The WERA Educational Journal

CONTENTS

Note from the Editor

This issue contains manuscripts on a range of relevant and timely educational topics, from Free and Public Education (FAPE) during a pandemic to the challenges of implementing a multi-tiered system of support through partner collaborations, from collaborative action research focused on inclusion to examining the effects of equity training on teachers. This issue concludes with a manuscript examining arts-based assessments and science learning as well as a manuscript analyzing teacher perceptions of cultural competency and academic achievement for American Indian/Alaskan Native Students. This variety of topics reflects the diverse educational research and practice efforts and initiatives taking place in our region. It is my honor to serve as WEJ editor, and I hope that you enjoy this issue!

I want to take a moment to thank the new WEJ Editorial Board: Bill Ash, Kristin Pratt, Andy Boyd, and Shannon Calderone. With the help of these dedicated individuals we were able to complete the process for manuscript submissions, reviews, and issue publication during this challenging time of a national pandemic. I would also like to thank WEJ's copyeditor, Wendy Oleson, for her meticulous work preparing manuscripts for this issue for publication.

We are seeking submissions for the Autumn 2021 issue of the *WERA Educational Journal*. The *WEJ* is a collection of academic papers, professional reports, book reviews, and other articles and summaries of general significance and interest to the Northwest education research and practitioner community.

Topics in the *WEJ* cover a wide range of areas of educational research and related disciplines. These include but are not limited to issues related to the topics listed below.

- Early childhood education
- Curriculum and instruction
- State and national standards
- Professional development
- Special populations (e.g., gifted, ELLs, students with disabilities)
- Assessments and their relationship with other variables

- Early warning indicators
- Social and emotional issues
- School and district effectiveness
- Teacher and principal evaluation
- Education finance and policy
- Educational technology
- Educational leadership

We encourage the submission of condensed versions of dissertations and theses that are reader-friendly. Papers for the Autumn 2021 issue are due June 1, 2021. For information about the *WEJ* and its submissions, see the Submission Guidelines posted on the WERA website. If you have questions about the process or about possible submissions, email smithant@uw.edu

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Free and Appropriate Public Education in a Time of Uncertainty

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With uncertainty surrounding COVID-19, many educational processes need to be addressed, including Free Appropriate Public Education (FAPE) for individuals with disabilities receiving special education services. School districts are faced with many challenges throughout the school year, but the current COVID-19 contexts provide an added element of complexity in regard to school closures as well as distance, online, and remote instruction. The purpose of this paper is to review several critical elements in the implementation of FAPE, as they pertain to schools in Washington State. Implications for practice that can better support students with and without disabilities during this time are also discussed.

The Individuals with Disabilities Education Act (IDEA) states that "all children have available to them a free appropriate public education that emphasizes special education and related services designed to meet their unique needs and prepare them for future education, employment, and independent living" (Individuals with Disabilities Education Act, 2017). The highly individualized nature of this policy has historically made a Free Appropriate Public Education (FAPE) difficult to define in concrete terms and guarantee for students with disabilities (Yell & Bateman, 2020). However, these challenges are further compounded when public schools are required to provide access to a FAPE while also modifying instructional delivery in response to the coronavirus (COVID-19) pandemic. The unprecedented spread of COVID-19 has caused leaders across the northwestern United States and around the world to enact stay-at-home orders to mitigate the spread of the virus. More specifically, in the spring of 2019-2020 school year, the Washington Office of Superintendent of Public Instruction (OSPI) mandated school closures through the end of the school year. Throughout the summer of 2020, OSPI then worked with the Washington Governor's office, legislators, and educational stakeholders to provide guidance on reopening schools for Fall 2020 that balanced public health and the mission of public education (Miller et al., 2020; May et al., 2020). In the fall of 2020, communities have experienced the reopening of Washington schools, and students throughout the state are participating in a constellation of face-to face instruction and remote learning opportunities. It has been reported that as many as 90% of the schools in some of Washington's most populated counties (e.g., King, Kitsap, Snohomish, and Pierce) are implementing online and distance learning options (Klein, 2020). Despite guidance from OSPI on how to best support students with disabilities during these times, this evolving situation raises questions about equity and access for students with disabilities. To help address these questions, the purpose of this paper is to review the current context of COVID-19 as it pertains to access to FAPE across schools in Washington State, as well as give practical solutions to educators, school leaders, and administrators supporting students with and without disabilities in times of crisis.

Situating FAPE in its National and Historic Context

When IDEA was first enacted in 1975 as Public Law 94-142, a central goal was to provide students with disabilities guaranteed access to a FAPE. Federal law has defined a FAPE as "special education and related services," which must be provided at public expense, meet the standards of the respective state educational agency, cover preschool through secondary school education, and conform to the student's individualized education program (IEP; Yell & Bateman, 2017). Original wording of Public Law 94-142 states that the IEP must meet the child's educational needs and that the child is allowed to benefit from their education; however, "meets" and "benefit" are not thoroughly defined. In 1982, the Supreme Court's decision in *Board of Education v. Rowley* brought some clarity to these ambiguous terms and set a precedent for how a FAPE is determined. The majority's decision was not accompanied by a single test that could determine adequacy of educational benefits provided to students with disabilities (Yell & Bateman, 2020). Instead, throughout their opinion, the Supreme Court presented six different definitions of FAPE which are now recognized by lower courts (e.g., Appellate Courts, Trial Courts) as six separate standards that can be used to determine educational benefit. By way of differences in the interpretation of these definitions, each of the 13 U.S. Courts of Appeals have since been provided the discretion to decide which of these standards to adopt (Marisco, 2019).

Interpreting a FAPE in the State of Washington

The state of Washington is part of the Ninth Circuit Court of Appeals, which has adopted educational benefit standards five and six of the Supreme Court's *Rowley* decision. Standard five states that "School districts must provide 'access to specialized instruction and related services which are individually designed to provide educational benefit' to students with disabilities" (Marsico, 2019, p. 36). Standard six states that "School districts must provide personalized instruction with sufficient support services to permit the child to benefit educationally from that instruction" (Marsico, 2019, p. 36). For many years, these have been the standards that determined a FAPE in the state of Washington.

Recent National Precedents for Interpreting a FAPE

In 2017, the precedent set by *Rowley* was replaced by the Supreme Court decision in *Endrew F. v. Douglas County School District.* The replacement was in the language surrounding a student making progress that is appropriate in light of the student's circumstances (Marsico, 2019; Endrew F. v. Douglas County School District, 2016). This finding includes four major components in its determination of a FAPE: "educational program, reasonably calculated, progress, and child's circumstances" (Turnbull, Turnbull, & Cooper, 2018, p. 126). The court defined "appropriate progress" as something that is standard within the IEP and that the role of

the IEP is to create a program that helps the child advance academically and functionally. The court also made the determination that every child should have the chance to meet challenging objectives. What comprises challenging objectives for an individual student is to be decided by the IEP team and replaces the previous standard of *de minimis* progress (Turnbull et al., 2018). This language is provided to support students who may not be able to achieve grade-level advancement at a similar rate to same-aged peers, ensuring that all students are still stimulated and challenged by their educational programming.

Lastly, the Supreme Courts' ruling in *Endrew F. v. Douglas County School District* case requires a school district to offer students with disabilities an educational program that helps these students "make progress in the general curriculum" (Marsico, 2019, p.48). This verbiage also explains that the school district should take into account the progress of students without disabilities and each individual's potential. Taken together, the *Rowley* and *Endrew F.* decisions provide more specific and concrete language that can help stakeholders such as educators, related service providers, and school leaders understand their educational responsibilities during a time of crisis like the COVID-19 pandemic.

Implementation of a FAPE in Times of Crisis

While issues in providing a FAPE to students with disabilities have been noted by scholars in recent years (Doebler, 2019; Zirkel 2013), prolonged school closures and the subsequent necessity for distance learning have compounded the barriers to a FAPE. Access to the Internet has proven to be an obstacle for many students and families and many services provided through IEPs are difficult to translate to online and/or distance models; it has been reported that students in some areas of Washington State went several months without services (Nadworny, 2020; Bazzazz, 2020). Recognizing that failing to provide these services is a direct violation of students' legally-binding IEPs, some schools are choosing to not offer online or distance instruction whatsoever, to avoid legal implications of serving some students—but not all (Strauss, 2020). In response to these challenges and concerns, the U.S. Department of Education has provided mixed messages to educators. Though it was decided that provisions of IDEA would not be waived during this time, the Secretary of Education has also advocated for flexibility of this law; this response was characterized by the Council of Administrators of Special Education as "confusing" (Strauss, 2020). In a supplemental fact sheet, the Department of Education states that "ensuring compliance with the IDEA, Section 504, and the ADA should not prevent any school from offering educational programs through distance instruction" (United States Department of Education, 2020, p. 1). This language is contradictory because it implies that distance instruction efforts that are noncompliant with federal law are acceptable for schools. However, an individual's IEP is a legally-binding contract that all educators and stakeholders are bound to follow. Federal law must be clear enough to protect the rights of all students, and especially vulnerable populations of students. The lack of clarity in the federal definition of a

FAPE fails to support stakeholders in maintaining compliance with federal law in times of sudden change.

At the state level, OSPI has determined that decisions regarding service provision and a FAPE must be made on a case-by-case basis. Additionally, "regardless of service setting, the district remains responsible for a free appropriate public education" (Washington Office of Superintendent of Public Instruction, 2020d). For students who did not receive a FAPE during Spring 2020 due to prolonged school closure, "recovery services" must also be determined on an individual basis (Gallo, 2020). While these considerations have helped to direct teams in their approaches to the 2020-2021 school year, the relationship between federal and state laws creates challenges for interpretation and implementation. Making decisions about complex situations at the individual level is both a logical and pragmatic approach, but this may not be a sustainable plan of action for the 165,000 students in Washington State who receive special education services (Bazzazz, 2020).

Adapting FAPE to Distance, Online and Remote Instruction

During this time of extraordinary stress for families in Washington State, there are considerations and unanswered questions regarding access to online education and service delivery for students with disabilities, as well as their parents and caretakers (Bazzazz, 2020; Williamson, Eynon & Potter, 2020). Considering the uncertainty of this evolving situation and the variety of students' needs across the state, making generalizable recommendations for stakeholders and teams can be difficult. While many special education teachers and related service providers across the nation are changing their practices in order to make distance learning accessible and meaningful for students with disabilities, gaps in resources and opportunities have been exacerbated. These gaps may include access to digital devices, internet, telehealth platforms for related service delivery, a quiet learning space, assistance or support from an adult, and transportation in the event that services can be delivered outside of the student's home – as well as access to long-term and sustainable solutions as the pandemic continues to constrain opportunities for face-to-face instructional delivery (Nadworny, 2020; Williamson et al., 2020). At the federal level, there is a need for clear language that will support educators and stakeholders in adapting FAPE to distance, online, and remote models of learning.

In the state of Washington, OSPI has recommended that school districts "consider special education needs on a case-by-case basis during the closure to address health and safety needs of students with disabilities" (Washington Office of Superintendent of Public Instruction, 2020c). During these times, it is helpful that special education needs, such as a FAPE, are determined on a case-by-case basis. What supports some students in times of crisis may not work best for all students in a particular community, and the current guidance allows for supports to be tailored for a student's benefit given their circumstances. As circumstances evolve and change, teams are

allowed to revisit what a FAPE looks like and determine how this could be changed to provide a student with opportunities equal to other children in their community. For example, during each year of a student's school career, the IEP team convenes at least once to discuss the student's progress and "level of services needed by the student in order to receive a FAPE, including the frequency, location, and duration of special education and related services" (Gallo, 2020, p. 24). With input and agreement across the team, alterations to the frequency, location, and duration of services may be made to support the student at their present levels of educational performance.

While a strength of the legal precedents surrounding a FAPE is the highly individualized nature of determining it, this also creates many logistical barriers in times of crisis. For example, it may not be feasible for schools to meet individually with teams of teachers and parents who are also bombarded by shifting responsibilities and much stress (Green, 2020). However, stakeholders should be provided with the time to discuss these questions in order to redefine what a FAPE should look like for the student and determine how this can be provided during these circumstances.

Implications for Practice

The IDEA, Section 504, and Title II of the ADA do not specifically address a situation in which elementary and secondary schools are closed for an extended period of time, generally more than 10 consecutive days, because of exceptional circumstances, such as an outbreak of a particular disease (Department of Education, March 2020). Due to a gap in literature addressing special education and related service delivery during extended school closures, we propose four guidelines that will help to alleviate educational stakeholders' concerns and guide the planning process in designing a FAPE in response to the developing circumstances impacting education in Washington State:

1. **Prioritize Needs**: It is imperative to consider how schools are supporting teachers in this work. For some students, it may be helpful to also consider and prioritize the needs of caring adults in their lives, such their parents, therapists, and service providers.
2. **Allow a Planning Grace Period**: As schools work collaboratively to plan and implement distance teaching, a "grace period" may be appropriate to allow for thoughtful planning and translation of services to a new format. With such procedures, it would be critical to inform parents and community members, perhaps through a prior written notice, detailing what instructional components can and cannot be delivered given the current constraints and circumstances.
3. **Convert Service Minutes:** Regarding services minutes, and particularly services provided in general education settings, it may be appropriate to convert service minutes to a percentage that corresponds to the amount of time the student is now expected to engage with schoolwork. This is consistent with OSPI guidance that states "students should not have reductions in IEP services…due to school reopening models or

availability of funding or staffing, but rather "changes in the child's circumstances" (Gallo, 2020, p. 24).

