education, 2016; Tagami, 2016). They enter the field with the desire to inspire and change lives. However,

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in actuality, many teachers enter classrooms in which they are tested as much as their students. The centralized focus on student test scores and teacher evaluation has had a negative impact on educator collaboration (Network for Public Education, 2016). In short, if teachers, do not live up to the predetermined level of proficiency, their jobs are at risk (Banchero, 2010; Network for Public Education, 2016). In many cases, this is rightfully so. Should educators lead classrooms if they are not producing successful students or teaching in effective ways? Most likely, no. Still, we truly do not want teachers to get to this point at all. We want educators to enter the classroom well-equipped to produce positive growth in the children they teach. We do not want teachers to finish a degree program, pass all required tests, and then fail to succeed. Their investment of time and money is great and should show its worth. As a college of teacher education, we value each child that our completers teach, and we want our completers to enter classrooms with the skills and resources to succeed.

However, even among seasoned educators, it can be difficult to identify an effective, successful teacher (Strong, Gargani & Hacifazlioglu, 2011). Educator preparation programs (EPP) use several common quantitative data points in the admissions and program processes, with the intention that using such data-based methods to select and promote our candidates will allow us to support qualified candidates destined to be successful in their future classrooms. For example, before beginning our teacher preparation programs, candidates are required to submit common standardized test data, such as ACT, SAT, GRE, or MAT scores. Such standardized scores have had marginal associations with future educator performance (Kuncel, Hezlett & Ones, 2004; Perney, 1994; Rockoff, Jacob, Kane & Staiger, 2011; Solochek, 2016; Vecchio & Costin, 1977), though there have been a few studies that show a link between teachers' previous standardized test scores and student performance (Ferguson & Ladd, 1996).

At our institution, similar to others, we also consider candidates' GPA when determining admissions. In a summary of research analyzing studies linking candidate GPA to teacher effectiveness, the results are mixed (Davy & Higgins, 2007). Davy and Higgins (2007) cite several studies that indicate no correlation between GPA and future teacher effectiveness (e.g., Glass, 2002; Kane, Rockoff, & Staiger, 2006; Zumwalt & Craig, 2005) as well as other studies that demonstrate a positive correlation between GPA and effectiveness in the classroom (e.g., Graham & Garton, 2003; Roth, BeVier, Switzer & Schippmann, 1996).

Many teacher education programs also attend to licensure tests, such as the Praxis test. In most states, passing a battery of Praxis tests or something similar is required for licensure. Thus, as a common metric and one that is believed to demonstrate proficiency for educators, we collect candidate Praxis scores. Some data suggest that candidates' scores on these pre-licensure assessments are predictive of teacher effectiveness and student achievement (Clotfelter, Ladd, & Vigdor, 2006; Goldhaber, 2007). However, though a common metric, the Praxis tests' cut scores vary from state to state. So, while we can compare our pass rates to others in our state, it is more difficult and less accurate to compare to completers in other states. These differences also make predictions less clear.

Beyond numeric data points, we also require candidate interviews and assessments of candidate dispositions prior to formal admission to teacher education and at several points in our program. Qualitative information regarding candidates' motivation, interests, values, and drive can be gained through our initial interview; interviews provide the opportunity for prospective candidates to meet with multiple faculty members and for faculty to gauge candidates' fit and potential success in our program. Pratt (1977) described that candidate interviews can predict future "teacher survival". Candidate interviews can also showcase readiness for the profession (MacMath & Salingre, 2015) and predict future practice-teaching performance (Hannan & Mulford, 1995).

Dispositions assessments provide additional qualitative information about candidates at multiple points in their program; our dispositions assessment focuses on candidates' professionalism, confidence, compassion, leadership, collaboration, and communication. Collaboration is a disposition that has been correlated with a successful student teaching experience (Masunaga & Lewis, 2011). Robertson-Kraft and Duckworth (2014) identified that grit, the disposition to pursue challenging goals with sustained passion and perseverance, "predicts effectiveness and retention among novice teachers in low-income districts". When another set of researchers examined educator dispositions' link to student achievement, it was found that conscientiousness (0.015) had a moderate relation to student achievement, but the link to extraversion was negligible (0.001; Rockoff, Jacob, Kane & Staiger, 2011). In terms of general and personal efficacy, the same research team found positive correlations between these constructs and student achievement (Rockoff, Jacob, Kane & Staiger, 2011). When examining emotional intelligence and teacher performance, no significant correlation was found (Corcoran & Tormey, 2013). In addition, when a researcher examined Missouri teachers' dispositions (as measured by the Teacher Perceiver Interview rubric) and ranking as a "top teacher" or "bottom teacher" within the state, no significant correlation was found (Welle, 2011).

