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How Aspiring Principals Applied Course-Based Learning to Develop School Improvement Plans

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Purpose:

School improvement planning and implementation is one organizational process by which principals may positively impact school and student outcomes. Limited research, however, has explored how principal preparation programs prepare aspiring leaders for this common school leadership activity. This study examined aspiring principals engaged in the school improvement process by evaluating what they included in their school improvement plans that were developed as part of their field experience.

Design/Methodology/Approach:

The authors examined school improvement plans aspiring principals collaboratively developed as part of their field experience. Using an abductive analysis method, combining both deductive and inductive coding methods, authors examined 77 school improvement plans in which aspiring principals used school level data in planning.

Findings:

Each aspiring principal's school improvement plan was contextually specific. No two plans were identical relative to who was targeted for improvement and how the plan was to be implemented, indicating aspiring principals can gain and implement important data driven decision making skills in field-based school improvement projects.

Originality:

This study was the first to document the content of aspiring principals' field-based SIPS and how skills in data driven decision making were applied in a SIP field-based activity.

Implication:

This study highlights the importance of authentic field-based experiences in principal preparation that apply data driven decision making skills in context.

Key Words:

Principal preparation, Leadership preparation, School improvement, Principal, Data driven decisions

Research Paper (Qualitative)

Empirical, scientifc or clinical research

How Aspiring Principals Applied Course-Based Learning to Develop School Improvement Plans

Principal leadership impacts how a school functions and students learn (Leithwood, *et al*., 2004; Robinson *et al*., 2008). School improvement planning and implementation is one organizational process by which principals may positively impact school and student outcomes (Caputo and Rastelli, 2014; Fernandez, 2011; Huber and Conway, 2015; Strunk, *et al.*, 2016; Sun, *et al.*, 2019; Wikeley, *et al.*, 2005). As such, through policy and practice, school improvement planning has become a common responsibility of school leaders (Fernandez, 2011; Meyers and VanGronigen, 2019; Strunk et al., 2016). A limited body of research suggests the quality of school improvement plans (SIPs) is impacted by principal knowledge and skills and positive student outcomes are dependent on the quality of SIPs (Fernandez, 2011; Huber and Conway, 2015; Meyers and VanGronigen, 2019; VanGronigen and Meyers, 2017; *Wikeley et al.*, 2005). Researchers and theorists have identified myriad skills principals must engage in to develop quality SIPs (Beach and Lindahl, 2004; Boudett, *et al.*, 2013; Mintrop and Zumpe, 2019). There is a dearth of research, however, examining how principals are prepared to effectively engage in school improvement planning.

Researchers have identified the importance of aspiring principals' engagement in genuine field-based experiences that prepare them to assume the roles and responsibilities of a school administrator (Crow and Whiteman, 2016; Darling-Hammond, *et al.*, 2007). Aspiring principals leading a school improvement process as a field-based experience have the potential to develop the knowledge and skills necessary for effective school improvement planning. Knowledge and skills learned as part of the SIP process include data collection and analysis, problem identification, decision making, collaboration, and situating the plan within the context and

culture of the school (Beach and Lindahl, 2004; Boudett *et al*., 2013; Wikeley *et al*., 2005). The purpose of this study was to examine how aspiring principals applied course-based content to develop school improvement plans as part of their field experience by evaluating what they included in their plans. The research questions that guided this study was: What do aspiring principals include in their plans that indicate the application of knowledge and skills associated with school improvement planning. We examined which group of students aspiring principals targeted for improvement, how they identified this group, what the intended student outcomes were, what strategies they planned for improving student outcomes, and how they would determine if students reached the intended outcomes. In short, we examined the product aspiring principals developed as part of their engagement in learning the school improvement planning process.

Conceptual Framework

We begin framing this research with the model of leadership outlined by Mumford, et al. (2000). In this model, effective leadership equates to the leader's capacity to problem-solve solutions to organizational issues. Although the leader's individual attributes contribute to their problem-solving capabilities, central to the model are the leader's skills and knowledge associated with problem-solving. Leaders need skill and knowledge in unraveling new and unusual problems and understanding people and systems that are integral to solving organizational issues. Additionally, environmental influences and career experiences influence a leader's problem-solving attributes, competencies, and solutions. Skills and knowledge are malleable and influenced by the environment and experience.

