

# A Chatbot-Guided Learning Experience in The Inquiry Science Classroom - Abstract

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## Abstract

This presentation describes a practitioner's design-based development of a prototype chatbot to guide students in learning biological concepts of genetic mutations and protein synthesis. Exploration of chatbots in education is still emerging. Chatbots can function as intelligent tutoring systems that interact with students. Winkler & Soellner [1] defined chatbot-mediated learning as synchronous, individualized, student-focused, and usually web-based. Mousavinasab and colleagues [2] documented types of AI techniques commonly used by education developers and found that most intelligent tutoring systems have been designed for computer science programs, followed by medical sciences and mathematics. Most widely, chatbots are used to give adaptive feedback, hints, or recommendations (Mousavinasab et al., 2021). This chatbot's architecture provides learning activities, feedback, and support throughout a series of short, connected lessons. The chatbot is designed to scaffold learners through a predict, observe, explain model of inquiry learning [3]. It utilizes real-world phenomena to lead students through biology core ideas and incorporates several NGSS science and engineering practices and crosscutting concepts [4]. The researcher presents the design experience from a technologically knowledgeable practitioner's point of view, examining pragmatic challenges and current tools accessible to teachers that may want to explore this type of technology. The discussion includes a report on the three parts of the design process, the preliminary research, development, and prototyping. Design challenges include steep learning curves, tool constraints, and a requisite repositioning of how intents are considered and situated in a bot-led conversation, as opposed to most use-cases in the wider development community. Results of prototype testing include survey results in support of the proof of concept among both students and teachers, as well as accuracy measurements of chatbot intents. Descriptive statistics and suggestions were collected from both groups to evaluate the relevancy, consistency, practicality, and effectiveness of the project as well as speak to improvements for the next iteration of the design. The designer finds that the construction of chatbots as a guided learning experience holds untapped potential in science educational technology.

## Keywords

Chatbot, Natural Language Processing, Biology, Intelligent Tutoring Systems

## References

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