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# INVESTIGATING MATHEMATICS STUDENTS' PERCEPTIONS ON THE ROLE OF PROFESSIONAL DIPLOMA IN TEACHING PROGRAM IN MEETING THE VISION OF SUSTAINABLE DEVELOPMENT IN THE UAE

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## ABSTRACT

In light of the rapid development witnessed by the world, this study concentrated on teacher rehabilitation, preparation, and training programs as it is the executor of the learning and teaching process. Given the importance of education as a goal of sustainable development and its significant role in achieving all other sustainable development goals, there was a need for sustainable development that helps to keep pace with development and progress. Therefore, this study aims to determine whether the Professional Diploma Programs in Teaching meets the goal of quality education and whether those opinions vary according to specialization (mathematics, science), From the perspective of mathematics students in the United Arab Emirates. The response of (187) male and female students was collected using the education quality scale. When determining how well the Professional Diploma Programs in Teaching satisfies the standards for quality education, the arithmetic averages of the respondents' replies were calculated using the SPSS software. The statistician's value (t), which reached ( $t = 2.93$ ), also showed that there are statistically significant differences in favor of students majoring in mathematics when it comes to how well the professional diploma program in teaching satisfies the standards of quality education. The study recommended the need to include the goals of sustainable development in the courses of various programs in universities, and to pay attention to other sustainable development objectives.

**KEYWORDS:** Investigating Mathematics, Students' Perceptions, Professional Diploma, Teaching Program in Meeting the Vision of Sustainable Development.

## 1. INTRODUCTION

Countries all over the world strive to solve current issues and make efforts to provide their citizens with the necessities of a decent life in all of its aspects. The concept of sustainable development emerged to fulfill these aspirations through the creation of an integrated and researched plan that incorporates the desired goals of sustainable development that result in a decent life for its individuals and for future generations within an organized agenda for the vision. The sustainable development objectives are defined as a series of goals that seek to improve the world by addressing social, economic, environmental, and political issues at the local and global levels. It is believed that by 2030, the environment, economy, and societies throughout the world would have improved (Marshall and Oxfam Education, 2019).

In a website entitled "Education as a national priority" (<https://u.ae/en/about-the-uae/leaving-no-one-behind/4qualityeducation>), that The signing of an agreement between 193 United Nations member countries and hundreds of thousands of interested parties to achieve a collective future vision, leading to a common understanding and drawing the features of a bright future for future generations, was one of the efforts made to achieve sustainable development around the world. Additionally, the United Arab Emirates (UAE) has sought, through collaborative efforts, national committees that work to coordinate work between various ministries in order to achieve the goals of sustainable development and to chart the parameters of a high-quality life for its members, paving the way for the development and advancement of societies.

As the UAE has paid special attention to women, citizen happiness, the preservation and renewal of sustainable energy sources, the climate, education improvement, poverty eradication, interest in the health sector, technology and applications of artificial intelligence, and other factors influencing societal development, the UAE has launched an initiative. It commemorated fifty years of national growth and the United Arab Emirates' centennial in 2071, and it focused on attaining sustainable development objectives by incorporating them into the development agenda of the National Committee for Sustainable growth objectives, which was founded in 2017 (UAE National Committee on SDGs, 2017).

Efforts to attain the seventeen sustainable development objectives, which include most aspects of life as follows: no poverty (1), zero hunger (2), quality health and wellbeing (3), quality education (4), gender equality (5), clean water and sanitation

(6), affordable and green energy (7), decent work and economic growth (8), Industry, innovation, and infrastructure (9), reducing inequality (10), sustainable cities and communities (11), responsible consumption and production (12), climate action (13), life below water (14), life on land (15), peace, justice, and strong institution (16), partnerships for the goals (17) (Gulseven and Ahmed, 2022).

### Theoretical Framework

The Ministry of Education, like other ministries in the country, has worked to achieve the goals of sustainable development, and has paid special attention to the fourth goal (quality education) of the sustainable development goals, as it represents its primary role, which calls for providing high-quality education to all students throughout their lives. Plans were developed with the intention of enhancing the education system, particularly teaching techniques and student education, as well as establishing a framework to include sustainable development goals into school plans. (Marshall and Oxfam Education, 2019).

