

Project 3: Research Methodology

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Introduction

This study methodology paper's main goal is to investigate the use of instructional coaching programs that integrate cutting-edge technology in K–12 classrooms. Should K–12 schools roll out instructional coaching programs that more deliberately support teachers' use of technology integration strategies to enhance student learning outcomes?

Education institutions have recently seen both the rapid growth of technology and the growing significance of incorporating it into the teaching and learning process. Programs for instructional coaching have become a potent tool for assisting instructors in successfully integrating technology into their classrooms. To improve their instructional practices and student outcomes, these initiatives offer teachers continual support, professional development, and opportunities for teamwork.

But when cutting-edge tools develop, it becomes increasingly important to look at how instructional deployment efforts are deliberately incorporated with them. Technology has the potential to transform educational practices by providing individualized training, adaptive learning experiences, and data-driven insights that can raise student accomplishment and engagement. To maximize the advantages of technology in K–12 education, it is crucial to investigate the function of instructional coaching programs in assisting teacher technology integration practices, particularly in the context of new deployed technology.

To promote teacher technology integration practices and enhance student learning outcomes, the study proposal aims to examine the efficacy and impact of instructional coaching programs that

use technology. This study aims to offer evidence-based insights and recommendations for educational institutions and policymakers regarding the implementation of instructional coaching programs that harness the power of technology by reviewing existing literature, carrying out data collection procedures, and analyzing the data.

This study intends to add to the body of information on effective technology integration methods in K–12 schools by answering the research question and examining the function of instructional coaching programs in the context of technology. The results of this study will give important new insights into the advantages, difficulties, and viable tactics for putting into practice instructional coaching systems that assist teachers in effectively leveraging technology to improve student learning outcomes.

This research methodology paper will give a thorough overview of the proposed study, including the research design, participant selection, instrumentation, data collection methods, data analysis techniques, limitations, and overall scholarly presentation, with a clear focus on the integration of instructional coaching programs and technology.

Through this research, we hope to raise awareness of the value of instructional coaching programs that use technology and offer direction for K–12 schools looking to make use of these programs to improve student learning outcomes and maximize technology integration practices.

Research Design

A mixed-methods study plan will be used to answer the research question. Creswell and Plano Clark (2018) say that this method combines qualitative and quantitative methods to get a full picture of the topic and to make sure the results are more reliable.

For the qualitative part of the study design, instructional specialists, teachers, and school administrators will be interviewed in depth. In these chats, they will talk about their experiences, thoughts, and problems with instructional coaching programs and the use of technology. The qualitative data will give us a lot of information about how complicated, useful, and limited technology-based educational coaching programs are.

A representative sample of teachers will be given surveys as part of the quantitative part of the study design. The polls will gather information about their experiences with instructional coaching programs, how they use technology in the classroom, and how they think it affects how well their students learn. Also, student performance data, such as scores on standardized tests or other measures, will be collected to look at how instructional coaching programs that use technology affect how well students do in school.

Using a mixed-methods research approach, the goal of this study is to give a full picture of how instructional coaching programs help teachers use technology in the classroom, with a focus on technology. The qualitative data will give rich stories and insights, while the quantitative data will give statistical proof to back up the findings.

This study design is based on the research paradigm of constructivism, which recognizes that knowledge is socially built and stresses the importance of each person's experiences and interpretations (Creswell, 2014). The constructivist model fits well with the goal of finding out what teachers and instructional specialists think about the use of technology in instructional coaching programs from their own personal experiences and points of view.

Several independent and dependent factors will be looked at to study the relationships between instructional coaching programs and technology integration. The prevalence and structure of instructional coaching programs, the use of technology in coaching sessions, and the amount of help and training given to teachers are all independent variables. The dependent variables are how teachers use technology, how well students learn, and how successful teachers are thought to be.

In short, this study's research methodology will use a mix of qualitative interviews and quantitative surveys to investigate how instructional coaching programs that use technology are put into place. The constructivist paradigm will lead the process of gathering and analyzing data, which will allow a thorough look at the variables of interest. The goal of the study design is to find out how well and what kind of effects instructional coaching programs have on helping teachers integrate technology and improving how well students learn when technology is involved.

