

College Student's Towards Physics at Palestinian Universities

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Abstract

The study aimed to identify the attitudes of the students toward physics and its relation to some variables such as sex, cumulative average, and University level at three national Palestinian universities. The study sample consisted of 134 students of the Faculty of Science at the Islamic University, Al-Aqsa University and Al-Azhar University. The trends are composed of the variables of the demographic study, and then the trends in its three dimensions, cognitive, emotional, and behavioral, and open questions about the strengths and weaknesses and proposals to increase them toward physics. The total score of the students of the Faculty of Science towards physics in the Palestinian universities 70%. In terms of dimensions, the degree of cognitive dimension factor is 72%, emotional dimension factor is 68% and behavioral dimension factor is 69%. The trend of the sample towards physics is attributed to the gender variable, while differences in the sample were found to be in favor of the GPA variable in favor of the excellent, and there were statistically significant differences in the degree of trend among the sample members. Support the University for Al-Aqsa University, kth most prominent points of weakness were the lack of diversity in teaching methods and evaluation, the non-use of modern technology in teaching, and the existence of physical courses in the field of physics. The most important proposals to increase the attitudes of the students of the Faculty of Science towards physics were the need to pay attention to the practical aspects, activate the academic guidance and follow up textbooks by specialized committees, and consider the needs of students and their wishes.

Keywords: Physics education, Students' attitudes, Palestinian Universities.

INTRODUCTION

Palestinian universities offer through the faculties of science the specialization of physics as a single specialization or with other specializations as well as a basic physics subject for engineering, education and medical students. Students' orientations are very important to determine how to deal with their orientations and try to evaluate it, and among the motives of this study is the small number of students enrolled in the colleges of science in Palestinian universities to find out the reasons, including making a vision to bridge the gap and increasing the orientation of students at science colleges towards the specialization of Physics. Some researchers have pointed out through series of studies that dealt with trends in terms of aspects and were as follows:

The Buffler et al. (2009) study aimed to identify students' views on the nature of science and their views on the nature of scientific measurement. 179 students were selected for the first level in the field of physics. The view was divided into four categories: Scientific, scientific theories, observations and experimentation. The results indicated that students with beliefs that the nature of science focuses on the laws of nature more believe in the importance of scientific measurement and reaching the real values, while students with beliefs that scientific theories are the ideas of scientists have beliefs that the nature of scientific measurements is uncertain from scientific evidence, compared to students with beliefs that the nature of science is based on observations and experimentation. The study also aimed to evaluate the role of the physics teacher in the third grade in the development of students' attitudes towards communication technology through the opinions of the physics teachers in the secondary schools about the objectives of the course and the content of the scientific material, drawings and images related to the communication technology and teaching methods used in teaching the course and the extent of tendencies Physics teachers to develop students' attitudes towards communication. The descriptive approach was used in this study. The research sample consisted of (100) teachers and physics majors in secondary schools. The study concluded that the objectives of the physics course for the third-grade secondary do not contain skill aspects. And aspects related to the employment of communication technology to solve problems, and the scientific material on communication technology is not enough to develop the attitudes of students towards communications and the graphics and images related to communication technology in the physics curriculum for the third-grade secondary need to be modified and teachers are not trained on modern teaching methods that help to develop the attitudes of students Towards communication, in addition to the teaching methods used in the teaching of physics curriculum for the third grade secondary does not provide opportunities for participation in learning.

The objective of the study (Ibrahim, 2009) was to develop and modernize the methods of teaching science and make the physics material of social value to the students, and to give the students cognitive skills and positive trends, including the trend toward physics and its vital applications. The study sample consisted of (40).

The results of the study indicated high average female students in post-application. In addition; the teaching of the proposed unit had positive results in improving the level of knowledge among the students of the study group towards some

of the physical concepts contained in the proposed unit through its vital applications. The purpose of the study was to examine the use of computer in the achievement of the first-year students in physics laboratories and their attitudes toward physics. The study sample consisted of (253) male and female students (153 students and 100 students).

