Analysis of the tools for teaching EIA

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Abstract

According to SENACE (2016), Environmental Impact Assessments are highly effective environmental management instruments for decision-making and a tool for promoting sustainability. The objective of this study is to analyze the point of view of Environmental Engineering students in Peru regarding Environmental Impact Assessments and what tools they believe they should master in the future to carry out solid studies that ensure sustainability.

Future environmental engineers require comprehensive tools, as well as knowledge of technology and the social part of the analysis, to evaluate, formulate, and analyze environmental management instruments. According to MINAM, (2016), several aspects must be considered in environmental management, including economic, social, and environmental criteria.

A survey was carried out among students from the 3rd year of the Environmental Engineering Program of a Peruvian university, who have taken courses related to Environmental Impact Assessments.

The results were analyzed and compared, and strategies were proposed to improve the curricula and the content of the courses in the future.

Background

According to an article published in Impact Assessment and Project Appraisal, by Sánchez and Morrison (2010), environmental impact is studied in depth through cases and scientific articles and even though the courses have different names in the countries, the contents are very similar. (Sánchez & Morrison, 2010).

A study conducted in Canada in 2005 shows that more and more courses on environmental impact are being offered and that teachers are applying innovative strategies, and that there is also a multidisciplinary approach in the curricula. (Stelmack, et al, 20025).

Regarding the use of artificial intelligence in environmental impact studies, a study by Koyamparambath, et al (2022) indicates that there is a greater demand to know about these products and services linked to AI, and that they are related in the prediction of impacts and modeling with greater precision.

Methodology

A survey was conducted with 72 environmental engineering students from different semesters, of which only 48 were analyzed since they corresponded to students from the 3rd year of studies.

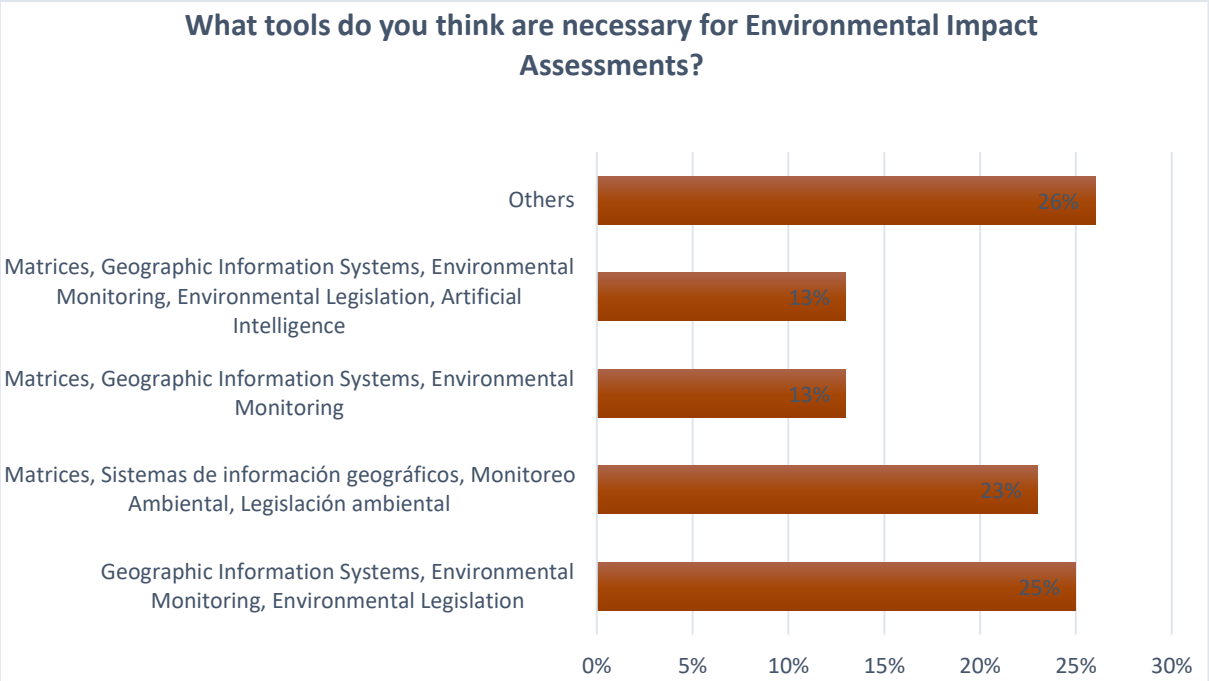
The questions asked were the following:

