King Abdelaziz University Preparatory Year Engineering Students' Reluctance to Enroll in Nuclear Engineering: Reasons and Possible Solutions

Abstract

The continuous increase in Co2 emissions in the atmosphere calls for instant response to find better alternatives for fossil fuels. Nuclear energy as carbon free energy might be one of the best alternatives. Unfortunately, some of theKing Abdelaziz University (KAU) preparatory year engineering students are reluctant to join nuclear engineering for different reasons.**Aim:**This study is meant to motivate KAU students to enroll in nuclear engineering NE as the most promising field. **Sample**: The sample of the study was prep. year engineering students at King Abdulaziz university in 2024/25. **Methodology**: To conduct this study, the researchers designed a questionnaire to inform students about the importance of NE, to investigate the reasons behind students' reluctance to join NE and to find ways to motivate and convince KAU students that NE is one of the best choices currently. They also interviewed three PhD holders in NE from the NE department. **Results:**The findings of the study detected lack of awareness among the students with regard to the importance of NE. They also show that students still have the traditional image that nuclear power is only associated with devastation and those who deal with this field will end up either handicapped or having permanent disability. **Conclusion:**The study recommended that schools, universities, and other related institutions should spread the awareness that nuclear energy is safe to deal with, job promising, and it is the future for low or zero emissions.

Key Words: King Abdulaziz University (KAU), Nuclear Engineering (NE), International Energy Agency (IEA), Preparatory Year students

1.INTRODUCTION

Nuclear power is unavoidable for a world free of emissions. As renewable energy, it is used as an alternative for petrol to generate electricity, for medical treatment and other technologies, for detecting smoke in our homes, testing for and treating cancer, and contributing to national defense. In a world that denies emissions and pollution, nuclear energy plays a pivotal role in a cleaner atmosphere and a better environment for the new generation. Among the plans of the decision makers in KSA headed by His highness the Crown Prince is to build a big project called Neom in the north of the Kingdom that is emissions free. Nuclear power offers progressive options to mitigate global warming and other effects of climate change[1].

Unfortunately,some of the prep. year engineering students in the Kingdom of Saudi Arabia have negative attitude towards NE which makes them hesitant to join this very important field. In the long run, this may negatively affect the need for nuclear engineers to cope with the future plans and satisfy the prospected labor market. This refers to the scarcity of universities that offer this field and the anti -nuclear groups among the decision makers who resist NE projects as the case in Indonesia [2]. Changing the attitude and perception of students towards NE through education and awareness is an important step towards promoting NE [3].Success stories about people involved in NE also contribute to breaking barriers against joining this field. Destiny white, the first black woman to get a bachelor's degree in NE is a good example. She said her teachers skipped the nuclear unit in chemistry and her mom was against her ambitions to be a radioactive waste manager. Despite these challenges, she ends with a master in NE and refers her success to the support she got from her colleagues. Research was also very motivating for her. Her advice is that girls should be given freedom to choose their options. She added "*I would love to see more women of color involved in nuclear"*[4].

Currently, a few prep. year students in the faculty of engineering at King Abdulaziz University are reluctant to study nuclear engineering for different reasons. Among these reasons are the challenging nature of nuclear engineering in terms of courses, tasks, assignments, and other submissions. Another reason is the widespread impression that nuclear engineering staff sooner or later will suffer of radiation and other consequences which either end their lives or turn them into handicapped or disabled. A third reason is the traditional impression that nuclear engineering graduates will not find job opportunities. In fact, the truth is totally different; there are currently safety procedures that make nuclear reactors the safest place to work in. In addition, the Kingdom of Saudi Arabia is heading towards building nuclear reactors as an alternative to petrol for producing energy and contributing to a cleaner environment according to global agreements the kingdom is engaged in. This unavoidable change to nuclear energy will certainly save thousands of job opportunities for NE graduates. The nuclear department at KAU and other similar departments at Saudi universities; in addition to other institutions related to nuclear engineering inside and outside the kingdom have great responsibility to change the image towards a new attitude to nuclear engineering that it is a promising field in KSA, and it is a completely safe job to adopt.

This study intends to unravel the secrets behind students' reluctance to join NE and change these secrets to motivating factors that steer the students' compass towards NE. To do this the study attempts to answer the following questions:

What is the importance of NE in our life?

Why are some prep. year engineering students at KAU reluctant to study NE?

How can the NE department and other related institutions motivate prep year engineering students at KAU to join Ne?