4. **Inform Families**: It is crucial to inform parents of their rights and help to make resources available. Resources such as those provided by the Northwest Justice Project (2020) can help parents understand choices made by schools and the rights they hold while working with the team to move forward. OSPI recommends that districts utilize prior written notice in order to notify families when decisions are made that impact educational placement and provision of a FAPE (Washington Office of Superintendent of Public Instruction 2020d).

Conclusion

Prior to the changes set in motion due to COVID-19, the question of how a FAPE is delivered equitably across schools in our country was already under scrutiny. The challenges of this moment in history highlight the disparities that continue to exist in our public systems. When students lose access to a community resource such as a school, the differences in availability of resources across communities become impossible to ignore (Green, 2020; Nadworny, 2020). While this moment exposes vulnerabilities within our systems, it also provides us with an incredible opportunity to envision how these systems can be reformed. For school administrators and leaders, the chance to listen to challenges of practice and brainstorm solutions in community schools can help our systems take steps toward correction. We embrace the dream shared by Washington Superintendent of Public Instruction, Chris Reykdal, of "using this moment to build more transformative systems for our students" (Miller et al., 2020).

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Using Mutually Beneficial University-School Partnerships to Address MTSS Implementation Barriers in Washington State

Richard Marsicano and Ashley Jantzer

School districts across Washington State continue to implement multi-tier systems of support (MTSS) with mixed results. Research has identified common implementation barriers experienced by school personnel in Washington State throughout this process. The purpose of this article is to summarize the MTSS implementation barrier research in Washington State, provide evidence as to why school psychology training programs (SPTPs) are uniquely qualified to collaborate with school districts to address these implementation concerns, and describe how SPTPs and school districts can work collaboratively to address these implementation concerns.

Washington State school districts are in the midst of transforming how educational services are delivered. The Individuals with Disabilities Education Improvement Act (IDEA, 2004) permitted school districts nationwide to use a student's response to empirically based intervention as a method of evaluating the presence or absence of a specific learning disability. In 2006, the Office of Superintendent for Public Instruction, with contributions from educational professionals from all over Washington State, released a comprehensive guidance paper on how to implement Response to Intervention (RTI) in Washington State school districts (Bergeson, 2006). Since the initial release of this guidance, the underlying core principles of RTI have been absorbed and repackaged as MTSS (the author will use the term MTSS to refer to both RTI and MTSS for the remainder of this manuscript).

MTSS is a data-based, decision-making framework used to address the academic and behavioral needs of all students (Porter, 2019). Typically, a student experiencing an academic or behavioral struggle will proceed through a structured sequence of data-based, increasing-in-intensity interventions and assessments (i.e., tiers) specifically designed to remediate their difficulties. The MTSS implementation process progresses through a series of four stages: (a) exploration, (b) installation, (c) initial implementation, and (d) full implementation (Fixsen, et al., 2005). Despite this predictable implementation progression, all schools implementing MTSS are contextually unique. As such, this implementation process can take anywhere from three to five years to complete depending upon such factors as the perceived need for change, staff knowledge of MTSS and systems change processes, and available resources (Fullan, 2007; Schrag, 1996).

In order for MTSS to be effective, all underlying core components[1] must be implemented throughout the entire school system. A system, as defined by Castillo and Curtis (2014), is, "an orderly combination of parts that interact to produce a desired outcome or product" (p. 13). From a top-down perspective every school district is a unique system focusing on producing well-educated students. Every school houses additional smaller systems including but not limited to

grade-level teams, crisis responses teams, and administration. These systems do not exist independently. Rather, each system reciprocally influences one another (Castillo & Curtis, 2014).

MTSS implementation is a "systems change initiative" due to the interconnectedness of these various systems (Averill, et al., 2011). For example, a common strategy to facilitate supplemental, tiered instruction within an MTSS framework is to rearrange the school schedule to include 20-30 minutes of built-in intervention time. This one change prompts significant discussion and planning within each system (e.g., third grade level team) and across these systems (e.g., administration working with teachers to identify whom is doing what, when, and where). Many additional necessary changes, like modifying existing criteria for SLD identification, also require considerable effort because these changes significantly affect multiple systems.

MTSS Implementation Barriers in Washington State

Across the country, schools *are* implementing MTSS. According to a large-scale MTSS effectiveness study involving 1249 schools across thirteen states (including 85 schools in Washington State), approximately 56% of randomly selected schools self-reported full implementation of MTSS for reading in grades 1-3 (Balu et al., 2015). In Washington State these 85 schools reported, on average, successful implementation of five out of eight core principles of MTSS. While implementation of five out of eight core MTSS might seem encouraging, failing to fully implement all core MTSS practices with fidelity significantly reduces the probability of improved student outcomes (Bradshaw, et al., 2010; Fixen et al., 2005). For example, of the 144 impact schools in the Balu et al. (2015) study, two out of three schools reported removing students struggling in reading from core reading instruction in order to provide "additional" targeted supplemental reading instruction.[2] This admission violates the fundamental principle of providing extra instructional support for struggling students *in addition to* core instruction. Based on this information alone, it's reasonable to conclude that two out of three schools in this sample are seeing lower rates of reading improvement when compared to the other schools providing supplemental instruction as intended. In sum, implementing MTSS with fidelity is difficult.

Working though barriers when implementing MTSS is not unique to Washington State. Research identifies significant overlap between the barriers educational professionals in Washington State experience and the barriers professionals from other states encounter (Marrs & Little, 2014; Perez, et al., 2017; Werts, et al., 2014). In 2017, Perez, Marrs, and Marsicano asked Washington State school psychologists – the primary change agents in the implementation process – to identify and discuss the barriers experienced during MTSS implementation. These individual responses, discussed below, were analyzed and grouped into three distinct overarching themes.

Lack of Resources

The first theme researchers identified consisted of barriers regarding the foundational aspects and prerequisites of MTSS Implementation. School psychologists reported a lack of resources (i.e., inadequate personnel and insufficient materials) and inadequate MTSS professional development as primary concerns. These two barriers emerge early ~~on~~ in the exploration and installation phases and can resurface throughout the entirety of the process if not adequately addressed.

Low Buy-in from School Personnel

The second theme identified consisted of barriers related to the philosophical underpinnings of MTSS implementation. School psychologists reported a lack of buy-in to the systems-change process from school personnel, including school psychologists. A low level of school personnel buy-in is a critical barrier to address because the success or failure of the systems change process is strongly correlated with school personnel's belief and involvement (Turnbull, 2002). This low level of buy-in also emerges early in the exploration and installation phases and can resurface absent remediation.

Inadequate Professional Development

The third theme reported consisted of barriers related to the maintenance of an already implemented MTSS framework. These data suggest significant consternation regarding ongoing professional development and implementation fidelity. These barriers manifest in the later stages of initial implementation and full implementation

Three conclusions can be made when interpreting the Washington State MTSS implementation data within the context of the aforementioned systems change literature. First, school psychologists in Washington State are experiencing barriers throughout the entirety of the MTSS implementation process. Second, barriers experienced during the exploration and initial phases of MTSS implementation should be addressed first to mitigate their impact during the later stages. Third, the burden of this time-consuming process is on school personnel. That ~~being~~ said, schools can enter into mutually beneficial partnerships with universities to share this responsibility of addressing these issues.

Mutually Beneficial University-School Partnerships

Mutually beneficial university program and public school partnerships have existed for decades (Sanderson, 2016). Every school year, for example, thousands of student teachers teach in real classrooms because of mutually beneficial partnerships between their university and district. Jones et al. (2016) states university-school partnerships must be formed on the foundation of a

mutual relationship. All parties should be actively and equally involved in reflective practice and maintain a commitment to share the responsibility of promoting and maintaining change within the school.

Each partnership is unique. This uniqueness notwithstanding, all successful university-school partnerships share common purpose: all parties benefit. Students are afforded opportunities to apply their classroom-based knowledge to further develop their skills. Schools benefit by hosting motivated, cost-controlled students able and willing to support the school in meeting the needs of its students. Students and faculty from SPTPs are uniquely qualified to partner with Washington State schools to address the MTSS implementation barriers reported above.

SPTPs as Ideal Partners to Address MTSS Implementation Concerns

According to the National Association of School Psychologists (NASP), school psychology is the practice of providing, "…effective services to help children and youth succeed academically, behaviorally, and emotionally" (NASP, 2010, p. 1). School psychologists can provide these services by directly working with students and/or indirectly by working with staff, teachers, and parents. School psychologists must also be capable of providing these services on the individual level and on the systems level (NASP, 2010).

School psychology students receive training in many areas directly and indirectly related to MTSS implementation, such as: systems-change theory, assessment, intervention, and program evaluation. This wide breadth of knowledge qualifies school psychologists to undertake a wide variety of responsibilities during the systems-change process, a role commonly referred to as a "change agent" (NASP, 2010). Eagle, Dowd-Eagle, Snyder, and Holtzman (2015) identify the core functions of school psychologists during MTSS implementation as training and providing ongoing support to school personnel in the core components of MTSS (e.g., assessment practices; data-based decision making), assigning school personnel their roles on MTSS teams, leading MTSS problem-solving teams, and providing initial and ongoing professional development.

SPTPs are required to provide both classroom-based instruction and experiential learning opportunities to develop this broad set of school-psychology competencies. NASP provides minimal guidance on designing all experiential learning opportunities prior to internship – referred to as practica – permitting SPTPs to work with partnering school districts to design unique, mutually beneficial experiences for all parties. These practica can focus on any aspect of school-psychology service delivery including, but not limited to, MTSS implementation.

Collaboratively Addressing MTSS Implementation Barriers in Washington State

SPTPs can partner with school districts to collaboratively address the MTSS implementation barriers identified in the literature. Washington State school psychologists reported a lack of resources, low levels of school personnel buy-in, and inadequate professional development as primary barriers affecting initial MTSS implementation (Perez, et al., 2017).

Providing Additional Resources

SPTPs can provide resources in the form of expertise, materials, and personnel to support districts implementing MTSS (Eagle, et al., 2015). These resources can be utilized to facilitate implementation efforts directly and indirectly in a variety of ways. SPTPs, for example, can directly assist schools with MTSS implementation by identifying, creating, and/or modifying MTSS materials (e.g., data tracking methods). There is an abundance of MTSS materials (e.g., training modules; assessments; progress monitoring tools; SLD identification via MTSS documents) readily available (e.g., http://www.rtinetwork.org/). SPTPs can work with school personnel to identify and use appropriate, readymade materials or team members can design/create new materials that meet the needs of the school. In addition, SPTPs can support MTSS implementation indirectly, for example, by assisting in grant writing, by providing non-MTSS school psychological services as needed (e.g., cognitive assessment; behavioral consultation) and/or by providing more broad applied experiences (e.g., academic assessment practicum) to share the burden of providing such services. Providing these indirect services would support MTSS implementation efforts by freeing up school staff to devote more time to the MTSS implementation process.

The confluence of these three factors suggest the most impactful resource SPTPs can provide Washington State schools is additional personnel (i.e., graduate students working in the schools). First, school psychologists are expected to shoulder a significant portion of the responsibility for implementing MTSS (Eagle, et al., 2015). Second, implementing MTSS is not a necessary function of a school psychologist. School psychologists can provide the required continuum of services in accordance with NASP recommendations without implementing MTSS.[3] In other words, other services take precedence over MTSS implementation. Third, there is a pervasive shortage of school psychologists across Washington State (American Association for Employment in Education, 2016).

Assessing and Increasing School Personnel MTSS Buy-in

Assessing, obtaining, then maintaining school staff buy-in to the MTSS implementation process is a foundational prerequisite of successful school-based systems change (Turnbull, 2002). Low buy-in left unaddressed will hinder later MTSS implementation efforts. Buy-in is not a static dimension of systems change. Rather, it ebbs and flows contingent on a variety of interdependent factors. Entering into a mutually beneficial university school partnership with SPTPs enables all

parties to collaborative design structured MTSS implementation experiences that both increase and assess school personnel buy-in.

How, when, and where school personnel and university personnel meet face-to-face affects buy-in. Including school personnel who are directly responsible for enacting small-scale instructional changes and/or larger, systemic changes as team members facilities buy-in and increases the likelihood processes will be implemented with fidelity (Dart et al., 2011; Turnbull, 2002). Further, meeting in a place and at a time convenient for school personnel reduces the negative impact logistical barriers (e.g., time; transportation) may have on these meetings.

School and university personnel can collaboratively identify/create needs assessments to anonymously gather school personnel perceptions of: (a) the current need for a systems change initiative, (b) experience, or lack thereof, in past systems change efforts, (c) recommendations of specific actions going forward, and (d) the strengths and weaknesses of the school's capacity to support the initiative. Assessing these perceptions early, often, and throughout the university-school partnership enables members to proactively address the source(s) of low buy-in by designing and providing targeted professional development.

Providing Targeted Professional Development

According to Averill, Rinaldi, and Collaborative (2011), "…working within the MTSS framework requires that all school district staff change the way in which they have traditionally worked" (p. 1). As such, high-quality professional development is a vital component of successful MTSS implementation efforts throughout the entirety of the process (Freeman, et al., 2015). To this end, schools can choose to take advantage of the professional development materials and resources available online (e.g., http://www.rtinetwork.org/) or they may decide to create/modify materials better aligned with their own needs.