Administrator skills in problem solving begin with problem-finding or identifying the problem (McPherson *et al*., 1986; Peterson, 1985). Problem-finding "involves the definition and

specifications of the unresolved situation in such a way as to make the search for solutions possible" (Peterson, 1985 p. 89). McPherson, et al, (1986) point to problem-finding as the "first and most crucial element of problem-solving" (p. 273).

Inherent in the Mumford *et al*. (2000) model of leadership and problem-finding is the concept of employing data to first identify and then solve organizational problems. We therefore frame this study with concepts associated with data-driven decision making (DDDM). DDDM "is the application of an inquiry process that uses multiple school and student level data sources to develop plans of action that lead to improved school and student performance" (Bickmore, 2014, p. 20). Mandinach and Gummer (2013) proposed that to effectively engage in DDDM educators need to be data literate which includes skills in identifying, collecting, organizing, analyzing, summarizing and prioritizing data, planning and structuring collaboration around data, establishing a vision of data use, and aligning learning goals with data. Mandinach and Gummer and Bowers *et al.* (2014) point to both the lack of and need for the development of DDDM skills for pre-service principals. In this study, we specifically examine aspiring principals use of data literacy skills in problem-finding.

Finally, within the context of problem-solving, problem identification, and data literacy skills as part of DDDM, we frame this research around school improvement planning, defined as a process in which "staff analyze problems, identify underlying causes, establish measurable goals, incorporate strategies and adopt policies that directly address the problems, and monitor implementation" (Fernandez, 2011, p.341). More recent iterations of this process have emphasized the continuous nature of school improvement planning and collaboration among stakeholders (Bernhardt, 2017; Boudett *et al*., 2013; Byrk *et al.*, 2015; Copland, 2003; Mintrop and Zumpe, 2019; VanGronigen and Meyers, 2017). As an example, Bernhardt (2017) suggests

that school improvement planning should be cyclic, mimicking elements of the organizational change model popularized by Deming (2018) as Plan, Do, Study, Act. Boudett, *et al.* (2013) begin their proposed SIP process with "organizing for collaborate work" (p.13). In summary, this research is framed around DDDM, specifically data literacy skills and problem finding as part of school improvement planning.

Aspiring Principals, Field Experiences, and School Improvement

In response to criticism that principal preparation programs were disconnected from practice (Grogan and Andrews, 2002; Hess and Kelly, 2007; Levine, 2005), researchers and organizations associated with improving principal practices have forwarded that essential and genuine school-based field experiences are foundational to effective principal preparation (Crow and Whiteman, 2016; Darling-Hammond *et al*., 2007; Darling-Hammond *et al.*, 2012; Orr, 2011; Perez *et al.*, 2011; Sutcher *et al.*, 2017). Essential and genuine field experiences should be "comprehensive, coherent, and relevant" (Darling-Hammond *et al.*, 2007, p.11) and engage aspiring principals in current problems of practice (VanGronigen, *et al.*, 2018). Crow and Whiteman (2016), in their literature review of features of effective principal preparation programs, suggest that while researchers agree that field experiences are foundational components of high performing programs there is limited research surrounding the effects of essential, genuine field-based learning experiences (Crow and Whiteman, 2016). From the limited research, aspiring principals perceive engagement in authentic field experiences as contributing to their learning related to the skills and competencies associated with school leadership (Barton and Cox, 2012; Dodson, 2014; Geer *et al*., 2014; Lochmiller and Chesnut, 2017; Stevenson and Cooner, 2011) and quality field-experience may have an impact on principal practice (Orr, 2011).

There is also a paucity of research that describes and examines specific field experience activities that are essential and genuine for which aspiring principals have engaged in as part of their preparation programs (Geer *et al*., 2014; Oliver *et.al.,* 2018). Anderson *et al.* (2018) provide evidence that, in general, preparation programs engage aspiring principals in activities associated with school improvement. Surveying 97 preparation programs affiliated with the University Council for Educational Administration (UCEA), Anderson et.al determined that 90% of field-based learning experiences in these programs focused on school improvement, while 88% required aspiring principals to address school-based problems collectively with stake-holders and 84% engaged aspiring principals in making decisions that would impact schools and students. These findings are confirmed by the few studies that more specifically describe field-based activities. Oliver *et al*. (2018), surveyed aspiring principals upon completion of a preparation program and concluded that field-based experiences that required leading activities in schools was the highest rated learning experience in their program. Dodson (2014) discussed a variety of field-based experience which aspiring principals perceived prepared them for the principalship, most of which required them to engage with school data and lead data-driven discussion among faculty. Surveying aspiring principals using both Likert and open-ended questions, Lockmiller (2017) provided a list of representative field-based activities in which aspiring principals engaged in as part of their internship. Leading the collaborative development of school improvement plans was one such activity on the list, as well as analyzing school and district data.