Statistical significance in the attitudes of the students of the study sample towards physics subject to the sex of the students. Another study (1995) examined the trends of secondary school students in the private schools in Jerusalem towards science as a scientific content and methods of teaching. The sample of the study was 149 students from the second stage in the scientific branch. The results showed that gender and the educational level have a role in the attitudes of student's Secondary stage towards science. The results of the study were (320) students. The results showed a statistically significant effect of the gender variable in the direction of science, and the absence of interaction between the students and the students. Gender and cultural background in the direction of science. The study of Piburn & Baker (1993) aimed to identify students' attitudes towards science in the state of Mount Rocky. The study found that primary students enjoy science while this pleasure decreases in the secondary stage, resulting in negative attitudes due to complex scientific courses in the higher stages. The study of Young American students on science and mathematics was conducted in 1974. The study sample consisted of (117) students of middle and high school students. The study showed that the tendency of males towards science and mathematics is more positive than that of females. There are no significant differences in the direction of science and mathematics due to the academic level. Seit and Rausch (1992) examined the impact of student personality on academic achievement (mathematics, physics, chemistry), literary materials (German language, history, geography), and the relationship of achievement toward the teacher of each subject. (1237). The results showed that there was a relationship between the student's personality and the achievement in the subjects. There was also a strong relationship between the student's orientation toward the scientific materials and his collection in these subjects. The study of Banu (1986) examined the attitudes of secondary students towards science. The sample included six different schools in Nigeria, including single-sex schools, mixed schools, and science schools. The results showed that male students' attitudes toward science were better than those of females and students are interested in science and enjoy studying more than females, males have better positive attitudes in leisure time science and scientific activities, and it has been shown that female students in sex schools have more positive attitudes towards science than females in mixed schools.

In the previous study, all studies were conducted in different regions of the world (America, Nigeria, Saudi Arabia, Cairo, West Bank). All studies were conducted in the secondary education stages. There were no studies of university students. And all studies have shown differences in attitudes between males and females and the relation of the trend to the collection. Therefore, this study is to address the attitudes of the students of the Faculty of Science towards physics in the Palestinian universities.

This study attempts to identify the attitudes of the students of the Faculty of Science in the Palestinian universities toward physics. The problem of the study framed by the following main question:

What are the attitudes of students of the Faculty of Science in the Palestinian universities towards physics?

This study also attempts to answer the following sub-questions:

1. What is the degree of attitudes of students of the Faculty of Science in the Palestinian universities towards physics?

2. Are there statistically significant differences between physics students due to the sex variable?

3. Are there statistically significant differences between the students of the Faculty of Science and physics due to the cumulative average variable?

4. Are there statistically significant differences between the students of the Faculty of Science and Physics due to the variable of the academic level?

5. Are there statistically significant differences among the students of the Faculty of Science towards physics due to the university variable?

6. What are the most important strengths of specialization and affect the trends in students?

7. What are the most important weaknesses in the specialization and negatively affect the students' attitudes?

8. What are your most important suggestions for increasing students' attitudes towards physics?

The study aims to achieve the following:

1. Identifying the degree of attitudes of students of the Faculty of Science in the Palestinian universities towards physics.

2. Identifying the differences in the attitudes of the students of the Faculty of Science in the Palestinian universities due to the demographic variables (gender, cumulative average, educational level, university).

The importance of the study is the following:

1. Represents a contribution to fill the shortage in the scientific library, due to the lack of studies that dealt with this subject, according to the researchers.

2. Beneficiaries of university curricula and scientific disciplines.

3. Help researchers propose new research that complements the study.

STUDY HYPOTHESES AND MATERIALS

1. There are no statistically significant differences between the students of the Faculty of Science in the Palestinian universities due to the gender variable.
2. There are no statistically significant differences between the students of the Faculty of Science in the Palestinian universities due to the variable of the cumulative average.
3. There are no statistically significant differences between the students of the Faculty of Science in the Palestinian universities due to the variable of the academic level.
4. There are no statistically significant differences between the students of the Faculty of Science in the Palestinian universities due to the variable of the university.