Research has identified several keystone professional development targets linked to successful MTSS implementation. Schools should be prepared to provide professional development on: (a) addressing areas of low buy-in, (b) introducing new MTSS concepts (e.g., School-wide Positive Behavior Supports, (c) skill building (e.g., how to use data to make educational decisions), (d) identifying school personnel roles and responsibilities, (e) training new staff on an existing MTSS system, (f) examples of MTSS implementation success stories, and (g) data analysis and integration (Freeman, et al., 2015). While these areas make up the vast majority of MTSS implementation content, the appropriate quality, quantity, and focus of MTSS-oriented professional development is highly contingent on the characteristics of the school and its unique implementation process.

A partnering school may have a particular strength or concern that could help or hinder MTSS implementation, respectively. For an example, derived from the buy-in data mentioned above, a school with expertise in curriculum-based assessment may choose to forego a more traditional, prepackaged presentation for a more hands-on approach led by the in-house experts. A school with a particularly negative view of systems change because of, for another example, a previously failed educational initiative may benefit from designing unique professional development experiences and materials addressing the underlying concerns. Irrespective of the approach, coordinating and providing professional development is a time-consuming endeavor. Schools partnering with SPTPs can expect to share the burden and work collaboratively to design and provide professional development that meets the needs of the school.

Conclusion

Implementing MTSS with fidelity is a herculean task. Data suggest schools in Washington State experience MTSS implementation barriers and have not implemented MTSS fully and effectively (Balu et al., 2015; Marrs & Little, 2014; Perez, et al., 2017). These difficulties are compounded by the pervasive shortage of school psychologists across Washington State (American Association for Employment in Education, 2016). Schools and SPTPs benefit by entering into mutually beneficial partnerships to address these barriers in a collaborative, well-supported manner.

Notes

1. NASP (2016) identifies MTSS core components as using a continuum of culturally responsive and evidence-based interventions, using data-based decision making, focusing on preventative services, progress monitoring, and emphasizing family, students, and community engagement in service delivery and decision-making processes.

2. Impact schools in the Balu et al. (2015) study were schools identified by experts and leading educational researchers as examples of full RTI implementation. These identified schools were then evaluated over a two-year period – including site visits – by researchers to determine impact sample eligibility. However, many impact schools were found to provide supplemental reading interventions that both met this study's eligibility criteria and violated the axiom of providing supplemental reading instruction *in addition to* and not *instead of* core instruction.

3. According to NASP (2010), "school psychologists [must] work collaboratively with other school personnel to create and maintain a multitiered continuum of services to support all students' attainment of academic, social, emotional, and behavioral goals" (p. 6). A school psychologist providing services within a MTSS framework would meet this expectation. However, because NASP does not explicitly require these services to be providing *within a MTSS framework*, a school psychologist could technically meet this expectation by providing or

supporting the most basic of differentiated services.

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Creating Inclusive Classrooms through Collaborative Action Research with Professional Growth Plans

Kathryn Picanco and Cyndi Caniglia

A Professional Growth Plan is a method of professional development for educators encouraged by the Washington State Professional Educator Standards Board (PESB) to implement action research in schools while also earning clock hours towards certification renewal. A survey administered to participants of a Professional Learning Grant from PESB indicated this form of professional development is beneficial to educators across roles and is preferred to be completed in a Professional Learning Community.

It is critical that all educators are prepared to implement inclusive practices in order to address the complexities of classrooms today. Meaningful professional development for a school community can be a challenge to find, especially when looking at the diverse roles and requisites that must be considered. Washington State's Professional Educator Standards Board (PESB) offers the Professional Growth Plan (PGP) for all educators as a viable option for a personalized approach to professional development. A PGP consists of four steps: 1) A self-assessment and goal selection based on educator-certification standards specific to their role and context; 2) A professional growth action plan that specifies how the identified goals will be met; 3) Identification of the evidence collected and reflection on the plan's outcomes; and 4) Review of the process as a whole and how it contributed to the educator's professional growth. For the completion of a PGP, educators are awarded 25 clock hours towards certification renewal requirements at no cost.

The PGP process engages educators in action research and guided reflection to make informed changes that improve teaching and learning (Johnson, 2008; Vaughan & Burnaford, 2016). It also enhances professional judgement using evidence-based inclusive practices within one's school or classroom (Hong & Lawrence, 2011). Professional Learning Communities (PLC) are a model of shared inquiry used to acquire a greater understanding of issues through discussion and reflection in a collaborative setting (Darling-Hammond et al., 2017). Completing a PGP within a PLC provides opportunities for collaboration and deeper reflection on practice.

To build awareness of PGPs, PESB awarded Professional Learning Grants during the 2019-2020 academic year for educational agencies to create PLCs for their completion. Grantees built in elements including opportunities to elevate educator leadership, sustained culturally responsive teaching and learning practices, the integration of district and building initiatives, and consideration of educator experience to support the PLC and PGP process (Johnson et al., 2019). The structure of the grant provided a strong foundation of support for the participants and

demonstrated how a PGP can be systematically integrated into a school community and educator's practices to improve student outcomes.

Project Overview

Whitworth University was awarded a Professional Learning Grant to work with two Title One elementary schools located in urban neighborhoods. The focus of the PLC was on collaboration across roles, which included teachers, educational staff associates (ESA), and paraeducators (Johnson et al., 2019). The content focus for the PLCs was inclusive methods utilizing evidence-based High Leverage Practices (McKleskey et al., 2018). The participants attended a half-day training focused on the PGP process and an overview of inclusion and inclusive practices. All participants completed a self-assessment created by PESB and aligned with certification standards specific to their role (administrator, teacher, paraeducator, ESA) to determine a goal for their individual PGP. Some participants established areas of common focus and worked collaboratively on goals. Each site created a PLC meeting schedule to share and discuss learning related to the common text focused on inclusive practices, *High Leverage Practices for Inclusive Classrooms* (McKleskey et al., 2018), and to work on their PGPs and share progress. Participants collaborated with university facilitators on writing and implementing their PGPs throughout the grant period. In order to continue their plans and data collection, educators modified their plans as necessary when school closures due to COVID-19 restrictions took effect. At the conclusion of the four-month time period allotted for completion of the PGPs, each participant submitted their completed PGPs to the lead facilitator and filled out an exit survey administered by PESB.

Participants

There were 24 participants who volunteered to be in PLCs across sites; 14 at School One and ten at School Two. Additionally, two university faculty members assisted with the facilitation of each PLC. Eleven classroom teachers, three special education teachers, one Learning Assistance Program teacher, five paraeducators, one speech–language pathologist, one English Language Development teacher, one math coach, and one Library Information Technology specialist chose to participate between the two school sites. Participant years of experience included 43% with five or fewer years, 19% with 6-10 years, and 38% with 11 or more years. Fourteen percent held National Board Certification.

Methods

Survey Instrument

The 22 question exit survey administered by PESB consisted of a combination of demographic information, Likert scale questions about participant familiarity with the PGP process, and open-

ended responses related to specific aspects of the PGP and PLCs that were beneficial or challenging. The purpose of the survey and analysis was to determine what makes the PGP process beneficial to educators as well as what challenges are faced during the process. Open-ended questions were analyzed with qualitative methods to identify common themes and determine trends. The other results were reported based upon the percentage of respondents for each response selected. Twenty-one participants completed the survey.

Results

Value of Goal Setting

The self-assessment process was instrumental for the participants in goal selection. Participants found the role-based self-assessment helped identify areas for growth to establish and refine their PGP goal. Collaboration with colleagues helped individuals clarify goal selection.

Value of the PGP Template

Participants found the template to be very helpful in completing the PGP process. While most stated the entire template was useful to provide a clear structure, the specific steps of naming the intended outcome to establish learning targets and provide reflection on what they learned were noted as especially beneficial to the process. The most challenging aspects of the template included creating a goal for the plan and identifying the evidence necessary to determine progress toward meeting the goals.

Value of the PLC

The PLC format was well valued by the participants. The collaborative support system it provided to individuals to create and carry out their plans, as well as the diverse perspectives across roles provided in doing so, were identified as the main benefits. The shared text, which provided a common language and set of strategies to focus on, was also helpful to participants. Challenges included having a common time to meet and finding ways to collaborate when PGP goals differed. Participants were asked their format preference if they were to complete a PGP in future. Five percent stated they would complete it independently, 85% with a PLC, and 10% had no preference.

Discussion and Implications

The survey results reflect the collective experience of the two schools participating and are not generalized to a singular experience. While the overall focus of each PLC was the same, each site conducted their PLC to meet their school's needs for meeting and collaboration time.

Additionally, COVID-19 school closures resulted in the modification of some participant's studies. Despite these limitations, the survey results indicated that participants found the overall process of completing a PGP with a PLC beneficial to their practice and a valuable learning experience.

The action research process embedded in the PGP led to informed decision making for educators and an opportunity to reflect on their practice that was transformative. Reflective practices on their own can lead to needed change but are more powerful when done with colleagues to gather diverse perspectives on an issue. Collaboration with colleagues across roles was instrumental to each step of the process. There was great value in considering different points of view to analyze a problem and to create a solution, as well as to develop a shared understanding across perspectives. Additionally, the support system the PLC provided ensured participants persevered to complete plans despite experiencing challenges along the way.

The PGP process was meaningful to participants across the range of roles and levels of teaching experience. While the majority of the participants had less than ten years' experience, over a third held eleven or more. This offers a counter-narrative to stereotypes that veteran teachers are not as focused on professional development and learning new strategies as younger peers starting out in the profession. The personalized nature of the PLC, as well as the robust action research structure, offered a challenging and personally rewarding opportunity for professional growth for all.

The PGP is a valuable professional development tool that can be individualized to educator roles and contexts to enhance classroom instruction and build a stronger educational community. Goal selection for the plans based on certification requirements and areas for growth in an educator's practice illustrates for educators the power an individual has to make changes to their context in order to improve teaching and learning. In addition, the PGP links the process to professional requirements, providing a stronger connection to broader initiatives and a sense of personal ownership in them. The PGP process may yield the most benefit when educators are able to complete a PGP in a PLC or with a group of colleagues for support, to hear and understand perspectives across roles, and to gain a deeper understanding of one's practice through collaborative reflection. PLCs that involve a range of experience and roles provide opportunities for mentorship and peer coaching that are not embedded in other professional development models. This type of collaboration can be encouraged to provide the kind of ongoing support of the implementation of inclusive practices that is often necessary for long-term success. Overall, it is evident the PGP is a professional growth opportunity that will empower educators and positively impact the lives of students.

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Changing Teachers' Beliefs About Equity: Measuring the Long-Term Effects of Equity Trainings

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A meta-analysis of 178 studies revealed that long-term measurements of equity trainings are rare (Bezrukova et al., 2012). The purpose of this exploratory study was to investigate the effects of teachers' four-year participation in equity training focused on culturally relevant pedagogy. An equity survey measured changes in teacher beliefs, attitudes, and practices across four years, revealing the equity trainings impacted teacher attitudes (i.e., placing a value in diversity) and teachers' day-to-day practices (i.e., evaluating curriculum for cultural relevance). These results contribute to the field of education because equitable teacher attitudes and practices can result in higher student achievement (Koth et al., 2008).

Schools that focus on diversity and equity positively impact school climate and student performance because school climate and race relations go hand-in-hand (Booker, 2006; Koth et al., 2008). Culturally Relevant Pedagogy (CRP) (Gay, 2010; Sleeter, 2011) is a key component of building school climate and achieving these positive race relations. Ladson-Billings first introduced the concept in 1995, shedding ~~the~~ light on the action of *teacher pedagogy* into the discussion on equity. The successful use of CRP requires teachers to possess: (a) awareness of self; (b) acknowledgement of the broader context of the school's community; (c) equity-focused attitudes; and (d) abilities and expertise surrounding issues of culture (Applin, 2008, p. 19). Teachers who utilize culturally responsive instruction focus on individualizing student learning needs by providing diverse methods of instruction, emphasizing cooperative learning, and understanding the cultural nuances of others, particularly when they are different from those of the teacher (Gay, 2000, 2010). The effects of CRP in schools include positive impacts on students of color and strengthened student-teacher relationships (Sleeter, 2011).

CRP is a "developmental process that involves learning over time" (Gay, 2013, p. 57), requiring in-depth professional learning and reflection and continued negotiation of the vision (Gay, 2000). It is imperative that school districts committed to moving the dial on diversity and equity provide and emphasize participation in these opportunities for professional learning. Research on equity trainings in general, including those that emphasize CRP, indicate that trainings help facilitate positive intergroup interactions by reducing prejudice and discrimination (Pendry et al., 2007). Equity trainings promote dialogue aimed to bridge differences between diverse groups by asking participants to share stories about their diverse experiences working in school systems (Sue et al., 2009). Such trainings have also been shown to positively impact participants' attitudes, behaviors, and practices surrounding diversity. However, most studies that investigate the impacts of equity-focused trainings focus solely on analyzing short-term effects. Bezrukova, Jehn, and Spell (2012) performed a meta-analysis of 178 studies pertaining to equity trainings.

While the authors found clear short-term benefits from equity trainings, results from the meta-analysis showed that long-term measurements of the effects from diversity training were rare (Bezrukova et al., 2012).

More research is needed to determine whether district-mandated equity trainings actually produce the long-term results that they purport to provide. Therefore, the purpose of this study was to fill this gap in the literature by investigating the impact of participating in multiple equity trainings over a four-year time period on teachers' culturally relevant attitudes, beliefs, and practices. The analysis of survey data during this time frame provided insight into whether a continuous, longer-term equity training program impacted more substantial changes in participants than more common, short-term trainings (Bezrukova, Jehn, & Spell, 2012).

