

Research Studies Overview

Carrie Howard

University of Arkansas at Little Rock

EDFD 70303– 9U1 Introduction to Education Research

Dr. Monica Meadows

01/24/2026

Research Studies Overview

When reviewing research-based decisions, we must consider the critical role they play in graduate level study and professional practice in education. As students like me progress through coursework and prepare for future careers such as instructional design, we must develop the ability to locate, interpret, and apply our findings through peer reviewed research because this becomes extremely important. The purpose of this paper is to examine original research studies that are relevant to instructional design. This study will help determine the research design used, the research questions or guiding focus, the methods of data collection, the procedures used to analyze data, and the conclusions drawn by the authors. Throughout my analysis, this paper highlights how research can help inform instructional design decisions and support evidence-based practice within educational settings.

Type of Research Design

Quantitative research is a type of research that mainly focuses on collecting data in numbers. This helps to identify patterns, relations, and at time the differences that may occur through different variables. During this approach it relies on structured instruments which could be surveys or assessments and use statistical analysis to interpret results. Quantitative research is commonly used to measure perceptions behaviors, or even outcomes across larger groups to support conclusions with objective data.

This article is an example of quantitative research because the authors collected numerical data using structured questionnaires with Likert scale items. The study involved a large sample of preservice mathematics teachers and instructors, and all responses were converted into numerical values for analysis. The researchers relied on statistical procedures, including descriptive statistics, group comparisons, and priority needs index calculations, to

interpret the data. No qualitative methods, such as interviews or open-ended responses, were used, and the conclusions were based entirely on statistical findings (Chananil, Yuankrathok, & Somabut, 2025).

In addition to the first study, the second article also uses a quantitative research design. The authors collected numerical data through a structured online survey administered to university students who had prior experience with e learning systems. All survey items were measured using five-point Likert scale responses, allowing participant perceptions, attitudes, and behavioral intentions to be quantified for statistical analysis. The study relied exclusively on numerical data and statistical modeling to test hypothesized relationships between variables such as self-efficacy, perceived ease of use, technological innovativeness, and continuance intention. Because no qualitative data sources such as interviews or open-ended responses were used, and all conclusions were derived from statistical results, this study clearly aligns with a quantitative research approach (Pham, Nguyen, & Trinh, 2025).

Research Questions or Guiding Focus

The authors did not present the study using traditional research questions. Instead, they developed a set of hypotheses that guided the purpose and structure of the research. These hypotheses focused on identifying the gaps between current instructional practices and the desired instructional conditions needed to support mathematical resilience among preservice mathematics teachers. The study also aimed to examine instructional challenges that may hinder the development of mathematical resilience and to determine which dimensions of mathematical resilience represent the highest instructional needs. In addition, the authors sought to compare

the perceptions of instructors and preservice teachers to identify similarities and differences that could inform future instructional design decisions (Chananil et al., 2025).

Unlike the first study, which was guided by hypotheses, the second article explicitly stated three research questions to frame the investigation. These research questions focused on identifying the psychological and technological factors that influence students' intention to continue using e learning systems. Specifically, the authors examined which factors most strongly contribute to student self-motivation in online learning environments, whether experience or technological innovativeness has a stronger influence on students' self-motivation, and the extent to which perceived enjoyment moderates the relationship between students' attitudes and their intention to continue using e learning platforms. These research questions were grounded in established theoretical models, including the Technology Acceptance Model and the Theory of Planned Behavior, and were designed to address gaps in prior research related to emotional influences in e learning contexts (Pham et al., 2025).

Data Collections Methods

Data for this study were collected using two structured questionnaires designed by the researchers. One questionnaire was administered to preservice mathematics teachers, while the second was administered to mathematics instructors. Both questionnaires consisted of five-point Likert scale items that measured perceptions of current instructional practices, desired instructional practices, and the importance of developing mathematical resilience across four key dimensions growth mindset, value, struggle, and support. The participants included 372 preservice mathematics teachers and 83 mathematics instructors from 17 teacher education programs located in Northeastern Thailand. The surveys were distributed online, and participants

completed the questionnaires during a single data collection period. Participation was voluntary, and informed consent was obtained prior to data collection (Chananil et al., 2025).

