1. SOI Phase II is due in 2 weeks
2. What is it? Take what you have found in SOI I and

Creating bilingual curriculum

ML tools for individualized

Jim Diamond and Chris Devers

Possible app development

Bilingual education to go for empirical research

Dr. Bryant

Dr. Eith

Dr. John

Dr. Gilbard

Dr. Henry Smith

**Statement of Problem**

In this project I am proposing frameworks to addressing academic disparity among the English Language Learners in US schools which was explored in my scholarship of integration as it identified the many contributing factors of this phenomenon specifically language curricularization, teacher’s efficacy (specifically lack of qualified ESL teachers), and a lack of culturally responsive bilingual content to help English language learners in their educational journey.

My focus on English Language Learners (ELLs) stems from the enduring academic disparities they face in U.S. schools, a complex issue as shaped by multifaceted challenges. Typically, language barriers often hinder ELLs from fully accessing the curriculum, while cultural differences between their home and school environments can create additional obstacles to integration and learning. Socioeconomic challenges, including poverty and limited access to educational resources such as tutoring, technology, or after-school programs, further exacerbate these difficulties. Furthermore, teachers with little to no ESL or culturally responsive pedagogical training are in significant deficit as the many schools around the country are constantly striving to hire well-trained ESL and bilingual teachers.

For phase 2 of Doctoral Dossier I intend to adopt scholarship of application approach to further explain the existing contributing factors to my problem of practice and expand on possible solutions that would focus on creating bilingual curriculum and a collection of bilingual curriculum integrated into a database and in Phase 3, launching an assessment application an ELL student would use to take their initial placement test, then this application would integrate their answers into machine learning algorithms and access the database to create an individualized learning plan based on ELL student’s academic competency

Background:

As of recent data, ELLs comprise over 10% of the K-12 student population (Mang, 2021; PISA 2022 U.S. Results, n.d.; Rutkowski & Rutkowski, 2016, p. 264), yet only 18.7% (Genesee, F., 2005) meet state benchmarks in English reading proficiency, highlighting the pervasive nature of these disparities. This underperformance is magnified by stringent educational reforms that emphasize high standards and accountability without adequately addressing the unique needs of ELLs. Moreover, systemic issues such as the misidentification of ELLs within the public school system—often resulting in inappropriate placements or insufficient support—disproportionately affect students from marginalized and immigrant backgrounds, compounding the barriers to their academic success. These intersecting factors underscore the urgency of developing more inclusive and targeted interventions to support ELLs in achieving equitable educational outcomes.

Background:

According to data, ELLs comprise over 10% of the K-12 student population, yet less than half of that population meets state benchmarks in English reading proficiency. Series of educational reforms, lack of adequate bilingual content and bilingual educational frameworks, language curricularization (Sosnowski, 2021), inappropriate placements, or insufficient support disproportionately affect ELL students from marginalized and immigrant backgrounds without adequately addressing their unique needs.

Language curricularization, which is commonly adopted in many U.S. schools, defined as the process of developing standardized content and assessments to achieve measurable language outcomes (Sosnowski, 2021), but it often adopts a one-size-fits-all approach that overlooks the diverse backgrounds, socioeconomic contexts, and learning preferences of English Language Learners (ELLs).

On the other hand, Teachers’ efficacy is often attributed to student success. Teacher efficacy refers to “a cognitive process in which people construct beliefs about their capacity to perform at a given level of attainment” (Tschannen-Moran et al., 1998, p. 202). Teachers with high self-efficacy feel more confident dealing with ELL students and are receptive to adjusting instructional methods to accommodate language differences. Fluency and being bi-lingual, in ELL students’ language and being trained in culturally responsive teaching methods are found to be key indicators of increasing teacher’s efficacy (Haworth et al., 2015). Research also emphasizes the need for culturally and socially relevant teaching frameworks to enhance ELLs’ self-efficacy and success. Also, Bilingual curriculum greatly benefits the facilitation of cognitive development and positively enhances academic achievement among ELLs. The bilingual program helps increase language skills, helps ELLs gain more confidence, and creates a positive attitude toward learning for ELL students.