It also worked to activate the role of all members of society, including students, parents, teachers, supervisors, and specialists, in the process of developing and improving education within the goals of sustainable development, as the sustainable development goals are regarded as an important tool for developing the education system with its various components, including curricula, teachers, teaching, and evaluation methods. Furthermore, it built a new system for certifying teachers and educational leaders, as well as revised teacher rules, to guarantee that students are prepared to enter various colleges (SDSN Australia/Pacific, 2017).

Based on the primary role that universities play in preparing teachers, who play a major role in the implementation of educational policies and curricula, as well as the implementation of the educational process in all its aspects, interest has grown in teacher qualification programs in universities, as well as their evaluation and development, in order to keep pace with development in the educational system and achieve the goals of sustainable development. (Ashida, 2022)

As a result, it was necessary to pause for reflection on the nature of the relationship between the goals of sustainable development and the role of universities in qualifying the teacher who is capable of playing his role in achieving the goals of sustainable development for the development of society, as well as how to interact between university programs and the goals of sustainable development to produce the best results, as the relationship between them takes a reciprocal direction, a

relationship that is reciprocal in nature. Sustainable development, which throws light on the quality of educational programs that universities must give in order to contribute to society's advancement and the achievement of sustainable development goals. (Marshall and Oxfam Education, 2019).

The goals of sustainable development provide universities with a comprehensive and global view of the most recent developments in education, as well as assistance in obtaining international accreditation and establishing a framework that enhances their role in having a significant positive impact on society, as well as forging partnerships and cooperation with internal and external

institutions for the sake of excellence and creativity. Therefore, universities' programs give knowledge, innovations, and solutions towards the aims of sustainable development. They also contribute to the achievement of sustainable development goals now and in the future through its various programs that explain how to adopt, support, and implement sustainable development goals and incorporate them into culture and governance, as well as qualify educational leaders to lead the implementation of sustainable development goals (Kestin, 2017). Figure (1) illustrates the interrelationship between universities and the goals of sustainable development.

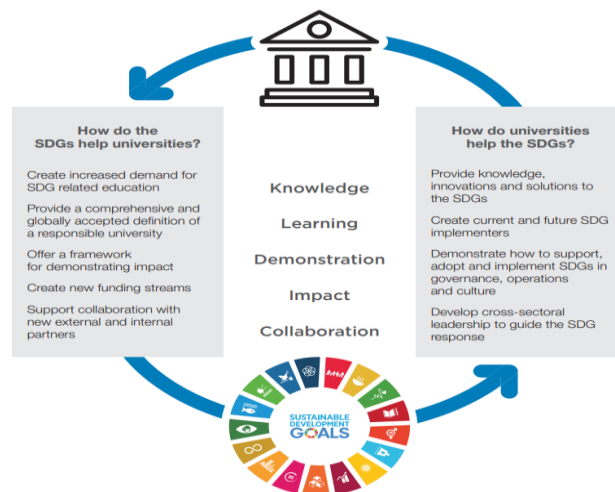


Figure 1: The case for university engagement in the SDGs (Kestin, 2017)

Universities play critical roles in achieving the goals of sustainable development, including activating the role of scientific research with the goal of searching for the best ways to achieve the goals of sustainable development, including its goals in its educational programs, supervising the governance of sustainable development goals and following up

on their implementation, and qualifying competencies and educational leaders to lead the plan of sustainable development implementation. (Kestin, 2017)

Figure (2) shows the role that universities can play to achieve these goals



Figure 2: An overview of university contributions to the SDGs (Kestin, 2017)

Given the significance of the various programs for qualifying teachers in universities in preparing teachers to implement quality education within the goals of sustainable development, the problem of this study arose, which sheds light on the extent to which the professional diploma program in teaching meets the fourth goal (quality education) within the goals of sustainable development from the perspective of mathematics students at Al Ain University, which can contribute to:

1. Shedding light on the extent to which the Professional Diploma Program in Teaching satisfies the purpose of excellent education within the context of the sustainable development goals, with the goal of development and improvement.
2. Expanding the scope of the investigation by incorporating more disciplines and factors.
3. Making use of the study's findings to build and improve teacher preparation programs.
4. Conducting research in different societies.

