How Does the Design and Implementation of Distance Education Courses Impact Learning and Satisfaction?


What the Research Says about Distance Education Courses

The preponderance of research on the impact of Distance Education (DE) focuses on comparisons to the more traditional approach of Classroom Instruction (CI). The volume of research produced comparing the effects of CI to DE is large enough to have produced at least three prominent meta-analyses on the subject (Bernard, et al., 2004; Means, et al., 2010; Zhao, et al., 2005).

In this article, Bernard, et al. suggest three conclusions to be drawn by researchers. First, the wide variation in comparative effect sizes is pervasive in the literature, but some aspects of the DE modalities appear to be related positively to student learning outcomes. Second, the research designs and methods used for most projects are poorly conceived and executed. Lack of controls via experimental or quasi-experimental design introduces confounding factors that impede the ability to make causal inferences about the relationships between variables and render all other findings automatically subject to skepticism. Third, the construction of research questions that pit DE against CI undermines our ability to research and understand what differences within the category of DE matter. And, since the question of DE versus CI has been largely settled (see also Means, et al., 2010), the subject, perhaps, is undeserving of further investigation, especially at the expense of unexplored territory.

Design and Methods

Bernard, et al.’s meta-analysis moves beyond the DE versus CI debate into the territory of empirically determining the factors that improve student learning within DE modalities in order to recommend approaches and designs in DE to improve learning outcomes. Specifically, this study is a meta-analysis in which different instructional treatments with regards to types of student interaction in DE courses are compared. The three basic types of interaction identified and examined are Student-Student (SS), Student-Teacher (ST), and Student-Content (SC).

SS interaction is defined as “interaction among individual students or among students working in small groups” (p. 1247) and evidenced both by synchronous (e.g. videoconferencing, chatting) and asynchronous (e.g. email, discussion boards, threaded discussion) activities.

ST interaction focuses on classroom based interaction between students and the instructor. Under DE conditions, ST interaction can include synchronous activities (e.g. phone calls, videoconferencing, chatting) and asynchronous activities (e.g. correspondence, email, discussion boards). In both the SS and ST interactions, face-to-face communication may also occur.

Finally, SC interaction is defined as “students interacting with the subject matter under study to construct meaning, related it to personal knowledge, and apply it to problem-solving”
Evidence of SC interaction includes “reading informational texts, using study guides, watching videos, interacting with computer-based multimedia, using simulations, or using cognitive support software (e.g. statistical software), ...searching for information, completing assignments, and working on projects” (p. 1248).

In addition to a consideration of the types of interaction, the strength of interaction (high, moderate, minimal) is measured and weighted in the analysis (pp. 1254-1255).

Bernard, et al. originally identified approximately 1034 full text manuscripts for possible inclusion in the study. Of those, only 190 (18.4%) met the following a priori requirements for inclusion into the study: 1) a comparison of two DE conditions; 2) measures of comprehensive achievement where DE components >50% of interventions; 3) sufficient statistical information with which to calculate effect sizes; 4) whole courses at institutions with 15+ intervention hours; 5) all grade levels; 6) publicly available sources; 7) published from 1985-2006. After close inspection and reapplication of the exclusion criteria, only 74 (7.2%) of the original number identified were kept.

The Meta-Analysis Findings

The results of the meta-analysis produced the following six (6) findings:

- The effects of ST Interaction Treatments (ITs) – instructional or media conditions that promote interaction in DE settings – are significantly smaller than the effects of either SS or SC ITs. The effects of SS and SC ITs are not significantly different from each other.
- Overall, increasing the strength of ITs has a positive and significant effect on achievement.
- The stronger the SC ITs, the higher achievement. This finding is not true for SS or ST ITs.
- The combinations of SS with SC and ST with SC produces better achievement outcomes than does the combination of SS with ST.
- There are no statistically significant differences in achievement between synchronous, asynchronous, or mixed, also referred to as blended with face-to-face in this study, DE conditions.
- The strength of SC ITs affects outcomes under asynchronous conditions more than synchronous or mixed DE conditions.

Discussion and Best Practices

- **ITs in DE courses work:** SS, ST, and SC interactions all contribute positively to student learning given the opportunities for increased cognitive engagement they may engender. However, not all ITs have the same impact on learning: ST ITs contribute comparatively less to student learning than SS and SC ITs. This finding suggests that resources and efforts should be directed at the development of SS and SC ITs, but especially in SC ITs.
- **Strength of IT matters:** The strength of ITs is significantly and positively associated with achievement outcomes with high and moderate IT strengths producing superior results to that of lower level ones, but separately only SC IT strength is associated with learning gains. Therefore, it is suggested that instructional designers should focus on the development of strong SC ITs.
References


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