The specific research questions we aimed to answer in this study related to better understanding the impact of one district's equity training program, TEACH, by utilizing Applin's (2008) culturally responsive teaching framework: To what extent has participating in TEACH trainings impacted (a) teachers' awareness of self; (b) teachers' acknowledgement of the broader context of the school's community; (c) teachers' equity-focused attitudes, and (d) teachers' abilities and expertise surrounding issues of culture.

Methods

This longitudinal mixed methods study utilized a natural comparison approach that arose due to the financial and logistical constraints necessitating different implementation timelines in the participating schools. In other words, some schools received and implemented equity-based strategies from equity trainings before other schools. An equity-based climate survey was administered to all teachers after each year of implementation of the equity trainings. The goal of this survey was to help teachers identify and engage with current socio-cultural issues affecting their school communities.

TEACH Equity Trainings Received by Participants

The specific equity trainings used in this study were developed by the district; for the purposes of this research, and to protect the identity of this specific district, it will be called TEACH. The TEACH trainings were coordinated, in-depth efforts that occurred both across schools during full-days in more traditional 'sit-and-get' formats of professional learning, as well as school-specific activities across shared planning and embedded learning hours throughout the school year. These trainings began as introductory courses in the first years of implementation for each school (i.e., focusing on awareness of self and self-reflection on culture) and advanced into more in-depth courses over time. The overarching goal of TEACH was to help teachers improve planning, teaching, monitoring, and adjusting lessons using culturally responsive pedagogy. During the trainings, sample actions included developing a portfolio in which teachers selected a focal group of students with an ethnicity other than their own, actively reflecting on their own understanding of race and how these views affect diverse ethnic groups of students in the classroom through their teaching, and creating lessons with focal students explicitly in mind. The

trainings were developed utilizing Critical Race Theory (Delgado & Stefancic, 2012) and key research surrounding culturally responsive pedagogy (i.e., Gay, 2000; Ladson-Billings, 1995).

The equity-focused TEACH trainings utilized novel approaches to investigating historical inequities that have shaped public institutions, including schools involved in the TEACH trainings. Educators were encouraged to utilize the conceptual lens of Critical Race Theory in order to better understand the experiences of students of color, the historical legacy of racism, and the impacts of racial inequality in education (Delgado & Stefancic, 2001). The trainings highlighted the effects of institutional racism (e.g., oppression of students of color associated with cultural norms) and its impact on students (e.g., students' perceptions of the school and their self-identity). The trainings emphasized how the school environment should facilitate learning and affirm the lived experience of students of color within the classrooms (Delgado & Stefancic, 2001). Both Critical Race Theory and CRP can be used as a framework for analyzing education systems that marginalize students by a variety of categories, including race, gender, sexual identity, language, ability, and academic achievement. It is therefore beneficial for all teachers, regardless of background, to learn the primary tenets of CRP.

Participants

All teachers in the district were invited to participate in an equity climate survey three times over a period of four years, and more than 500 teachers participated in the survey each year. Because the survey was completely anonymous to entice teachers' honesty, it is unknown to what extent the respondents were the same from year-to-year. Carver-Thomas and Darling-Hammond (2017) estimate 8% of teachers turnover each year and 8% change schools. These likely changes, coupled with the response rate (40%), indicate there was likely increased variety in who took the survey from year-to-year, which is a limitation of this study.

It does appear, however, that those who completed the survey well represented the district teachers in terms of grade level taught (i.e., all levels K-12 were well represented), race (about 25% of the teacher respondents were teachers of color), full-time equivalent (FTE; 80% of the respondents taught full-time, while the other 20% varied from 0.25 to 0.88 FTE), and gender (74% of the respondents were female).

These data were then coordinated with implementation-level data of TEACH to disaggregate data by levels of implementation. Implementation was determined by the district expert trainers at the school level, based on both implementation quality and quantity of trainings received. Trainers, for example, rated the extent that the school had an equity team and if it was fully-functioning or not, and the extent to which the school had teachers going through the TEACH trainings, whether this was at a team level or a school-wide level. Teacher respondents were primarily categorized as implementing TEACH at an 'emerging' or 'partial' level, with 16% of teachers not having implemented TEACH at all at the conclusion of the four years, 36% had emerging implementation, 38% had partial implementation, and 9% had full implementation of the TEACH program.

Equity Climate Survey

The equity survey was completed by teachers after each year of equity training implementation. This was a district-developed survey, utilizing an iterative process of piloting and revising over several years, and based on prior works by both other school districts (i.e., Colorado, Springfield) and Mason's (1995) Cultural Competence Self-Assessment Questionnaire. The survey included over 30 items, including demographic items such as respondents' gender and race/ethnicity, as well as items such as respondents' perceptions of their school's views and practices towards equity. Besides the iterative process of development and pilot testing, reliability and validity of the survey evidence included confirmatory factor analyses revealing nine interrelated factors measured by the survey and Cronbach's alpha internal consistency measures, all of which were above .80.

Due to the nature of continually revising the survey to both improve it and meet the specific changing needs of the district, many of the survey items changed from year to year based on implementation concerns and a desire to capture specific knowledge needed to be used formatively by the district at that time, while other survey questions remained consistent across the four years. The consistent items that were hypothesized to demonstrate changes in educator perceptions regarding equity and equitable practices and beliefs in response to the TEACH equity training were analyzed in this specific study. These included such items as, *My school expects culturally responsive lessons to be embedded in day-to-day teaching,* and *My school is mindful of the impact of race and ethnicity in education.* Participants rated these items on a 1 (Strongly Disagree) to 6 (Strongly Agree) scale with no neutral middle response choice.

Data Analysis

The equity survey contained a variety of question formats (e.g., scale and open-ended); therefore, several methods of analyses were used to generate the findings provided within this report. Descriptive statistics and chi-square analyses were used to analyze differences by implementation status in percent agreement for the scale items. Deductive coding using Applin's (2008) framework was used to analyze the open-ended questions (Miles & Huberman, 1994). To increase trustworthiness, the data were double coded by two researchers.

Results

Several key themes arose through analysis of both the scale and the open-ended items, which were coded into Applin's (2008) framework.

Awareness of Self

The first culturally responsive teaching criteria in Applin's (2008) framework is that teachers must understand their own identity, with the ability to reflect on their own backgrounds and cultures (Applin, 2008). In this study, the majority of all survey participants seemed to understand the importance of identity, regardless of the stage of TEACH implementation within each year (e.g., none, emerging, partial, or full). For example, 99% of respondents across all four implementation groups agreed with the item, *I have the responsibility to learn about the different*

racial/ethnic groups who make up my school across all three time points. Female teachers rated this item statistically higher than male teachers ($p < .05$). However, there is some evidence that participating in TEACH impacted awareness of self, as there was a statistically significant ($p < .05$) relationship between the length of time teachers had implemented TEACH practices and higher percentages of responding *agree* with *It is important to analyze your own racial background and how it affects your students*. Increases in awareness of self were also described in the qualitative comments: TEACH participants described how the trainings helped them "learn to become more aware of cultural diversity" and "became [*sic*] more aware of the impact of race through the equity trainings."

Acknowledgement of the Broader Context of the School's Community

The second culturally responsive teaching criteria in Applin's (2008) framework is that teachers must understand the larger contexts of discrimination and racist practices. It appears that those whose schools were implementing TEACH at higher levels, also felt statistically more strongly ($p < .05$) about their school's level of commitment to equity. For example, in the year 2016, on the item *My school expects culturally responsive lessons to be embedded in day-to-day teaching*, 70% of participants with no implementation of TEACH agreed with the item, whereas 91% of participants who had full implementation of TEACH agreed with that item. Across time, the percentages of teachers who agreed with this same item decreased from 77% in 2013 for those not implementing TEACH at all to 70% in 2016, while the percentages of teachers who agreed with this item increased from 85% for full implementers in 2013 to 91% in 2016. It is important to note, however, that Black teachers responded statistically less positively on this item than White teachers ($p < .05$).

Similarly, teachers were more likely to agree with the item, *Our district has placed a high priority on closing the racial achievement gap,* with any amount of participation in TEACH (i.e., those with emerging, partial, and full implementations of TEACH all rated this item significantly higher ($p < .05$) than those with no implementation). TEACH participants also described their learning regarding the school context in the open-ended comments. For example, one participant described how she is "more aware and sensitive to race as a factor at school for success" following participating in TEACH, while another described "rich discussions [with other teachers] about race and ethnicity in education" that have been "mind-opening."

Equity-Focused Attitudes

The third culturally responsive teaching criteria in Applin's (2008) framework is that teachers must possess attitudes of care, empathy, and be social justice-oriented. In other words, attitudes towards actions must come before the actions themselves. This study found that all participants, regardless of the extent of equity trainings received, reported a value in creating equitable classroom environments. There was a statistically significant impact of TEACH ($p < .05$), however, on those who responded *agree* with *Reviewing class curriculum and materials for cultural relevance according to your class demographics is important and promotes success for students*.

Abilities and Expertise Surrounding Issues of Culture

Fourth and finally, teachers must take action; they must possess abilities to support students academically through culturally specific classroom management practices, content, curriculum, and strategies (Applin, 2008). It seems that nearly all teachers, regardless of implementation group, at all three time points reported evaluating curriculum and materials with an equity lens. These numbers increased slightly over time, from 93% agreeing in the first year to 95% agreeing in the final year, with the item, *To inform my instructional practice, I evaluate curriculum and materials for cultural relevance*. In terms of the impacts of TEACH specifically, more than 90% of teachers agreed that the TEACH trainings had made their day-to-day interactions, their interactions with students' families, *and* their interactions with staff, *more* culturally responsive.

Discussion

This study sought to fill a gap in research regarding the long-term effects of equity training on participants' beliefs, attitudes, and practices (Bezrukova et al., 2012). This study reveals small glimpses into the ways in which culturally responsive instruction in the district have shifted over time. This growth was apparent across all four of Applin's (2008) categories, including awareness of self, acknowledgement of the broader context of the school's community, equity-focused attitudes, and abilities and expertise surrounding issues of culture. Differences in ratings of key survey items, albeit small, appeared both by varied TEACH implementation level and year-over-year changes as the TEACH initiative rolled out.

This study was, however, not without limitations. While direct observations of schools occurred to determine implementation level by two observers, this study is largely based on self-report by teachers, and it is unknown if their ratings of their culturally responsiveness are exhibited as highly in actions in the classroom. Follow-up interviews with teachers and observations of teaching would greatly increase the trustworthiness of these findings.

This exploratory study does, however, provide the field with valuable information regarding relationships between organizational-level views and workers' (i.e., in this case, teachers') views within the organization. This study revealed the teachers' beliefs reflected the district leaders' emphasis on equity; there was a positive relationship between participating in the TEACH equity trainings long-term and impactful teacher results, which, as reflected in other research (Sleeter, 2011), could lead to positive effects on students. Thus, school districts that seek to have their schools and teachers accept and promote diversity should consider demonstrating that the district places value on diversity and equity by implementing extended professional development initiatives (Pendry et al., 2007).

Furthermore, long-term equity training can have sustained effects on participants: the results in this study were the strongest for those teachers who had received the most equity training over the longest period of time. As one full implementer described: "The equity training has opened my eyes to this problem and made me more sensitive to my own cultural biases." This finding relates to prior research from Guskey and Yoon (2009), who found that effective professional learning required over 30 hours of contact time, including both structured sessions and sustained follow-up. Furthermore, Joyce and Showers (2002) found that teacher mastery of a task required

20 repetitions, meaning that just learning a task in a one-time professional development session will not lead to a change in practice. However, more research is needed to determine further implications of these types of trainings, such as which equity programs are most effective, whether the results carry over from school to school as participants transfer locations, and if the teacher responses to items are truly represented in their instruction. This research provides data to support the implementation of and relationship between equity trainings focused on CRP as contributors of change for teachers' attitudes and beliefs as they align with equitable practices.

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Assessing Science Learning and Systems Thinking Through Arts

Robert W. Danielson, Elizabeth Grace, Alison J. White, Molly L. Kelton, AnaMaria Diaz Martinez, Michaela Fallon, Jeb P. Owen, & Patricia Butterfield

We present two interventions aimed at promoting science learning. We utilize arts-based assessments alongside traditional measures to examine systems thinking. Taking place in rural communities in Washington State and focusing on students in third through fifth grades, our results indicate that arts-based assessment in STEM can support demonstration of systems thinking about socio-scientific issues. We conclude by illustrating the viability of arts-based approaches for assessment and how these methods can complement and extend more traditional measures of learning in and out of the classroom.

Engagement with socio-scientific issues (e.g., public health crises or global climate change) requires an equitably educated and scientifically literate citizenry. Often the approach to support students in becoming educated, democratic citizens involves an emphasis on STEM (science, technology, engineering, and mathematics) learning. While the definition and goals of STEM education are still debated, descriptions commonly include the integration of at least two STEM disciplines to encourage interdisciplinary thinking, cross-disciplinary recognition, and application of STEM concepts to real-world contexts (Bybee, 2010; Honey, et al., 2014; Vasquez, 2014). Many STEM educators focus on educating *all* students – particularly those who have been historically excluded from science – to respond to and communicate about socio-scientific issues (Treagust & Tsui, 2014). However, STEM education's culture and traditional practices can still be exclusionary (Calabrese Barton & Tan, 2018).