Beyond listing field experiences, Havard *et al.* (2010) broadly outlined the capstone project for the Auburn University's principal preparation program. Aspiring principals were required to identify a salient problem in their field-based school and develop a plan to address that problem. In identifying the key components of powerful learning experiences in preparation

programs, Cunningham et al. (2019) provide two examples of authentic field-based activities from five principal preparation programs identified as exemplary. These examples engaged aspiring principals in: 1) completing a full improvement cycle in their assigned field-based school from problem identification through implementation and evaluation, and 2) gathering data through a neighborhood community project that was used to inform a school improvement plan. Missing from the research are in-depth descriptions and examinations of field experiences that engage aspiring principals in the school improvement process, a process that is an integral part of the principalship.

Application of DDDM in SIPs

Defined as an inquiry-based process (Fernandez, 2011), school improvement planning requires data literacy and skills in DDDM (Mandinach and Honey, 2008; Sergis and Sampson, 2016), yet examples of how preparation programs support aspiring principal learning associated with requisite DDDM knowledge and skills and how they encourage the application of these skills in field-based experiences is another area where research is thin (Verbiest *et al.*, 2014). We found only two examples in the literature that provided in-depth descriptions of how preparation programs provided instruction related to DDDM. Wayman (2013) provided descriptions of modules used in preparation and development of aspiring leaders focused on improving their use of data and engagement with school faculty around data. Verbiest and colleagues (2014) also described modules used with aspiring principals to improve data literacy and DDDM skills as well as how to work collaboratively in the development of a school improvement plan. However, neither Wayman nor Verbiest *et al.* (2014) explored how the participants applied this learning in the field. Geer *et al.* (2014) provide the lone study we could find that connected engagement in the use of DDDM with at least one example of that engagement. Greer *et al.* (2014) reported that

97% of respondents to a survey of aspiring principals' perceptions of their internship indicated they have "frequent involvement in using data to support continuous school improvement during their internship" (p. 10) and then reported one respondent's example of this involvement,

> [I] Analyzed and compiled data to determine an assessment schedule, a professional development PDSA [Plan Do Study Act] plan, a structure for using data to complete "data dialogues" during data teams, and I processed the notes from leadership [team].

Considering the gaps in the literature concerning examples of how aspiring principals apply concepts of DDDM in conjunction with school improvement planning, we provide analysis of the school improvement plans that aspiring principals collaboratively developed in their field-based activities.

Methods

The aspiring principals involved in this study were matriculated master's degree students in the University of Nevada Las Vegas (UNLV) principal preparation program that leads to school leadership certification in the state of Nevada. As part of the UNLV program, aspiring principals engaged in a year-long collaborative improvement project in their field-based school. Prior to beginning the improvement project in the fall semester the university supervisor, aspiring leader, and the principal of the school in which the project would unfold met to detail expectations for the project and garner support from the principal. Principals were provided an outline of the coursework in which the aspiring leaders developed DDDM and data literacy skills and an understanding of school improvement planning and implementation. The role of the principal was outlined and included providing the aspiring leader with school and district data and material support as available and needed. Principals were explicitly asked not to direct aspiring principals' foci but to facilitate and support these future leaders to "discover" school

issues and students who may need additional support based on data analysis.

As the project began in the fall, aspiring principals were required to invite, organize, and facilitate a school improvement team to guide the improvement project. The number of team members was not specified but aspiring principals were required to invite a variety of school personnel and most teams were composed of five to seven members. The aspiring principal facilitated the team as they examined all schoolwide data available to the school administration to identify a targeted group of students who would benefit from additional instructional support or intervention. Schoolwide data was organized into four areas, student learning, demographics, school processes, and perceptual data (Bernhardt, 2013). Once the team identified the targeted students, the aspiring principal led the team to brainstorm root causes for the lack of student success and to examine research-based practices or interventions that could improve outcomes for the identified students. Aspiring principals also gathered and used schoolwide data to determine contextual issues that could support or hinder potential interventions such as experience levels of personnel who would be implementing the support or intervention. The team then developed a specific, measurable, attainable, realistic, time bound goal (SMART goal) and a detailed action plan. Although the plans were implemented in the final semester (Spring semester) of the aspiring principals' degree program, the results reported here are focused solely on the actual planning process.