2. REVIEW OF LITERATURE

Although nuclear energy has a gloomy history mainly incarnated by the bombing of Hiroshima and Nagasaki, it has also been crucial help for humanity through many sectors like medicine, manufacturing, water desalination and other human applications. In addition, nuclear energy is the key to the world ambition for decarbonized industry and a cleaner environment in 2050. The Kingdom of Saudi Arabia is a country with big ambitions and a promising future. Its leadership is determined to make a wide jump towards modernization, industrialization and globalization though abiding by the international agreements towards a cleaner atmosphere.

2. 1 Theoretical Background

The choice of an engineering major differs from one student to the other. Some students choose through modelling; a successful electrical, nuclear, or mechanical engineer who is leading a happy life with a big house and a luxurious car may inspire prep. year students especially relatives to choose the same field. Others may be affected by their colleagues' choiceand motivation. A minority choose based on early planning and childhood ambition that relies on the attitude and aptitude of the student.

Although much research has been done about choosing science, technology, engineering and math, little research probed choosing an engineering major. Some students choose engineering to join the college, others follow two steps: first to join general engineering, then to choose a major. This study goes back to the period before university including pre-high school, high school, and early college as determinant to choose engineering. The study recommends that all people concerned including administrators, teachers, and stakeholders at the pre university stage should develop strategies to motivate students to join the available engineering majors [5]. The social factor's contribution in choosing engineering majors in terms of having siblings who are engineers is of great importance. Individual characteristics and structural factors also have great influence on students' choice of an engineering major.

A study was conducted by a group of researchers to evaluate decisions made by engineering students to choose their major at the University of New Haven [6]. They studied socializers, self-identified confidence, and media sources in terms of their effect on students' selection of their engineering field. They also studied students' perception of different engineering majors. This study enabled decision makers at UNH to emerge new majors that match with students' interests and preferences. It also aims at developing a survey instrument to be used at other universities to help students choose their major. The study found out that almost half of the students determined their major before joining the university. This shows that there is a chance to influence students' choice of their major during their prep. year.

Choosing a major is a multifaceted issue; logically speaking, it should be based on students' aptitude and attitude. A student who doesn't like engineering or unable to get by with math and physics, should not join engineering. Unfortunately, it is not always the case; some students enroll in engineering because of their peers, others study engineering as show off especially in traditional environments, a minority follow their parents' dreams and ambitions especially those who have family companies where the sun is going to substitute his father or uncle in running that company.

To understand why first year students selected engineering as their major, 612 students from Midwestern university completed a survey about their beliefs and attitudes regarding engineering and they answered one question "What influenced your decision to study engineering?"The study found out that the top three reasons for choosing engineering are: interest in the subject matter, being influenced by family, and prior experience [7].

2. 2 The Importance of Nuclear Energy

Nuclear energy gets its significance from the fact that it is the best alternative for fossil fuels. Currently, most of the countries are engaged in agreements that reduce emissions and start Co2 free industries that guarantee a clean environment for citizens. Much effort was done so that carbon emissions reach net zero by 2050. Comprehensive policy changes, investments in innovation and infrastructure, deployment of non- emitting energy resources, electricity grids must be decarbonized, vehicles must be electrified, industries must rely on nuclear energy other than fossil fuels. In fact, a significant shift is needed for nations to meet the climate change requirements. Nuclear power plays a pivotal role towards a decarbonized world with the International Energy Agency (IEA) suggesting that the nuclear energy generation11 currently eliminates between 1.3 to 2.6 giga-tons of CO2 emissions from the power sector each year, depending on whether it is assumed that it replaces gas- or coal-fired power plants[1].International Atomic Energy Agency [8]stated that in order to limit the average global temperature increase to 1.5°C, much should be done to reduce the amount of Co2 to the minimum by 2050. Nuclear energy plays an important role in this regard through functioning as a viable alternative to fossil fuels; in addition to expanding low carbon capacity through the construction of new facilities. The production of energy,especially electricity generation, accounts for two thirds of greenhouse gases(GHG) emissions. Using nuclear energy contributed to minimizing these emissions to 50%.Nuclear energy does not emit greenhouse gases into the atmosphere and plays a major role in mitigating climatechange. It contributes to low carbon economy through 442 nuclear power reactors producing 393 GW of electricity which makes 11% of the total global electricity generation [9].
A study conducted into environmental pollution and global warming in which the researcherrecommended using energy industry to minimize using fossil fuels, especially coal and oil [10]. The suggested solution is increasing nuclear power generation, which is more productive, less petrol consumptive and less expensive in proportion to the electricity produced. Unfortunately, highly developed economies still rely mainly on fuel. Their reasons refer to their fear that nuclear power is not guaranteed and be a target to terrorist activities.The countries efforts to rely on nuclear energy as an alternative for fossil fuels and to reach clean energy mix by 50% by 2023was investigated[11]. To do this, KSA started preparing the infrastructure and the establishments related through following the IAEA approach. This article emphasizes the kingdom's commitment to international agreements and to vision 2030. The progress KSA achieved goes side by side with the safety and security measures of using nuclear energy. The current challenge for countries is to have industry with the least amounts of emissions [12].