To achieve STEM literacy for all, some scholars suggest integrating art into STEM education, creating STEAM (Allina, 2018; Lima & Timm-Bottos, 2018). By infusing art, STEAM education can allow space for students to creatively apply a wide range of experiences from their home, community, and history to make sense of STEAM content and practices as they relate to their local contexts and lives (Calabrese Barton & Tan, 2018). Through this coupling of arts and STEM, new understandings transcending either discipline are possible (Peppler & Wohlwend, 2017). Designing experiences that incorporate art may also increase relevance and accessibility and challenge the traditional culture around STEM, which commonly excludes youth of color and youth from low-income communities (Peppler & Wohlwend, 2017; Calabrese Barton & Tan, 2018). Additionally, incorporating historical, communal, and personal experiences may prompt students to engage in systems thinking.

Systems are a major conceptual theme running through the STEAM disciplines (American Association for the Advancement of Science, 1993) and can be a context for students to attend to the wide range of experiences they bring to learning. **Systems thinking** is now emphasized in the Next Generation Science Standards and includes reasoning about complex phenomena by attending to multiple components across scales and the relationships among them (e.g., the relationship among mosquito morphology, climatic conditions, and risk of mosquito-borne illness). We propose that emphasizing systems in a STEAM education context can bridge students' lived experiences and the goal of engaging students in socio-scientific issues. The

programs described below consider the affordances of STEAM education to increase equity and the core concept of systems thinking.

Considering the equity- and systems-oriented principles in the design of these programs, we take this one step further to suggest the integration of art into STEAM *assessment* to evaluate systems thinking equitably. In their discussion of drawing instruction in science, Ainsworth, Prain, and Tytler (2011) suggest five reasons for integrating art: 1) to enhance engagement, 2) to learn to represent in science, 3) to reason in science, 4) to utilize as a learning strategy, and 5) to communicate. Creating a drawing *assessment* allows students to explore content differently as they engage with this medium – not only are they *creating* and *communicating* their understanding of these science constructs, they are also communicating in a language of their own creation through the lens of their lived experience. Students can represent knowledge *as they understand it* and as it relates to the contexts of their lives. This can be especially powerful for expressing complex emotions or experiences. Arts-based assessments can also help students build their own knowledge. Drawing, for example, can serve as a metacognitive queue by illustrating gaps in knowledge. A student tasked with drawing an anatomically correct mosquito may realize they do not know how many appendages or body segments the mosquito has – prompting them to re-learn the material. Likewise, the same gaps are made visible to educators who can then alter their approach to target these gaps (e.g., reviewing appendages). Finally, student illustrations of mosquitoes with two eyes (like a human) could be an excellent jumping-off point for engaging class discussions (How are mosquitos' compound eyes similar and different compared with human eyes?). STEAM assessment allows students to interact with and create multiple models of their understanding of complex ideas in a concrete way.

Just as a focus on STEM learning and practices that exclude other disciplines, such as the arts and humanities (e.g., Peppler & Wohlwend, 2017), may create a dichotomy where students feel they must choose *between* the arts or the sciences, STEAM learning and practices that exclude art-based assessment may also reinforce this false dichotomy by assessing *either* artistic or scientific approaches. In addition, the exclusion of art-based assessments in STEAM learning may stifle students' creativity, limit their ability to communicate systems-level thinking and fail to equitably engage all students in fully communicating their knowledge, especially those who are uncomfortable or impeded by more traditional assessments methods.

The purpose of this study is to contrast multiple ways of assessing systems thinking to illustrate the viability of arts-based approaches for assessment. We also examine how arts-based assessment can extend more traditional measures of learning.

Methods

Our broader project, Health-Education through Arts-Based Learning (HEAL), leverages the use of multiple art modalities to engage rural Hispanic/Latinx youth in exploring complex scientific systems related to human health. The overall goal of this collaborative effort among university researchers, community organizations, local educators, and experts in science and science communication is to:

- build biomedical science interest and understanding among youth and their communities,
- address disparities among rural Hispanic/Latinx youth in STEM education,

- increase rural STEAM education capacity, both formal and informal, and
- ultimately increase rural Hispanic/Latinx representation in biomedical fields.

Our team of interdisciplinary scholars created two STEAM programs, *Buzzing for Blood* and *Zoom,* through iterative design, piloting, and evaluation. Programming engaged rural Hispanic/Latinx elementary students in scientific investigation and studio activities to blend scientific and artistic understanding utilizing scientific illustration, cartography, photography, sculpture, comic book narratives, and infographics. Both interventions are detailed below (for more information, please see https://heal.coe.wsu.edu/).

Buzzing for Blood

This program took place in two rural communities in Washington State in the fall and winter of 2018. Focusing on the biology and ecology of mosquitoes and related zoonotic diseases (particularly West Nile Virus), *Buzzing for Blood* was implemented as an afterschool program, where students attended two 90-minute sessions a week for six weeks (18 total hours). This program culminated with youth art exhibitions in which students shared their artwork (i.e., scientific illustration, photography, cartographic art, and infographics) with families and community members. Intended outcomes included students' understanding of mosquito life cycles and morphology, mosquito habitats in their communities, and the effects of environmental, social, and economic influences on mosquito systems.

Zoom!

This program took place in a third rural community in Washington State during the summer of 2019. Focusing on the concept of scale and exploring the biology and ecology of microbes, *Zoom!* was implemented as a summer day-camp where students attended four consecutive days of programming (18 total hours). Like *Buzzing for Blood, Zoom!* also culminated in youth art exhibitions in which students shared their STEM-related artwork (i.e., scientific illustration, sculpture, comic book narratives, and infographics) with their families and community members. Intended outcomes included students' understanding the ubiquity of microbes and the microbiome community, the phenomenon of getting sick, and recognizing that not all microbes are "bad."

Data Sources

Three separate measures are reported – a traditional true/false questionnaire, a moderately open-ended image selection task, and open student art activities. We discuss these measures in order of increasing complexity (from most traditional/simple to the most open/complex) rather than programmatically.

True/False Questionnaire

This 20-item instrument was designed by the team and validated by the content expert to measure students' understanding of microbes and disease systems. True/False assessments are both easy for educators to create (they don't require multiple "wrong" answers) and easy for students to complete (students decide if a statement is true or not - they don't have to write a paragraph or parse whether one option is more true than another). Yet this approach can still

provide valuable feedback about a student's understanding of deeper concepts. For example, items in this questionnaire include: "if you drop some chips on the floor, but pick them up really quick[ly], microbes won't have time to get on them" (a common misconception, which is false), and "microbes can protect me from getting sick" (which can seem counterintuitive to many students, but is true). The entire questionnaire, including the directions, was 341 words in length and indicated a Flesch Reading Ease score of 91.8 and a Flesch/Kincaid Grade Level of 3.2. The questionnaire was translated into Spanish by a bilingual educator. Students were presented with both English and Spanish questionnaires simultaneously and completed whichever version they preferred. This questionnaire was only used in *Zoom!* and was administered at the beginning and the end of the program. For this assessment, an increase in the number of correct responses may indicate an expanded conceptual understanding.

Image Selection Task

While the content and procedure of the selection task varied by program, the underlying mechanisms were similar. Students were presented with a series of photographs (printed from the internet) and selected and grouped these photographs according to their understanding of related concepts. In *Buzzing for Blood*, students were presented with a total of 36 photographs. These images included flowers, trees, money, a pool of stagnant water, medical personnel, an ambulance, a bird, a horse, a human, a human finger with a drop of blood, a depiction of the four seasons, a cityscape at night, and others. Students were asked to select those they believed pertained to mosquitoes and health by circling the related images and writing explanations of their selections. This assessment was administered at the beginning and the end of the program, with writing support provided as needed via verbatim dictation. A student might initially select the finger with the drop of blood, the human, and the stagnant water image (where mosquitoes live). At the end of the program, the student might also select the bird and horse (more sources of blood), the flowers (source of nectar; food for mosquitoes), the medical personnel or ambulance (mosquitoes can make you sick), and money (an indirect consequence of disease). This example would suggest an emerging systems view of how these concepts are related and how this student's understanding has expanded over the course of the program.

Student Art

Throughout both STEAM programs, students produced a wide array of scientific artwork across various modalities – scientific illustration, photography, cartographic art, infographics, sculpture, and narrative. This included artwork produced throughout the sessions as well as capstone pieces created for culminating community art shows. Additionally, in some cases, we included scientific drawing assessments as part of a one-on-one interview protocol. In some cases, student art was examined in collaboration with its student creators, offering students opportunities to clarify and expand on their intended meanings; in other cases, it was not feasible to do so.

Results and Discussion

We begin this section with the results of our more traditional measures. We then examine the viability of arts-based assessment. Finally, we discuss how arts-based assessment can extend more traditional measures of learning.

Our 20-item True/False questionnaire indicated that, on average, students learned a significant amount about the topics (from an average of 60% correct to 80% correct, t (16) = 5.28, p < .05). This indicates that, on average, over the course of the *Zoom!* program student knowledge changed to incorporate more correct statements. This measure is an easy way to assess whether students recognize the foundational parts of a system, but it does not allow us to see *how* students connect these ideas (if they do so at all). One way to illustrate these connections would be to provide students with these parts and ask them to assemble them. Our image selection task was designed with this in mind.

Examining our results from the image selection task, we see that students' thinking around mosquitoes and disease systems expanded after completion of *Buzzing for Blood*. The average number of images selected per student (out of 36) increased between the pre-assessment (5.82) and the post-assessment (20.14). A greater selection of images pertaining to mosquitoes indicates that students were attending to an increased number of elements and their relatedness to mosquitoes after the intervention. This simple measure of volume additionally suggests an increase in recognition of multiple interacting causal forces influencing mosquito systems.

Expanding from the true/false questionnaire, students indicated which pictures were related to one another (by selecting them) and *how* they were related to one another. Student descriptions indicated qualitative changes in systems thinking. For example, images depicting temperature and seasons were selected more frequently in the post-assessment. These selections were accompanied with descriptions such as "[on] warm days they get out and bite people" (student data), and "in different seasons they leave and return" (student data). These explanations also challenged our assumptions about how these concepts are related. For example, we assumed that a cityscape at night would be relatively unrelated to mosquitoes; however, one student selected this image and indicated that mosquitoes are more active at night (thereby attending to one aspect of the image, "nighttime," but excluding another – the dense urban cityscape). These data suggest that students are connecting the influence of larger systems such as weather and seasons on mosquitoes and going beyond direct instruction to include inferences from their own lives.

Figure 1. Student-selected items and descriptions.

From an educator's perspective, this assessment can be easily modified. Explanations provided us with invaluable data, but some students may prefer to explain verbally rather than in writing. This version had students select "all that go together," but you could have students sort images into hierarchies (different piles or levels) or build a collage and connect items via arrows. In this measure, we provided students with items that *we* would include, but students could go online (or through magazines, etc.) to find their own images. And of course, students could always create their own images. We now turn to artwork that students created.

In what follows, we reflect on assessment affordances and limitations of three different types of student artwork collected for this study – scientific illustrations created during one-on-one

interviews, artwork produced throughout the programs, and artwork produced as a final piece for a community art show. In all cases, we work through examples to show the richness of information about student thinking that their artwork makes visible, while acknowledging some of the natural challenges of interpretation that come with these kinds of complex visual assessments.

During the pre-assessment phase of *Buzzing for Blood*, we administered a semi-structured interview with individual students, with a goal of understanding both their incoming scientific content knowledge and systems-level thinking about West Nile Virus and mosquito dynamics. In one question, we asked students to create a drawing explaining why there was a spike in cases of West Nile Virus in Washington during a particular year. Figure 2 shows a drawing one of our students produced in response to this question. In this case, the interview context allowed us to elicit further elaboration from students as they were creating the image.
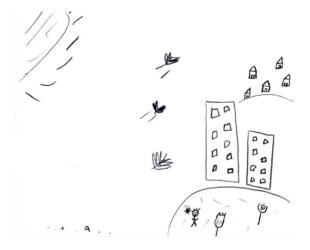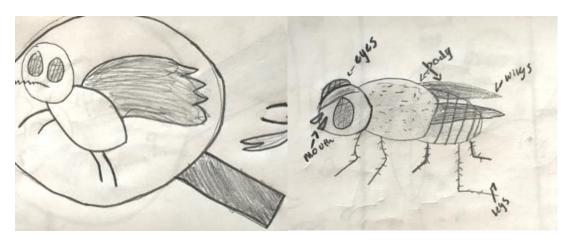

Figure 2. The cause of a recent West Nile increase.

In this image, the student first depicted a large sun in the top left, saying they thought "the climate" might be a cause for the increase in virus cases. The interviewer asked them to elaborate. The student drew grass and flowers on the bottom left, stating that these are what mosquitoes eat. Then they drew several mosquitoes in flight (middle) toward human dwellings such as houses (top right) and apartment buildings (middle right). Just below these, the student drew a region of land relatively more abundant in flowers and grass (bottom right). This region also included a drawing of a mosquito biting a human. When asked to describe their thinking, the student explained that the mosquitoes ran out of food that year and so went to places where humans lived that also included more grass and flowers. While this assessment item left several things unclear about the student's thinking (e.g., the specifics of the relationship between "climate" and "running out of food"), it did reveal the student was already thinking systemically about West Nile Virus (WNV). In particular, their drawing and elaboration identify and connect multiple elements: mosquito food supply, mosquito location and movement, humans, and human modifications of the landscape. There are a number of inaccuracies and partial understandings visible in the student's response. For example, it is not *migration* from resource-scarce to resource-abundant patches that causes WNV spikes but rather that *adjacencies* of abundant resources (fields with animals) and human populations that can lead to higher prevalence. These

inaccuracies provide us with an opportunity to further personalize their learning experience – for example, by exploring how their community fits into this larger system.