The data sources for this study were the Targeted School Improvement Plans (TGIP) of 77 aspiring principals in three cohorts of the UNLV school leader preparation program. These plans were the final assignment for the fall field experience class. Each plan included a SMART Goal that identified the students targeted and their learning centered issue to be addressed by the plan, the strategy used to improve student outcomes, and a detailed action plan to achieve the

goal.

Except for four aspiring principals in the program, all were employed by Bonanza School District (Pseudonym) (BSD) and TGIPs were planned and later implemented in BSD schools. BSD is a large school district in the U. S. and operates 360 schools of which 279 are designated Title 1. Student demographics include 46% Hispanic/Latino, 25% Caucasian, 14% Black/African American, and 6% Asian with approximately 64% of BSD's students qualifying for the federal free and reduced-price lunch program. Each aspiring principal's plan included: 1) a description of the targeted students; 2) how the students were identified, i.e., data used for identification; 3) an objective that specifically identified student outcomes; 4) the research-based teaching strategy or intervention to be implemented to support students in meeting the objective; and 5) the outcome measure that would be used to indicated whether the goal had been met.

The research team used an abductive analysis process to analyze each plan, combining both deductive and inductive coding methods (Denzen, 1978). Initially the team developed a set of deductive codes that mirrored five required components of the TGIPs; 1) *description of targeted students*; 2) *how the students were identified;* 3) *targeted goal(s)/outcome(s) for identified students*; 4) *strategies or interventions used*; and 5) *outcome measures to determine student goal(s)/outcome(s) was met*. These five categories created a coding framework. Deductive coding can be less flexible than other qualitative coding methods because it requires researchers to use units of analysis intrinsic to the pre-determined categories (LeCompte *et al*., 1993). As such, we were cognizant that additional categories may surface from the data. One additional code category was added to the framework after the team, using Atlas-Ti 7.5 software, coded for the initial five categories. Although not all plans had instances within this new category, *mediating outcomes* surfaced as the sixth code category.

Once the six-category framework was established the team inductively coded, identifying specific instances within the six code categories. In each of the six categories researchers added 2nd level codes to further describe each aspiring principal's plan. As an example, coding one TGIP, the initial framework code, *Description of Targeted Students* was further defined with three additional second level codes, *7th grade students, 25 students, and long-term English language learners.* This second level coding formed a chain of codes specific to each aspiring principals' plan in each category to more fully delineate aspiring principal's plans. In each code category there were code chains that ranged from one additional descriptive code to four additional codes. One example of a long descriptive chain within the *Intervention* category was coded: *Intervention – explicit small group instruction, exit tickets for parent/student discussion, mailings to parents.*

Trustworthiness in data analysis was addressed through several processes (Creswell, 2013). The data involved multiple sources from three different cohorts of aspiring principals. The coding process engaged three researchers in an iterative coding process in which multiple readings and levels of coding occurred. In each coding process researchers either independently read the TGIPs and came to consensus, as was the case with the initial code categories, or coded side-by-side as occurred in developing the code chains. The researchers randomly selected five former aspiring UNLV students to member check that our coding and analysis accurately represented their experiences (Creswell, 2013). As both course instructors and the researchers for this project, as well as former school principals who developed school improvement plans, the authors engaged in several discussions to explore our positionality as research insiders and our reflexivity to the research. These discussions were forwarded to bracket our perceptions as we analyzed the data (Creswell & Miller, 2010; Lincoln & Guba, 1985). Additionally, we elicited

critical feedback from two colleagues related to our analysis and write-ups by asking feedback to read draft of our work, similar to Patton's (2002) member checking strategy.

Findings

A salient finding from our analysis was that no two TGI plans were the same. Few plans overlapped even within any of the six code categories (Table 1).