For the second study, data were collected using an online questionnaire distributed to university students in Ho Chi Minh City, Vietnam. The researchers used a purposive sampling approach to ensure participants had sufficient experience with e learning systems. A total of 510 students completed the survey, which included Likert scale items measuring constructs such as experience, perceived ease of use, self-efficacy, attitude, technological innovativeness, perceived enjoyment, and continuance intention. Demographic information, including age, gender, academic level, field of study, and years of experience using e learning applications, was also collected. All data were gathered during a single collection period using Google Forms, and participants provided informed consent prior to participation (Pham et al., 2025).

Data Analysis Procedures

The researchers analyzed the collected data using a combination of descriptive and inferential statistical methods. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize participant responses and provide an overview of current and desired instructional conditions. To compare perceptions between instructors and preservice teachers, the researchers conducted t tests and chi square analyses.

In addition, the Modified Priority Needs Index was used to identify gaps between current instructional practices and desired instructional conditions. This index allowed the researchers to determine which areas required the highest priority for instructional improvement. Correlation

analysis was also conducted to explore relationships between perceptions of digital tool importance and instructional needs. All statistical analyses were completed using SPSS software (Chanani et al., 2025).

The authors of the second study analyzed the data using partial least squares structural equation modeling. This method was selected due to its effectiveness in examining complex relationships between latent variables and its suitability for non-normally distributed data. The researchers evaluated both the measurement model and the structural model to assess reliability, validity, and hypothesized relationships. Reliability was examined using Cronbach's alpha and composite reliability, while convergent and discriminant validity were assessed through average variance extracted values and correlation analyses. Structural relationships were tested using path coefficients, t values, and significance levels obtained through bootstrapping procedures. All statistical analyses were conducted using SmartPLS software (Pham et al., 2025).

Conclusion of the study

The authors concluded that there are significant gaps between current instructional practices and the instructional conditions needed to effectively support mathematical resilience among preservice mathematics teachers. The findings indicated that the greatest instructional needs were found in the areas of struggle and support, suggesting that learners require more opportunities for productive challenge as well as stronger emotional and instructional support. The study also identified overreliance on lecture-based instruction and limited integration of digital tools as major challenges that hinder the development of mathematical resilience.

Additionally, the authors found that preservice teachers consistently reported higher levels of instructional need than instructors, particularly in areas related to emotional and learning support. Based on these findings, the authors concluded that digital learning ecosystems have strong potential to address these gaps by providing adaptive feedback, scaffolding, and supportive learning environments. They recommended that future research include qualitative methods and intervention-based studies to further examine the impact of digital learning ecosystems on mathematical resilience (Chananil et al., 2025).

The findings of the second study indicated that experience and technological innovativeness significantly influence students perceived ease of use and self-efficacy, which in turn positively affect their attitudes toward e learning. These attitudes were found to be a strong predictor of students' intention to continue using e learning systems. Additionally, perceived enjoyment played a moderating role, enhancing engagement when balanced appropriately but reducing continuance intention when enjoyment distracted from learning goals. The authors concluded that instructional designers and educational institutions should carefully balance emotional engagement with academic rigor when developing digital learning environments. By incorporating supportive design features, promoting learner confidence, and ensuring usability, e learning systems can better support long term student engagement and persistence (Pham et al., 2025).

References

- Chananil, S., Yuankrathok, P., & Somabut, A. (2025). Needs assessment for designing a digital learning ecosystem to enhance mathematical resilience in preservice mathematics teachers. *Higher Education Studies*, 15(4), 22–33. <https://doi.org/10.5539/hes.v15n4p22>
- Pham, M., Nguyen, P. X. T., & Trinh, N. N. (2025). Exploring emotional and technological drivers of e learning continuance intention among university students. *Discover Education*, 4(334). <https://doi.org/10.1007/s44217-025-00800-3>

