Homo Fabiens Redux:
The Essence of Creativity in Engineering Education and Innovation

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Summary

In a broad sense engineering education encompasses the essential knowledge elements of a modern innovation system. Knowledge acquisition, dissemination, evolution, verification and validation are elements that are included, but not limited to the processes that characterize innovation-driven productivity and entrepreneurship. These elements are seldom encountered in earlier forms of production (e.g., manufaktura) but are *sine qua non* for creativity-driven modern design of customized products and services. Creativity entails the ability to imagine and shape the future of artifacts by imparting ideas from the past on to the future. To be creative means to identify the elements of the design that are likely to stand the test of time and use. In this sense the multitude of human-made objects, or artifacts, that surround us become the connecting threads of civilization, sometimes unconsciously but mostly with intent and purpose. An engineer "decides" through the creative process, how an artifact will speak to a future user about his past. The origins but also the life of artifacts provide a *raison d' etre* for their particular existence, in context, and thus a semantic substrate upon which rest their use but also communicative and interpretative value. We will examine these ideas in the context of engineering education and the new field of developmental engineering and draw upon recent research findings to propose possible new directions for the future.

Short Bio

Prof. Evangelou has research and policy experience relevant to the advancement of technological and scientific literacy. She has been an education advisor to several international organizations and foundations including the Van Leer Foundation (Netherlands), the Comenius Foundation (Ministry of Education, Poland) and the National Science Foundation (USA). In 2013 she has served as Advisor and Chief of Staff in the Ministry of Infrastructure, Transport and Networks of Greece. She is currently on the faculty of Democritus University and serves as an Advisor and Chief of Staff in the Greek Ministry of Rural Development and Food. Professor Evangelou is credited with introducing the concept of ***Developmental Engineering***, a new area of research and education that explores engineering and human development. In 2011 she was awarded by President Obama the Presidential Early Career Award for Scientists and Engineers (PECASE) which is the "the highest honor bestowed by the US Government on Science and Engineering professionals in the early stages of their independent research career." The award citation read "***for outstanding research into how early experiences can lead children to pursue engineering later in life and for working with teachers from diverse schools to develop new teaching materials and methods that can help students become innovative and more technologically literate."***

Prof. Evangelou is actively involved in research including, but not limited to, early childhood antecedents of engineering thinking, developmental factors in engineering pedagogy, technological literacy and human-artefact interactions. The research is cross-disciplinary involving active collaborations with colleagues from Education, Psychology and Engineering. Prof. Evangelou has served on the faculty of Purdue University, Aristotle University and the University of Thessaly. She holds a PhD from the University of Illinois at Champaign-Urbana and is a member of several scientific and professional societies, including the Sigma Xi Science Honor Society. In 2009 she was awarded the prestigious NSF CAREER Award.

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