2. 3 Encouraging prep. year students to enroll in NE

The Kingdom of Saudi Arabia's inclination to become an industrialized country, to rely on nuclear energy as an alternative to fuel energy and to abide by the globe's agreements towards decarbonated industry is interrupted by some of the Saudi students' reluctance to study nuclear engineering. This might refer to the challenging nature of this field and the gloomy history of nuclear energy. The Saudi nuclear industry would require 40,000 jobs. Most of these jobs should be localized. To do this, KSA needs to transfer technology, license agreements, start joint ventures with other developed countries, initiate an industrialization program based on the development of local manufacturing plants. In addition, the public sector pushes localization interests to the private sector, then the private sector pulls economic opportunities and leverages industrialization enablers. This relation of push and pull keeps going between the two sectors[13].

A coursewas initiated**(**Spanish Young Generation in Nuclear, JJNN) to spread awareness among students about nuclear technology. The aims of this course are to inform the public, to answer the frequently asked questions about Nuclear Energy and to motivate preparatory year students to join NE. Therefore, the main targets of this course are high school students who are not settled on joining a certain field in particular, the university students who joined the faculty of engineering and still confused which field to enroll in and to anybody interested in NE [14].The future of nuclear engineering in terms of advancing technology, manufacturing and infrastructure is determined by students' choice of nuclear engineering and other engineering majors. This calls for the interference of colleges and academic institutions to direct students' choices towards these fields. They used a survey to discover why students selected their major. The study found out that students' traits like gender, social backgrounds affect students' choice of engineering majors. Destiny white the black first woman to get a bachelor degree in NE said that although her teachers skipped the nuclear unit in chemistry and her mom was against her ambitions to be a radioactive waste manager, she ends with a master in NE. She referred this to the support she got from her colleagues and the motivation she got from research. Her advice is that girls should be given freedom to choose their options[4].)A study addressed the factors associated with engineering major choice. Quantitively and qualitatively the researchers identified which demographic characteristics and academic variables affect engineering choice and when and why they choose a certain engineering choice respectively. The findings of the study revealed the importance of the academic achievement and scores on choosing the engineering major and that peers and university personnel have more effect in this regard than family and teachers before enrolling at university[5].

There are many variables that determine students' choice of engineering major. Specific socializers, interest, external influences, gender, parental educational background, important influencersare all important and might be hidden triggers for students' choice of an engineering major. The researchersidentify four factors influencing engineering students' choice of their major: care about the subject, achievement, good career opportunities and future prospects [6].

3. METHODOLOGY

3.1 Population and sample

The population of the study is all preparatory year engineering students in the Saudi universities who are in the process of choosing their fields of study (electrical, mechanical, industrial, nuclear …) in the faculty of engineering. These students finished the requirements of the foundation and prep year in engineering and about to formally join their prospected choice among the fields offered in most of the engineering faculties in KSA. These are males and females between 18 and 20 years old. The sample of the study is 100 students chosen randomly from the population. The study focuses on the prep. year engineering students at KAU as an intended sample.

3. 2 Research design

The research intends to investigate the reasons behind the prep. year engineering students' reluctance to join nuclear engineering. To do this, the researchers prepared a group of 10 interview questions to be asked to 3 doctors in the nuclear engineering department including the head of the department. The researchers also designed a questionnaire consisting of three categories reflecting the three research questions. The first category is about the importance of nuclear engineering, and it incorporated six items. The reasons behind students' reluctance to study nuclear engineering were depicted in the second category which includes five items. The third category of six items discussed the NE department's role in motivating Prep. Year engineering students to join NE. The questionnaire was validated by experts in NE before it was launched to google forms. The pie charts taken from google forms were changed to charts for easier manipulation. The common answers of the three doctors interviewed were refined and tabulated for later discussion.

4. RESULTS

This chapter illustrates the results of the questionnaire represented by the respondents' answers to the three research questions. The questionnaire consists of seventeen items. The first six items are about the importance of nuclear engineering. The second five items are about the reasons that make students reluctant to enroll in nuclear engineering and the last six items are about the suggestions that motivate students to join nuclear engineering. Each category is represented by a chart that is explained thoroughly in terms of the common features and the significant percentages. This chapter also includes the results of the interview questions represented in tables that contains the common answers of the interviewees.