Participants

This study is aimed at K–12 teachers and instructional specialists who are actively involved in instructional coaching programs and using technology in their classes. So that the results can be

used in a wider range of situations, the group will come from schools in different places and with different social and demographic backgrounds.

Participants who meet the conditions of taking part in instructional coaching programs that use technology will be chosen using a method called "purposeful sampling." (Patton, 2015) says that participants with relevant knowledge and experience in integrating technology into teaching practices can give valuable insights into the study topic through a process called "purposeful sampling." Also, efforts will be made to include people with different backgrounds and levels of experience so that a variety of points of view can be heard.

To find participants, the first step will be to get in touch with school districts and educational institutions that have used technology in teaching coaching programs. Teachers and instructional specialists who meet the standards will be asked to take part in the study with the help of school administrators. All participants will give their informed permission before taking part, and participation will be up to them.

Guest et al. (2006) suggest that the sample size will be based on "the point at which no new information or themes can be found" in the data. This method makes sure that the sample size is big enough to get a wide range of views while avoiding collecting data that isn't needed.

For privacy and anonymity, everyone will be given a unique identifier, and all their personal information will be kept private. Throughout the study, strict ethical rules will be followed to protect the rights and well-being of the people taking part.

This study aims to get a wide range of experiences, points of view, and insights about the research question by choosing a representative sample of teachers and instructional specialists who part in instructional coaching programs are that use technology. The expertise and participation of the participants in instructional coaching programs will give us important information about the success and impact of these programs in helping teachers use technology better and helping students learn more.

The purposeful sampling method will be used to choose participants who have appropriate knowledge and experience in instructional coaching programs that use technology. Data saturation will be used to decide the size of the group. Ethical concerns will be given top priority to protect the privacy and safety of the participants. The goal of this study is to answer the research question as well as possible by getting information from a wide range of subjects.

The Instruments

There will be a mix of ready-made and custom-made tools used to measure the factors related to instructional coaching programs, how teachers use technology, and how well their students learn. Knezek and Christensen's *Structural Model of Technology Integration* (Knezek, Christensen, Hancock, and Shoho, 2000) will be one of our instruments. This model assumes that the educator's will (positive attitudes), skill (competence, ability to complete tasks), and access to technology tools are necessary for successful technology integration. The model is based on educational psychology principles that identify important variables that influence the school learning environment (Klausmeir & Goodwin, 1975), and it employs the multivariate technique of

Structured Equation Modeling (Schumacker, 1996) to guide measurement techniques (Knezek et al.).

A changed form of the Technology Integration Matrix (TIM) will be used to measure how teachers use technology. The TIM measures how much technology teachers use in their lessons at different stages of integration (entry, adoption, adaptation, infusion, and transformation) (Jonassen, Howland, Moore & Marra, 2003). The new version of the TIM will have special indicators related to the use of technology to capture the unique parts of using technology in teaching.

The learning results of students will be measured with both qualitative and quantitative tools. To measure academic success, scores on standardized tests, classroom assessments, and student performance data linked to the goals of the curriculum will be collected. Also, qualitative methods like interviews, observations, and student work will be used to find out how instructional coaching programs that use technology affect students' drive, engagement, and ability to think critically.

Several steps will be taken to make sure that the chosen tools are valid and reliable. First, there will be a thorough review of the available literature on the instruments to see if they are right for the sample and research context. The instruments will be changed and adapted so that they are in line with the focus on educational coaching programs that use technology.

The instruments' validity will be determined by their content validity. Experts in the fields of instructional coaching and technology integration, will look over the items on the instruments and

give comments on them. Also, a small group of people will take part in pilot testing to see how clear, relevant, and easy to understand the gadget items are.

Internal consistency measures like Cronbach's alpha will be used to figure out how reliable the poll instruments are. For test-retest reliability, the instruments will be given to a subset of subjects twice, and the correlation between the two sets of answers will be looked at.