Therefore, the study sought to provide answers to the following questions:

1. To what extent does the professional diploma program in teaching meet the requirement for quality education as a goal of sustainable development from the point of view of mathematics students in the United Arab Emirates?
2. Are there statistically significant differences in the extent to which the Postgraduate Professional Diploma in Teaching program meets the requirement of quality education as a goal of sustainable development in the UAE, from the perspective of students, based on their specialization (mathematics, science)?

### Literature Review

Several studies addressed the subject of the study, which is to investigate the extent to which the professional diploma program in teaching meets the vision of quality education from the perspective of mathematics students, as well as the extent of their differences based on the variable of specialization (Kong et al., 2022; Li et al, 2023; Yang, 2022; Zguir et al, 2022). A study conducted by Li et al., (2023) to determine the influence of conflict and external cultural pressure on the global sustainable development of teachers. The findings revealed that individuals experience fundamental role conflicts

and conventional social stereotypes, and that the innate thought and behavior patterns that develop as a result of female teachers' socialization makes it harder for them to create professional self-identity. Female professors must therefore improve their self-awareness rather than consume several identities. Universities and colleges must also defend women's reproductive rights and prohibit sexual discrimination connected to those rights. Cultural identity must be strengthened and integrated, and cultural biases between the sexes must be avoided in order to promote equality and modify behaviors.

Another study conducted by Zguir et al., (2022) aimed primarily at investigating eighth-grade teachers' perceptions of the integration of education for sustainable development, and the findings revealed an urgent need for a more comprehensive and integrated entrenchment of sustainability values that do not conflict with local values. Furthermore, the findings show that additional ESD-related education policies, as well as their implementation in classrooms, are urgently needed. Although the study found no statistically significant differences in teachers' perceptions of ESD integration based on gender, nationality, or age, the findings do show a fundamental difference in teachers' perceptions that correspond to their perceptions of the subject of teaching, specialization, and the extent to which their schools participate in education initiatives for sustainable development. Kong et al. (2022) conducted a study titled Expanding the scope of teacher preparation programs to achieve sustainability in sensory thinking through a teacher opinion survey, with the goal of identifying the effectiveness of the teacher preparation program and sustainable development programs in developing computational thinking skills among primary education teachers. This study presented two studies, one of which examined the effectiveness of some courses based on the use of scratch software and some innovative applications in developing teachers' abilities in sensory thinking. The results indicated that the program worked on developing teachers' ability to understand computational thinking concepts such as building data and operations on it. The findings of the second research also suggested that teacher preparation programs that mix a variety of software environments with teacher experiences have considerably improved instructors' ability to utilize various teaching abilities. Yang (2022) carried out research to improve and rectify the content of the assessment index for teacher training programs by developing a complete education quality evaluation index. The performance of faculty members in certain programs.

Moreover, Aslam et al. (2022) conducted a study to improve our understanding of how to achieve the

goals of sustainable development in Pakistani institutes of higher education by exploring students' perspectives on the commitment of the programs to meet the requirements of the goals of sustainable development. The findings suggested that the aims of sustainable development have become an important and necessary subject at this time. Students also expressed a need for additional training on the aims of sustainable development through teacher preparation programs in institutions. Participation in groups that promote sustainable development initiatives. The findings also demonstrated the need of considering and implementing sustainable development goals in teacher education programs. Furthermore, Zguir et al. (2022) conducted a study to determine the perspectives of eighth-grade teachers in Qatar on the incorporation of the sustainable development goals. It also looked at the difficulties that instructors have while incorporating the sustainable development goals into their curriculum. The findings demonstrated the need of incorporating the concepts and substance of sustainable development goals, as well as their values that do not contradict with local values. The findings also demonstrated the critical need of coordinating educational policy related to sustainable development goals and classroom practices. Although the study's findings revealed no differences in teachers' perspectives on sustainable development goals based on variables such as gender, nationality, or age, they did reveal a difference in teachers' perspectives based on specialization, and the findings also revealed that teachers were aware of the concepts of sustainable development goals. However, the study proposed that not all information and skills be included in education, and that a framework be established to accommodate the principles of sustainable development into school curriculum.

