Department of Educational Technology, New Jersey City University

Doctorate in Educational Technology Leadership

EDTC 810 - Section 1346: Statistics for Education Research

Assignment 2: Analysis of the Data/Findings Review

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Analyzing the Major Findings of Research Articles on AI in Education

This analysis examines the core insights from five peer-reviewed journal articles on Artificial Intelligence in Education (AIEd), based on the Methods Literature Review. It explores how each study derived its conclusions through various data collection and analysis techniques, with a focus on quantitative (inferential statistics) and mixed-method approaches. The discussion highlights how the findings align with the respective research questions and emphasizes the application of inferential statistics.

Article 1. Holmes, W. (2020). Artificial intelligence in education. In *Encyclopedia of education and information technologies* (pp. 88-103). Cham: Springer International Publishing.

Holmes (2020) used a mixed-methods design to explore the implementation of AI in educational settings, with a focus on educators' adoption of AI. Data was collected via teacher surveys, interviews, and student test scores. Quantitative methods included regression analysis to forecast AI adoption, correlation to explore variable relationships (for example., tech acceptance and AI integration), and t-tests for comparing test scores. Qualitative data from interviews were analyzed thematically.

Major Findings

The study likely identified factors that influence educators' willingness to adopt AI technologies.

It probably found correlations among variables such as technology acceptance, innovation adoption, and teachers' views on AI's effectiveness.

It may have shown how AI tools impact student performance through test score comparisons.

These findings directly address the research questions by providing evidence on the factors affecting AIED adoption and its effect on learning. Holmes' use of inferential statistics enabled broader generalizations about these patterns across larger educational populations.

Article 2. Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International journal of artificial intelligence in education*, *26*, 582-599.

Roll and Wylie (2016) reviewed previous research published in the *International Journal of Artificial Intelligence in Education (IJAIED)*, analyzing 47 articles across the years 1994, 2004, and 2014. They applied a structured coding scheme and used descriptive statistics (like frequencies and percentages) to identify trends, along with qualitative techniques to detect thematic patterns.

Major Findings

The study likely traced the evolution of AIEd research over time.

It probably identified shifts in research focus, methodologies, technologies used, and educational goals.

Linguistic analysis of abstracts may have supported these findings with quantitative data.

These findings directly inform the research questions by offering a historical perspective on AIEd research trends. While the study used some quantitative techniques, the emphasis was on qualitative thematic analysis.

Article 3. Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

This article conducted a literature review, analyzing 30 selected studies on AI in education. The focus was on identifying recurring themes and patterns through qualitative analysis.

Major Findings

The study likely synthesized how AI is influencing educational administration, teaching practices, and
student learning.

It probably highlighted emerging trends, common challenges, and potential future directions.

The study contributes to the research questions by offering a broad overview of AI's role in education, relying on qualitative synthesis to uncover major themes.

Article 4. Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. *Computers and Education: Artificial Intelligence*, *2*, 100020.

Ouyang and Jiao (2021) carried out a literature review combined with conceptual analysis, using databases such as Web of Science, Scopus, and Google Scholar. The analysis focused on interpreting and synthesizing information to outline three AIEd paradigms.

Major Findings

The study defined three AIEd paradigms such as AI-Directed (Learner-as-Recipient), AI-Supported (Learner-as-Collaborator), and AI-Empowered (Learner-as-Leader).

It presented a conceptual framework for understanding the diverse roles of AI in education.

These insights support the research questions by offering a theoretical structure to classify different educational applications of AI. The study used qualitative methods to develop this framework.

Article 5. Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.

Pedro et al. (2019) reviewed literature and conducted a conceptual analysis of AI's integration into education, particularly within the context of sustainable development. The sources included research articles, reports, case studies, and policy documents. While the study

was primarily qualitative, it also acknowledged the role of data analytics (quantitative methods) and statistical methods in some referenced initiatives.

Major Findings

The review explored both challenges and opportunities tied to using AI in education for Sustainable development.

It likely examined variables such as AI technologies, student outcomes, educational equity, and ethical considerations.

Policy implications of AI integration in education were also discussed.

These findings relate directly to the research questions by offering a macro-level view of AI's educational role within sustainable development frameworks. Though mainly qualitative, the study recognized the influence of quantitative methods in the broader field.

Inference Statistics

Inferential statistics are tools that are used to infer (deduce) characteristics of a population based on data from a sample of that population (Salkind, 2017. Pg.10). Additionally, inferential statistics allow researchers to draw conclusions about a population based on sample data. According to Salkind (2017), inferential statistics are often (but not always) the next step after you have collected and summarized data. Furthermore, inferential statistics are used to make inferences or predictions based on a smaller group of data (such as our group of 12 students) about a possibly larger one (such as all the graduate students in the Department of Educational Technology) (Salkind, 2017. Pg. 10).

In this context, Holmes (2020) utilized inferential statistics (by applying methods like regression analysis and t-tests) to generalize findings about AI use among teachers and students. Furthermore, the researcher Holmes (2020) used inferential statistics to generalize findings from

the teacher and student samples to the broader population of educators and learners. These techniques help determine whether observed patterns are statistically significant. In contrast, the other four articles relied more heavily on qualitative data analysis and synthesis, with limited or no use of inferential statistics.

References

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

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Salkind, N. (2017). Statistics for People Who Think They Hate Statistics (6 ed.). Thousand Oaks: Sage.