

# Guest Editorial (1)

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## EDUCATIONAL APPLICATIONS OF PRODUCT LIFECYCLE MANAGEMENT SYSTEMS

Product Lifecycle Management (PLM) is an integrated, information-driven approach to all aspects of a product's life, from its conception through design, manufacture, deployment and maintenance, culminating in the product's removal from service and final disposal or recycle. PLM is a key activity for enterprise survival and competitiveness. This process should be agile and efficient to provide enough flexibility for adapting to a changing market. An important success factor when developing new products in a PLM environment is the capability to leverage previous knowledge obtained from previous design and manufacturing processes. The goal of this special issue was to bring together the papers that address a range of topics related to educating engineering students on the concept of PLM. Specific topics mentioned in the call for papers included:

- Design Reuse to support PLM.
- Digital Product Representation and Development.
- Design for Manufacturing/Assembly, Supply, Service, and Recycling.
- Product Lifecycle Information, Function, Process Modeling for Collaboration.
- Collaboration Framework and Infrastructure for PLM.
- PLM and Supply Chain Management Integration.
- Product Lifecycle Collaboration Protocol and Ontology.
- Product Innovation Management and Virtual Product Innovation.
- Product Lifecycle Performance Modeling, Evaluation, and Optimization.
- Knowledge Management and Industrial Case Studies for PLM.
- Web Based Solutions to PLM.
- Semantic Webs for PLM.
- PLM & Sustainable Development.

The call for papers indicated that "papers may present innovative course modules, novel course and curriculum development, pedagogical techniques and learning projects, which focus on exchanging and sharing of knowledge of PLM". We particularly encouraged papers addressing the development of teaching materials, and interdisciplinary courses and activities that focus on sustainability. The selected papers according to the scope of the special issue and the required quality level are described next.

Sánchez Alejo *et al.* using a hybrid vehicle design exercise, explain how to combine the introduction of a commercial PLM system and a life cycle energy analysis application in an automotive engineering course at the postgraduate level.

Gutiérrez and Sastrón present a computer-supported simulation game that deals with product lifecycle planning dynamics in the Engineer-To-Order (ETO) industry. The game is intended for teaching the planning aspects of Product Lifecycle Management (PLM) making emphasis on unified product development, multi-project planning and manufacturing planning, giving links between PLM software and ERP systems.

Moon shares his experience of developing and teaching a course in PLM from the Enterprise Systems point of view. His students carry out a semester-long project of developing new products, applying state-of-the-art information tools, particularly the Enterprise Systems.

Vila *et al.*, present their teaching experience, introducing the PLM topic in a senior Computer Integrated Manufacturing (CIM) course for graduate students. Their approach is based on the development of a collaborative product development project, where students acquire abilities related to design and manufacturing in a collaborative environment, using CAD/CAE/CAM and PLM software tools.

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# Guest Editorial (2)

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## ASSESSMENT

This second set of articles on assessment of technical programs continues to document the progress being made in the application of assessment processes in a systematic and scholarly manner. In the previous issue on assessment in the *International Journal of Engineering Education*, (Vol. 24, No. 5) there were ten articles which covered a wide variety of methodologies used to assess different aspects of student learning outcomes in technical education. In this issue, there are five additional articles which describe specific tools and processes that can be used to enhance the quality and effectiveness of technical programs.

Three of the articles describe various system level processes and attributes that embody continuous quality improvement. The Tarnoff article describes the development of a culture of assessment which draws from theory to describe and understand the phases which were experienced as a “culture” developed. The involvement of both faculty and students is described as a necessary part of the culture. The Sanderson article describes the complete cycle of process improvement through closing the loop. Based in a Computer and Information Services department, it documents the development and sustainability of a highly integrated process. Bender and Stiller demonstrate how program-level student learning research can be designed to satisfy institutional expectations along with specialized and regional accreditation criteria without duplication of effort. Through a centralized university quality management system faculty are able to submit documentation that meets several university and program needs.

The article by Estell focuses on a course reporting process that is designed to document the improvement of an individual course as well as being able to use the course-level findings to inform program assessment. This is accomplished through the use of a structured sequence of reporting categories and a reporting process to document recommended improvements.

Welch *et al.*, document the evolution of the development of a communication rubric that was designed to assess skills of students in a senior design process. The article describes the process that was used to test the rubric through a series of inter-rater testing protocols and refinement of the rubric based on results. Through the use of multiple ratings recommendations are made that can enhance the quality and objectivity of the use of rubrics.

As the culture of continuous quality improvement continues to mature in technical programs these articles represent the broad spectrum of activity that is currently taken place in engineering, technology, computing, and applied science education.

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