USER EXPERIENCE OF EMBEDDED SYSTEM STUDENTS ON ARDUINO AND PROGRAMMABLE GATE ARRAY (FPGA)

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The emergence of computing technology has posed challenges in the landscape of computer engineering education. Project-based learning is applied as inductive instructional approach and is perceived to be a student centered approach to learning. Project-based learning offers promise as an instructional method that affords authentic learning tasks grounded in the personal interests of learners. Emphasis of Project-based Learning focuses on application and integration of skills and knowledge to materialize end-product. In the process of "learning to learn", a project is set by facilitator while the students need to produce a solution to solve the problem. Project-based learning facilitator provides guidance and encouraged self-directed and active learning by providing assignments that leads to production of final product in terms of design, model, device, program coding and simulation.

With the author's contention to the project pedagogy, students were tasked to design and develop an assistive or adaptive technology or generally applied embedded systems using Arduino and FPGA. These projects are solutions to real-world problems which provides context for learning in the form of complex, ill-structured or open ended that led to defining the problem articulately, determination of the need, formulate and evaluate alternatives solutions and lesson learned.

The study sought to explore the nature of students' perception and experiences with learning in PBL environment, and explore how learners design and developed projects. Nonjudgmental and permissive Focus Group Discussion (FGD) has been employed to let the participants articulate, elicit and elaborate experiences in the context. Nine (9) participants have been purposively selected from undergraduate embedded system students of Jose Rizal University. The tape recorded focus group data were transcribed and the analyzed using content analysis to identify recurring, and main thematic pattern in the responses to key questions. Also the researcher has been a privileged and active observant during the design, development, and project demonstrations.

The study result in five themes emerged from what influenced participants' project and what the participants learned: (1) internal factors, (2) external factors, (3) technology and tools, (4) beliefs about projects, (5) end product and learning outcomes. Implication of the results to learning can be used to inform practice and research-based curriculum development in an outcome-based engineering education.