Addressing these contributing factors is essential in bridging the academic disparity among the ELL students and also help transition school cultures to embrace multicultural and multilingual teaching methods more broadly in order to help increase teachers efficacy and integrating bilingual content development into schools’ pedagogical frameworks

English Language Learners (ELLs) constitute over 10% of the K-12 student population, yet fewer than half achieve state benchmarks in English reading proficiency. Factors such as educational reforms, limited access to bilingual content and frameworks, language curricularization (Sosnowski, 2021), inappropriate students placements, and insufficient support disproportionately impact ELLs from marginalized and immigrant backgrounds, often failing to address their unique needs. Language curricularization, a process designed to standardize content and assessments for measurable outcomes, frequently adopts a uniform approach that neglects the diverse cultural, socioeconomic, and educational contexts of ELLs.

Teacher efficacy, a critical factor in student success, refers to educators’ beliefs in their capacity to achieve specific instructional goals (Tschannen-Moran et al., 1998). Teachers with high self-efficacy are more confident in supporting ELLs and willing to adapt their methods to address linguistic differences. Fluency in ELLs’ native languages and training in culturally responsive teaching practices are key indicators of increased teacher efficacy (Haworth et al., 2015). Research highlights the importance of bilingual curricula and culturally relevant pedagogies, which support cognitive development, enhance academic achievement, foster positive attitudes toward learning, and build ELLs’ confidence.

Addressing these issues is critical to reducing academic disparities among ELLs and fostering school cultures that embrace multicultural and multilingual teaching methods. Integrating bilingual content and culturally responsive frameworks into pedagogical practices not only supports ELLs but also enhances overall teacher efficacy.

Proposal and Objective:

There is ample research has been conducted into academic disparity which yielded several possible solutions ranging from instructional scaffolding, immersive teaching, individualized learning plan, and dual language bilingual education to even including Educational Technology tools, all of which succeeded in certain areas and fell short in others. In my own professional context, I witnessed the power of having a bilingual teacher implement a bilingual content in Algebra which led to discovery of a misdiagnosed IEP student into a top Mathlete in a short period of time. However, realization came after a series of trial and error and months of trying to figure the best approach to help assimilate immigrant ELL students into classrooms.

That strategy of utilizing a bilingual teacher to teach a bilingual content convinced me that this factor deserves further research and consideration.

For my proposal in this project, my objectives are to work with my target audiences (a) school administrators, instructional leaders, and instructional content developers and (b) ELL students. First phase is to work in tandem with the school administration to hire bilingual teachers (for example Arabic, Urdu, Swahili, and Somali) with experience of socially and culturally relative content development. Then, offer intensive workshops and training needed to design effective, ELL-oriented lessons that address both language and content objectives. This will help with putting the existing bilingual education culture into more structured framework and help streamline the creation of bilingual curriculum based on needs assessment.

During this process, I will reach out to other similar urban schools with higher ELL student population to learn more about their existing bilingual content and possibly their own instructional database. This process will help integrate homegrown bilingual content into our own database which then will help with seeking out other existing databases locally, statewide, or even nationally.

This will help segway into next phase of the project: launching the assessment application that will utilize cloud tools such as AWS Bedrock/Anthropic Claude to integrate student responses with machine learning algorithms to access the existing databases to help craft an individualized learning pathway based on student’s competency test results.

Proposal and Objectives:

Extensive research on academic disparities among English Language Learners (ELLs) has identified various potential solutions, including instructional scaffolding, immersive teaching, individualized learning plans, dual-language bilingual education, and the integration of educational technology tools. While each approach has demonstrated success in certain areas, limitations persist in others. In my professional experience, as a former principal of an urban school in Indianapolis, IN, the implementation of bilingual instruction in Algebra by a bilingual teacher led to significant discovery. This approach not only facilitated the assimilation of immigrant ELL students but also led to the discovery of a misdiagnosed Individualized Education Program (IEP) student who subsequently excelled as a top-performing Mathlete. The student’s struggles were due to language barriers (Arabic to English and not at all attributed to the student’s competency of the subject matter). However, achieving this success required months of experimentation and refinement to identify the most effective strategy for integrating ELL students into classroom learning environments.

This experience underscores the need for further research into the role of bilingual educators and bilingual content in addressing the academic needs of ELLs. For my project proposal, the objectives focus on collaborating with key stakeholders, including school administrators, instructional leaders, content developers, and ELL students. The initial phase involves partnering with school administrators to recruit bilingual teachers proficient in languages such as Arabic, Urdu, Swahili, and Somali, with expertise in developing culturally and socially relevant instructional content. These educators will undergo intensive workshops and training facilitated by the school to design lessons that effectively address both language acquisition and content mastery. This effort aims to formalize and streamline bilingual education practices through structured frameworks and needs-based curriculum development.