Place Table 1 here

Except for the code category Outcome Measures, less than a third of the plans had first level code similarities. As an example, within the code category with the most commonality, Outcome Measures, 52 out of 77 aspiring leaders planned to use a standardized benchmark or screening assessment to determine if students had improved performance. However, when second level coding with code chains was applied, 22 different standardized benchmark or screening assessments would be used by the aspiring principals. Only six aspiring principals planned to use the same standardized assessment. However, code chains revealed none of the six were similar when other code categories were considered, including differences in who would be targeted for support and the strategies/interventions used to improve student reading performance. This same diversity of planning elements appeared in each code category and across code categories. The variety of the aspiring principals TGI plans are outlined in the following sections, organized by each of the six code categories.

Targeted Students

Based on the schoolwide data analyzed, aspiring principals identified a targeted group of students that needed support to improve performance. As aspiring principals' field placements were within the schools where they taught, the targeted students for each plan were in one school level, either elementary, middle, or high school. A total of 36 aspiring principals taught and

targeted elementary school age students. Eighteen aspiring principals targeted their plans in middle grades schools, and 23 in high schools. However, the actual students who were targeted varied widely by specific grades as indicated in Table 2.

Place Table 2 here

When identifying the targeted students, the grade level chosen was a function of identifying a challenge or issue that impeded the success of a group of students within the school. Except for eight TGI plans, the vast majority of aspiring principals most often identified students with academic difficulties as their target. The eight aspiring principals not identifying students with academic issues as the target included students with behavior issues (3), gifted students (2), student taking concurrent college classes (1), students identifying they had no adult connections at the school (1), and students ineligible to participate in after school activities (1).

Within targeted academic issues, however, aspiring principals used intersection of data (Bernhardt, 2013) to identify a variety of subgroups of students with academic issues. Of the 69 plans that targeted academic performance, all used at least one additional indicator to identify their targeted group beyond just academic performance on standardized tests or grades. For example, the most common second level code chain indicated that 24 aspiring principals identified English language learners (ELLs) with academic issues as their targeted students to support. However, of the 24, all also included two to three other identifiers including gender, how long the student had been in English as a second language (ESL) programming, and grades. Within the second level code chains, 12 plans had one overlapping identifier, students who had been in ESL programming for an extended time. However, none of these 12 overlapped as aspiring principals continued to identify specific ESL students for support and specific issues faced by these students. As an example, 9 aspiring principals identified reading/literacy as the

most common academic area targeted (three identified math). However, of the nine, none identified the same grade level.

The other academic issues identified for support included students in a particular grade level or course with poor academic performance (9), special education students (8), students with behavior issues (7), African American students (3), and Hispanic students (2). As with the long-term ESL students, no plans associated with these groups of students were identical when considering other categorical data points.

How Students Were Identified

Aspiring principals identified students who needed extra support by looking at a variety of data that had been collected since the beginning of the preparation program. As a cohort program, the first major assessment in the first course of the program was for students to develop a data inventory, a spreadsheet of the data points available to principals in their district/system. Students in subsequent courses were required to collect this school data and begin analyzing it. In the process of analyzing the schoolwide data, aspiring principals were also to engage their TGI team to help with this analysis. Aspiring principals were required to disaggregate data and look at intersections of data in their analysis. Through this process aspiring principals and their teams identified the students outlined in the previous section.

Through this process aspiring principals focused on one to three data pieces that would often act as both the major data for identification as well as an outcome measure of the intervention/strategy they would use to improve student outcomes. In most cases aspiring principals used state testing as a starting data point. However, none used this data point as the sole data source in identifying students. Overall, 41 aspiring principals, after analyzing a number of data sources, eventually used one data point as their final source in targeting students. The

other 36 used two to three data points. Overall 32 students used at least one standardized screening or benchmark assessment. Nineteen used state testing as one of two to three indicators for student identification. Grades (14) and behaviors (12) were additional major data points used by aspiring principals to identify targeted students. Other data used to identify the targeted students included end of course assessments (2), special education Individual Education Plans (IEPs) (2), writing samples (2), attendance (2), college placement exams (1), Response to Intervention (RTI) data, students who were transferred mid-year to other teachers (1), and students who felt they had no adult support at school (1).

Targeted Student Outcomes

The outcomes aspiring principals identified in their plans were primarily student academic outcomes, although some were associated with equity issues and socio-emotional learning. The first level coding indicated that 29 aspiring principals identified desired improvement in student academic outcomes related to English language arts (ELA), with improved math performance as the second most targeted student outcome (25). Five aspiring principals targeted improvement in student performance in science. Two aspiring principals targeted academic improvement in multiple content areas, ELA and math (1) and ELA and history (1). Four aspiring principals targeted improved academic performance through overall GPA and/or grades, while two students targeted improvement in grades and behaviors as measures of improved academic performance.

