Predictors of Teacher Candidate Success in Developing a Capstone Project: The Teacher Work Sampling (TWS) Methodology

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Introduction

Many university and college teacher education programs have adopted the Teacher Work Sample (TWS) as their capstone assessment demonstrating a teacher candidate"s competencies in planning, assessing and reflecting on instructional practice (Kinne & Watson, 2005; Denner, Norman, A. D., Salzman, S. A. & Pankratz R. S., 2003). Further, The TWS has been recognized by the National Council for Accreditation of Teacher Education (NCATE) as an authentic form of assessment that is both systematic and provides credible evidence of teacher candidate performance (Williams & Carrol, 2007). The Teacher Work Sample model represents a formalized unit of study using the INTASC (Interstate New Teacher Assessment and Support Consortium) holistic approach to teacher career development (Schalok, 1993). Such a holistic approach requires an instructional context that begins with the classroom and school community. It extends to the actual construction of learning goals and assessment, and culminates with reflective insights about what it all means for teaching and student performance.

Nine elements provide a framework for the TWS assessment. Teacher candidates must understand their community of learners, design the learning experiences around that community, and analyze outcomes through assessments designed around the learning goals. These require structure and guidance that provide a scaffold for planning, implementing and assessing P12 student learning:

1. Contextual Factors: the teacher candidates investigate the learners and the environment within which they learn.
2. Learning Goals: with an understanding of the learning environment unit learning goals are developed and aligned with local, state and national standards.
3. Assessment Plan: the teacher candidates develop a formative and summative blue print for the TWS that aligns with the learning goals and includes a pre and post assessment.
4. Design for Instruction: the instructional design maps the day-to-day learning activities for the TWS that align with the learning goals and supports the assessment planning.
5. Classroom Management: an understanding of motivational strategies and expectations of classroom civility are developed.
6. Instructional Decision Making: at this point in the TWS candidates consider adjustments they must make based on their analysis of student learning.
7. Analysis of Student Learning: assessment data from the pre and post testing is used to consider the important question, "Did my teaching make a difference with student learning?"
8. Family Involvement:tThe candidates demonstrate ways that the family was engaged with student learning through letters, class newsletters, or meetings.

9. Reflection and Self Evaluation: it is here that the candidates examine through self-reflection how their TWS promoted student learning and where it fell short. They must also reflect on their future professional development needs. (Renaissance Group, 2002)

Because the TWS is a high stakes assessment of a candidate's ability to demonstrate pre service teaching competency and capacity to reveal the effectiveness of the teacher preparation program, it is important to consider predictive dispositions among pre service candidates. This study will examine three questions related to predictive characteristics of pre service teacher candidates and their successful completion of a TWS.

1. Can a candidate's writing ability predict a successful score on the TWS?
2. Does a candidate's GPA predict TWS competency?
3. Is content knowledge a predictor of TWS success?

Prompted by the debate around quality teacher preparation, these three questions and their answers will be helpful in developing pre candidacy dispositional attributes.

Dispositional Predictors for TWS Development

Abbot-Vaugh (2006) reports that research informing teacher preparation programs about the writing abilities of university students is limited. However, The American Association of Colleges (2006) documents that only eleven percent of college seniors are able to write at a proficient level. While writing ability is a sign that college and university students are developing competence (Chickering & Reiser, 1996), current research would challenge such a conclusion. Indeed, communication skills among graduating college seniors lacks proficiency important in competing in a global economy (Astin, 1993; Hiebert, Brewer, 2007; Walsh, 2001).

