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Undergraduate Research Program

Project Name	Socioscientific problems in engineering and sciences approached from educative innovation and curricular analysis
Campus & Location in Mexico	San Luis Potosí
Faculty	Engineering and Sciences
Research Area	Social Sciences and Humanities => Education => Curriculum => Higher Education
Research Responsible	José Manuel Olais Govea
Description of the Project	<p>Educational research has made enormous advances in recent decades, impacting on problems that concern the teaching-learning process, curricular studies, and educational policy, among others. However, a good part of academic research is focused on educational phenomena that occur at basic levels of education and, if anything, in the first half of a professional career. The super specialization that dominates the last rung of the educational path in science and engineering areas lacks educational models that combine the social nature of knowledge with the most recent advances in science and technology. The accelerated development in science leads to rethinking questions such as what are the boundaries and range of action of conventional educational theories? How to reformulate the university curriculum to carry out scholarly research on advanced topics in science and technology? How to link the social character of science and technology research? One approach to addressing these questions almost naturally leads us to rethink the science and technology curriculum, and one mechanism for implementing it in practice could be educational innovation. Connecting these theoretical elements requires us to understand the evolutionary line of the educational innovation construct and its impact on the shaping of new curricular schemes that impact the final part of a professional training program or later. This project consists of a theoretical revision of the curriculum based on socio-scientific problems. It also consists of making a proposal for implementation in the university teaching practice of engineering and science careers through educational innovation approaches. This implies transferring concepts of socio-critical pedagogy and defining the in-action-teacher in higher education.</p> <p>[1] Fleming, R. (1986). Adolescent reasoning in socio-scientific issues: I. Social cognition. <i>Journal of Research in Science Teaching</i>.</p> <p>[2] Sadler, T. D. (2009). Situated learning in science education: socio-scientific issues as contexts for practice. <i>Studies in Science Education</i>, 45(1), 1-42.</p> <p>[3] Presley, M. L., Sikkil, A. J., Muslu, N., Merle-Johnson, D., Witzig, S. B., Izci, K., & Sadler, T. D. (2013). A Framework for Socio-Scientific Issues Based Education. <i>Science Educator</i>, 22(1), 26-32.</p> <p>[4] Amos, R., Knippels, M. C., & Levinson, R. (2020). Socio-scientific inquiry-based learning: Possibilities and challenges for teacher education. In <i>Science Teacher Education for Responsible Citizenship</i> (pp. 41-61). Springer, Cham.</p> <p>[5] Hancock, T. S., Friedrichsen, P. J., Kinslow, A. T., & Sadler, T. D. (2019). <i>Educating for socio-scientific issues for teaching</i>. <i>Science & Education</i>, 29(2).</p>
Training Provided	<ol style="list-style-type: none"> 1. Elements of action research in higher education. 2. Curriculum analysis based on socio-scientific problems. 3. Review of the concept of educational innovation and its implications in curricular design in engineering and science careers.

Offered during:

SUMMER WINTER SEMESTER

Student

Tasks/Responsibilities	<ol style="list-style-type: none"> 1. Offer weekly seminars in which they present their progress in the literary investigation of the subject, to discuss and correlate the information collected (informal discussions). 2. Write a proposal on the relationship between the curriculum based on socio-scientific problems and educational innovation. 3. Analyze a concrete case of the critical pedagogy stance, action research at the higher level, and educational innovation with undergraduate students. 4. Write a review report in which the aforementioned concepts can be logically related. Notice: It is intended to outline a review article on the topic. It's a publishing opportunity you can be a part of.
Required Language Proficiency	English B2, Spanish B2 or a mixture of them
Required Skills and Abilities	<p>Ability to search for scientific literature. Experience in qualitative research methods. Interest in educational phenomena. Be daring to propose new ways of thinking about the study of a known problem. Ability to interact and speak with specialist teachers in science and technology areas. Experience (basic at least) in writing academic texts.</p>
Other Documents	<ol style="list-style-type: none"> 2) Accumulative grade point average (GPA) 2.5 3) Official Transcript 4) 2 letters of recommendation of faculty members 5) Resume 6) Letter of intention explaining the reason why you would like to participate in the research program