Place Table 3 here

Disaggregating these academic outcomes through analysis of the second level code chains indicated that there was a vast divergence among the outcomes aspiring principals targeted for ELA and math outcomes. For ELA outcomes, there were 6 different areas in which

aspiring principal's targeted improvement – reading comprehension (5), increased vocabulary (5), reading fluency (5), multiple literacy skills (5), phonics (4), writing (3), and two in which aspiring principals targeted the volume of texts read. Similarly, in math, aspiring principals targeted a variety of specific skill improvement including math literacy (8), math computation (6), math fluency (4), math grades (4), and numbers and operations (3).

Six aspiring principals targeted equity issues related to enrollment in advanced placement (AP) (3), gifted (2), and honors (1) courses. These aspiring principals' goals were to increase the number or percentage of minority students in these courses, noting a disproportionate number of White students in these courses. Other aspiring principals (4) focused positive changes in student socio-emotional outcomes. These included improving growth mindset, assuring students felt they had a supportive adult to turn to, students' perception of school success, and self-regulation to increase time on task.

Outcomes Strategy or Intervention

The strategy or intervention selected by aspiring principals for their TGIP required they first identify the student and issue to target by using data and then research specific strategies to address the issue faced by students. Interestingly, just under half of the aspiring principals (38) used more than one strategy or intervention to improve student outcomes, with 17 aspiring principals employing three different strategies/interventions.

As with the other categories, from a more holistic examination, initially 34 aspiring principals decided to use a similar intervention or strategy either singly or in conjunction with another intervention or strategy. This intervention or strategy was improving teacher capacity by strengthening an instructional strategy used by teachers or adding a new teaching strategy to their teaching repertoire. For 18 aspiring principals this was the only strategy or intervention used to

improve outcomes. The additional strategies/interventions used by the 16 aspiring principals that employed multiple strategies in conjunction with improving teaching were: goal setting (4), after school tutoring (4), self-regulation (3), parent engagement (3), teaching strategies (2), peer mentoring (2), and behavior rewards (1).

The teaching strategy that aspiring principals used to improve teacher capacity in route to improving student outcomes varied widely. Only two strategies were used by more than one aspiring principal, which meant there were 32 different instructional strategies teachers were engaged in learning. These two strategies were developing teacher capacity to conduct Socratic seminars and development of a specific math teaching strategy labeled Number Talks.

Beyond improving teacher capacity as the primary strategy or intervention to improve student outcomes, aspiring principals employed 11 other strategies/interventions either singularly or in conjunction with other strategies. Broadly identified, these 11 strategies/interventions were: student goal setting (13), after school remediation and support (12), adult mentoring (12), peer tutoring (9), technology assisted instruction (8), programmed instruction (7), push/in pullout remediation (4), rewards and incentives (3), teacher collaboration (3), family engagement (2), and organizational changes (1). Repeating previous patterns, there were variations within each of these broad areas. As an example, of the 13 aspiring principals who identified goal setting and self-regulation as the TGIP interventions, only three used this intervention alone. The other 10 TGIPs outlined a combination of two to three strategies or interventions. These combinations included adult mentoring and goal setting (3), an improved instructional strategy such as expressive writing and goal setting (3), after school remediation and goal setting (2), adult mentoring, peer tutoring, and goal setting (1), and teaching strategy, parent engagement, and goal setting (1).

Outcome Measures

In the code category with the most commonality, *Outcome Measures,* 52 aspiring leaders used a standardized academic screening or benchmark assessment to determine if students had met their goals for improved student outcomes. However, within this code there were 22 different assessments, the most common of which was Aimsweb©. Eighteen aspiring leaders used this standardized assessment. Yet, Aimsweb© has multiple sub-assessments in math, reading, and writing, of which 11 aspiring leaders used some type of math assessment, (fluency or math facts), 6 used a reading assessment (phonics, or fluency, or comprehension) and one used the writing sub-assessment indicating little overlap in assessments used by aspiring leaders. Star Reading was the next most common standardized assessment with six aspiring principals using this as their outcome measure again showing the diversity of student plans. All of the aspiring principals using Aimsweb© and four of the six using the Star reading assessment were planning for elementary students.