4. 1. Results of the Questionnaire

chart 1 below demonstrates the respondents' answers to the first research question related to the importance of nuclear engineering.

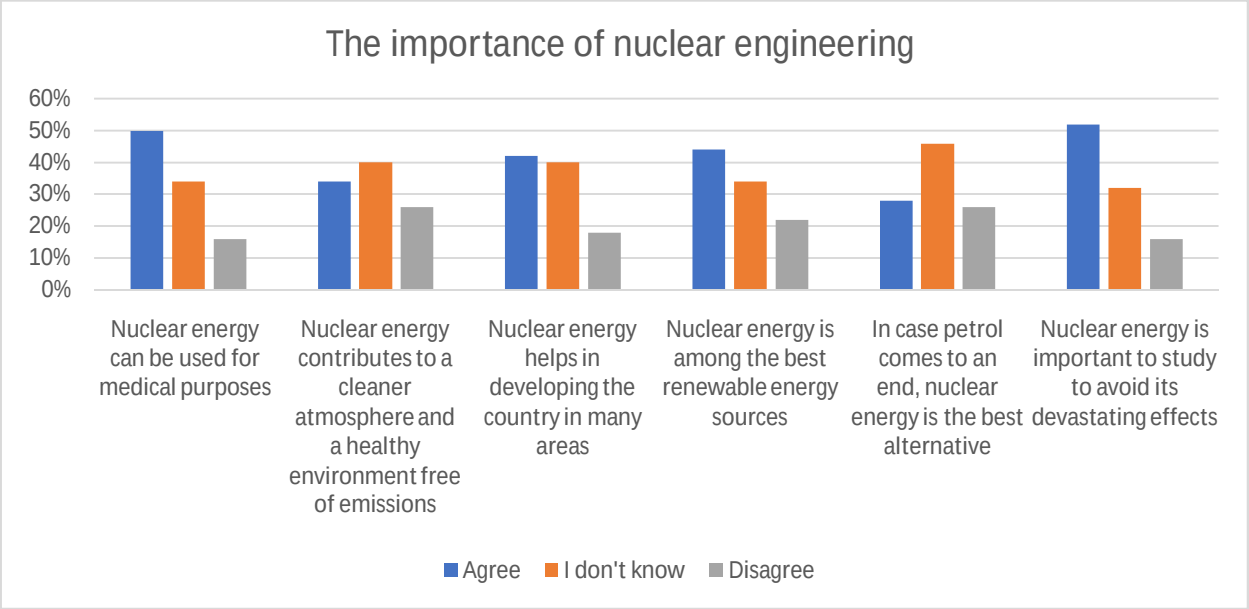

Chart 1 above illustrates the respondents' answers with regard to the first research question (What makes nuclear engineering an important field to study?). It can be seen clearly that half of the respondents think nuclear engineering can be used for medical purposes and just over half of them think studying nuclear energy is essential to avoid its devastating effects (50%., 52%) respectively. Respondents have nearly equal responses in terms of agreeing or being unaware with regard to cleaner atmosphere, healthy environment, and nuclear engineering contribution in developing the country. Surprisingly, respondents seem to have little knowledge about the importance of nuclear engineering for

the future of KSA in particular and the world in general especially with regard to nuclear energy as the best alternative for petrol. All in all, less than 30% of respondents disagree that nuclear engineering is important.

chart 2 demonstrates the percentages of respondents who answered the second category of the questionnaire. The three-Likert scale- agree, I do not know, disagree was used to reflect the results.