- What profession are you studying?
- What semester are you in?
- What courses of your career have you studied topics related to Environmental Impact Assessments in?
- What tools do you think are necessary for Environmental Impact Assessments?
- What competencies do you think a professional should have to prepare Environmental Impact Assessments?
- What shortcomings do you think Environmental Impact Assessments have today?
- How do you think artificial intelligence will be a useful tool in the coming years for environmental assessments?

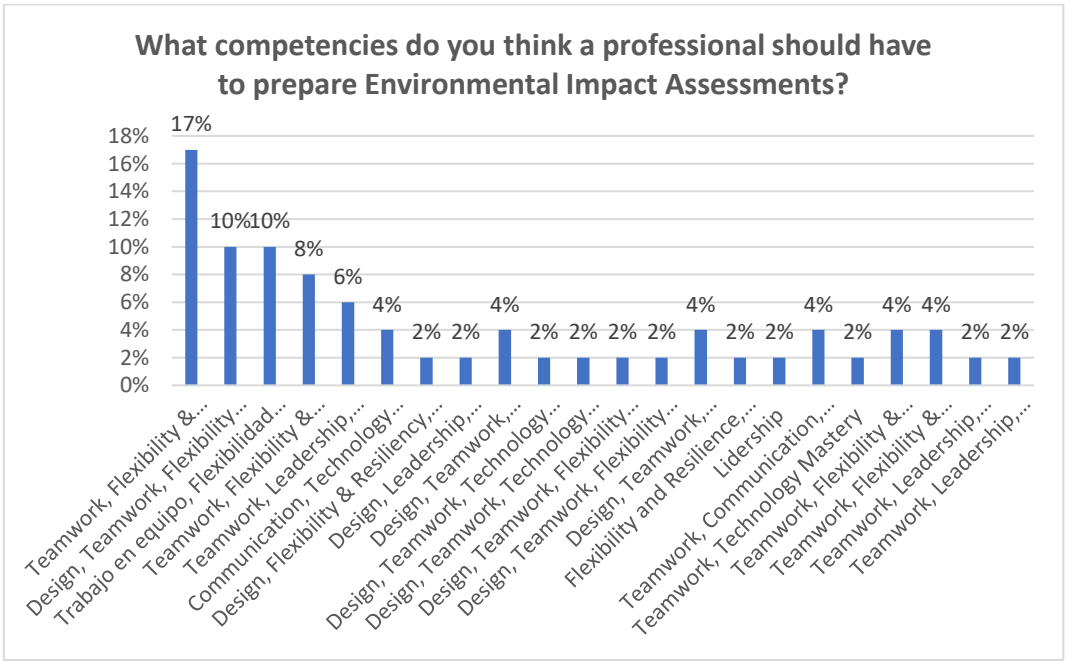
Results

- 100% of respondents were Environmental Engineering students.
- 48 of the 72 surveys were considered, since these were the students who were in the third year of studies. (66.6% of the sample).
- Regarding the courses in which they have studied topics related to Environmental Impact Studies, the answers were varied: Environmental Impact Assessment, Environmental Legislation, Air Pollution, Environmental Management Systems, Environmental Certifications, among others.

• What tools do they believe are necessary for Environmental Impact Assessments, 25% responded: Geographic Information Systems, Environmental Monitoring, Environmental Legislation, 23% Matrices, Geographic Information Systems, Environmental Monitoring, Environmental Legislation as a whole and 13% Matrices, Geographic Information Systems, Environmental Monitoring, Environmental Legislation, Artificial Intelligence, 13% think that only the Matrices are necessary, Geographic Information Systems, Environmental Monitoring and the rest gave varied answers.

