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Threshold Concepts and Skills in Software Architecture: Instructors' Perspectives

Context: Software Architecture is considered an important subject and core course in the Software Engineering degree. The academic community believes that the course teaches multiple co-mingled concepts that are difficult to grasp by students. Identification of threshold concepts and skills can help educators to prioritize topics in alignment with course learning objectives.

Objective: The aim of the study was to identify threshold concepts and skills in Software Architecture to help educators focus on redesigning the curriculum and improving didactic.

Method: We applied the Delphi technique to identify threshold concepts and skills from instructors with teaching experience in university-level Software Architecture courses.

Results: We identified eleven threshold concepts and nine threshold skills with more than 80% agreement among the participants. Six out of twenty-one threshold concepts and skills achieved 100% agreement from participants indicating high consensus.

Conclusion: The identified threshold concepts and skills could be prioritized in the course to ensure students acquire, understand and apply them fully in realistic scenarios. Software Architecture course is demanding, and the industry expects graduating students are prepared to design solutions for complex systems. Often theoretical concepts are considered more important than the skills required to apply them in practice. However, all participants agreed that students struggle to apply theoretical concepts in designing solutions. Thus, skills development should be equally emphasized.