But, if each of these data points is at best limited at predicting candidate outcomes, then why are they required for admission? Why do we put so much emphasis on these pieces of data? Our goal is and continues to be focused on continuous improvement, for our candidates and our program offerings. We want to shape our candidates into the best educators that they can be, positively impacting the students in their future classrooms. Our data provides us with valuable information, but only the resulting reflections and action plans provide impetus for change to best fit our candidates' needs. Perhaps, we should be questioning what we know — the data collected each term.

2. The Current Study

The current study seeks to extend the aforementioned findings to our college's decision-making processes. In this study, we sought to examine, change, and improve our programs based on the data that we maintain. We want to have an educator preparation program that prepares candidates to be the best educators that make the greatest impact with the children in their classrooms. Perhaps, we can use the data at our disposal to make deliberate changes in our programs and foci. Knowing these connections could help us better prepare our candidates to be effective educators. This knowledge would also lead to a more refined, more productive admissions process to our teacher education programs. For, in our teacher preparation programs, we want to emphasize variables that are valuable to complete success. Thus, our research questions included:

Are there candidate differences that predict teacher effectiveness scores? Are there program factors, candidate performance indicators, or rubric indicators that predict teacher effectiveness scores? Do we give appropriate attention to data points that demonstrate prediction of teacher effectiveness? How can we change our current practices to better match the predictive data?

3. Method

3.1 Sample

Archived data from 2014 completers (N = 178) was used to complete the data analysis. Our sample included 190 female completers and 80 male completers. One hundred nine completers were a part of the Teach for

America (TFA) program, while 69 completers were not associated with TFA. Completers ethnically identified as White (71%), Black (8%), Asian (1%), Hispanic (2%), Pacific Islander (0%), or Multiple (2%); forty completers (15%) did not identify ethnicity. The average age of participants was 29.12 years (range 24–58 years). As a part of our graduation and licensure paperwork, we ask candidates to consider signing a consent form, which allows us to use their de-identified data from rubrics, score reports, GPA, and reported demographics in program evaluation research. The described sample is composed of completers who provided consent.

3.2 Assessment of Teacher Effectiveness

For the teacher effectiveness measure, we used completers' scores on the TVAAS (Tennessee Value Added Assessment System), which "measures the impact schools and teachers have on their academic progress" (Tennessee Value Added Assessment System). TVAAS was developed to measure a teacher's impact on student learning. TVAAS measures student growth rather than proficiency, "allowing students of all ability levels the opportunity to show strong scores on teachers' assessments." TVAAS estimates student academic growth based on previous student achievement scores on standardized assessments. Teachers' TVAAS scores are determined by comparing students' predicted growth to their actual growth over the course of the school year. TVAAS scores also contribute to annual teacher evaluations. As a teacher preparation program, we receive a yearly report of TVAAS scores for our completers.

3.3 Archived Completer Data

Throughout our teacher preparation programs, we regularly collect data for a variety of purposes (e.g., admissions, formative assessment, summative assessment and licensure requirements). For the participating completers, we had archived records of their admission data, including grade point average at the time of admissions and standardized admissions test scores (e.g., ACT, SAT, GRE and MAT). We also had completers' graduating GPA, which is their GPA at the time of graduating from our programs and records of completers' Praxis II PLT scores. The type of candidate, undergraduate, graduate, traditional, alternative, or Teach for America (TFA), was an additional piece of data that we have recorded.

In addition, we have records of completers' interview data and rubric assessment scores from their program tenure. For example, we maintain records of completers' performance on our Dispositions rubric, which collects information on candidates' levels of key characteristics essential to the field of education. Our college's Dispositions rubric assesses professionalism, commitment, ethics, acceptance of feedback, attitude, demeanor, servant leadership, and respect for diversity, collaboration, and communication skills.

4. Results

We examined typically-used candidate data (e.g., GPA, rubric data, test scores) and correlated these with completers' scores on future outcome measures (e.g., teacher effectiveness). We found that some of our most trusted data was not as predictive as we had hoped.

Pearson r correlations were used to determine the relationships between specific completer data (e.g., GPA, Praxis PLT score) and TVAAS teacher effectiveness scores. A negligible correlation ($r = 0.03$) was found between completers' TVAAS score and GPA. Completers' Praxis II PLT scores also demonstrated no sizeable correlation to their future TVAAS scores; depending on the PLT taken, completers' test score correlation with their future TVAAS score ranged from $r = 0.006$ (PLT 7-12) to $r = 0.08$ (PLT 5-9). None of these correlations approached

significance. On the other hand, a completers' TVAAS score compared to their placement as a TFA or non-TFA was weak ($r = 0.24$), but the association was significant $p < 0.01$. In terms of entrance tests (e.g., ACT, GRE), completers' scores on entrance assessments were not associated with TVAAS performance. In fact, SAT performance actually had a moderately negative correlation with TVAAS performance ($r = -0.36$, $p = 0.11$), though only approaching significance.