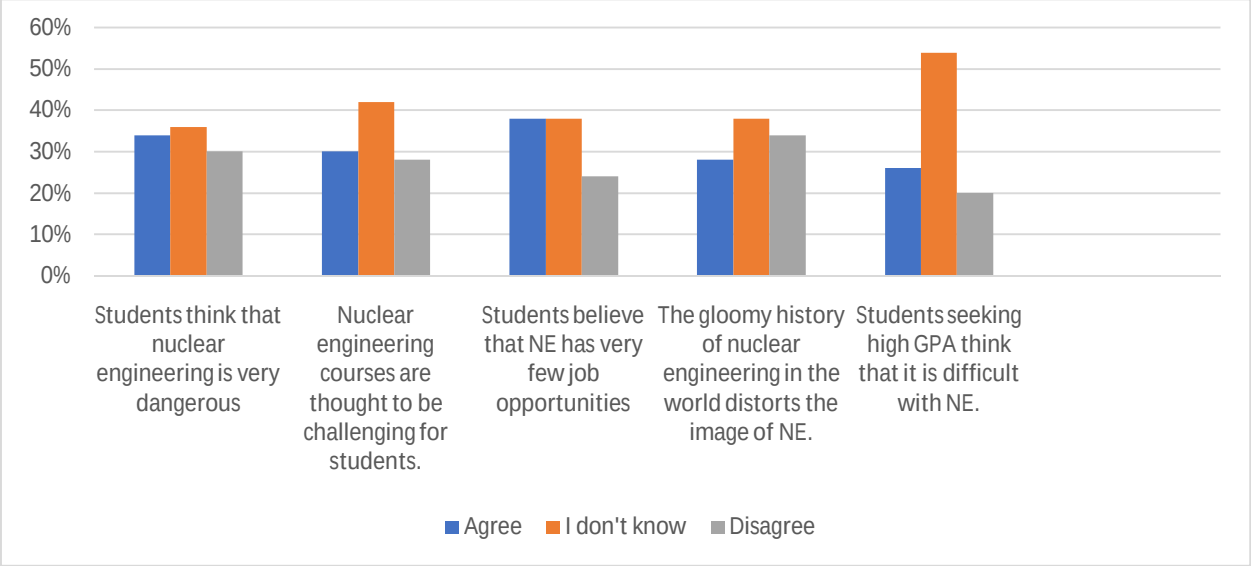

Chart 2. The respondent's answers to the second group of the questionnaire

Chart 2 above shows the respondents' answers to the second research question (Why are preparatory year engineering students reluctant to study NE?). As can be clearly seen, over half of all respondents do not know if getting a high GPA in NE is possible (nearly 55%). However, nearly a third of students consider NE hazardous, while over a third of them are not sure it is a safe field and 30% of them have a totally different opinion. Approximately 4 in 10 of the students believe NE has very few job opportunities which is the same compared to the students who do not know. Over a third of the students think that the history of NE does not distort the image of NE. Generally speaking, engineering students seem to have poor knowledge about why they have this negative attitude towards NE.

chart 3 demonstrates the percentages of respondents who answered the third group of the questionnaire. The three-Likert scale- agree, I do not know, disagree was used to reflect the results.