The ability to communicate effectively to P12 students, constituents, and colleagues is a critical skill for both active and perspective teachers (Scardamalia, 1986; Routman, 2000; Walsh, 2001; Darling-Hammond, 2001 & patric, Anderman, Ryan, Edlin, & Midgely, 2001). Vance and Schlecty (1982) advance the claim that there is a causal link between the ability to communicate effectively (particularly verbal communication) and teacher effectiveness. For example, P12 students may often mishear or misunderstand concepts, and teachers must have the skill to rephrase or reframe those concepts, clarifying or redirecting comprehension. Darling-Hammond (1999) points out that communication skills alone are not a precondition for certification with Interstate New Teacher Assessment Support Consortium (INTASC) and National Board certification. But, she goes on to tell us communication skills represent a piece of the high quality teacher standard (Darling-Hammond). Such skills among state preparation programs around the country place a high value on the importance of written, symbolic, and verbal communication among teacher candidates (Moore, 2006). Teacher preparation programs may emphasize effective communication more than the national endorsement organizations. These subtle inconsistencies surrounding the importance of communication skills, specifically writing, leads to an important question: just how closely linked are communication skills and proficiency on the TWS?

Shulman maintained that subject knowledge on a particular content area was a critical teaching skill (as cited in Sherin, 2002). Further, No Child Left Behind (NCLB) places a high priority on a teacher's content knowledge. It is one of three attributes of a highly qualified teacher. Goldhaber and Brewer (1988) warn that when subject-specific information is related to student achievement, no cause and effect connection links the two. They go on to caution that a degree in math, science, social studies, English, and others should never be used as proxies for a

teacher's ability to teach. Such debate has implications for this study because it looks at the impact on subject-matter skills among teacher candidates and elements of teaching practice assessed by the TWS (Fenster & Judd, 2008). Therefore, does content knowledge predict success in planning and developing an instructional TWS?

Grade point average (GPA) is often used as a predictor of success particularly in admission to professional schools. Many teacher education programs also use GPA as a condition for entry into their programs. Critics, politicians, and pendants point to teacher preparation admissions that do not hold a high GPA standard (Vance & Shlechty, 1982; Walsh 2001 & Levine, 2006). The National Center of Education Statistics (2005) reported that students with higher GPAs (< 2.93) were more likely to be hired as teachers than those with lower GPAs (> 2.75), regardless of the type of degree (content area/teacher education degree). These results would point to GPA as a significant factor in determining hiring potential for pre service teachers. It is evident that GPA makes a difference, but does GPA predict the ability to successfully complete a TWS?

The ability to communicate a teaching stance through academic capacity, written form, and factual understanding are central to the current debate over quality teacher preparation (Walsh 2001; Darling-Hammond 2001; DeBerard, Scott & Julka, 2004 Levine 2007). One example of how important intellectual capacity can be for a teacher education program can be found in a 1989 study at Michigan State. The University established an entrance policy raising the teacher candidacy GPA entrance requirement. Students prior to the higher standard and those after the policy implementation were compared. Students with higher GPA's demonstrated stronger performance in the program and stayed in the program at greater rates than the cohorts prior to the higher GPA standard (Freeman, 1999).

Method and Procedures

Participants all attend a mid-size state university who were in their final semester of a teacher preparation program. These participants were all elementary, special education and early childhood majors. One hundred eleven elementary, 15 special education, and 17 early childhood TWSs were studied for this research. They were selected because their majors represent a generalist teacher preparation and not a specialized content major found in secondary and middle school programs. These teacher candidates have developed two previous TWS documents at various levels of completion during their program. The first TWS included elements one through four from the above, the second incorporated all eight elements. These were based on limited lesson design. During the teacher candidates' final internship, a complete TWS is completed with full lesson design, instructional strategies, classroom management planning, and dispositional reflections that support state licensure.

The participants were all admitted to the teacher education program scoring a minimum of 235 on each content area test in Writing, language arts, mathematics, science, and social studies on the College Basic Academic Subjects Examination (C BASE). They must have also maintained a 2.5 GPA during their first two years at the university. Finally, participants maintained a grade of C or above in all their professional courses prior to participating in the final field experience.