Student-produced art during program sessions can provide valuable formative, in-the-moment assessments of student understandings of scientific content and evolving shifts in these understandings following specific activities. As an example of the formative potential of assessing student artwork and its development during the course of instruction, consider Figures 3 and 4. On the left is a drawing produced by a *Buzzing for Blood* student in response to the prompt to draw a mosquito "from memory."

Figures 3 and 4. Student representation of mosquito anatomy.

This drawing shows some initial understandings of mosquito anatomy that it has compound eyes, wings, a head, and legs. Several components of the drawing demonstrate some areas for increasing accuracy, however, allowing further instruction to respond to specific understandings, such as the number of legs and body segments. The second picture was created by the same student following some instruction involving both close examinations of mosquito specimens and art techniques for drawing in ways that represent subject matter with more detail and dimension. This second drawing could be used as further formative assessment; the student is now representing the mosquito more accurately with multiple body segments, additional legs, and new features such as the fine spurs on the mosquito's legs. Other aspects of the drawing might prompt interesting follow-up questions. For example, does the mosquito have only five legs because that is the student's new understanding of the number of mosquito legs? Or has the student omitted the explicit appearance of the 6th leg as a matter of deploying emerging understandings of artistic perspective?

Finally, students' artistic products were displayed in open community art shows. These were typically attended by multiple generations of students' families (e.g., siblings, parents, and grandparents). The image in Figure 5 shows a multi-media final art piece produced by a *Buzzing for Blood* student. The piece indicates that the area around students' homes is ideal for mosquitoes, providing food (flowers and animals), water, and places to breed (stagnant water with decaying matter). This student also constructed a map of their town illustrating where you can find these elements in the community and placing them in context within their geospatial location. They also drew the mosquito's life cycle, what they look like, and how their appearance

changes (both over time and through magnification). This life cycle was then connected to the photographs. Taken as a whole, this multimodal art piece depicts connections across mosquito anatomy (through scientific illustration), life cycles (infographics), local habitat (photography), and the spatial organization of the local community (cartography). We suggest that this kind of multimedia artistic creation is a particularly informative arts-based assessment because elements mutually elaborate on one another in ways that allow for educators to gather data about the student's systems-level thinking about the subject matter.

Figure 5. Multimodal representation of mosquitoes in the community.

Conclusion and Implications for Educators

Creative pedagogy should include creative assessments. Our study illustrates this by integrating art assessments into STEAM programs aimed at supporting science learning and systems thinking. Our goal was to increase attendance to multiple elements and their relationships, increase recognition of multiple interacting causal forces, and make sense of cascading influences as a result of changes to one part of the system. Given these goals, our assessments aimed to allow students the time and creative space to illustrate multiple elements and indicate how they interact with one another. Many of these assessments were designed with no "right" answer, but rather (in the case of Figure 5) to raise awareness of the students' place in their community and how the system holistically supports mosquito growth and its impact on the student. We are not suggesting abandoning all "standard" assessments - in the case of our true/false questionnaire we were able to quickly and easily illustrate areas of student growth and areas that we as educators may need to refine. We are suggesting that teachers and practitioners consider supplementing these more traditional methods with other arts-based approaches. One common theme we found was that students knew significantly more than what we asked of them, and the more open-ended our measures, the more prevalent this theme became. By encouraging students to illustrate these concepts and connections, we were allowed greater insight into how they understood the material and its relevance to their lives. As students described their image selections, they made connections to mosquitoes through images initially thought by researchers to be irrelevant – prompting us to reconsider many of our own assumptions about how to make the content more relevant to students.

We recognize that this approach may take significantly more time and effort to administer compared with more traditional measures. However, our findings suggest that educators may discover their students possess a wealth of knowledge that was not apparent under previous testing conditions by incorporating these measures. Moreover, educators may be able to tailor their instruction to both fill gaps in knowledge that would have previously been missed, and at the same time, increase the relevance of science concepts to their students' everyday lives.

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Correlations between Teachers' Perceptions of Educator Cultural Competency and Academic Achievement for American Indian/Alaskan Native Students

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American Indian/Alaskan Native (Indigenous) students in K-12 education demonstrate fewer indicators of achievement in the areas of standardized test score proficiency, graduation, and attendance rates compared to their same school, district, state, and national non-Indigenous peers. The purpose of this study was to determine the extent of the relationship between the independent variables of teachers' perceptions of their educator cultural competency, school socioeconomic status, and student attendance and the dependent variable of student achievement scores on the Smarter Balanced (SBA) English/Language Arts (ELA) and Math assessments for Indigenous students in Grades 3-10. A nonexperimental, bivariate, correlational design was used to determine the strength and direction of the correlation between student ethnicity/race, student attendance, teachers' perceptions of their educator cultural competency (ECC), and student academic achievement as measured by the SBA-ELA and SBA-Math assessments. The sample included six schools with an overall Indigenous student population of 20% in a single school district in the Pacific region of the United States. A multistage cluster sampling design was used to sample records from students enrolled in Grades 3-8 during the 2017-2018 school year. The sample also included teachers assigned to the same grade levels during the same time period. The sample consisted of 1,307 students in Grades 3-8 who had participated in the 2017-2018 SBA administration and 88 teachers who responded to the Multicultural Awareness, Skills, and Knowledge Survey (MASKS). Data analysis was conducted using bivariate correlational and part/partial correlational analysis in SPSS v.26. The results indicated a statistically significant, weak correlation between teachers' perceptions of their educator cultural competency and student academic achievement as measured by the SBA assessments for non-Indigenous students.

Previous research with American Indian/Alaskan Native (Indigenous) student populations has revealed that Indigenous students demonstrate fewer indicators of positive achievement in primary, secondary, and postsecondary education than their non-Indigenous peers (Apthorp, 2016; National Center for Education Statistics, 2017; Smarter Balanced Assessment Consortium, 2017; U.S. Department of Education, 2017). Compared to their non-Indigenous peers, Indigenous students demonstrate lower achievement rates on standardized tests in ELA and math (American College Testing, 2018; Smarter Balanced Assessment Consortium, 2016; U.S. Department of Education, 2017). Further, Indigenous students have higher rates of chronic absenteeism than their non-Indigenous peers (Fuller & Davis, 2016; Office of Superintendent of Public Instruction, 2015, 2016b; Oregon Department of Education, 2018b). These indicators of low academic achievement are consistent when controlling for socioeconomic and geographic

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factors, as non-Indigenous same-school peers regularly demonstrate higher achievement in the aforementioned categories (Fuller & Davis, 2016; Office of Superintendent of Public Instruction, 2015, 2016b; Oregon Department of Education, 2018b).

Researchers studying student retention and persistence have found strong correlations between teacher-student relationships and academic achievement (Lundberg, 2012, 2014; Lundberg & Lowe, 2016). Additionally, researchers studying cultural competency and culturally responsive practices in schools have noted that incorporating student culture into curricular materials and instruction has a positive relationship with academic achievement and retention (Brayboy & Maaka, 2015; Carjuzaa, 2017; Chain, et al., 2017; Frey, 2018; Fryberg, et al., 2018). The purpose of this study was to determine the extent of the relationship between the independent variables of teachers' perceptions of their educator cultural competency and student attendance and the dependent variable of student achievement scores on the SBA-ELA and Math assessments for Indigenous students in Grades 3-10. The need for the study was supported by findings of previous research studies that indicated that Indigenous students demonstrated lower academic achievement than their non-Indigenous peers (Flores, 2017; Jones & Walker, 2016; Office of Superintendent of Public Instruction, 2016b; Oregon Department of Education, 2018b; Smarter Balanced Assessment Consortium, 2017; Takashiro, 2017).

Theoretical Framework

The theories that framed this study were Bronfenbrenner's ecological systems model and Tinto's student retention theory (Bronfenbrenner, 1979; Tinto, 1975, 1989, 1999, 2006). Bronfenbrenner's ecological systems model states that developing individuals exist in a network of interconnected environments (Bronfenbrenner, 1979). Microsystems are the smallest unit of social interaction in which an individual exists and may include families, peer groups, and schools (Bronfenbrenner, 1979). When two microsystems meet and have conflicting values, developing individuals may be forced to choose to align with one of the two systems (Bronfenbrenner, 1979). In education, students with low engagement and without strong teacher-student relationships are less likely to align with the values of the school (Hussain, et al., 2018). Students who identify strongly with their home culture but do not see that culture reflected in the educational setting are less likely to demonstrate strong engagement, teacher-student relationships, or academic success (Apthorp, 2016; Covarrubias & Fryberg, 2015; Hussain et al., 2018). These students may be present in the educational setting but do not fully engage with it.

Bronfenbrenner's ecological systems model provides a probable explanation for why Indigenous students demonstrate lower academic performance than their non-Indigenous peers. Students who strongly identify with their home culture and who feel that the school culture or values are in conflict with their home values are less likely to be engaged in their education (Bronfenbrenner, 1979; Covarrubias & Fryberg, 2015). These students then demonstrate lower

academic achievement than their non-Indigenous peers whose home cultures are more reflected by the school (Apthorp, 2016; Covarrubias & Fryberg, 2015). Researchers have found that implementing Indigenous cultural programs in schools can lead to increased academic growth for Indigenous students (Fryberg et al., 2018).

Tinto's student retention theory explains how a lack of student engagement can lead to increased absenteeism and dropout rates. Students who lack strong relationships with their instructors or peers are less likely to persist in education (Tinto, 1975, 1989, 1999, 2006). Students who feel that the school environment does not support their identity of self and home culture are less likely to forge strong relationships with their teachers and peers (Covarrubias & Fryberg, 2015; Tachine et al., 2017). Further, students who feel threatened, either physically or mentally, by the school environment are more likely to drop out prior to graduation (Hickman et al., 2017). Students who do not feel supported by their teachers or the school are less likely to demonstrate persistence (Covarrubias & Fryberg, 2015; Tinto, 1975). Therefore, these students will align their time and energy with activities and groups that support them or reflect their sense of self (Kiefer et al., 2015; Tinto, 1975). If those activities or groups are not aligned with the goals of the educational system, this will lead to lower student attendance and/or motivation (Tachine et al., 2017; Tinto, 1975). As attendance has been found to have a strong positive relationship with academic achievement on standardized tests, less frequent attendance will lead to fewer successful academic outcomes (Stone, et al., 2017).

Tinto's student retention theory provides a probable explanation for why Indigenous students are more likely to demonstrate higher rates of absenteeism and dropout than their non-Indigenous peers. Indigenous students whose sense of self greatly aligns with Indigenous cultural identity feel a sense of isolation or detachment when the environment around them does not reflect their culture (Tachine et al., 2017; Urbaeva, et al., 2017). Indigenous students who believe that their teachers lack understanding of their cultural background are less likely to feel that those teachers support them (Lundberg, 2012, 2014; Lundberg & Lowe, 2016; Strayhorn et al., 2016). Students who feel unsupported by the educational institution must therefore make a choice to either persist in a setting that does not support them or move their time and energy into a more supportive environment (Tinto, 1975, 1989, 1999, 2006). For schools where local tribal home culture is not integrated into curriculum and instruction, this can lead to higher dropout and absenteeism rates for Indigenous students (Brayboy & Maaka, 2015; Covarrubias & Fryberg, 2015).

Indigenous students who lack strong supportive teacher-student relationships are more likely to experience low motivation and increased academic struggle (Lundberg, 2012, 2014; Lundberg & Lowe, 2016). A lack of strong supportive relationships and decreased school engagement can lead to decreased academic performance for Indigenous students (Hussain et al., 2018). Indigenous student performance can be improved through the use of culturally relevant and responsive practices that mirror their cultural identity (Urbaeva et al., 2017). For Indigenous

students, a primary reason for the lack of strong relationships between students and teachers is a lack of shared cultural traditions, history, and/or values (Brayboy & Maaka, 2015). When Indigenous cultural experiences and ways-of-knowing are incorporated into school curricula and instruction, Indigenous students are more likely to be active and motivated participants in their learning (Brayboy & Maaka, 2015; San Pedro, 2015). The inclusion and empowerment of Indigenous culture within the school system can lead to improved academic achievement for developing Indigenous students (Apthorp, 2016; Bronfenbrenner, 1979).

American Indian/Alaskan Native and Indigenous Student Research

Student Academic Outcomes

Indigenous students are one of the smallest ethnic group populations in the United States with an estimated national population of just under 3.8 million as indicated by federal race codes (U.S. Census Bureau, 2018). The Indigenous student population between the ages of 5 to 18 is estimated at 838,329 or 1.6% of the total K-12 student population (de Brey et al., 2019; U.S. Census Bureau, 2018). In the Pacific region of the United States, Indigenous students make up between 1-2% of the student population ages 5 to 18 (Dearien & Salant, 2016; Norris et al., 2012; Oregon Department of Education, 2018; Washington State Report Card, 2018). American Indian/Alaskan Natives are a diverse people with 567 federally recognized tribes, more than 50 state-recognized tribes, and 324 federally recognized American Indian/Alaskan Native reservations located across the continental United States and Alaska (Keith et al., 2016; Krakoff, 2017; Lambert, 2016). With the tendency for Indigenous students to live on or near tribal reservations, they tend to be clustered in public school districts on or near reservation borders, public districts that reside on deeded land within reservation borders, or private schools operating on reservation property under the control of the Bureau of Indian Education and tribal government (BIE) (Bureau of Indian Education, 2016). Given the size of the Indigenous student population (statewide, regionally, and nationally), previous studies have shown that Indigenous students disproportionately demonstrate lower performance than non-Indigenous students in the areas of attendance rates, state test proficiency rates, and other indicators of academic success or equity.