Vukeli (2022) conducted a research to determine the preparedness of teacher and student teacher preparation programs to include sustainable development goals into various educational programs, and whether this readiness varies according to particular criteria, such as age and gender. The findings revealed a larger interest on the part of student teachers in implementing the objectives of sustainable development, as well as a reduction in the interest of student teachers in implementing the goals of sustainable development as the student's age grew. Furthermore, students studying natural sciences exhibited less interest than those studying arts, literature, and social studies. The results also revealed that students who studied courses on sustainable development goals wanted to apply them in their teaching, implying that the more teacher preparation courses that focus on sustainable development goals, the more willing the

student teacher is to implement the goals of sustainable development in their teaching. Al-Basiouni et al., (2021) carried out an investigation to improve the teaching performance of primary school mathematics instructors using a curriculum based on sustainable development and twenty-first century capabilities. The primary stage, and the findings demonstrated the efficiency of the training program based on sustainable development and twenty-first century abilities in developing the practical side of mathematics teachers' primary stage teaching performance.

Another study, accomplished by Leal Filho et al., (2021), intended to discover the numerous foci and the level of commitment to fulfilling the sustainable development goals now contained in university teacher training programs. The study demonstrated the necessity for a framework that governs the inclusion of sustainable development goals in university curriculum. Individual, institutional, and structural factors must be incorporated and taken into account in order to guarantee adequate implementation of sustainable development goals in university programs.

Tatto (2020) conducted a study entitled a comparative study on teachers and their education, global perspectives to form the fourth goal of the goals of the sustainable development agenda in UNESCO. The study found that the construction of comparative research societies contributes to the enrichment of the fourth aim of the sustainable development agenda, which is teacher preparation. As a result, shifting from focusing on evaluating teachers based on performance indicators related to teachers' qualifications to focusing on performance indicators related to teacher quality for evaluation, a teacher assessment based on the quality of their teaching, using evidence from two international Mathematics Teacher Education Studies, suggested that engagement with comparative education research could help re-imagine education and make it more sustainable.

Additionally, a study entitled Education for Sustainable Development: The Impact of Sustainable Education on Pre-Service Teachers' Attitudes Toward Sustainable Development, conducted by Nousheen et al., (2020) sought to determine the impact of educational courses for sustainable development on student teachers' attitudes toward sustainable development. The findings revealed a positive shift in student teachers' attitudes toward sustainable development, highlighting the critical role of sustainable development education courses in various academic programs, particularly teacher preparation programs, in improving students' attitudes toward sustainable development. Nguyen

(2018) conducted a study to identify geography teachers' perspectives on education for sustainable development, and the findings revealed that teachers have a deep understanding of topics related to sustainable development, as well as practical experience in teacher training programs, national curricula, and destinations. Teachers' reactions to sustainable development education were affected by a social perspective. The study also demonstrated the applicability of Vietnam's teacher preparation programs for sustainable development instruction.

After examining the theoretical literature on the subject of the study, examine how well the professional diploma program in teaching meets the goal of quality education from the perspective of mathematics students in the United Arab Emirates, and how it differs depending on the variable of specialization. It shows the importance and role of universities in developing the capacities of teachers to pay attention to achieving the goals of sustainable development. Many of them investigated the influence of sustainable education on pre-service teachers' attitudes toward sustainable development, including a research done by Nousheen *et al.*, (2020). Some of them also studied global perspectives to form the fourth goal of UNESCO's sustainable development agenda, such as the study conducted by Tatto (2020), which is titled a comparative study on teachers and their education, and global perspectives to form the fourth goal of UNESCO's sustainable development agenda. Another study looked at eighth-grade teachers' perspectives of the integration of education for sustainable development, as well as the effects of gender and age on teachers' conceptions of sustainable development (Zguir *et al.*, (2022). The current study varies from earlier studies in that it looked at how effectively the professional diploma program in teaching meets the goal of great education from the perspective of mathematics students in the United Arab Emirates. It addressed a specialization variable that had not been addressed in most previous studies. Universities in developing concepts of sustainable development by paying attention to student awareness of these goals, the current study benefited from previous studies by building the study tool, which is the questionnaire, and it also benefited from some studies in interpreting the findings of the study.