Terminology of Study

It is an acquired willingness saturated with emotion that determines the behavior of the individual towards the attitudes, subjects and persons he deals with in the surrounding environment either by accepting or rejecting them (Ahmad, 2002: 170). Faculty of Science: One of the faculties of the university and includes the following disciplines (Chemistry, Biochemistry, Physics, Mathematics, Biology, Biotechnology, Environment and Earth Sciences, Marine Sciences).

METHODOLOGY

The descriptive approach was defined as an attempt to gain access to the precise and detailed knowledge of existing problem or phenomenon elements in order to arrive at a better and more accurate understanding or formulation of policies and procedures. (Al-Rifai, 1998, 122). The original study population is the student's groups of the Faculty of Science in Palestinian Universities in the Gaza Governorates (Islamic University, Al-Aqsa University, and Al-Azhar University).

The study sample consists of:

- 1- The exploratory sample: The tool was applied to a sample of 50 students from the Islamic University to verify the validity and stability of the tool. The sample was randomized and was not included in the final sample.
2. The actual sample: The actual sample of the current study consisted of (134) male and female students from the Faculty of Science in Palestinian Universities in the Gaza Governorates (Islamic University, Al-Aqsa University, Al-Azhar University) 59 students from the Islamic University and 25 students from Al-Azhar University).

COLLECTION TOOLS, RELIABILITY AND VALIDITY

To verify the study hypotheses, the researchers prepared a tool to identify the attitudes of the students of the Faculty of Science towards physics. In order to prepare the tool, the two groups carried out the following steps: 1) Review the psychological, educational and social literature related to the subject of the study, (4) the preparation of the standard in its final form, which included (44) paragraphs divided into three dimensions, as follows: Cognitive (19) paragraph, sentimental (12) paragraph, and the behavior (13), paragraph 5), the scale was presented to M. A group of arbitrators in the specialization and their observations were taken from the amendment of some paragraphs, 6). The scale was taken out in its final form. It is of three dimensions: cognitive, emotional and behavioral. The quadrilateral scale was used to a large degree,) and the degrees of this scale range from (44-176) (see Appendix 1).

To verify the validity of the tool for the scale, the researchers conducted various sincerity procedures including the following:

First: The judges' credibility: The scale was presented to a group of specialists to determine the appropriateness of the phrases, and they agreed on the validity of the application.

Second, the validity of the internal consistency: The honesty of the internal consistency is the consistency of each paragraph of the questionnaire with the dimension to which this paragraph belongs. The scale was applied to a sample of 50 students from the Islamic University. The coefficient of correlation was between 0.247 * * -0.666 **) in all dimensions.

Building honesty is a measure of the validity of a tool that measures the extent to which the objectives of the tool were achieved. It shows the extent to which each dimension of the study relates to the total score of the scale. The correlation coefficient ranges from (0.283 ** - 0.669 **). It is clear from the above that all correlation coefficients in all areas of the questionnaire are statistically significant at the level of $0.01 = \alpha$. For the stability procedures, the researchers verified the stability of the scale by using the alpha coefficient Cronbach and found that the scale has a high degree of stability as it reached (0.91).

DISCUSSIONS AND RESULTS

Results related to the first question: which provides the following: What are the attitudes of the students of the Faculty of Science towards physics?

To answer this question, the researchers used the arithmetic mean, standard deviation and relative weight. The results were as shown in the following table.

Table 1. Students' Attitudes Towards Physics (N = 134)

Dimension	Mean standard	Standard Deviation	Relative Weight	Rank
Cognitive	55.09	9.94	72	1
Emotional	32.41	6.71	68	3
Behavioral	36.02	6.83	69	2
Total grade	123.53	21.73	70	

The relative weight of the total score of the students of the Faculty of Science towards physics was 70%, while the relative weight of the cognitive dimension was 72%, followed by the behavioral dimension where the relative weight reached 69% and the relative weight of the emotional dimension (68%). It is clear from the above that the attitudes of the students of the Faculty of Science in the Palestinian universities toward physics are high. This trend is due to the knowledge dimension. This is due to their belief in the importance of studying physics and its role in the various environmental changes and finding solutions to the various scientific problems. Moreover, attendance at physics-related activities has been seen on their attitudes and reflected in these practices and activities on their feelings and attitudes, this study is consistent with the Baffler and others study (Baffler & et al, 2009) and the study of Young (Yong, 1992).