Other than standardized screening or benchmark assessments, aspiring principals used 9 additional outcome measures. These outcome measures were semester grades (8), teacher-created assessments (4), behavior indicators such as referrals to the office, absences, and tardies (3), socio-emotional assessments (3), enrollment in AP and honor classes (3), practice state tests (1), college placement exams (1), credits earned (1), and practice graduation exams. Three TGIPs included a combination of two assessments, i.e., college placement exam and grades, grades and a standardized benchmark assessment, and grades and credits earned.

One note about the category *Outcome Measures*; schools did not have access to state testing at the time aspiring principals' projects were to be completed in the Spring. State testing was thus not an option for aspiring leaders as an outcome measure. However, because some

aspiring leaders were targeting other academic and socio-emotional student outcomes, such as credits earned, behavior, grades and changes in student mindset, state testing may not have been an appropriate outcome measure for a number of TGI projects.

Mediated Outcomes

Aspiring principals were required to assess their project during implementation rather than having just one summative assessment. Most aspiring principals used the final outcome assessment as an interim or formative assessment as well. As an example, if the final goal was to raise student reading comprehension the aspiring principal planned at least one interim reading comprehension assessment. If the final goal was to increase grades, then aspiring principals with this goal most often planned to do grade checks throughout the implementation period.

In our second level coding, however, we noted plans where aspiring principals were measuring transitional outcomes related to, but not specific to, the outcome goal or measure of that goal. Aspiring principals identified necessary transitional changes that had to occur in order for their identified intervention to effectively improve student outcomes We noted 29 TGIPs that were measuring these transitional outcomes. We identified these 29 plans as using a *Mediated Outcome Measure* and added this as a sixth category. These *Mediating Outcome Measures* were either tracking an interim student behavior or how the intervention was functioning related to the final student outcome.

The most common *Mediating Outcome Measures* involved monitoring student non-academic or socio-emotional skills or perceptions. These interim measures included student reflection (2), self-regulation (2), self-confidence (2), mindset (1), goal setting (1), motivation (1), and test-taking anxiety (1). As an example, one aspiring principal followed the research indicating that promoting student self-regulated learning (SRL) improved academic performance.

The aspiring principal and leadership team included SRL and reading strategies to improve student reading comprehension. Thus, while the outcome goal was improved reading measure by a standardized reading assessment, the *Mediating Outcome Measure* was improved self-regulation monitored throughout the intervention.

Tracking teacher engagement in PLCs, student grades, and student behavioral issues were the second most common *Mediating Outcome Measures* with three instances each. One example of PLC engagement as a *Mediating Outcome Measure* involved an aspiring principal noting low student reading proficiency at one grade level, then observed that the teachers in this grade level were not using professional learning community (PLC) time effectively. The intervention required initial trainings on common reading assessments with the four first grade teacher PLC members and then interim observational assessments of how teachers in the PLC were spending their time related to these common reading comprehension assessments. Therefore, the interim assessment was how teachers were spending their PLC time. This aspiring principal developed an observational tool to assess how teachers were using PLC time as a mediating outcome measure. The three aspiring principals who employed several interim behavior checks throughout the intervention did so as a means to evaluate the implementation of various interventions that would lead to improved grades. Those checking grades as a *Mediating Outcome Measure* did so to assure students received credit from a course. The remaining 10 *Mediating Outcome Measures* were all different and ranged from numbers of families engaged in an afterschool program to perceptions of students about their peer tutors.

Discussion, Implications, and Conclusions

In this study we evaluated what aspiring principals included in their school improvement plans as part of their field experience to determine how they applied course-based learning. The

findings indicate that aspiring principals were able to apply a number of initial problem-solving skills, such as problem identification, to recognize context specific student level problems in their schools and then develop plans to address these problems. The fact that none of the 77 TGIP plans developed by aspiring principals in collaboration with a school team were the same and rarely similar suggests that these aspiring principals applied DDDM and data literacy skills as outlined by Mandich and Gummer (2013) in the development of a SIP as forwarded by Bernhardt (2018). For all but four aspiring principals from charter school contexts, each aspiring principal had access to the same assessments and databases at each school level – elementary, middle, and high school. Yet aspiring principals applied the knowledge and skills gained from course-based learning, exploring intersections of data, maneuvering through the nuanced contextual issues within each school, and identifying the students and issues to address in their SIP. In so doing, aspiring principals were better able, as outlined by Mumford *et al.* (2000), to unravel unique, contextual organizational problems contributing to aspiring leaders problem-solving capacity and their effectiveness as school leaders.