### 3. Methodology

#### 3.1. Study approach

The current study employed a descriptive-analytical approach, which analyzes, characterizes, compares, and measures things as they exist (McNabb, 2020). The purpose of this study is to explore the extent to which the Postgraduate Professional Diploma in Teaching (PPDT) program

delivers quality education (GE) as one of the Sustainable Development (SD) Goals, as well as its relationship with various factors.

#### 3.2. Study participants

The study participants were 187 male and female students from Al Ain University's Postgraduate Professional Diploma in Teaching (PPDT) program during the second semester of the academic year 2022-2023, as shown in Table 1.

**Table 1.** Number and Percentage of the Study Participating

Variable	Category	Frequency	Percentage
Qualification	Mathematics	97	51.9
	Science	90	48.1
	<b>Total</b>	<b>187</b>	<b>100.0</b>

#### 3.3. Instrument of Study

The quality Teaching Scale was first constructed with 39 items on a five-level Likert scale: strongly agree, agree, uncertain, disagree, and strongly disagree. The relevant literature was searched, and a set of earlier investigations, such as Siralkhatim *et al.*, (2021), were utilized.

The validity of the scale was validated using face validity to determine the validity of the items by presenting the scale in its initial state to a panel of education, teaching techniques, and educational supervisors experts. Items with an agreement rating of greater than 75% were retained. Things that needed to be amended were adjusted, while things that did not meet the required agreement rate were removed. The final version of the scale contains 27 items, and the respondent's score on the scale spans from 27 (lowest score) to 135 (highest score). The Cronbach's alpha coefficient was used to calculate the scale's reliability, which was applied to a sample of 40 students, and the coefficient was 0.81. This coefficient can be considered acceptable for using the scale.

### 4. Results

The statistical Package for Social Studies (SPSS/28 edition) was used To answer the study questions, "To what extent does the professional diploma program in teaching meet the requirement for quality education as a goal of sustainable development from the point of view of mathematics students in the United Arab Emirates?" the arithmetic mean was calculated by dividing the arithmetic range ( $5-1=4$ ) by 3 levels (resulting in 1.33); thus, the low level  $1 + 1.33 = 2.33$ , the average level  $2.33 + 1.33 = 3.66$ , and the low level  $3.66 + 1.33 = 4.99$ . Accordingly, the arithmetic averages are as shown in Table 2 below:

**Table 2.** Arithmetic Averages

No.	Mean	Level
1	1.00 - 2.33	Low
2	2.34 - 3.66	Intermediate
3	3.67 - 5.00	High

Based on Table 2, the items were arranged as indicated in Table 3, which displays the items that assess the degree of relevance of the influencing factor for quality education as well as the arithmetic means, standard deviations, and level (order of importance).

**Table 3.** Means, standard deviations, and level of importance of the degree of importance of the influencing factor for quality education