Beyond the standardized test and GPA data, we also compared each measured category on our Dispositions rubrics to completer TVAAS performance. Here, we found a few significant associations. First, among traditional undergraduates with Dispositions data ($N = 17$) for the category that measures a candidate's ability to "Communicates student progress to students, their parents (when directed by the mentor teacher to do so), and appropriate others", there was a moderate correlation to TVAAS performance ($r = 0.50$, $p < 0.05$). In addition, for the category that measures a candidate's ability to "project confidence, enthusiasm and initiative", a moderate correlation ($r = 0.49$, $p < 0.05$) was found. Then, among graduate completers with Dispositions data ($N = 69$), there was an additional interesting finding. When correlated with future TVAAS scores, the item reading, "Being forthright and truthful when dealing with others" was negatively correlated ($r = -0.25$). All other associations among graduate students were negligible; the graduate student group was comprised of both TFA and other graduate completers.

It is valuable to note that graduate completers completed the Dispositions rubric as a self-assessment. The undergraduate group was comprised of traditional, non-TFA completers only, and their dispositions were assessed by mentor teachers and faculty.

5. Discussion

We began this quest with a focus on continuous improvement, improving our candidates' experience, their future effectiveness, and our preparatory programs. As we reflect on our findings, we must consider the weight given to application documents, such as ACT, SAT, and GRE scores. Our data did not provide support for using these scores to make decisions about potential candidate success. Admissions test scores were not related to teacher effectiveness scores.

Though a much smaller sample, our Dispositions rubric data provided interesting findings to consider. Demonstrations of effective communication and confidence were the strongest correlates to future teacher effectiveness ratings. While we already valued these categories enough to include them on our college's Dispositions rubric, their data-based value is new knowledge. Knowing that communication skills and confidence are potentially so important to future teacher effectiveness should increase our emphases on these factors in our training programs. We certainly want our candidates to be strong in these areas, especially knowing that strength in these areas is linked to future teacher success.

In addition, graduate completers' Dispositions presented informative findings. The moderate, negative link of future teacher effectiveness with being forthright and truthful is surprising. We believe that it is safe to assume that most colleges of education promote truthfulness and forthrightness among candidates. However, among graduate completers, self-assessed strength in truthfulness and forthrightness was not linked to strong future effectiveness scores. As a follow up, some graduate completers added qualitative remarks when asked about this specific Dispositions statement: "I try to be forward and direct with my remarks, but there are times when I shy away from being too forward with people, hence letting things slide." "When I believe the truth will hurt someone, I am

hesitant to share it." "I struggle sometimes with this when the truth may hurt the other party involved." It is safe to say that we will not be discounting the need for truthfulness among educators. Perhaps, instead, those completers who did not rate themselves highly on this particular category were more discerning; these may have been the same educators who later earned higher effectiveness scores. Graduate completers who provided higher self-ratings may be overestimating their abilities or may not be expressing the said truthfulness with tact or discernment, leading to possible classroom scuffles.

6. Limitations and Future Directions

Although our results are valuable and add to the existing literature, there are some important limitations. For example, a large percentage of our graduates are not included in the TVAAS report. TVAAS reports provide data on graduates who are in their first three years of teaching. However, if graduates accept teaching positions outside Tennessee, teach at a private school, or teach a non-tested subject area, their effectiveness scores would not be captured or reported through TVAAS. In addition, teachers' TVAAS scores may be linked to a particular institution because they graduated from that institution; but, this may not be where teachers actually received their training to be a teacher. This is especially true for those earning their teaching credentials at the postbaccalaureate or Master's level. Including their data can skew the connected evaluation data for the degree-granting institution. Thus, our TVAAS information does not completely mirror our completers' classroom performance.

Though our study's total sample size was 178, we do not have complete data on all participants. For example, undergraduate completers entered our programs with ACT or SAT data, not GRE or MAT. The reverse is true for graduate completers. In addition, college rubrics, such as a Dispositions rubric, may not be used in the same way by all programs. For example, undergraduate candidates are assessed with the Dispositions rubric at several points in their progress through the programs. Graduate candidates self-assess with the Dispositions rubric early in their programs, but not as often as undergraduate candidates. Though we do not discount the need to focus on dispositional factors found to have a link to teacher effectiveness, these findings should be considered pilot at best and should be expanded in the future before making bold statements regarding the effects.

