

Knowing Your Learners to Scaffolding Their Autonomy: The Perspective of Learner Capability and Perception

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Abstract. Learner autonomy has been a primary learning outcome for all fields, including engineering, since it has been positively connected with successful learning experiences. Autonomy encompasses skills and abilities including self-awareness and reflection, independent learning and development, creativity and inventive thinking, and decision-making, all of which are crucial for the modern workplace. Learners with high autonomy demonstrate higher preparedness and more responsibility to finish their tasks, as well as a strong potential to sustain and enhance their competences as they progress through their professional pathways. In the engineering discipline, several strategies that provide opportunities for learners to act autonomously and develop confidence in a real-world context, such as learner-led research and project, and community service learning, have been incorporated into academic journeys in an attempt to foster learner autonomy. Many high-impact teaching and learning strategies and methods (for example, project-, problem-, and inquiry-based learning) have also been adopted in classrooms. However, because students have varying levels of autonomy, it is common that not the entire class can engage in and successfully complete challenging activities. Scaffolding and progressing learner autonomy is linked to the development of learner capabilities and the enhancement of their perceived value in attaining greater autonomy. Therefore, this paper presents a four-quadrant learner autonomy analysis under the perspective of learner capability and perception to assist instructors in determining the learners' autonomy level before developing appropriate instructional scaffolding to progress their autonomy to the expected level. Case studies of engineering students and adult learners are presented and discussed.

Keywords. Learner autonomy, scaffolding, learner capability, learner perception, engineering education

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