No	Item	Mean	Std. Deviation	Level	Order
Q1	Improving the planning process and decision-making helps to create quality education.	4.648	.6261	High	1
Q2	Improving the level of services provided in universities works towards creating quality education.	4.533	.7063	High	2
Q5	Encouraging teamwork and achieving positive interaction among students leads to quality education in the university.	4.505	.7841	High	3
Q3	Providing students with proper methods to organize and utilize available knowledge works towards creating quality education.	4.481	.7960	High	4
Q6	Providing information resources works towards increasing students' abilities in research and innovating modern methods and techniques for problem-solving.	4.419	.8390	High	5
Q20	Knowledge management works towards investing in the intellectual capital of the student.	4.410	.7727	High	6
Q4	Students are provided with sciences and knowledge that keep up with the requirements of the era and the job market.	4.381	.7993	High	7
Q21	Providing students with proper methods to organize and utilize available knowledge works towards creating quality education.	4.367	.8380	High	8
Q19	Encouraging creative initiatives improves the quality of learning.	4.362	.8925	High	9
Q7	Improving the efficiency and effectiveness of services provided in the university and reducing their costs contributes to achieving quality education.	4.343	.9467	High	10
Q22	Working on providing employees with the sciences and knowledge that keep up with the requirements of the era and the labor market leads to the continuation of quality education.	4.343	.8731	High	11
Q23	A faculty member is responsible for identifying, developing, and evaluating the required knowledge in line with the requirements of quality education.	4.333	.8983	High	12
Q15	Creating a suitable learning environment in the university works towards achieving quality education in it.	4.333	.9246	High	13
Q24	Encouraging teamwork and achieving positive interaction among students leads to the promotion of quality education at the university.	4.310	.8936	High	14
Q10	Facilitating the processes of exchanging and sharing knowledge in the university leads to creating quality education.	4.300	.8968	High	15
Q25	Providing necessary information easily works to increase students' abilities in research and innovate modern ways and methods to solve problems.	4.300	.8752	High	16
Q12	Developing energies in the university leads to raising the efficiency of educational services.	4.290	.8785	High	17
Q14	The clarity of goals and objectives leads to enhancing the outcomes of the educational process.	4.286	.8935	High	18
Q18	The availability of competition opportunities among students in the university leads to creating quality education.	4.276	.9733	High	19
Q16	Providing opportunities for development in line with the capabilities of the university through optimal utilization of available resources.	4.262	.8766	High	20
Q11	Cognitive skills work towards defining responsibilities, leading to improved student performance towards the university.	4.257	.8129	High	21
Q26	Improving the efficiency and effectiveness of administrative services provided by the university and reducing their costs leads to improving the quality of education in it.	4.257	.8861	High	22
Q27	Supporting the quality of educational programs, scientific research, and serving the community leads to improving the quality of education in it.	4.248	.9258	High	23
Q8	The university works towards supporting the quality of educational programs, scientific research, and serving the community.	4.243	.9245	High	24
Q17	Supporting the university to benefit the student from tangible and intangible assets improves the achievement of quality education.	4.238	.9127	High	25
Q13	The compatibility between the capabilities of human resources and the targeted performance in the university is achieved.	4.205	.8364	High	26
Q9	The university provides the necessary information to its users with suitable quality and at the appropriate time.	4.148	.9986	High	27
<b>Total means</b>		4.3362	.70238	High	

Table 3 shows that item 1 of the survey, which states, "Improving the planning and decision-making process helps to create quality education." rated first with a (4.648) average and a standard deviation of (0.6261). Meanwhile, item 2 of the survey which claims "Improving the level of services provided in universities works towards creating quality education," scored second with an average of (4.533) and a standard deviation of (0.7063). Item 5 of the survey placed third, with an average of (4.505) and a standard deviation of (.7841). Item 17 of the survey, which examines "Supporting the university to benefit students from tangible and intangible assets improves the achievement of quality education," placed 25th with an average of (4.238) and a standard deviation of (0.9127). Item 13 of the survey, which states "The compatibility between the capabilities of human resources and the targeted performance in the university is achieved," ranked 26th with an average of (4.205) and a standard deviation of (0.8364), while the last rank 9 was occupied by item 27 of the survey, which states "The university provides the necessary information to its users with suitable quality and at the appropriate time" with an average of (4.148) and a standard deviation of (0.9986). It is worth noting that all items were at a high level. The arithmetic mean of the scale's individual items was 4.3362, with a standard deviation of 0.70238, as shown in Table 3. According to Table 2, this indicates that the Postgraduate Professional Diploma in Teaching (PPDT) program, as perceived by student-teachers, delivers quality education as one of the aspects of sustainable development. The overall score is generally high.

To answer the second question, "Are there statistically significant differences in the extent to which the Postgraduate Professional Diploma in Teaching program meets the requirement of quality education as a goal of sustainable development in the UAE, from the perspective of student, based on their specialization (mathematics, science)?, the arithmetic means and standard deviations of the students' scores were calculated on the students' quality education scale according to their Qualification (Mathematics and Science), as shown in Table 4.