In the end, we will measure the variables under study. These tools include the *Instructional Structural Model of Technology Integration*, a modified version of the Technology Integration Matrix (TIM), and a mix of qualitative and quantitative measures for figuring out how well students are learning. Expert review, pilot testing, and a reliability study will be used to figure out if the instruments are valid and can be relied on. By using these tools, the goal of this study is to collect reliable and valid data that can be used to judge the usefulness and effects of instructional coaching programs that use technology.

Data Collection Procedures

Surveys: Both teaching specialists and teachers will be asked to fill out surveys to get quantitative data. These polls will be made to find out what they know, how they feel, what they do, and what they think about technology integration. The surveys will be sent out electronically through online survey tools to make it easy to collect data and get answers back quickly. The survey questions will be based on well-known scales and tested tools that have to do with integrating technology and coaching teachers.

Interviews: Some instructional specialists and teachers will be asked to take part in in-depth interviews so that we can learn more about their experiences and thoughts on how technology is used in the classroom. We'll use semi-structured interviews, which let us ask open-ended questions and dig deeper to get rich, detailed answers. With the participants' permission, the talks will be recorded on audio and transcribed so that a qualitative analysis can be done. The people who will be interviewed will be chosen on purpose to make sure that a wide range of experience, knowledge, and school settings are represented.

Observations of classrooms: Observations of classrooms will be done to get first-hand information about how teachers use technology. Trained observers will go to the classrooms of participants and use structured observation methods to record how technology is used, what teaching strategies are used, and how engaged the students are. Observations will be done over several meetings to get a full picture of how technology is used in different teaching situations. The observation data will give us important information about how technology integration methods are used and how well they work.

Document Analysis: Relevant documents, such as instructional materials, lesson plans, and professional development tools, will be collected and analyzed to add to the data gathered from surveys, interviews, and classroom observations. These documents will give more context and proof of what instructional experts are doing and how they are helping to integrate technology. The text of the document will be looked at in a systematic way to find themes, patterns, and alignment with well-known best practices for integrating technology.

Student Performance Data: Student performance data, such as scores on standardized tests, assessments, and academic records, will be collected so that the effects of instructional coaching programs that use technology to improve learning results for students can be studied. These data will give quantitative measures of student achievement and growth that can be used to figure out how well practices that use technology to improve student performance are working.

The methods for collecting data will be done in a way that respects the privacy, confidentiality, and informed consent of the participants. Participants will be told clearly what the goals of the study are, what their rights are, and that their participation is voluntary. Before they are used everywhere, data collection tools will be tested and tweaked to make sure they are clear and accurate. Throughout the data collection process, ethical concerns will be considered, and the right steps will be taken to protect the identity and privacy of participants.

In short, to get a full picture of instructional coaching programs and how they use technology, data from surveys, interviews, classroom observations, document analysis, and student success will be collected. During the data collection process, participant privacy, informed consent, and ethical factors will be given the most weight. These data will help answer the research question and meet the research goals. They will also make it possible to do a full analysis of how and why instructional coaching programs help integrate technology and improve student learning outcomes.

Data Analysis Procedures

Quantitative Data Analysis: Statistical methods will be used to evaluate the quantitative data collected through surveys and student performance tests. Descriptive statistics, like frequencies,

means, and standard deviations, will be used to sum up the survey answers and demographic information about the people who took the survey. Inferential statistics like correlations, t-tests, and regression analyses will be used to look at similarities, differences, and predictive models between how technology is used in the classroom and how well students learn. The SPSS (Statistical Package for the Social Sciences) statistical program will be used to look at the data.

Analysis of Qualitative Data: Thematic analysis will be used to look at the qualitative data gathered through interviews, classroom observations, and document analysis. The transcripts, observation notes, and documents will be coded and put into categories and topics that make sense. These themes will be found through a process of organizing, putting things into categories, and figuring out what they mean. The qualitative data analysis will involve finding patterns, connections, and meanings to learn more about how instructional experts and teachers have used, thought about, and worked with technology integration.