The TWS summative results submitted by students were evaluated by teams of faculty, university supervisors (part-time faculty), and practicing classroom teachers who work with the university students in the field. These evaluators are assigned to teams for inter-rater reliability

purposes. The scoring procedures increase the reliability of student outcomes. Students are expected to meet all of the elements with 70% accuracy or higher. If an element falls below this expectation the student is given comments and time to revise the element so that it meets the 70% or higher expectation. Students who fall short of a successful TWS by not meeting 60% of the elements must write a new TWS for submission. Table One has the percentage of students passing all elements with their first submission. Those who did not meet the 70% or 60% levels are also reflected in Table One.

Results

Following the completion of student teaching, internship candidates completed a Teacher Work Sample, a requirement for program completion. Two faculty members, providing inter-rater-reliability, scored the TWS. Grade Point Averages (GPA's) prior to the student teaching experience were collected along with their C BASE scores admitting them to the teaching program. Table 1 provides the demographic profile of the sample used for this study. The research only considered interns who were majoring in Elementary, Early Childhood or Exceptional child. As a result an overwhelming number of the sample were female (95%). This percentage, however, is representative of many teacher preparation programs. According to the Schools and Staffing survey, 2003-2004, 83% of the elementary teachers responding to the survey were female and only 16.2% were male (National Center for Education Statistics, 2005).

Table 1
Demographic Data for Gender, Education Major, and Student TWS Results

Demographic	**Number**	**Percent**
Male	5	4
Female	125	96
Majors		
Elementary	95	73
Early Childhood	28	22
Exceptional Child	7	5
GPA Prior to Internship		
GPA Between 3.5 – 4.0	46	36
GPA Between 3.4 – 2.9	60	46
GPA Between 2.8-2.5	24	18
Student TWS Results		
Meeting the Eight TWS Elements	89	74
Not Meeting TWS Eight Elements	31	26

Table 2 below presents the mean TWS scores for the sample population and the standard deviation from the mean. Looking at GPA, the teacher candidates on average have earned slightly above a B average going into their teacher education program. The program has a minimum GPA cut off of 2.5 to enter Teacher education at the institution where these students are enrolled. The maximum score for a candidate's TWS during their student teaching experience is 420. Table two reveals that most students in this research earned a relatively high TWS score. Undergraduate students applying for teacher candidacy are required to score a minimum of 265 on the C BASE subtest. Mean subtest scores indicate that with this sample students generally scored well in the area of mathematics and writing, with social studies their lowest average.

Table 2
Means and Standard Deviations for TWS, GPA and CBASE Scores

Variables	M	SD
TWS	348.00	62.21
Writing	292.01	29.60
GPA	3.22	.43
Science	288.46	41.04
Social Studies	276.63	35.43
Language Arts	282.93	28.23
Math	302.72	45.7

N = 130

Table 3 presents a correlation matrix. In examining these relationships subtests are highly correlated to each other and to GPA. These correlations are not unexpected. The C BASE means of these content areas are closely clustered in writing, science, social studies, and language arts. Math is seemingly an outlier, but remains highly correlated with the other content subtests. The TWS, however is only correlated with writing ($r = .208$; $p > .05$) GPA ($r = .354$; $p > .001$), and Language Arts ($r = .313$; $p > .01$) The TWS does not show any correlation with science, social studies or math aptitudes.

Table 3
TWS Correlational Variables in a Regression Model

	1	2	3	4	5	6	7
1. TWS	1.00						
2. Writing	.208*	1.00					
3. GPA	.354***	.435*	1.00				
4. Science	.124	.514***	.386***	1.00			
5. Social Studies	.017	.238*	.323***	.518***	1.00		
6. Language Arts	.313**	.658**	.345***	.569***	.499**	1.00	
7. Math	.12	.433***	.464***	.633***	.252***	.424***	1.00

*$p > .05$, **$p > .01$, ***$p > .001$

Table 4
Summary of Regression Analysis for Variables Predicting TWS Scores (N = 72)

Variable	B	*SE* B	β
Block 1: $R^2 = .359$; $\Delta R^2 = .129$			
TWS	155.72	73.60	
Writing	.139	.262	.066
GPA	47.118	18.051	.326**
Block 2: $R^2 = .471$; $\Delta R^2 = .122$			
TWS	157.821	81.051	

