Literature Review

In conducting background research to prepare for hosting this lesson study cycle, multiple academic articles were utilized. The focus of our team research centered around creating an intentionally accessible UDL (Universal Designed Lesson) project launch lesson to reach a diverse array of students. Our goal was to build upon students' existing funds of knowledge in pursuit of developing a greater critical consciousness when understanding the link between redlined communities and exposure to environmental pollution. By providing students with research informed strategies to construct and derive meaning from multiple familiar sources of information, such as short video clips or segments of a documentary, and visual forms of spatial maps we can promote greater engagement with academic content and help develop individual learners' executive function skills. For example in the work by author Evmenova (2018) geared towards preparing teachers to use UDL strategies to support diverse learners of all abilities, having familiar educational technology corresponds to higher academic achievement. Existing research that reports gains in students' academic outcomes in all major content areas because of UDL-based interventions includes the use of such technologies as content acquisition podcasts (e.g., Kennedy, Thomas, Meyer, & Alves, 2014); videos and narrated presentations (King-Sears et al., 2015); digital backpacks (e.g., Basham, Meyer, & Ernest, 2010); video games (e.g., Marino et al., 2014); and computer-based reading programs (Hall, Cohen, Vue, & Ganley, 2015). With the goal of utilizing scholarly based research to not only help develop students' historical understanding of the effects of redlining, but also provide students unique opportunities to demonstrations their learning, the following themes emerged:

1. Allow for Multiple Means of Representation
2. Promote Individual Self Autonomy
3. Have Flexibility in Lesson Structure

Allow for Multiple Means of Representation

Informed by neuroscience and research conducted with the intent of making academic content learning more accessible and meaningful, we adjusted the ways in which students would receive information based upon observed student strengths. UDL facilitates the attainment of learning goals for individuals with wide differences in their abilities to see, hear, move, read, write, understand English, sustain attention, organize, engage, and remember. Educators who implement UDL practices realize the importance of providing natural curricular provisions for all individuals, without having to adapt the curriculum repeatedly to meet special needs (Rose et al. 2002). This lesson would build an understanding of how the practice of redlining in the United States coincides with worse health outcomes for residence in those marginalized communities by

giving our visual learners an opportunity to review informative content through an assets based approach. The modality that we would prepare students to examine would be visional in the form of an environment justice documentary, spatial maps, and a news segment video with captions on for the students to interpret. “As a result, increasing numbers of support and intervention teams have begun to draw on the framework of UDL, a brain-based approach that emphasizes the use of multiple means of representing content, of providing to students varied means of action and expression, and of engaging students’ interests” (CAST, 2011; Gravel, Ralabate, & Thomas, 2010). After reviewing the visional information students would have multiple ways expressing their thinking via anonymous polling, partner talks and whole class discussions. In groups students would express their understanding via jamboard where they could demonstrate what they have learned for more creative minded individuals by drawing an image depicting the new academic term, analytically minded students could research the academic term in history and find an photograph example, and expressive minded students could create their own definition based upon unique understanding. This varied approach of garnering student understanding in multiple forms contributed to greater engagement from our focus students and more accessible lesson for all learners.

Promote Individual Self Autonomy

Providing students opportunities to work together and learn from each other builds not only academic prowess but social emotional awareness as well. Our lesson was designed to build students' confidence based upon merit and having the ability to gauge their understanding by having a clear outline of the day, a checklist to review understanding during the course of the lesson, and chances to share thinking with peers in discussion. Preparing students to be confident in performing their group activity role meant finding ways within the lesson for them to check their understanding autonomously and being intentional about how the development of their executive function impacts their ability to contribute to the group project. After each learning segment in the lesson students would have intentional thinking to individually process what was observed, then discuss with a partner before having a whole class share out. Our lesson would review previous class content building on that knowledge and inviting students to make personal connections to new content based upon their own life experience. Having an intentional outlined structure for the day helped students understand the course of activities and how they can track their learning throughout themselves. “Using prompts, scaffolds, checklists, and models, students set realistic and individualized goals, and determine next steps in their own learning process.

Student planning is encouraged by their use of "think aloud" processes, as well as "stop and think" and "tum and talk" prompts.” At the start of the lesson students would have a clear understanding of what goal of the day’s activities would be and how they would contribute their understanding in collaboration with peers. The use of intentional prompts, peer talks and aiding all students with checklists as we progressed in the lesson helped the learners develop their individual autonomy in a scaffolded way.

Have Flexibility in Lesson Structure

Our research goal of helping students learn for themselves how the effects of redlining placed marginalized people of color in closer proximity to harmful pollutants than the general population meant anticipating potential areas of difficulty. Having flexibility in how we would deliver academic content as well as how we would ask students to demonstrate their learning became a prevalent factor in the success of our lesson. “Having multiple or flexible representations of information and concepts (the “what” of learning), 2. multiple or flexible options in expression and performance (the “how” of learning), and 3. multiple or flexible ways to engage learners in the curriculum (the “why” of learning)” (Rose & Meyer, 2002). This researched concept helped us in reaching our lesson goal by giving students access to a more dynamic learning structure that respected all students' unique learning styles and invited multiple ways of expressing their understanding. Alterations were made to our planned lesson based upon previous observations of students having comprehension difficulties when presented with complex texts, and content that was considered non relatable. “Planning involves minimizing barriers and maximizing accessibility, with a corresponding emphasis on providing challenge for all learners, often through flexibility and the use of options (CAST, 2011).” In order to avoid these potential barriers we utilized informative videos with captions provided about young high school aged protagonists combating the negative effects of redlining and pollution. This intentional adjustment and flexibility connected with more students, fostering greater engagement and provided us more opportunities to help all learners reach our academic goal.

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