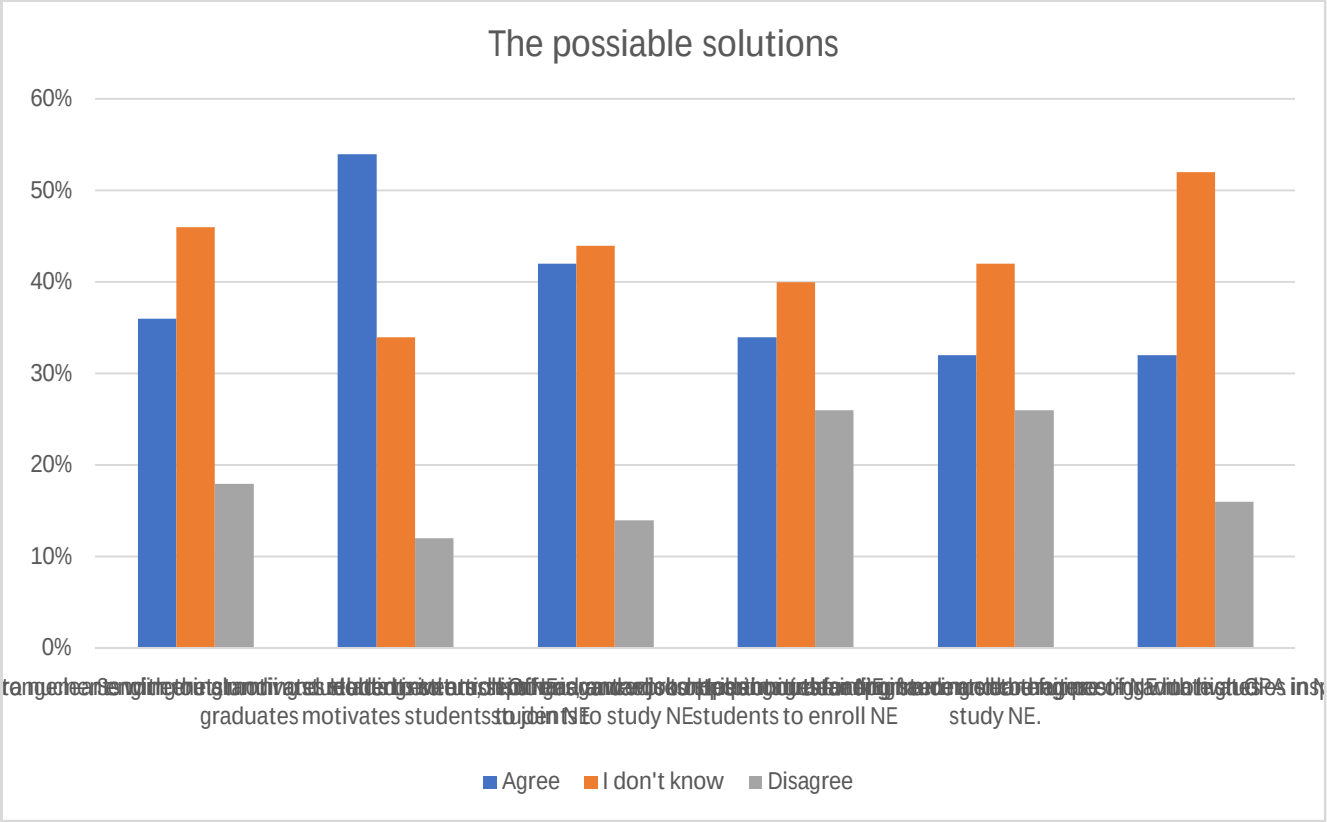

Chart 3. The respondent's answers to the third group of the questionnaire

Chart 3 above shows the respondents' answers to the third research question (How can the NE department at KAU and other related institutions motivate prep-year engineering students to study NE?). It is very clear that over half of the students find thatarranging with alumni and related institutions to guarantee job opportunities for NE graduates might be a great solution to motivate students to study NE. More than a third of respondents were not sure that the six suggestions to encourage students to enroll in nuclear engineering are helpful and viable. On the other hand, less than a third disagree with the suggested solutions.

The charts above described the respondents' answers indetails and shed the light on a common feature that appeared clearly in all items. That feature is the lack of awareness and uncertainty with regard to the three research questions. The detailed description and the common feature will be a rich material in the discussion chapter.

4. 2 Results of the Interview Questions

4. 2. 1 Results of RQ. 1

What makes NE an important field to study?	What are the NE applications in our daily life?	There are many applications of nuclear engineering especially in hospitals. For example, if someone has a broken leg or broken arm, they go to the hospital and take an image of it with an X-ray radiation. Also, there is a fire alarm in any building in case of a fire. Furthermore, there are a lot of fields in which nuclear energy can be applied such as agriculture, water resources, generating electricity, industries, and the environment.

	What are the job opportunities NE graduates may have in the labor market?	Nuclear engineers might work in nuclear power plants to generate electricity or in some companies. For example, in Saudi Arabia nuclear engineers have a chance to work in Aramco, NRRC (Nuclear and Radiological Regulatory Commission), King Abdullah City for Atomic and Renewable Energy, and King Abdulaziz City for Science and Technology. Moreover, in hospitals and the military.
	How can NE make KAU economy better and stronger?	While using nuclear energy instead of fossil fuels, the country saves the money used for treating pollution. In addition, finding alternatives to produce energy saves the effort and the money dedicated for manufacturing petrol which can be either sold to other countries or kept as a storage for future plans. NE is a seatbelt for KSA to cope with the accelerated progress the country witnesses currently.

4. 2. 2 Results of RQ. 2

Why are prep. year engineering students reluctant to study NE?	What is the traditional impression some people have about NE?	People have a common impression that nuclear energy is not safe,and it is the reason for mass destruction over years and what happened in Japan and other places in the world was a clear example about this gloomy history.
	Why do they have this impression?	This impression comes from the devastation caused by nuclear weapons during wars that threatens human life and natural resources. In addition, certain mistakes caused by peoples' carelessness while working in nuclear reactors are terrifying to prep. year engineering students and contribute to the distorted impression about NE.
	What are the measures that make working in NE safe?	There are many measures that make the nuclear engineering a safe field, but it depends on the activity itself. For instance, the measures in nuclear power plants are different from the ones in the hospitals because each place uses nuclear energy in its own way. For example, in hospitals, there should be a limit for working hours that shouldn't be exceeded. Moreover, workers should use detectors to know how much radiation is there in the working environment and weather it is threatening or not.
	What courses in NE engineering students consider challenging?	Well, it depends on the student himself and it is like the other fields, but the challenge is that nuclear engineering is multidisciplinary.The student needs many fields of sciences such as mathematics, physics, chemistry, biology, and geology. This overlap in sciences makes the students unable to follow up and to use higher order thinking skills.