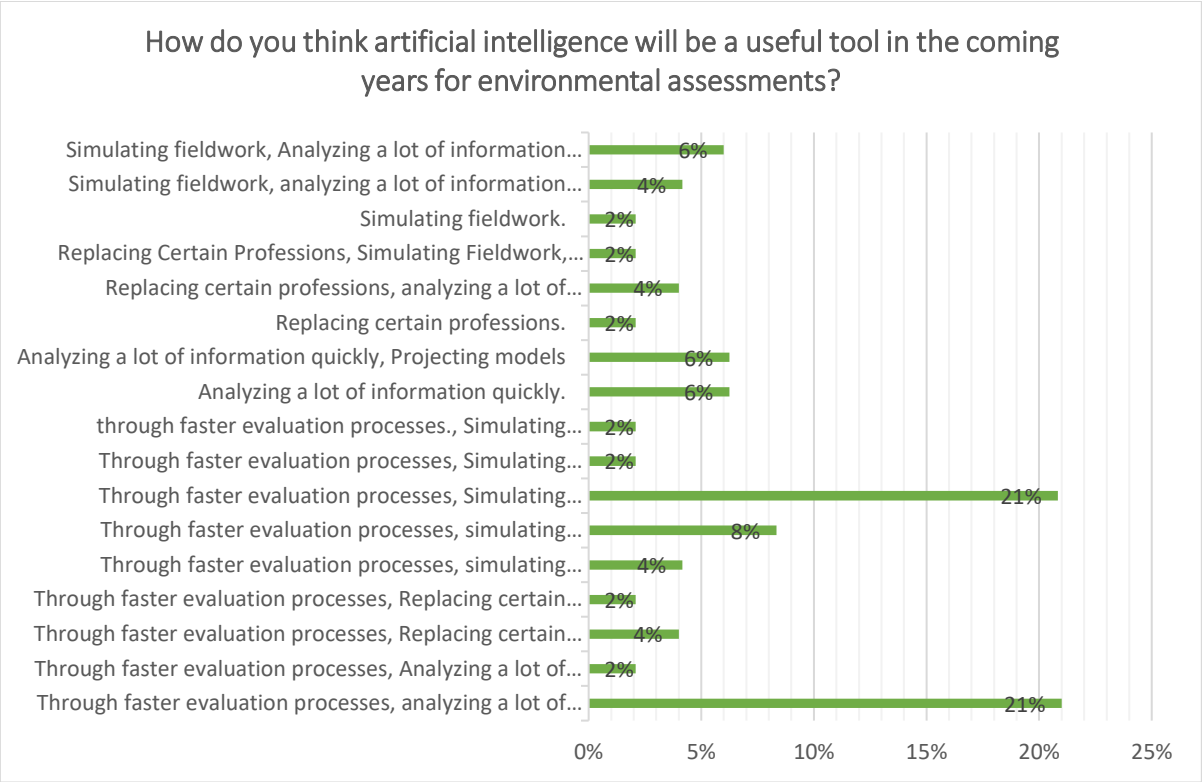


• Regarding the question about the shortcomings of Environmental Impact Assessments today, 17% responded that Teamwork, Flexibility and resilience, Leadership, Communication, Mastery of technology, 10% Design, Teamwork, Flexibility and resilience, Leadership, Communication, Mastery of technology, others 10% Teamwork, Flexibility and resilience, Communication, Mastery of technology, and 8% Teamwork, Flexibility and resilience, Leadership, Communication, and 6% Teamwork, Leadership, Communication, giving the rest varied answers. It should be noted that 2% considered knowledge of indigenous languages.



• On the question that includes their perception of artificial intelligence as a useful tool in the coming years for environmental assessments, the answers were as follows: 21% Through faster evaluation processes, simulating fieldwork, Analyzing a lot of information quickly, Projecting models, another 21% Through faster evaluation processes. Analyzing a lot of information quickly,

8% Through faster evaluation processes, simulating fieldwork, Analyzing a lot of information quickly. It should be noted that only 2% think that they will only replace certain professions and only 4% think that they only serve to simulate field work.



Conclusions

- The competencies that students believe are necessary are related to both technical and soft skills, as well as in some cases those related to the social part.
- Environmental engineering students find different uses for artificial intelligence in environmental impact assessments in the future, all leading to faster, more efficient, and more analytical processes. They hardly find a function that replaces them as professionals or a negative connotation.
- The courses they take in the curriculum coincide with the topics that students consider necessary to know. It would be interesting to do a complementary study with graduates.

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