In juxtaposition to these findings Meyers and VanGronigen's (2019) research suggests practicing principals frequently engage in generic school improvement planning with limited analysis of school specific data. Meyers and VanGronigen question principals' skill and will to develop school improvement plans grounded in data and developed to do more than suffice and meet compliance requirements. Without instruction and class-based assessements of problem-sovling and DDDM skills throughout the program, we would anticipate aspiring principals' school improvement plans would be more generic. The variations in school improvement planning by the aspiring principals in this study suggests aspiring principals exercised the ability and will to use the data literacy skills associated with DDDM learned in courses to begin

developing improvement plans specific to their school needs and context. Aspiring principal's dug into layers of data in each of the six areas associated with planning – which students to target, how they would identify students, the student outcomes planned, the strategy to be used to improve student outcomes, measures to track progress, and what measures to use to evaluate the outcomes. A question for future research is whether these aspiring principals will apply their learning and continue to spend the time and energy to engage staff in deep data analysis for school improvement when they become school administrators.

The findings from this study also point to the value of program faculty engaging in detailed analysis of aspiring principal's field-based development of school improvement planning. While findings appear to confirm the value of this field-based project to student learning associated with DDDM and school improvement planning, it also points to areas of refinement for the project and program. Of concern was the percentage (72%) of aspiring principals who's plans focused on students with issues in two academic content areas, ELA and math. Although these 54 plans included intersections of data to more closely identify students that needed support, such as gender and English language learning within the two content areas, the focus on the two academic areas that are used by the state to publicly rate schools suggests leadership issues to address within the program and potential changes to the project. As an example, program faculty need to further refine curriculum to address how leadership focused on compliance rather than the wide array of student subjects and student needs may contribute to limited innovation (Abbate, 2010; Fullan, 2005) and school-based equity issues (Ross and Berger, 2009).

Alternatively, detailed analysis of aspiring principal's SIPs also provided evidence that program learning goals were attained beyond application of school improvement planning skills.

As example, a foundational program focus is the development of aspiring principals as instructional leaders, specifically principal's fundamental role in improving teacher instructional capacity (Hallinger, 2005, Robinson *et al*., 2008). The detailed analysis suggested that improving teacher instructional practices was the most widely used strategy to address student needs (44%), with the next most used intervention well behind – student goal setting (18%). The findings of this study highlight that detailed analysis of field-based projects can provide evidence for continuous leadership preparation program improvement.

Our findings are exploratory and limited to plans developed by aspiring principals in one university program in one large urban school district context. The findings that specific requirements and program structures affected the aspiring principal's SIP planning process as did the overall school context needs further investigation. How do other programs' field-based school improvement projects compare to these findings? How might variation in program curriculum and district and school contexts affect principals' school improvement planning? Future studies may consider aspiring principal interviews and focus groups to tease out more explicitly how course-based learning affected decisions about data and the process of planning improvement in their field projects. Additionally, this research is limited to examining the planning process. Not included in this study was whether these plans positively affected student outcomes when implemented. Last, this research is limited to preparation, not practice. Whether the initial problem-solving skills and improvement planning displayed in these projects will be displayed in practice needs to be the subject of future research.

With these limitations highlighted, this study is unique in detailing how aspiring principals applied course-based learning to develop school improvement plans based on school context and specific student needs. This study was the first to document the content of aspiring

principals' field-based SIPS and how skills in DDDM were applied in a SIP field-based activity. Unlike previous studies, our findings provided evidence of how specific course-content associated with school improvement planning was applied to various school contexts through detailed analysis of aspiring principals' school improvement plans. Study findings add to the sparse research connecting how principal preparation programs may impact aspiring principal learning and application of that learning through field-based projects. As such, study findings have potential implications for practice and policy. For those preparing future leaders, this study can act as a template for connecting and evaluating classroom learning in problem identification, DDDM, data literacy skills, and the application of these skills in school improvement planning through field-based projects. The findings from this study may also inform those developing and evaluating policies affecting principal preparation. This study suggests policymakers should continue pressing for integration of course-based content and field-based learning specific to school improvement to better prepare future school leaders.

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