Writing	-.269	.332	-.128
GPA	54.687	19.77	.378***
Science	.031	.260	.020
Social Studies	-.463	.248	-.264
Language Arts	.925	.369	.420**
Math	-.164	.207	-.121

**$p > .01$ ***$p > .001$

Writing, C BASE scores, and student GPA were loaded in Block 1 as the primary variables under study. Grade Point Averages accounted for 40% of the variance ($F= 5.117$; $p > .05$), In Block 2 C BASE sub scores for science, social studies, language arts, and math were loaded. Grade Point Averages remained highly significant and the language arts variable loaded as highly significant, explaining 47% of the variance ($F = 3.087$; $p > .01$). These results indicate that, while GPA score may not cause higher TWS scores, it does seem to have some relevance to predictability.

Discussion

Entering this study it was the assumption of this researcher that high scores on the TWS were actually the function of good writing ability and language aptitude. However, results demonstrate that GPA may have more impact on the TWS than any of the variable aptitudes under study. While language arts appear to have some impact on TWS results, GPA consistently demonstrates a strong predictor of success. Indeed, as a result of this study the null hypothesis cannot be rejected for two of the three research questions. Writing ability and content area knowledge do not predict success by teacher candidates' who construct a Teacher Work Sample assessment. The bounded sample represents one limitation in this study.

These results include only students who are pursuing elementary, early childhood, and special education certification. No secondary education student was included for this study. These students are accountable to one less TWS standard on the assessment. As a result, the inconsistency in scoring would create spurious results. However, further study should look at TWS results, GPA and C BASE sub scores for this population to discover if the results here hold true for secondary education teacher candidates.

The English portion of the CBASE examination addresses a student's reading and literature understanding and writing knowledge and skills. I further sub divides the student's knowledge into sub skills for reading critically, reading analytically within the reading and literature portions (Flowers, Osterlind, Pascarella, & Pierson, 2004). CBASE English results are not necessarily precursors to writing ability, but they certainly have a tangential relationship. Reading critically and analytically help model for the reader as writer literary conventions and structural processes for good writing habits. This linkage between reading and writing is much tighter than reading and solving algebraic equations or reading and producing lab results. As a result, it should not be surprising that high TWS scores align closely with the English subtest. This is evident that English and writing have sustained significance in both regression models, Block 1 and Block2.

Implications

Because GPA has an impact on how well students do on the TWS, the implication for teacher education programs is to consider the GPA entry requirement. In the case of this study students were admitted to the education program with a minimum 2.5 GPA. To assure the program is getting highly qualified students, the University should consider raising the GPA requirement to as much as 2.7. States like Missouri, which have a 2.5 GPA minimum requirement, might also consider raising their admissions requirements. The demands on teachers, administrators, and boards of education to maximize P12 annual assessment scores, require highly qualified teachers in every classroom. Consequently, teacher preparation programs must set high expectations for their graduates. These programs must select candidates who enter the program first as high performing undergraduates and finish as proficient, highly qualified professional teachers.

Conclusion

While there is never a substitute for subject knowledge in effective teaching, this study points to the fact that knowledge of subject is not as good a predictor of success as grade point average. Success on the TWS relates more strongly to GPA than any other predictor considered in this study. As was mentioned in the review of literature at the beginning of this study, more students with GPAs above 2.93 actually teach upon graduation than do those students who graduate with GPAs below 2.75 (National Center for Education Statistics, 2005). It was also pointed out in the review that subject specific information is related to student achievement but no cause and effect connection links the two (Goldhaber and Brewer, 1988). In summary, the results of this study support the idea that GPA provides a reliable basis for predicting student success with the TWS, a critical assessment for Missouri teacher licensure. More teacher preparation programs around the country who adopt the TWS assessment model should consider those dispositions and prerequisites that strengthen the teacher candidate's likelihood of success.

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