4. 2. 3 Results of RQ. 3

How can the NE department at KAU and other	How can the NE department at KAU encourage prep. year	Informing students about the benefits of nuclear engineering and assuring them that nuclear engineering is a safe field. Also, promising students to arrange with

related institutions motivate prep. year engineering students to study NE?	engineering students to join NE?	alumni to find job opportunities to the students andgiving incentives to students who join NE.
	What should the labor market do to make NE a better choice for engineering students?	Building a nuclear power plant can be a great solution to enhance the nuclear field and with that, it will provide a lot of job opportunities. In addition, the hospitals and many other nuclear industries can motivate students by giving higher salaries to NE students.
	How can schools and mass media promote NE?	Schools can provide advanced students who are about to finish school with leaflets about prospected fields including nuclear engineering and how important it is for the future of the country. They may also invite experts to schools to give lectures and workshops about the future of nuclear engineering.

5. DISCUSSION

The current study investigates the reasons behind the prep. year engineering students' reluctance to study nuclear engineering. In a developing country like KSA with the many promising projects and the commitment to reduce Co2 emissions, nuclear power and nuclear engineering graduates are the key to fulfill the promises and abide by the commitments. To answer the questions of the study, the researcher designed a questionnaire of seventeen items that cover the importance of nuclear engineering, the reasons behind students' reluctance to enroll in NE and suggestions to motivate students to join this important field of study. In addition, three PhD holders in the NE department were interviewed to answer the three research questions and their sub questions.

The most significant finding related to the first research question as well as the other two research questions is the lack of awareness among engineering students with regard to the importance of NE for medical purposes, as a viable alternative for petrol, for a cleaner environment and as a necessary step for avoiding the devastating effects of nuclear power. This finding is alarming as the whole world now is moving towards nuclear energy as an alternative for petrol especially in KSA as petrol may come to an end in the near future. The reason behind this refers to the belief that petrol is going to stay forever and there is no need to think about alternatives. This implies that academic institutions starting from school should start spreading awareness among students that nuclear power is not only a devastating weapon; it can also be very beneficial in many peaceful aspects. [1],[14], [9] and [11] pointed out the importance of nuclear energy for peaceful purposes and for reducing emissions. Although more than half of the respondents agreed that nuclear power is of great importance in the future, a good percentage of respondents are not convinced that nuclear power is the best alternative for petrol and the most appropriate device for developing KSA in medicine, manufacturing, and having a cleaner atmosphere free of emissions and pollution. Social network sites and media have a great responsibility towards informing Saudi people about the importance of nuclear engineering. This agrees with [5] who amplifies the role of socializes and media in this regard.

With regard to the second research question related to the reasons behind students' reluctance to study nuclear engineering, the overwhelming result that was very clear in RQ1 is the students' lack of knowledge and uncertainty about these reasons. Starting from a third to more than half of the respondents expressed their neutral attitude towards students' reluctance to enroll in nuclear engineering. This might be a result of other students' attitudes towards NE. Prep. year students usually ask senior students for advice while choosing their majors. Unfortunately, this advice may not be based on a wise, mature opinion which leaves fresh students confused and threatened to choose certain majors including NE. This calls for initiating a specialized body consisting of experienced people, professors, and alumni

members to give clear and reliable information to the prep. year students. This goes with [4] who emphasized the role of peers and university staff in advising prep. year students. The respondents' percentages for agreeing and disagreeing were almost the same which is an extension and confirmation for the absence of a clear and final decision that these reasons are real reasons for not joining NE. This implies that prep year engineering students should consult the right people while choosing their majors with the help of their specialized and experienced supervisors. A course was initiated to spread awareness among prep. year students about NE to fill the uncertainty gap related to choosing their major [13].

The respondents' answers to question three also dedicate the state of confusion about the feasibility of the suggestions to motivate prep. year engineering students to join NE. More than 50% of the respondents have no idea that facilitating entry, guaranteeing jobs for NE graduates, internships, rewarding and post graduate studies are motivating factors for joining NE. What is encouraging is that about nearly a third of the respondents agree that the suggestions above are helpful in motivating students. This refers to the renaissance era that KSA has witnessed recently. The threat that petrol may come to an end, the demands for industry without emissions, and the prospected nuclear plants in the kingdom all contribute to encouraging students to study NE. This calls for convincing prep year engineering students that nuclear energy is the future of the Kingdom of Saudi Arabia, and the nuclear facilities should only be monitored by Saudi hands. Students should know that NE with its two available branches: Medication and Radiation will be the best choice as they will lead to instant attractive jobs upon graduation.