**Table 4.** The arithmetic means and standard deviations of students' quality education according to their Qualification

Qualification	f	Mean	Std. Deviation
Mathematics	97	4.482	.709
Science	90	4.185	.675

Table 4 shows that the arithmetic averages of the students' scores on the scale of their quality of education fluctuate depending on their academic background (Mathematics and Science). The t-test was applied to independent samples to determine whether these differences are statistically significant, and Table 5 displays the outcomes:

**Table 5.** Independent Sample T-test to identify the source of differences in students' quality education scale according to their Qualification

Qualification	f	Mean	Std. Deviation	t	df	sig
Mathematics	97	4.482	.709	2.935	184.862	.004
Science	90	4.185	.675			

Table 5 shows that there are statistically significant differences at the significance level ( $p \leq 0.05$ ) between the arithmetic means of the students' scores on the students' quality education scale according to their academic background (Mathematics and Science), as the arithmetic mean of the Mathematics students was (4.482), with standard deviation (0.709), and the arithmetic mean of the Science students was (4.185) with standard deviation (0.675), and the statistical value (t) was (2.935), which is statistically significant value at the level (0.05). According to this, mathematics students believe the Postgraduate Professional Diploma in Teaching (PPDT) program provides higher-quality instruction than does science.

#### Discussion:

The findings of the first question showed that the professional diploma program in teaching satisfies the standards of quality education from the perspective of university students majoring in mathematics. This outcome was consistent with findings from a research by Kong *et al.* (2022), which showed that the curriculum had an impact on raising instructors' understanding of computational thinking concepts including constructing data and performing operations on it. In addition, teacher training programs that incorporate a variety of software environments and teacher experiences have considerably improved teachers' capacity to use a variety of teaching techniques to deliver high-quality instruction while pursuing sustainable development goals. The findings concurred with those of a study done by Aslam *et al.*, (2022), which showed that the topic of sustainable development goals has grown in importance and necessity in teacher preparation programs at universities. Some students also suggested that more instruction on these goals be given through teacher preparation

programs in universities. This may be a result of universities' growing desire to participate in the national effort to incorporate sustainable development goals into their programs due to their significant contribution to the achievement of UAE agenda goals, as well as their desire to elevate their status and increase the levels of their programs to keep up with societal advancements. In order to remain competitive with other universities in the area and to prepare future teachers who are fully capable of achieving high standards of education, the university's professional diploma program in teaching offers a variety of thorough courses that cover every aspect of teacher qualification for high standards of education. The second question's results were in line with those of Zguir et al.'s (2022) study, which revealed discrepancies in the opinions of students from various disciplines regarding whether or not the university's teacher preparation program met the objectives of sustainable development. This discrepancy may be due to the

different specificity of the scientific material and its relationship to the questions at hand. With the goal of providing high-quality education, and as a result, the divergence in perspectives among students from other academic fields regarding the extent to which the program satisfies those standards. Consequently, there is a discrepancy in their assessments of how well the program fits educational standards.

#### Recommendations:

In light of the findings, the researchers suggest the following recommendations:

1. Including the goals of sustainable development within the courses of the various programs for preparing teachers in universities.
2. Studying the goals of sustainable development and including them in the programs of various universities.
3. Attention to training teachers to include the goals of sustainable development in teaching.

