

Structural scaffolding via diagrams to teach students syntactic proof production (CEE/Innovation Fund)

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One of the main difficulties for students starting a computer science (or mathematics) degree is the ability to argue and prove in a rigorous manner. Despite supporting courses in their first year, many students continue to struggle with formal proofs. The resulting lack of understanding causes a ripple-effect throughout the curriculum. We consider the notion of structural scaffolding for facilitating syntactic proof production. To achieve structural scaffolding we aim to supply students with a visual diagram-style representation of the underlying logic in the argumentation of a proof. This diagram is offered in the context of a series of exercises that explicitly relate the structure of the diagram both with the structure of the purely logic-based argumentation and the underlying structure of a textually written proof. With the project focus on developing said exercises, we ask the research question: What are the effects of structural scaffolding on students' learning of syntactic proof production?