Attendance. In 2015, 31% of Pacific region American Indian/Alaskan Native students missed 10% of enrolled school days compared to their White (15%), Asian (9%), and Hispanic (25%) peers (Office of Superintendent of Public Instruction, 2016b; Oregon Department of Education, 2018b). When compared to same-school peers, the gap between Indigenous and non-Indigenous attendance rates persists even for districts whose chronic absenteeism rate is above the regional or state average (Fuller & Davis, 2016; Office of Superintendent of Public Instruction, 2015, 2016b; Oregon Department of Education, 2018b; Washington State Report Card, 2017). A 2017 study on student attendance found that the greatest predictors of absenteeism duration were

student, peer, and family reasons; students who lacked pro-education values or were struggling academically and socially were more likely to be chronically absent (Önder, 2017). Chronically absent students are more likely to struggle academically on standardized assessments and drop out than peers with regular attendance (de Brey et al., 2019; Önder, 2017). Support programs that include targeted academic support, flexible schedules, and culturally responsive practices have been found to be effective in lowering chronic absenteeism rates for both Indigenous and non-Indigenous students (Wilcox, 2015).

Assessment proficiency rates. The National Assessment of Educational Progress (NAEP) longitudinal study found that Indigenous students in fourth and eighth grade consistently underperform on the assessment compared to their non-Indigenous peers (de Brey et al., 2019; U.S. Department of Education, 2017). This proficiency achievement gap is present even when same-school peers also underperform compared to the national average (U.S. Department of Education, 2017). Similarly, American Indian/Alaskan Native students demonstrate lower achievement rates than their peers on the national American College Test (ACT), scoring well below benchmark levels on all subtests, whereas their White peers score at/above benchmark levels (Keith et al., 2016, p. 702). For the 2018 national ACT administration only 14% of Indigenous students met three or more benchmarks, as compared to their White (48%), Asian (62%), and Hispanic (22%) peers (American College Testing, 2018). Indigenous students in the Pacific region of the United States performed in line with their national cohort, with 9-17% of Indigenous students meeting standards on three or more benchmarks (American College Testing, 2018b).

On state-level standardized assessments, Indigenous students consistently demonstrate lower proficiency rates than their non-Indigenous peers. On the national Grade 11 SBA-ELA exam, only 42.9% of Indigenous students met the standard, compared to their White (67.2%), Asian (76.3%), and Hispanic (46.4%) peers (Smarter Balanced Assessment Consortium, 2016). In Washington, 43% of Indigenous students met the standard on the 2017 Grade 10 SBA-ELA, as compared to the statewide mean of 70% (Washington State Report Card, 2018). Additionally, the 3-year ELA academic achievement proficiency rate on non-SBA assessments for Oregon Indigenous students was 56.6%, as compared to all (70.9%), White (75.9%), Asian (77.5%), and Hispanic (58.7%) students (Oregon Department of Education, 2018). When compared to same-school peers, the achievement gap between Indigenous and non-Indigenous students decreases but persists (Oregon Department of Education, 2018; Washington State Report Card, 2018).

Cultural Identity and Relationships

American Indian/Alaskan Native cultural identity is relational and the separation or isolation from cultural touchstones such as family, traditions, and languages can lead to increased feelings of isolation, loneliness, and detachment (Tachine et al., 2017). For individuals whose cultural

sense of self is closely linked with their identity as Indigenous, this can lead to increased loss of self as well as a loss of cultural traditions (Tachine et al., 2017). American Indian/Alaskan native cultural identification is often linked to participation in cultural activities, meals, and events and whether Indigenous youth and/or families follow the local or customary ways of life (Urbaeva et al., 2017). Researchers have noted that Indigenous youth living on or near reservations had particularly high rates of cultural identification ($M = 3.01$ out of 4) as compared to Indigenous youth not living on reservations (Urbaeva et al., 2017).

In a 2015 study, researchers found that increased positive representation of American Indian/Alaskan Native culture and/or important figures led to improved academic outcomes for Indigenous students (Covarrubias & Fryberg, 2015). Indigenous students who experienced higher rates of positive representation in the classroom were more likely to demonstrate engagement in their learning and in their teacher-peer relationships than Indigenous students who experienced lower rates of positive representation (Covarrubias & Fryberg, 2015). Researchers found that being exposed to self-relevant role models significantly improved motivation and school connectedness for Indigenous students (Covarrubias & Fryberg, 2015). In a follow-up study, researchers found that Indigenous students who knew multiple (8) self-relevant role models who attended postsecondary education demonstrated higher motivation and teacher-student relationships than Indigenous students who knew relatively few (2) self-relevant role models (Covarrubias & Fryberg, 2015). Researchers also found that students of European descent were more likely to have multiple self-relevant role models than Indigenous students, making it more likely for White students to feel higher motivation and school connectedness than Indigenous students (Covarrubias & Fryberg, 2015).

Most Indigenous students in education do not feel a strong sense of connectedness or belonging to the institution and feel lower rates of support than White or Black students (Strayhorn et al., 2016). Interactions with teachers and peers from other ethnic groups have been indicated to have a statistically significant positive correlation with increased motivation and relationships for Indigenous students (Strayhorn et al., 2016). While both in-class and out-of-class interactions with teachers have been found to increase Indigenous student persistence, the effect of out-of-class interactions is relatively minor (Strayhorn et al., 2016). Increased communication and relationships with teachers have been linked to increased persistence for all student racial/ethnic groups, with teacher support positively associated with academic motivation and engagement (Kiefer et al., 2015).

Method

This study used a nonexperimental, bivariate correlational design. Bivariate correlational analysis was used to determine the strength and direction of the correlation between the dependent variable of student academic achievement (SAA) and each of the following

independent variables: student attendance, student ethnicity/race, and teachers' perceptions of their educator cultural competency (ECC). Part/partial correlational analysis was also used to determine the extent of the relationship between SAA and ECC when controlling for the other independent variables. This additional level of analysis was used to the extent to which student attendance and student ethnicity/race confounded the impact of ECC on SAA. The study sample was chosen through multistage clustering, with data collected from a sample of student records and surveys from teachers assigned to Grades 3-10 during the 2017-2018 school year. Only those students with complete attendance, demographic, and assessment records were included in the study and students were clustered/grouped by grade-level and school. Student records were gathered from archived demographic and assessment data provided by the district. Student academic achievement was measured by the SBA-ELA and SBA-Math assessments (Smarter Balanced Assessment Consortium, 2017). Teacher data were gathered using the MASKS survey instrument, a 54-question Likert-scale instrument that was used to measure teachers' perceptions of their own educator cultural competency (Jones & Walker, 2016). The data obtained from the sample were analyzed using an independent *t*-test to determine the difference in means between all groups.

Population

The target population for this study consisted of all school districts in the Pacific region of the United States with Indigenous students. In the Pacific region of the United States, American Indian/Alaskan Native students make up 1-2% of the student population ages 5-18 (Dearien & Salant, 2016; Norris et al., 2012; U.S. Department of Education, 2018; Washington State Report Card, 2018). These students are largely clustered in public and BIE-controlled school districts located on or near reservation borders and can make up a significant percentage of the student population for those districts (Bureau of Indian Education, 2016; Dearien & Salant, 2016; Norris et al., 2012; U.S. Department of Education, 2018; Washington State Report Card, 2018). As participation in standardized testing is optional for private schools, tribal or BIE schools were not included in the target population (U.S. Department of Education, 2018).

Sample

A multistage cluster sampling design was used during the data collection process for both the students and teachers in the sample. This sampling methodology was used to select participants from a larger population after the application of inclusion and exclusion criteria (Till & Matei, 2016). This allowed the study to cast an initially wide net to gather data on a large group of potential participants before filtering down to the final sample pool who met all of the study criteria. The sample for this study was a single school district located in the Pacific region of the United States. This district had six schools in 2017-2018, three of which served students in Kindergarten and Grades 1-5 while the other three schools served students from Grades 6-12, with a total student population of nearly 3,500. The student population for the district was 20%

American Indian/Alaskan Native, with the majority of the remaining students being Hispanic or Asian. The district had a 4-year adjusted graduation rate (ADGR) of more than 80% which was similar, if slightly higher, than the ADGRs of the surrounding region (U.S. Department of Education, 2017b). The teacher population for the district was 66% female and was predominantly White and Hispanic/Latino. The total teacher population was around 160. To facilitate analysis of the data, all students and teachers were clustered/grouped by building and grade-level and given group designations (i.e. A3 = Building A, Grade 3, etc.). This process allowed teacher MASKS data to be correlated with demographic and academic achievement data from the students they had served in 2017-2018.

The sample for this study included 88 teacher surveys and demographic/assessment records for 1,307 students. The student sample included records for students enrolled in Grades 3-8 and 10th grade during the 2017-2018 school year. The inclusion criteria for the student sample required that each student had a 2017-2018 SBA-ELA and SBA-Math score, demographic information as recorded by the student information system operated by the district, and an attendance record from 2017-2018. The exclusion criteria required that any student missing assessment, attendance, or demographic data was removed, as well as students who were not enrolled in the district during the 2017-2018 school year, students enrolled in a self-contained special education program, students who transferred out of the district midyear, and students enrolled in Kindergarten, first, second, 11th, and 12th grade.

The teachers in the sample included teachers employed by the district during both the 2017-2018 and 2018-2019 school years. The inclusion criteria for the study required that all teacher participants had instructional positions in the 2017-2018 school year and that those positions were with students enrolled in Grades 3-8 and 10th grade. Exclusion criteria for the teacher sample required excluding teachers on special assignments that did not include instructional duties in 2017-2018 (i.e., instructional coaches), teachers who did not have 2017-2018 instructional positions with students in Grades 3-8 and 10th grade, teachers no longer employed by the district in 2018-2019, and all other school employees who were not contractually classified as certificated teachers in 2017-2018.

Research Questions and Variables

1. Is there a significant relationship between teachers' perceptions of their educator cultural competency and academic achievement for Indigenous and non-Indigenous students enrolled in Grades 3-10?
2. Is there a significant relationship between teachers' perceptions of their educator cultural competency and academic achievement for Indigenous and non-Indigenous students in Grades 3-10 when controlling for student ethnicity/race?
3. Is there a significant relationship between teachers' perceptions of their educator cultural competency and academic achievement for Indigenous and non-Indigenous students enrolled in Grades 3-10 when controlling for student attendance?

Student academic achievement (SAA). Student academic achievement was measured by proficiency rates and scale scores on the 2017-2018 SBA-ELA and SBA-Math end-of-year exams for Grades 3-8 (Smarter Balanced Assessment Consortium, 2016).

Student attendance. Attendance was reported as the percent of active attendance per student, which was calculated by the number of days present divided by the number of total days enrolled over the course of the 2017-2018 school year. School attendance rates were calculated by the mean attendance for each grade level and school (Office of Superintendent of Public Instruction, 2016b; Oregon Department of Education, 2018b).

Student ethnicity/race. Student ethnicity/race was self-reported during initial district enrollment. Students were then assigned codes (1-5) according to federal race classifications (Flores, 2017; National Center for Education Statistics, 2017). Students who are White/Hispanic and Two or More Races did not fall under one of the federal race classifications and were assigned two additional codes (6 and 7). As there were low student populations for some ethnic groups, two additional categories (Indigenous =1 and non-Indigenous =0) were used during data analysis.

Teachers' perceptions of their educator cultural competency (ECC). Educator cultural competency was measured by the Multicultural Awareness, Skills, and Knowledge Survey (MASKS), which assessed teachers' perceptions of their awareness of cultural differences, knowledge of other cultures, and the skills needed to work with cultures other than their own (Chain et al., 2017; Jones & Walker, 2016).

Results

Overall SBA Results. Prior to correlational analysis, an examination of SBA scores was conducted to determine whether or not the Indigenous students in the sample demonstrated a proficiency gap between their non-Indigenous same-school and national peers. This examination (*see* Table 1) revealed that both the Indigenous and non-Indigenous sample groups scored below the mean for their national cohort and that, with few exceptions, the Indigenous students in the sample scored lower than their non-Indigenous same-school peers. Furthermore, the mean scores for both groups indicated that the majority of students in the sample did not meet the Level 3 cut score threshold required to pass the exam, indicating that the entire sample as a whole did not meet end-of-year grade-level requirements.

Table 1

SBA-ELA Scale Scores, Sample Versus National Cohort

Group	Indigenous M (SD)	Non-Indigenous M (SD)	National Cohort M (SD)	Range Min-Max	L3 Cut Score Scale Score
A3	2372.9 (77.7)	2375.5 (74.6)	2412.9 (87.1)	2114-2538	2432
B3	2344.4 (62.9)	2348.0 (69.2)	--	--	--
C3	2318.8 (80.9)	2359.8 (72.9)	--	--	--
A4	2408.8 (56.0)	2451.7 (78.9)	2454.9 (92.0)	2131-2554	2473
B4	2407.6 (79.2)	2402.5 (89.5)	--	--	--
C4	2408.3 (77.1)	2427.2 (91.1)	--	--	--
A5	2453.9 (78.6)	2481.8 (77.8)	2495.3 (93.0)	2201-2548	2502
B5	2468.3 (75.5)	2432.8 (79.0)	--	--	--
D6	2466.9 (95.2)	2463.2 (90.3)	2517.6 (91.3)	2210-2543	2531
D7	2494.4 (98.5)	2511.7 (96.6)	2540.1 (95.8)	2258-2545	2552
D8	2510.8 (109.0	2530.0 (92.6)	2559.6 (94.7)	2288-2538	2567

Correlation between SAA and ECC. The Pearson correlation coefficient results from the analysis ranged from .034 to .065 for the SBA-ELA and from .002 to .032 for the SBA-Math assessment, indicating a weak, positive correlation between ECC and student academic achievement. Results for Indigenous students on both assessments were not statistically significant, while results for non-Indigenous and all students combined were statistically significant for both assessments at an alpha of .05. Based on the results of this analysis, ECC does have a statistically significant correlation with student academic achievement, but only for non-Indigenous students.

