

Mixed Methods Research in Studies on ChatGPT in English Language Learning: A Systematic Review

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Background, Purpose, and Research Question

- In-depth investigations are needed to address a novel phenomenon like AI (e.g., ChatGPT) in language learning.
- **Mixed methods research (MMR)** can provide comprehensive, balanced, and useful findings on this topic.
- An MMR study on ChatGPT in English language learning (ELL) can-
 - **quantitatively** analyze the **trends** of ChatGPT's use,
 - **qualitatively** explore the **nuances** of the tool's impact, and
 - **integrate** the quantitative trends and qualitative nuances to get a **complete picture** of how ChatGPT's use impacts ELL.
- Synthesizing the use of MMR in this evolving topic would **inform its more effective application** in AI in language learning and **provide a contemporary picture** of the methodology.

Thus, the purpose of this in-progress review is to examine and synthesize **how different elements of MMR** are implemented to **investigate ChatGPT in English language learning**.

Research Question

What types of MMR **rationales**, **core designs**, and **integrations** are used in research on ChatGPT in ELL?

Lit Search and Selection

- **Databases:** Academic Search Complete, Education Full Text, ERIC, APA PsychInfo, ProQuest, Scopus, and Education Research Complete
 - **Keywords:** *ChatGPT AND mixed methods or MMR and ELL or TESOL or EFL or ESL or ESOL*
 - **Inclusion Criteria:** Investigated ChatGPT in ELL context, mentioned MMR as methodology, and published in peer-reviewed journals
 - **Publication years:** November 2022-April 2024
- Six studies fulfilled the criteria and were analyzed for this initial review.

Extraction and Analysis

Data extraction and analysis were done based on the following categories

- **Rationale:** the reasons behind using MMR and the patterns following **Bryman's (2006) typology**
- **Core Designs:** core MMR design types (**convergent, explanatory sequential, and exploratory sequential**) and their characteristics following **Creswell and Plano Clark (2018)**
- **Integration:** how the studies integrated quantitative and qualitative strands (**connecting, building, and merging**) following the definitions from **Fetters et al. (2013)**

Results: Rationale for Using MMR

- **Triangulation** or **greater validity** (Abdelhalim, 2024; Mahapatra, 2024)
 - The qualitative part added **more strength and validity** to the quantitative part's findings (Mahapatra, 2024)
- **Completeness/in-depth details/comprehensive** examination (Mahapatra, 2024; Muniandy & Selvanathan, 2024; Song & Song, 2023)
 - MMR provides a **"holistic" picture** of ChatGPT's application for improving speaking skills (Muniandy & Selvanathan, 2024)
- **Explanation** of one strand's findings with the other's (Dong, 2024; Liu et al., 2024)
 - The qualitative strand was used "to **elucidate** the reasons for any observed quantitative difference" (Dong, 2025, p. 5)

Results: Core Designs

- **Did not name their design (interpreted as convergent)** (Abdelhalim, 2024; Song & Song, 2023),
- Mahapatra (2024) mentioned having a mixed methods intervention design (**interpreted as convergent design at its core**).
- Three identified themselves as **explanatory sequential design** (Dong, 2024; Liu et al., 2024; Muniandy & Selvanathan, 2024).
 - However, in Liu et al. (2024) and Muniandy and Selvanathan (2024), the **quantitative analysis did not guide** any part of **the qualitative strand**, thus interpreted as having **a convergent design**.
 - The features of explanatory sequential design were present in Dong(2024) as **qualitative strand was informed by quantitative results**.
- Overall, **five studies had the characteristics of convergent design at their core**, although named otherwise or not named at all (Abdelhalim, 2024; Liu et al., 2024; Mahapatra, 2024; Muniandy & Selvanathan; 2024; Song & Song, 2023)

Results: Integration

- Merging integration was found in all six studies, but the evidence was not always explicit and extensive.
 - Implicit: **Just one sentence** in the conclusion with no explicit comparison between the findings (Song & Song, 2023)
 - Explicit: presented two strands' analysis **together based on research question** (Muniandy & Selvanathan, 2024)
- **No joint display** was found in any studies.
- Connecting and Building was found in only Dong (2024), supporting its explanatory sequential design.
 - **Connecting**: focus group participants were identified based on cluster analysis of the quantitative findings.
 - **Building**: the discussion guide for the focus group was built upon quantitative findings.

Topic Related Findings

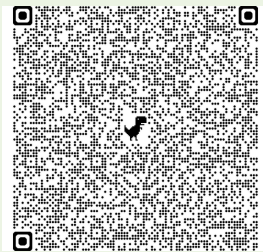
- ChatGPT significantly **improved** English learners' **writing** skills (Mahapatra, 2024; Song & Song, 2024).
 - **Complexity of writing, satisfaction, motivation, metacognitive awareness, informal learning, and speaking skills** were positively influenced by ChatGPT (Abdelhalim, 2024; Dong, 2024; Liu et al., 2024; Muniandy & Selvanathan, 2024)
- **Challenges**- students mentioned **being overdependent on ChatGPT** and **losing creativity** (Mahapatra, 2024; Song & Song, 2023). Other challenges: **plagiarism, ethical concerns, inaccuracies, biases** and **ChatGPT's inability to understand context**(Abdelhalim, 2024; Dong, 2024; Liu et al., 2024; Muniandy & Selvanathan, 2024).
- **Benefits** were mostly **reported in quantitative** findings and **challenges** in **qualitative findings**

Discussion on Current Findings

- Varied reasons for using MMR indicate that the researchers of AI in language learning are **well aware of the different usefulness** of the methodology.
- Fewer variations in designs and more convergent designs might be a result of keeping pace with the **fast, changing nature of AI, as other design types require more time.**
- The practice of not naming design and misalignment between designs and characteristics indicate-
 - a need for **more attention in conceptualizing and reporting the designs and procedures** based on MMR literature.
- Lack of varied integration types may have resulted from **the above need and popularity of convergent design.**
- Findings on **ChatGPT's benefits from the quantitative** strand and the **challenges from the qualitative** strand reflect MMR's needs and significance.

Limitations and Future Directions

- Limited number of studies
- Narrow scope with only one type of AI tool and one language
- Analysis is based on the article reports, not actual implementation.
- In the future, the focus would be broadened, focusing on
 - generative AI and language learning in general, and
 - more aspects of MMR.



Any questions or comments? Reach out at hasanmi@mail.uc.edu

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