The results of the interview also emphasized the importance of NE for the future of KSA and the world as a whole. The doctors interviewed pointed out that many promising jobs related to NE are going to be available for Saudi NE specialists. They also referred the students' reluctance to enroll in NE to the challenging nature of NE requirements in terms of courses, assignments, tests & quizzes, in addition to the multidisciplinary courses in the NE plan. The interviewed doctors also highlighted the related institutions' role in motivating prep. year engineering students whether before or after joining the university.

6. CONCLUSION

The current study investigates the KAU prep. year engineering students' reluctance to join nuclear engineering. A questionnaire was designed to survey a sample of engineering students' opinions about the reasons behind this reluctance. The gloomy history of nuclear energy and the devastating effects it causes throughout history is one of the major reasons. The challenging nature of nuclear engineering, the fear of having a low GPA, and uncertainty of finding a stable job upon graduation are all valid reasons in the prep year engineering students' opinion. The most surprising result of the questionnaire was the students' confusion and uncertainty about the reasons of their reluctance. Such results are alarming as nuclear engineering is the most needed in the coming years as the world is heading towards emission free globe. There are many agreements signed by the decision makers to reduce Co2 and other poisonous gases to the minimum.

This study gets its significance from the fact that it attempts to draw students' attention to nuclear engineering as a promising field of study. The Kingdom of Saudi Arabia is heading towards building nuclear reactors and there is an urgent demand towards decarbonizing industry. This calls for graduating specialists in NE to run the reactors and lead the change. When local resources are run by local people, decisions, planning, and implementation will be in local hands.

The study is limited by the sample size as the researcher can't wait to have a big number of respondents; in addition, respondents are not motivated to answer questionnaires. The study is also limited by time as the research should be finished by the end of the semester. The lack of references about motivating students to enroll in NE is another limitation. The researchers recommend that supervision and orientation meetings should be facilitated to inform prep. year engineering students about the importance

and utility of joining NE. They also recommend that more research should be conducted to highlight the benefits of studying nuclear engineering and to find solutions for any obstacles that may face students with this regard.

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16.

APPENDICES

Appendix 1
The Interview Questions

1.	What makes NE an important field to study?	What are the NE applications in our daily life?
		What are the job opportunities NE graduates may have in the labor market?
		How can NE make KAU economy better and stronger?
2.	Why are prep. year engineering students reluctant to study NE?	What is the traditional impression some people have about NE?
		Why do they have this impression?
		What are the measures that make working in NE safe?
		What courses in NE engineering students consider challenging?
3.	How can the NE department at KAU and other related institutions motivate prep. year engineering students to study NE?	How can the NE department at KAU encourage prep. year engineering students to join NE?
		What should the labor market do to make NE a better choice for engineering students?
		How can schools and mass media promote NE?

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Appendix 2

The questionnaire

Dear gentle preparatory year engineering students, this questionnaire is about the reasons behind students' reluctance to join nuclear engineering. Your cooperation is highly appreciated as it will contribute to breaking the barriers and motivating students and opening their eyes on the fact that nuclear engineering, energy and power are the future of the Kingdom and the whole world. More student joining nuclear engineering means more graduates to run the nuclear reactors which very soon will be available in the Kingdom.

	Item	Agree	I do not know	disagree
	1. Why is nuclear engineering important			
	Nuclear energy can be used for medical purposes.			
	Nuclear energy contributes to a cleaner atmosphere and a healthy environment free of			

emissions.			
Nuclear energy helps in developing the country in many areas.			
Nuclear energy is among the best renewable energy sources.			
In case petrol comes to an end, nuclear energy is the best alternative.			
Nuclear energy is important to study to avoid its devastating effects.			

Item	Agree	I do not know	Disagree
2. Why are students reluctant to study nuclear engineering?			
Students think that nuclear engineering is very dangerous.			
Nuclear engineering courses are thought to be challenging for students.			
Students believe that NE has very few job opportunities.			
The gloomy history of nuclear engineering in the world distorts the image of NE.			
Students seeking high GPA think that it is difficult with NE.			

Item	Agree	I do not know	disagree
3. How to motivate students to enroll in nuclear engineering.			
Facilitating entry to nuclear engineering motivates students to enroll in NE.			
Planning with the alumni and related institutions to guarantee job opportunities for NE graduates.			
Sending outstanding students to internships in advanced countries in nuclear engineering.			
Holding events, seminars, and workshops about the importance and the future of NE.			
Offering awards to students graduating from nuclear engineering with highGPA.			
Helping outstanding students do their post graduate studies in NE.			