In addition, the present study is purely quantitative. Although we have correlations, data, and significance to share, there is certainly a need for additional qualitative measures to further understand the connections between completers' pre-service data and future effectiveness as educators. Moreover, although the study sheds light on the relationships of dispositional factors and teacher effectiveness, we do not know specifically where the interactions are taking place. Qualitative investigation would be needed to decipher these details. Solely focusing on quantitative data will likely lead to missed components of the measured construct, pre-service factors and teacher effectiveness in this case. A mixture of qualitative and quantitative measures should be implemented in order to gain the benefits of each method.

As our candidates, completers, and faculty continue their work with children, schools, school systems, universities, and other community programs, we want to ensure that we are equipping our future educators with the tools they need to be successful in the classroom and beyond. Our data analysis leads us to new questions that will help us make positive changes; are we using adequate, valid data to make our most important decisions? Is there a better way or more accurate piece of data we should be using to look at future teacher outcomes? How can we determine what pieces of candidate data will yield the strongest link to future teacher effectiveness?

Our data evaluation and analysis led to self-reflection; the application documents that are given the most

weight towards admission (ACT, SAT, GRE scores) did not show a connection to future teacher effectiveness. If these constructs are not connected, we must question the validity of placing so much emphasis on scores for candidate admission to our programs. The same could be said for candidates' GPA. As we continue to reflect on our data with an aim for continuous improvement, we must consider the weight given to admissions criteria that do not predict future success. In our case, an evaluation of admissions criteria may be in order.

Based on our data, changes in our program foci may be in order; the only meaningful correlations linked to teacher effectiveness were based on candidate Disposition rubric data. We could consider granting more time and attention to developing candidate communication skills and confidence, as these were moderately correlated with future teacher effectiveness. Perhaps, these specific dispositions should also be emphasized more directly throughout coursework for both undergraduate and graduate candidates. In addition, the impact of self-perceived truthfulness presented an interesting finding. Candidates may need more direct experiences with communication between teacher and parents, students, colleagues, and others they will encounter as teachers. Simulated conversations may be helpful to support our candidates in these areas (Kok, 2010; Sharma, 2015; Walker & Dotger, 2012).

Outside of admissions documents, licensure assessments (e.g., Praxis) were also surprisingly unrelated to future teacher effectiveness in this study. We included a Praxis assessment that is taken by most completers (PLT) regardless of licensure area. Though the Praxis PLT assessment differs according to the licensure area age group (e.g., Early childhood, elementary, secondary), all of our completers had taken some iteration of the PLT prior to entering the classroom. While this assessment is required for educator licensing in this state, completers' performance on the PLT was not predictive of future effectiveness. That is, higher performance on the PLT did not correlate with higher TVAAS scores. Though these assessments are required for licensure, the weight of these assessments should be considered in light of their marginal connection to future teacher effectiveness among our completers.

It would be unwise to make the aforementioned connections to teacher effectiveness without also discussing the measure of teacher effectiveness, TVAAS. Perhaps, candidates' admissions tests, Praxis scores, and GPA do predict teacher effectiveness. It could be that the measure used in our analysis, TVAAS, does not capture the elements of teacher effectiveness that can be predicted from our data points. It would be beneficial to evaluate TVAAS versus other measures of teacher effectiveness, noting similarities and differences in terms of values and constructs assessed. Perhaps, we are currently evaluating different areas of teacher effectiveness that are not captured by other measurement tools.

7. Conclusion

There is much research assessing factors that influence or predict teacher effectiveness (Clotfelter, Ladd & Vigdor, 2006; Davy & Higgins, 2007; Ferguson & Ladd, 1996; Goldhaber, 2007). However, the factors and measures are not consistent from one study or preparation program to the next (Clotfelter, Ladd & Vigdor, 2006; Goldhaber, 2007; Kuncel, Hezlett & Ones, 2004; Strong, Gargani & Hacifazlioglu, 2011). It is up to us as education preparation providers to continually self-assess and reflect upon what makes a difference for our candidates and completers. In our case, at present, it appears that greater focus on communication skills and confidence would support improved teacher effectiveness. It would be valuable for all teacher preparation entities to regularly evaluate what pieces of collected data are yielding fruit in the form of predicted effectiveness. This

constant and consistent focus on data and results could dramatically change our program over the years as needs shape our focus and direction for program modifications.

In addition, collaboration is essential to educator preparation and success. We want to ensure that candidates leave our programs with the tools they need to be effective collaborators. We must model this for our candidates. Educator preparation providers need to be collegial, working together to determine program strengths and weaknesses, while growing stronger together. No educator preparation program is identical to another; we each have our own mission and vision for education, though we likely have common goals. We own our uniqueness with intent, focusing on our strengths as we share and support candidates. Our program strengths should not be secret; educator preparation programs should learn from each other to grow stronger programs and better educators. Our internal data shows us who we are, what we value, and how our completers transform this into potential effectiveness. We must continue to reflect and refine as we learn more about our data-based decisions.

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