Adaptive Interventions: A Context-Sensitive, Dialogic Approach

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ABSTRACT

Background

The Scijourn project is based on the notion that practices of professional science journalists—such as making use of multiple and diverse credit sources—relate to skills that scientifically literate adults could use. In A Framework for High School Science, Schomberg has used a distributed activity system of school sites, an informal science institution. Recent work on the construction of science news stories for a regional science print newspaper and online publication (SciJourn.org). Team members developed a set of science literacy and article writing standards within the project.

Example 1: From writing to reading and writing

One of the notable ways that teachers in the process of implementation made the initiative’s own was in stressing the reading of science news. The university team originally focused only on writing science news. In our first professional development workshop, our university team used a read-aloud/think-aloud (RTA) technique common in elementary reading instruction to highlight the cultural elements of science news texts. We did not initially advocate for use of RTAs in high school classrooms, but one teacher found them well-adapted to his time and curriculum constraints. In just a few minutes at the beginning or end of class, Mike used RTAs to model how he critically examines aspects of science news related to his curriculum, such as the credibility of sources, while assessing how important that news is to society. Mike shared how the RTAs helped him gain stronger rapport with students within the curriculum goals. More teachers utilized RTAs, and the university team has since encouraged forms of this activity as flexible means for teachers to model critical science literacy.

Example 2: Sources of Information for Science News

“Writing science news” has also been transformed through implementation. In developing a storyline, search for multiple credible sources on the Internet in the manner that originators of the project envisioned, learning a great deal about how to critically consume science information on the web, and think about the kind of expertise different sources offer: But in part because the university-based researchers feared interviews were not well-adapted to the rapid time and relative isolation of schools, we did not initially push student interviews as a method. We have since learned that interviews are possible and very helpful in encouraging—school nurses, maintenance staff, and local stakeholders often help learners make sense of the science and its significance. Interviewing is often a memorable and transformative experience for learners. In addition, although the project initially focused on teens using secondary science information, youth participants have included primary data from social media surveys and primary investigations from their own school in their stories.

Summary

SciJourn has been adapted in local contexts, enabled by norms for adaptation and dialogue within a distributed and diverse “ecosystem.” Standards are formed as principles that many different instructional actions could fulfill. The professional development and research infrastructure facilitated the positioning of researchers and teachers as co-inquirers and co-developers of instruction. These factors enabled new patterns of activity to emerge and be taken up by others.

Critical Civic Inquiry

Background

Cultural Historical Theory

Cultural historical psychologists have extended Vygotsky’s notion of “tools” or “artifacts” by showing how tools carry cultural-social norms that encourage dialogic interactions. Cultural Historical Theory (Cultural Historical Psychology) was developed in the 1960s by sociocultural psychologists who were influenced by Vygotsky’s work. These psychologists focused on how tools and artifacts are used to support learning and development. They argued that tools and artifacts are not just physical objects, but rather cultural constructs that are used to mediate social interactions and support cognitive development.

Example 2: Educational Trajectories at Pathways Academy

Pathways Academy, a school that serves students whose needs had not been met by comprehensive high schools. The school sought to build a relationally supportive environment where students felt cared for and heard. Within this environment, students who had difficulty finding a topic that generated enthusiasm. This approach to student identification and take action to solve problems in their schools, and ongoing design-based research to understand and refine CCI curriculum. Evidence developed through research suggests significant increases relative to a control group in academic engagement and civic efficacy, as well as positive impacts on school climate (Kirshner, Zion, and Hipolito-Delgado, 2013).

Critical Civic Inquiry

Critical Civic Inquiry (CCI) is an approach to engaging students from historically marginalized groups who face significant barriers to participation in science education. CCI is based on a collaborative approach to scientific inquiry that involves students in the design and implementation of research projects. CCI projects are developed in collaboration with community partners, who provide guidance and support throughout the research process. The goal of CCI is to empower students to become active participants in the scientific process, while also addressing the social and cultural contexts in which science is practiced.

Example 1: School Spirit at Jane Addams High

At Jane Addams students identified a lack of school spirit as a problem at their school. They wanted to build it through developing school colors and events such as the upcoming first inaugural prom, which they persuaded the school leadership to support. Without an understanding of context, students’ excitement about these emblematic features of school spirit, a ubiquitous feature of American high school life, might appear unrelated to CCI’s focus on transformative student voice. The meaning of the prom, however, was quite different at JAH, a school for pregnant or parenting mothers. According to the teacher we worked with, Ms. M, most of her students had experienced failure in their prior school experience. Now at Jane Addams because of trauma, expulsion, or weak school performance at the comprehensive high schools they were previously attending. Their effort to establish this rite of passage could be understood as a desire to build a stronger sense of belonging in school and normalize more diverse educational paths for pregnant and parenting teens.

IMPLICATIONS

SciJourn and CCI aim to build flexibility and dialogues into their design. Consistent with the DFR principles, we believe that worthwhile ideas are more likely to be sustained when the core interventions are in line with and responsive to varied contexts, local actors understand the relevant principles, and relationships/trust networks facilitate legitimacy, critical reflection, and adaptation. Such interventions are marked by an ongoing commitment to iteration and dialogue.

SELECTED REFERENCES