

## Analysis of the Learning Effectiveness of the Steam-6e Course: A Case Study on the Development of Virtual Idol Product Design as an Example

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**Abstract :** STEAM (Science, Technology, Engineering, Art, and Mathematics) represents a cross-disciplinary and learner-centered teaching model that cultivates students to link theory with the presentation of real situations, thereby improving their various abilities. This study explores students' learning performance after using the 6E model in STEAM teaching for a professional course in the digital media design department of technical colleges, as well as the difficulties and countermeasures faced by STEAM curriculum design and its implementation. In this study, through industry experts' work experience, activity exchanges, course teaching, and experience, learners can think about the design and development value of virtual idol products that meet the needs of users and to employ AR/VR technology to innovate their product applications. Applying action research, the investigation has 35 junior students from the department of digital media design of the school where the researcher teaches as the research subjects. The teaching research was conducted over two stages spanning ten weeks and 30 sessions. This research collected the data and conducted quantitative and qualitative data sorting analyses through 'design draft sheet', 'student interview record', 'STEAM Product Semantic Scale', and 'Creative Product Semantic Scale (CPSS)'. Research conclusions are presented, and relevant suggestions are proposed as a reference for teachers or follow-up researchers. The contribution of this study is to teach college students to develop original virtual idols and product designs, improve learning effectiveness through STEAM teaching activities, and effectively cultivate innovative and practical cross-disciplinary design talents.

**Keywords :** STEAM, 6E model, virtual idol, learning effectiveness, practical courses

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