During this process, I will also reach out to other similar urban schools with higher ELL student population to learn more about their existing bilingual content and inquiry about their own instructional database. This process will help integrate homegrown bilingual content into our own database which then will help with seeking out other existing databases locally, statewide, or even nationally.

This will help segway into next phase of the project: launching the assessment application that will utilize cloud tools such as AWS Bedrock/Anthropic Claude to integrate student responses with machine learning algorithms to access the existing databases to help craft an individualized learning pathway based on student’s competency test results.

Ethical considerations:

To address the ethical concerns surrounding AI in education, institutions and AI developers (Schwartz & Solove, 2011) should implement the following measures:

1. **Establishing Data Protection Standards**: Educational institutions must develop and enforce robust data security and confidentiality protocols, ensuring that student data is collected and utilized transparently and with informed consent (O'Neil, 2016).
2. **Auditing Algorithms for Fairness**: Conducting regular audits of AI algorithms can help identify and mitigate biases or discriminatory practices, thereby enhancing fairness in AI applications.
3. **Providing Training and Promoting Stakeholder Engagement**: Educating teachers and students about AI fundamentals will empower them to understand and effectively manage the use of AI technologies in their educational contexts.
4. **Forming Ethical Committees**: Establishing committees comprising teachers, students, parents, and AI experts can facilitate the development of ethical guidelines to ensure responsible AI use within educational settings.

all stakeholders, including students, teachers and administration, should have a clear understanding of what data is collected, how it is processed, and how the AI makes certain conclusions or recommendations based on this data

Ethical considerations:

Ethical considerations of this project surround around the collection and use of student data as it is ingested into AI/ML processes. To address these ethical concerns, I will advocate school administrators and content developers (Schwartz & Solove, 2011) to adopt comprehensive measures. Such measures will include establishing robust data protection standards to ensure transparency and informed consent in the collection and use of student data (O'Neil, 2016), and regularly auditing algorithms to identify and mitigate potential biases or discriminatory practices. Educating teachers, students, and other stakeholders on AI/ML fundamentals is crucial for fostering an understanding of how AI/ML operates, including its data processing and decision-making processes.

Implications:

This project provides further research into the effects of using bilingual education in reducing the academic disparity and a clear step by step approach to instilling a bilingual education culture in schools. The project also offers additional research work to fill the gap in academia aimed at studying and understanding the academic disparity in underserved schools with high ELL population. For stakeholders and administrators, the project offers a comprehensive approach to hire, train bilingual teachers and establish a systemic bilingual education culture. Locally grown content will add to the creation of content database and This culture can lead to wider collaboration between schools and institutions to encourage wider collaboration with the goal to offer equitable and effective education system for ELLs in hopes of bridging the academic gap.

Technologically, the creation of database can serve as a plug-in template for addressing the long-existing academic concerns of ELLs and other racial and ethnic minoriites that are often neglected in schools due to lack of resources and effective pedagogical approaches. With the integration of the ML powered assessment application, teacehrs would be able to create individualized lesson plans to help ELLs to make strides in their academic journey.

The implications of this project are to advance research on the impact of bilingual education in addressing academic disparities in US schools and provide a detailed, step-by-step framework for fostering a bilingual education culture for schools and school leaders. It also contributes to academic literature by addressing the gaps in understanding the challenges faced by underserved schools with high ELL populations. For stakeholders and administrators, the project offers a structured approach to recruiting and training bilingual teachers and establishing a systemic bilingual education framework. By incorporating locally developed content into a centralized database, this initiative aims to facilitate collaboration among schools and institutions, fostering a unified effort to provide equitable and effective education for ELLs and reduce academic disparities.

From a technological perspective, the content database can serve as a scalable template for addressing long-standing educational inequities affecting ELLs and other underrepresented racial and ethnic minorities, often overlooked due to resource and pedagogical limitations. Additionally, integrating a machine-learning-powered assessment application will enable teachers to design individualized lesson plans tailored to ELLs’ specific needs, supporting significant academic progress and fostering personalized learning pathways.

Modality:

I will continue utilizing written academic English adopted during the scholarship of integration as the primary modality for this project. The training sessions and workshops conducted for bilingual teachers will be thoroughly documented, as will the implementation of policies at the administrative level and the collaborative efforts between and within schools. Additionally, the analysis of student data, including their test scores, and its application in developing bilingual content for integration into a centralized database system will be systematically documented and reported in formal academic English.