**POOLS Instrument Validation Study**

In the wake of the COVID-19 pandemic, an estimated 1.2 billion school-aged children around the world were displaced from their classrooms leading to a drastic rise in various forms of online learning (Li & Lalani, 2020). The sudden shift in educational routine widely impacted the United States educational system where an estimated 55 million school-aged children were displaced from their classrooms (García & Weiss, 2020). The U.S. Census Bureau’s Household Pulse Survey indicated that 93% of U.S. households with school-age children reported some form of distance learning in the wake of the COVID-19 pandemic (Mcelrath, 2020). The same study reported that 80% of those U.S. households’ students were using online learning resources while about 20% were using paper materials sent home from the school.

The sudden switch to online learning brought an unintended spotlight to the gradually expanding educational innovation. A recent Pew Research Center survey (*n*=2,561; Horowitz & Igielnik, 2020) found that parents whose students are receiving online only instruction or a mix of face-to-face and online during the pandemic are less satisfied with the way their schools are handling teaching and learning during the COVID-19 pandemic. In general parents and teachers are concerned about their students falling behind due to shifts in teaching and learning during the pandemic. Income demographics differences further complicated these perceptions of learning quality. Almost three-fourths of parents with lower income (72%) say they are very or somewhat concerned with their children falling behind compared to 63% of middle income and only 55% of high income parents (Horowitz & Igielnik, 2020). Among upper income students 40% are receiving online only instruction while lower income students receive online only instruction at higher rates (53%).

Online learning has generally been stigmatized as less effective than traditional face-to-face learning (Hodges et al., 2020) even though research to support that assertion is inconclusive a research-supported perception. Whether or not online learning is actually more or less effective than traditional learning models is not easily answered. In fact it may depend largely on how one defines online learning which can range from well-planned learning designs intended for virtual learning spaces to sudden switches to emergency remote teaching (Czerniewicz, 2020; Hodges et al., 2020). Intuitively and empirically, the former is more effective than the latter (see Means et al., 2014). Highlighting the complexity of perceptions of online learning, Czerniewicz (2020) described how university shutdowns due to political unrest in South Africa forced teaching and learning to switch online. She noted that the very perception of online learning was heavily tainted by the politics of the situation rather than true reflective assessment of the online learning. It is possible Czerniewicz’s cautionary tale applies to the COVID-19 sudden shift to online learning—perceptions on online learning may be laden with political clutter.

Perceptions of online learning existed prior to the COVID-19 sudden shift in educational delivery, and those perceptions are continually being impacted by the displacement of students and techniques of emergency remote learning. The purpose for developing the Perceptions of Online Learning Scale (POOLS) was to move beyond simple satisfaction surveys and develop a theoretically grounded and psychometrically sound tool to measure perceptions of online learning among teacher populations. Teachers’ individual differences and perceptions tend to influence the way they teach and interact with students (Brophy & Good, 1974; Hardré & Sullivan, 2008; Skinner & Belmont, 1993). The research goal for developing the POOLS is to explore ways that teachers’ perceptions of online learning influence the way they teach and interact with students. For instance, Hardré and Sullivan (2008) noted that teachers’ perceptions of external and systematic factors influence and constrain the options they believe they have and the strategies they choose to use. At the time, Hardré and Sullivan were not specifically focusing on online learning, but the increased use of online learning is arguably a systematic factor about which teachers likely have clear perceptions.

**Theoretical Framework**

Quality online learning has been defined in a comprehensive set of standards specifying industry standards for online teaching, online programs, and online courses (Quality Matters & Virtual Learning and Leadership Alliance, 2021). Those sets of standards broadly establish what is expected of high quality online learning. The *Perceptions of Online Learning Scale* (POOLS) was derived from those broad standards of quality online learning. The POOLS seeks to measure perceptions of online learning across four theoretical constructs associated with quality education in both online and traditional face-to-face formats.

**Effective Learning**

Learning is an activity that involves both mental processes and behavior or action (Ormrod, 2016; Watkins et al., 2002). Therefore, any measure of effective learning must consider both the acquisition of new knowledge and its use or application. Defining effective learning can be challenging because learning occurs in a wide variety of contexts and domains and is studied across differences in learning theory (de Freitas, 2018; Ormrod, 2016). Effective learning measured in POOLS items includes cross-domain characteristics reflecting both the process and the outcomes of effective learning (de Freitas, 2018; Harden & Laidlaw, 2013; McTighe & O’Connor, 2005; Ormrod, 2016; Watkins et al., 2002). Effective learning is defined as learning in which students masterfully acquire and utilize relevant new knowledge and/or skills, as witnessed through application and assessment that occur within or outside the immediate classroom.

**Engaged Learning**

Engagement in the learning process generally refers to the extent a student is actively involved in learning activities (Reeve, 2012). Engagement may be observed in three related categories. Cognitive engagement involves thinking, integration of ideas, setting learning goals, self-regulation, and intentional efforts to understand. Affective engagement includes enthusiasm, curiosity, interest, and finding relevance and satisfaction in the process of learning. Behavioral engagement is observed as effort, attention, focus, personal agency, attempting and completing work (Bond & Bedenlier, 2019). Student engagement in acts of learning generally leads to positive short and long-term outcomes that can in turn support continuous engagement (Bond et al., 2020). For the POOLS, engaged learning was defined as the energy and effort that students present in their learning environment. Engagement can be observed in three areas: cognitive engagement, behavioral engagement, and affective engagement. Engagement can be influenced internal factors as well as environmental factors, and higher levels of engagement generally support more efficient learning, retention, and transfer.

**Interactive Learning**

Interaction is a reciprocal event that requires two elements that are mutually influencing one another (Wagner, 1994). Moreover, interactive learning is conceived of in a three-part interactive scheme: (a) learner – instructor interaction, (b) learner – learner interaction, and (c) learner – content interaction (Moore, 1989; Su et al., 2005). For the POOLS, interactive learning involves three facets of interaction: (a) student to instructor, (b) student to student, and (c) student to content. These interactions contribute to quality learning singularly as well as in combination. All three facets of interaction can be present regardless of the learning mode (online or face-to-face).

**Student-Centered Learning**

Student-centered approaches to learning may be traced back to Dewey’s belief that teacher instruction should be driven by students’ interests as characteristics as unique learners (Schiro, 2012). Student-centered learning is characterized with high levels of student direction –student-based activities, interactions, and assessments. In student-centered learning environments, students work collaboratively to achieve the learning goals based on students’ interests with teachers’ facilitation (Pedersen & Liu, 2003). Student-centered approaches include models such as case-based learning, problem-based learning, and team-based learning, and they can be applied in both online learning and face-to-face settings. Empirical evidence supports that student-centered approach enhances student learning and motivation (Cornelius-White, 2007; Wilson et al., 2018). For the POOLS, student-centered learning is defined as learning that empowers students to actively drive and direct the learning process rather than be a passive receiver of teacher-centered instruction.

**Current Study**

The purpose of this study is to report on the development and initial validation of the POOLS. The POOLS asks participants compare online learning to face-to-face learning on items measuring effective learning, engaged learning, interactive learning, and student-centered learning. The research goal is to use the POOLS to examine ways that demographics, prior experiences, and personality traits influence perceptions of online learning.

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