



Extended Abstract

Factors Affecting the Quality of Education and Learning of geomechanics

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Abstract

Geomechanics plays an important role in the development of energy resources and sustainability. In many parts of the world, potentially important oil resources in unconventional shale formations characterized by low permeability and high heterogeneity, reservoirs in deep waters with high temperature and high pressure, geothermal systems of rocks and hot geofluids can be an abundant source of renewable energy in the form of heat or electricity, among which Geomechanics can play a prominent role. Therefore, education and training of specialists in the field of Geomechanics can be considered one of the important topics. For this reason, the present article deals with the factors affecting the quality of education and learning of Geomechanics engineering students. To determine the causal relationships between the factors affecting the quality of education, 37 Geomechanics and education experts were selected through purposive sampling. The results of DEMATEL and causal relationships between dimensions showed that the factors related to the professor had the highest interaction (influence/influenceability) and then, respectively, the factors related to the student, the factors related to the industry, the factors related to the curriculum and the factors related to the management in terms of interaction with other factors. The industry was the most influential factor on the other factors, then, the professor factor was the next influential factor, and these two factors are pure influential factors. The most influential factors were, respectively, the curriculum, the student and the management.

1. Introduction

Many studies indicate that the quality of teaching is very important for learning. Therefore, it is not surprising that many empirical studies show a positive relationship between teaching quality and student learning and academic achievement [1]. In the past, rock mechanics specialists employed by exploration and production companies and other companies operating upstream of the oil and gas supply chain were mainly required for homogeneous reservoirs and approximate data for the economic feasibility of fields and wells. However, geomechanics is now considered a specialized subject in the petroleum industry due

to its strong connection with geology and engineering, and it has been developed to address the mechanical behavior of reservoir and boundary rocks during exploration and production (E&P) activities. Geomechanics, which includes all thermo-hydro-mechanical phenomena, plays a fundamental role in hydrocarbon exploitation operations, from planning the well before drilling and supporting well stability to managing sand production during drilling and, finally, until the wells are abandoned. In this sense, developing a suitable course and curriculum for this course is one of the recent necessities in universities. Therefore, the purpose of this study is to identify

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the factors affecting the quality of teaching and learning of geomechanics engineering students.

2. Methodology

In terms of practical purpose, the present research used the paradigm of pragmatism and a mixed approach (qualitative/quantitative) with a sequential exploratory design. To collect data, 10 semi-structured interviews with industry and university experts were conducted in a targeted manner, and overt and hidden themes were analyzed using category analysis until factors were formed.

To determine the causal relationships among the factors affecting the quality of education and learning of geomechanics engineering students, experts' consensus and specialized knowledge were used, and the DEMATEL method was applied.

The research community in the quantitative part was formed by experts and specialists in education and geomechanics (with relevant education and at least 10 years of executive and research experience), among whom 37 people have purposefully completed a questionnaire of paired comparisons to determine the effectiveness of factors affecting the quality of education and learning of geomechanics engineering students.

3. Results and Conclusions

Factors related to the professor interact most with other factors, indicating that this factor is the most important and is a net Cause factor. Factors related to management have the strongest influence on other factors. Factors related to the industry are a net Cause because the amount of influence is greater than the effectiveness. Curriculum-related factors, considering that their effect value is lower than effectiveness, are a pure effect. Student-related factors are a net effect.

The field of petroleum geomechanics engineering deals with the identification, extraction, and optimal exploitation of oil and gas resources. Students in this field become acquainted with topics such as petroleum geology, drilling, reservoir engineering, and production methods. Graduates of this field can work upstream in the oil and gas industry and in drilling, exploration, and production projects. The goal of geomechanics is to identify the problems

encountered during the exploration or extraction of oil and gas reservoirs. The science of geomechanics investigates and analyzes the earth's behavior under stress and is used to solve many physical and mechanical problems resulting from the interaction of the earth's materials with various stresses. Geomechanics is an important and currently missing link in the upstream part of the oil industry, in terms of reducing cost and time and increasing efficiency from the beginning of the exploration process to development and production and finally leaving the reservoir, and has a special place that should be given special attention. The field of geomechanics focuses on understanding ground stresses, so that by determining these stresses, the risk in oil and gas exploration and production can be reduced to an acceptable level and the optimal life of the field can be increased.

In the model aimed at enhancing educational quality and student experience in transnational education, the service quality framework emphasizes that higher education institutions should prioritize meeting students' expectations regarding service quality at the start of their educational journey, throughout various stages, and in the programs they offer.

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5. References

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