Triangulation of Data: In triangulation, results from different data sources are put together to give a more complete picture of the research subject. The numeric and qualitative data will be used to confirm and add to each other's results. When results from different data sources come together, it makes the study more reliable and valid and adds to the depth of the research.

Integration of Findings: The results of the quantitative and qualitative analyses will be put together to give a complete picture of educational coaching programs and how they affect how technology is used in the classroom and how well students learn. For this integration, the quantitative and qualitative results will be compared, patterns will be found, and full

interpretations will be made. The combined results will be used to answer the research question and meet the research goals, draw conclusions, and make suggestions.

Interpretation and Discussion: For the interpretation and discussion of the results, the results will be looked at critically considering the research question, the goals, and any relevant theoretical frameworks. We'll talk about what the results mean, considering what's already been written and what it means for instructional experts, teachers, policymakers, and other interested parties. We will also talk about the study's limitations and possible places for more research.

The procedures for analyzing the data will follow strict rules for study methodology and statistical analysis. The process will be done in a planned way, using set rules for analyzing both quantitative and qualitative data. The research team will make sure the analysis is accurate, reliable, and open by keeping track of the steps they take and the choices they make.

Data analysis procedures include quantitative data analysis, qualitative data analysis, triangulation of data, integration of findings, interpretation of results, and talk of results. These steps will help us figure out how instructional coaching programs, technology integration practices, and student learning results are related to each other. The study will lead to useful results that will answer the research question and goals, add to what is already known, and help shape educational practice and policy.

Limitations of Study

The following are possible limitations and flaws that could affect the truth, reliability, and generalizability of the study's results.

Size of the sample and how it was chosen: The size of the sample and how it was chosen may be one of the study's flaws. Because of limited time and money, it might not be possible to include a large and varied group of instructional experts and teachers. The study's results might only apply to the people and situations in which they were done, making them less useful for a larger group of people.

Subjectivity and bias: Another problem is that it is possible for bias and subjectivity to come into play when collecting and analyzing data. Even though researchers try to be objective, the views and experiences of the researchers may affect how they interpret and draw conclusions from qualitative data. There will be steps taken to make up for this, such as using more than one researcher to look at the data and using member checking methods.

Time Limits: The suggested study could be limited by time, which could make it harder to collect and analyze data in depth and breadth. Comprehensive polls, interviews, classroom observations, and document analysis take a lot of time and money to do well. The amount of time we have may limit how much data we can collect, which could make the study less thorough.

External Factors: Things outside of the researcher's power could change the study. During the study time, the implementation of instructional coaching programs or technology integration practices could be affected by things like changes in educational policies, advances in

technology, or unplanned events. These outside factors could add confusing variables that change the results of the study.

Self-Reported Data: Using surveys and conversations to get self-reported data makes it possible for responses to be biased. Participants may give answers that are socially acceptable or may not correctly remember or talk about their experiences and habits. To reduce these biases as much as possible, steps will be taken, such as ensuring anonymity and privacy, using validated tools, and collecting data in a strict way.

Limited Focus on Specific Technologies: Because the study is mostly about instructional coaching programs that use technology integration practices, it may not be able to focus on technologies as much as it could. The results may not consider the subtleties and effects of each technology or the different ways they are used. But instead of focusing on specific technologies, the study wants to find out how educational coaching programs affect the integration of technology.

Contextual Factors: The study may be affected by things like the culture of the school, the tools available, and the support systems in place. These factors may be different in different educational settings and could affect how well teaching coaching programs work and what they accomplish. The study's results might be unique to the setting in which the research is done.

Even though there are some problems with the planned study, it renders useful information and insights to the fields of instructional coaching and technology integration. By pointing out and

dealing with these problems, the research stays honest and gives a fair view of the study's scope and what its results mean.

Limitations include sample size and selection, bias and subjectivity, time limits, external factors, self-reported data, a limited focus on specific technologies, and contextual factors. By pointing out these limits, the research's trustworthiness and reliability are improved, and the scope and limits of the study are made clear.

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