#### References:

- Al-Basiouni, M. S. M., Muhammad, I. R. I., Hassan, S. M. A., and Zaghloul, M. M. M. (2021). The Effectiveness of a Program Based on Sustainable Development and 21st Century Skills to Develop the Teaching Performances of Mathematics Teachers. *Journal of the College of Education*, (36) 380-428. <https://doi.org/10.21608/JFTP.2021.55980.1108>
- Aslam, S., Parveen, K., Alghamdi, A. A., Abbas, S., Shah, A. H., & Elumalai, K. V. (2022). Hopes for the Future: Capturing the Perspectives of Students on Higher Education and Sustainable Development in the Post-Pandemic Era. *Sustainability*, 14(19), 12531. <https://doi.org/10.3390/su141912531>
- Ashida, A. (2022). The Role of Higher Education in Achieving the Sustainable Development Goals. In *Sustainable Development Disciplines for Humanity: Breaking Down the 5Ps—People, Planet, Prosperity, Peace, and Partnerships* (pp. 71-84). Singapore: Springer Nature Singapore. <https://doi.org/10.1007/978-981-19-4859-6>
- Gulseven, O., & Ahmed, G. (2022). The State of Life on Land (SDG 15) in the United Arab Emirates. *International Journal of Social Ecology and Sustainable Development (IJSESD)*, 13(1), 1-15. <https://doi.org/10.4018/IJSESD.306264>
- Kestin, T., van den Belt, M., Denby, L., Ross, K., Thwaites, J., & Hawkes, M. (2017). Getting started with the SDGs in universities: A guide for universities, higher education institutions, and the academic sector. [https://ap-unsdsn.org/wp-content/uploads/University-SDG-Guide\\_web.pdf](https://ap-unsdsn.org/wp-content/uploads/University-SDG-Guide_web.pdf)
- Kong, S. C., Lai, M., & Li, Y. (2023). Scaling up a teacher development programme for sustainable computational thinking education: TPACK surveys, concept tests and primary school visits. *Computers & Education*, 194, 104707. <https://doi.org/10.1016/j.compedu.2022.104707>
- Leal Filho, W., Frankenberger, F., Salvia, A. L., Azeiteiro, U., Alves, F., Castro, P., ... & Avila, L. V. (2021). A framework for the implementation of the Sustainable Development Goals in university programmes. *Journal of Cleaner Production*, 299, 126915. <https://doi.org/10.1016/j.jclepro.2021.126915>
- Li, J., Xue, E., & Li, K. (2023). Exploring the Challenges and Strategies of the Sustainable Development of Female Teachers in China's World-Class Universities: Stakeholder Perspectives. *Sustainability*, 15(4), 3488. <https://doi.org/10.3390/su15043488>
- McNabb, D. E. (2020). *Research methods for political science: quantitative, qualitative and mixed method approaches*. Routledge. <https://doi.org/10.4324/9781003103141>
- Marshall, H., & Oxfam Education. (2019). The sustainable development goals: A guide for teachers. <https://policy-practice.oxfam.org/resources/the-sustainable-development-goals-a-guide-for-teachers-620842>
- Ministry of Education (2020, November). Education as a national priority. Retrieved from <https://u.ae/en/about-the-uae/leaving-no-one-behind/4qualityeducation>.

- Nguyen, T. P. (2018). Education for sustainable development in Vietnam: exploring the geography teachers' perspectives. *International Research in Geographical and Environmental Education*, 27(4), 341-356. <https://doi.org/10.1080/10382046.2017.1366204>
- Nousheen, A., Zai, S. A. Y., Waseem, M., & Khan, S. A. (2020). Education for sustainable development (ESD): Effects of sustainability education on pre-service teachers' attitude towards sustainable development (SD). *Journal of Cleaner Production*, 250, 119537. <https://doi.org/10.1016/j.jclepro.2019.119537>
- Siralkhatim p. b., on t. A., Awad S. Dr., & Othman A. s. (2021). Developing knowledge management strategies to create sustainable development at King Khalid University. *Journal of Economic, Administrative and Legal Sciences*, 5(13), 142-126. <https://doi.org/10.26389/AJSRP.R170321>
- Tatto, M. T. (2021). Comparative research on teachers and teacher education: global perspectives to inform UNESCO's SDG 4 agenda. *Oxford Review of Education*, 47(1), 25-44. <https://doi.org/10.1080/03054985.2020.1842183>
- UAE National Committee on SDGs. (2017). *UAE and the 2030 Agenda for Sustainable Development: Excellence in Implementation*. [https://sustainabledevelopment.un.org/content/documents/20161UAE\\_SDGs\\_Report\\_Full\\_English.pdf](https://sustainabledevelopment.un.org/content/documents/20161UAE_SDGs_Report_Full_English.pdf)
- Vukelić, N. (2022). Student Teachers' Readiness to Implement Education for Sustainable Development. *Education sciences*, 12(8), 505. <https://doi.org/10.3390/educsci12080505>
- Yang, X. (2022). The Modeling of Comprehensive Evaluation System of College Teachers' Professional Quality Based on Deep Learning. *Advances in Multimedia*, 2022. <https://doi.org/10.1155/2022/8383699>
- Zguir, M. F., Dubis, S., & Koç, M. (2022). Integrating sustainability into curricula: Teachers' perceptions, preparation and practice in Qatar. *Journal of Cleaner Production*, 371, 133167. <https://doi.org/10.1016/j.jclepro.2022.133167>