Correlation between SAA and ECC, Controlling for Student Ethnicity/Race. Student ethnicity/race was reported on a Likert scale from 0-1 denoting Indigenous (1) or non-Indigenous (0) status. When controlling for student ethnicity/race, there was a weak, positive partial correlation between the MASKS composite score and the standardized mean SBA-ELA score for all students. Results were statistically significant at an alpha of .05 for both groups, with a *p*-value of .031. Results for the SBA-Math assessment were not statistically significant ($p = .336$).

Zero-order correlations revealed a statistically significant correlation between ECC and student academic achievement for all students when no longer controlling for student ethnicity/race on the SBA-ELA assessment. The results from the analysis indicated that student ethnicity/race has

very little influence in controlling the relationship between ECC and student academic achievement for Indigenous and non-Indigenous students. ECC had a statistically significant correlation with student academic achievement when controlling for student ethnicity/race.

Correlation between SAA and ECC, Controlling for Student Attendance. When controlling for student attendance, there was a weak, positive partial correlation between the MASKS composite score and the standardized mean SBA-ELA score for each student group and the SBA-Math score for Indigenous students. For non-Indigenous students there was a weak, negative partial correlation between the MASKS composite score and the standardized mean SBA-Math score. Results were statistically significant at an alpha of .05 for non-Indigenous and all students combined on the SBA-ELA assessment, with a *p*-value of .040 for both groups. Results were statistically significant at an alpha of .01 for non-Indigenous students only on the SBA-Math assessment, with a *p*-value of .000.

Zero-order correlations revealed a statistically significant correlation between ECC and student academic achievement for non-Indigenous and all students combined when no longer controlling for student attendance on the SBA-ELA assessment. Zero-order correlations also revealed a statistically significant correlation between ECC and student academic achievement for non-Indigenous when no longer controlling for student attendance on the SBA-Math assessment. The results from the analysis indicated that student attendance has very little influence in controlling the relationship between ECC and student academic achievement for non-Indigenous students. ECC had a statistically significant correlation with student academic achievement when controlling for student attendance for non-Indigenous students

Table 2
Correlational Analysis Results

		SBA-ELA		SBA-MATH	
		Pearson's *r*	*p*-Value	Pearson's *r*	*p*-Value
Correlation between SAA and ECC	Indigenous	0.034	0.593	0.002	0.970
	Non-Indigenous	0.065	0.034	0.032	0.294
	Combined	0.063	0.023	0.030	0.275
Correlation between SAA and ECC in combination with other independent variables	Indigenous	0.034	0.593	0.002	0.970
	Non-Indigenous	0.065	0.034	-0.112	0.000
	Combined	0.063	0.023	0.030	0.275

When controlling for Student Ethnicity/Race	Combined	0.060	0.031	0.027	0.336
When controlling for Student Attendance	Indigenous	0.019	0.765	-0.014	0.823
	Non-Indigenous	0.063	0.040	-0.116	0.000
	Combined	0.057	0.040	0.023	0.415

Discussion and Limitations

The findings of this study add to previous literature indicating that American Indian/Alaskan Native students demonstrate lower academic performance on standardized assessments than their non-Indigenous peers (American College Testing, 2018b; Fuller & Davis, 2016; National Center for Education Statistics, 2017, 2019; Office of Superintendent of Public Instruction, 2015, 2016b; Oregon Department of Education, 2017, 2018; Smarter Balanced Assessment Consortium, 2016, 2017; U.S. Department of Education, 2017b; Washington State Report Card, 2017). As with previous research, Indigenous students included in the sample demonstrated generally lower proficiency rates on the SBA assessment than their non-Indigenous same-school peers, despite the low overall performance of all students in the sample (*see* Table 1) (Oregon Department of Education, 2017, 2018; Smarter Balanced Assessment Consortium, 2016, 2017; Washington State Report Card, 2017, 2018).

Study results indicated a statistically significant, weak, positive correlation between teachers' perceptions of their educator cultural competency (ECC) and student academic achievement (SAA) as measured by the SBA-ELA and SBA-Math assessments for the non-Indigenous students in the study. Student ethnicity/race and student attendance had statistically significant, weak correlations with student academic achievement for both Indigenous and non-Indigenous students. When controlling for all other independent variables, teachers' perceptions of educator cultural competency continued to have a statistically significant correlation to SBA scores for non-Indigenous students only. No statistically significant relationship between ECC and SAA for Indigenous students was found when controlling for other independent variables.

Table 3
Summary of Study Findings

RQs	Stat. Technique	Results
RQ1	Bivariate correlational analysis	Statistically significant, weak, positive correlation between ECC and student academic achievement for non-Indigenous students only
RQ2	Part/Partial correlational analysis	ECC had a statistically significant, weak, positive correlation with student academic achievement when controlling for student ethnicity/race for all students
RQ3	Part/Partial correlational analysis	ECC had a statistically significant, weak, correlation with student academic achievement when controlling for student attendance for non-Indigenous students only. Correlation was positive for SBA-ELA and negative for SBA-Math.

Several limiting factors may have impacted the results. As stated previously, the overall proficiency rate on the SBA exam for the Indigenous student sample was low, with few students in the sample groups meeting proficiency. The low overall performance coupled with the small sample size of Indigenous students may have decreased the strength of the correlation between ECC and SAA for Indigenous students. Additionally, the teacher sample of the study included only a single teacher of Indigenous descent, with the remaining teachers being primary White or Hispanic. This may help explain the positive correlation between ECC and SAA for the White and Hispanic students in the sample, who were more likely to have a teacher who shared their cultural background than the Indigenous students in the sample.

This last limitation speaks to the overall issue of representation for Indigenous students in education. American Indian/Alaskan Native students make up over 1% of the student population in the Pacific region, while less than 1% of the teacher population is Indigenous (Dearien & Salant, 2016; Norris et al., 2012; U.S. Department of Education, 2018; Washington State Report Card, 2018). In the case of districts like the research site the gap between the two populations can widen tremendously, with 20% of the site/sample students and less than .1% of the total teacher population being of Indigenous descent. As stated previously, very few Indigenous students in the sample were taught by teachers that shared their cultural traditions and histories. Assuming that districts are unable to hire teachers who share cultural backgrounds with marginalized student groups, fostering the development of educator cultural competency and a greater understanding of student cultural backgrounds may lead to improved motivation and academic outcomes for said marginalized student groups through the support of their cultural

values and improved teacher-student relationships (Apthorp, 2016; Bronfenbrenner, 1979; Lundberg, 2012, 2014; Lundberg & Lowe, 2016; Tinto, 1975).

Recommendations

Further research is needed to determine the extent of the relationship, if any, between educator cultural competency and Indigenous student academic achievement. Larger-scale studies of school districts with Indigenous populations should be undertaken and it is recommended that similar studies be carried out at districts that have both a large Indigenous student and Indigenous staff population. It is also recommended that subsequent studies include samples from various geographic regions that include different socioeconomic environments as well as Indigenous students and teachers of a variety of Indigenous nations and communities. Considering the sometimes vast cultural and economic differences between tribes within the region, a wider net may need to be cast to better understand the relationship between academic achievement and cultural competency for Indigenous students.

Considering the proximity of large Indigenous student populations to tribal lands in the Pacific region, this presents schools and districts an opportunity to partner with tribal organizations to foster educator cultural competency through professional development opportunities, guest speakers and local experts, and other avenues. These partnerships can be used to promote increased awareness and knowledge of Indigenous histories, stories, traditions, and experiences. Such partnerships may also help promote an increase in hiring Indigenous educators, which has been correlated with improved academic outcomes for Indigenous students (Covarrubias & Fryberg, 2015).

Last, it is recommended that more be done to improve educator pre-service training through the inclusion of culturally competent materials and experiences that include the histories, traditions, and experiences of marginalized peoples. As with improvements to professional development, this will require intentional partnerships with tribal authorities and other community leaders to ensure that these training opportunities are not generalized and include the relevant cultural traditions and histories of local Indigenous/marginalized communities in the areas that pre-service educators may eventually serve. By providing pre-service educators with the skills and knowledge needed to work with Indigenous and marginalized student groups, they may be better prepared to include positive representations of said cultures into their instruction and curriculum. This will help them demonstrate culturally competent knowledge and awareness of Indigenous cultures, which may lead to improved student academic achievement (Covarrubias & Fryberg, 2015).

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<center>**Appendix**</center>

The Multicultural Awareness, Skills, and Knowledge Survey (MASKS)

Knowledge is defined as the extent to which the pre-service teacher understands and relates to the perspectives of culturally different individuals and groups (Sue & Sue, 2003).

For the purpose of this survey, please use the following definitions.

Institutional Barriers - a rule, policy, or practice that places a select group of people at a disadvantage.

Race – refers to groups of people who have differences and similarities in biological traits.

Ethnicity - refers to a person's cultural background, nationality, ancestry, and language.

Minority students – refers to students who have been traditionally oppressed due to race or ethnicity.

Socioeconomic status - is a classification of someone determined by using occupation, education, income, wealth, and place of residence.

Diverse students/populations – include different race/ethnicities, socio-economic backgrounds, gender, and sexual orientations.

Please rank from 1 - 5
1 - not at all
2 - to a very small extent
3 - to a moderate extent
4 - to a great extent
5 - to a very great extent

I have knowledge of the institutional barriers that can affect the educational experiences of ...

       1) racial and ethnic minority students.
       2) students from low socioeconomic backgrounds.
       3) diverse students.

I have knowledge about particular teaching strategies that affirm the identity of ...

       4) racial and ethnic minority students.
       5) students from low socioeconomic backgrounds.
       6) female students.
       7) diverse students.

I have knowledge of the institutional barriers that can affect the educational experiences of ...

      8) gay, lesbian, bisexual, and transgendered students.

I have knowledge about particular teaching strategies that affirm the identity of ...

      9) gay, lesbian, bisexual, and transgendered students.

I have knowledge about ...

      10) gay, lesbian, bisexual, and transgendered identity theories.

I have knowledge of how historical experiences of ...

      11) gay, lesbian, bisexual, and transgendered people may affect students learning experiences.

I have knowledge of cultural perspectives that ...

      12) gay, lesbian, bisexual, and transgendered students bring to the classroom.

Skills are defined as the extent to which pre-service teachers engage in behaviors that are culturally similar and sensitive with diverse cultures; use culturally relevant resources and materials; and seek to do away with oppressive, stereotypical and prejudicial attitudes and behaviors (Prieto, 2012).

Please rank from 1 - 5
1 - not at all
2 - to a very small extent
3 - to a moderate extent
4 - to a great extent
5 - to a very great extent

I think I have the ability to teach ...

      13) students from a cultural background different from my own.
      14) racial and ethnic minority students.
      15) students from low socioeconomic backgrounds.
      16) gay, lesbian, bisexual, and transgendered students.

I think I have the ability to effectively assess the educational needs of ...

17) students from a cultural background different from my own.

18) racial and ethnic minority students.

19) students from low socioeconomic backgrounds.

20) gay, lesbian, bisexual, and transgendered students.

21) male students.

22) female students.

I am comfortable communicating with ...

23) individuals from diverse populations.

24) racial and ethnic minority individuals.

25) individuals from low socioeconomic backgrounds.

26) gay, lesbian, bisexual, and transgendered individuals.

Awareness is defined as the extent to which the pre-service teacher is aware of "(a) self and others as cultural beings, (b) their own attitudes and biases, and (c) the need to create culturally sensitive learning environments for all students" (Spanierman et al., 2010, p. 445).

Please rank from 1 - 5

1 - not at all
2 - to a very small extent
3 - to a moderate extent
4 - to a great extent
5 - to a very great extent

27) I am aware of the cultural biases I bring to my teaching.

I am aware of the cultural biases I bring to my teaching concerning ...

28) racial and ethnic minority students.

29) students from low socioeconomic backgrounds.

30) gay, lesbian, bisexual, and transgendered students.

31) male students.

32) female students.

33) I am aware of the cultural stereotypes I bring to my teaching.

I am aware of the cultural stereotypes I bring to my teaching concerning ...

34) racial and ethnic minority students.

35) students from low income socioeconomic backgrounds.

36) gay, lesbian, bisexual, and transgendered students.

37) I am aware of how my cultural background has influenced the way I think.

I am aware of how my cultural background has influenced the way I think about ...

38) racial and ethnic minority students.
39) students from low income socioeconomic backgrounds.
40) gay, lesbian, bisexual, and transgendered students.
41) male students.
42) female students.
43) I am aware of how my cultural background has influenced the way I act.

I am aware of how my cultural background has influenced the way I act toward ...

44) racial and ethnic minority students.
45) students from low socioeconomic backgrounds.
46) gay, lesbian, bisexual, and transgendered students.
47) male students.
48) female students.

I am aware that some of the academic difficulties faced by ...

49) students from diverse groups are not the fault of those students.
50) racial and ethnic minority students are not the fault of those students.
51) students from low socioeconomic backgrounds are not the fault of those students.
52) gay, lesbian, bisexual, and transgendered students are not the fault of those students.
53) male students are not the fault of those students.
54) female students are not the fault of those students.