

Research Methodology, Reliability and Validity

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Educational researchers share the goal of describing, explaining, predicting or controlling educational phenomena (Gay, Mills, & Airasian, 2012, p. 5) in ways that “significantly contribute to both educational theory and educational practice” (Gay et al., 2012, p. 4). Choosing and utilizing an appropriate research methodology is foundational to establishing the reliability and validity of research outcomes and to defining the significance of their contribution.

Reliability and validity, and their statistical reporting, are commonly associated with quantitative experimental research. Golashani (2003) extends this traditional association and argues reliability and validity can be redefined to include a qualitative perspective and “conceptualized as trustworthiness, rigor, and quality” (p. 604). Both concepts encourage researchers to attend to the consistency of their data collection, analysis, and interpretation (Internal Reliability) and the extent to which a study can be reproduced with similar results (External Reliability). Attention should also be paid to the extent to which a study measures what it is supposed to measure (Internal Validity) and provides results generalizable to the real world (External Validity).

This paper explores reliability and validity in educational research by comparing and contrasting a quantitative study (Hamre and Pianta, 2005) and a qualitative study (Sleeter, 2009) and applying this analysis to the author’s task of planning a research project.

Descriptive Analysis and Critique

Hamre and Pianta (2005) and Sleeter (2009) provide background information and review previous research to introduce their studies. Important terms, ideas, variables and strategies are explained as topics are narrowed and purposes are defined. Hamre and Pianta place their work within the extensive body of research on the impact of emotional and instructional support on at-

risk children and make their case for a causal-comparative methodology. In contrast, Sleeter immediately creates a more personal context as she ties a comprehensive introduction to her professional interests and situation and prepares to use a case study methodology.

Describing participants, Hamre and Pianta (2005) recognize the threat to validity resulting from the lack of random assignment inherent in a causal-comparative methodology. They address the potential impact of the differential selection of participants and selection treatment interaction by examining the balance of their groups. They also acknowledge and discuss the potential impact of selected attrition. However, Hamre and Pianta discuss but do not fully address the possibility of statistical regression in their data on at-risk students. The participants' developmental levels and over-all cognitive abilities, as confounding variables, should have been considered

Although "qualitative researchers are less concerned than quantitative researchers about the generalizability of their research" (Gay et al., 2012, p. 395), the impact of participant selection and assignment on validity is not limited to quantitative research. Sleeter (2009) addresses this issue by providing a thorough description of her subject and the rationale for her selection. Illustrating the rigor and quality of Sleeter's work, this builds trust in her results and supports the notion of considering her conclusions in similar situations.

The researchers address reliability and validity in their studies by clearly describing their procedures, data, instruments, and methods of analysis. A rationale for each feature is provided. Notwithstanding the potential impact of global descriptions of classroom quality, Hamre and Pianta (2005) make extensive use of field-tested and norm-referenced instruments that are widely recognized as objective, reliable, and valid and allow for statistical comparison using Analysis of Covariance (ANCOVA). These techniques are typical of quantitative research. In the same vein,

Sleeter (2009) employs a variety of qualitative tools. Her use of detailed description, triangulation, and reflection are appropriate for a qualitative study. Additionally, the development, description and use of a well referenced rubric adds to the strength of her analysis and reporting.

Reporting results and conclusions, the researchers return to their questions and purposes while referencing additional sources for explanation and illustration. Sleeter's (2009) conclusions are confined to the limits of a case study methodology as "research on a unit of study or bounded system" (Gay et al., 2012, p. 14). Her conclusions are specific to the participant and environment described in her study and she is conservative when discussing potentials for their generalizability. Hamre and Pianta (2005) are also conservative in reporting their results. They recognize that "casual-comparative research provides limited cause-effect information" (Gay et al., 2012, p. 11). So while making it clear that their study "provides evidence" (Hamre and Pianta, 2005, p. 963) of a relationship between the variables studied, they also consider and discuss alternative explanations for their results.

Methodological Considerations for the Author's Future Research

Hamre and Pinata (2005) and Sleeter (2009) provide enough detail for an independent researcher to evaluate, if not replicate, their work. They stay within the boundaries of their methodologies while incorporating concepts, techniques, and strategies from others to ensure the reliability and validity of their results and conclusions. It is this understanding that the author extended to the task of designing a future research project to answer the following questions about mobile electronic portfolios (mPortfolios):

1. How do the mPortfolios designed by the teacher and used in his Kindergarten meet the provincial, school district, and school criteria for reporting student progress?

2. What support exists amongst the education stakeholders in this Kindergarten for replacing written report cards with mPortfolios.

The author's professional and personal focus on mPortfolios and his quest for persuasive, relevant, and accessible results, lend themselves to an action research approach. Following Sleeter's (2009) example for qualitative research, a review of the existing research will be completed. Important terms, ideas, and variables will be defined. Patterns and relationships will be explained. Set within the context of his personal experience with mPortfolios, this information will help focus the author's inquiry and provide rationales for the choices made in designing and conducting the project, analyzing its data, reporting its results, and reaching conclusions.

The project will likely occur in three stages corresponding to the school terms: written report cards in Term 1, written report cards embedded in mPortfolios in Term 2, and mPortfolios only in Term 3. Cognisant of potential threats to a study's validity when participants serve as their own controls, consideration may be given to dividing the class into groups and varying the order in which the three reporting options are presented. The author will consider the potential impact of the novelty effect on the data collected.

In keeping with qualitative research design, data will be collected using a research journal, surveys and interviews. The experiences and opinions of students, parents, teachers, school administrators and district administrators will be collected and analyzed at each stage of the project. Provisions for the impact of repeated surveying will be developed and data will be analyzed using triangulation and reflection.

The author will employ an additional range of qualitative research techniques to address the validity and reliability of his study. They will include: providing examples, reporting detailed descriptive data, reporting a detailed description of the study's context, establishing an audit trail,

using peer debriefing, and reviewing the completed report with participants (Gay et al., 2012, p. 393). Thoroughness, rigor, and quality will characterize the project.

At the end the project the author hopes to reach valid and reliable conclusions about the use of mPortfolios to replace written report cards in his Kindergarten class and to report a personal example that illuminates educational theory and demonstrates improved educational practice.

References

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