The Study Hypotheses

According to the first hypothesis, it has been noticed that there are no statistically significant differences in the overall score of the attitudes of Palestinian university students toward physics due to gender variable (males, females). To answer this hypothesis, the T-Test has been implemented to indicate gender differences. The results showed that there were no statistically significant differences in the total score of the trend scale due to the gender variable. Table (2) shows the results of the overall score.

Table 2. The Value Of "T" For The Total Score Of The Trend Is Attributed To The Gender Variable

Dimension	Type	N	Average calculation	Std. Dev	t-value	Level of significance
Total degree of attitudes of university students towards physics	Male	29	126.24	15.12	.959	
	Female	105	122.78	23.22		

It is clear from the previous table that there are no statistically significant differences in the overall score of the trend related to the gender variable (males and females). The researchers explain this result because of the same university environment, the same curriculum, content, and teaching method. (15.12) was higher than the female average of (122.78) and the standard deviation (23.22). This is due to the difference in mental abilities between males and females where it is higher than the average of males (126.24) Male to female in (2002), while disagreeing with Banu (1986) and Young (1992) which showed differences in attitudes for males, as well as with the study of " 1993) and the (1995) study, which showed differences in student attitudes towards science in general. Results related to the second hypothesis: There are no statistically significant differences in the overall score of the Palestinian university students towards physics due to the cumulative average variable (excellence, very good, good, and acceptable).

To answer this hypothesis, the One-Way ANOVA test has been used. The results showed that there were statistically significant differences in the overall score of the trend due to the cumulative average variable. Table (3) shows the results of the overall grade.

Table 3. The Value Of The Analysis Of The Single Variance "P" Of The Total Score Of The Trend Is Due To The Variable Of The Cumulative Average

Source of variance	Total squares	Freedom degrees	Mean squares	t-value	level of significance
Between groups	6796.583	3	2265.528	5.26	statistically significant
Inside the groups	430.606	130	430.606		
Total	62775.381	133			

It is clear from the previous table that there are statistically significant differences in the overall score of the attitudes of Palestinian university students towards physics due to the cumulative average variable. The researchers explain the result that the cumulative rate is indicative of the desire and conviction and participation in the specialization. The student who is positive and convinced by specialization and there is a correlation with specialization will reflect on its cumulative average. There were differences between the acceptable and the excellent. The differences in the averages were in favor of the excellent (28.252), the differences between the good and the excellent were in favor of the excellent (15.928), and the differences between the very good (10,883), and differences between the acceptable and the good in favor of the good (9.323). Table (4) shows the difference in order according to the cumulative rate:

Table 4. *The Result Of A Test Of Differences According To The Cumulative Rate Dimension Variable Variance Classes*

Dimension	Variable classes	Average differences
The total score of Palestinian university students' attitudes towards physics is attributed to the cumulative average	Acceptable	108.111
	Good	117.434
	Very good	127.617
	Excellent	136.363

The above table shows differences in the attitudes of the students of the Faculty of Science in the Palestinian universities due to the cumulative rate.

Results Related To The Third Hypothesis

There are no statistically significant differences in the total score of the attitudes of the students of the Faculty of Science toward physics due to the variable of the academic level (II, III, and IV). To answer this hypothesis, the researchers used the One-Way ANOVA test. The results showed statistically significant differences in the overall score of the trend due to the variable of the academic level. Table (5) shows the results of the overall grade.

Table 5. *The Value Of The Analysis Of The Single Variance "P" Of The Total Score Of The Trend Is Due To The Variable Of The Academic Level*

Source of variance	Total squares	Freedom degrees	Mean squares	t-value	level of significance
Between groups	4701.078	2	2350.539	5.302	statistically significant
Within groups	58074.303	131	443.315		
Total	62775.381	133			

The differences between the second and third levels in favor of the third level, where differences in the averages (12,618), as well as differences between the third and fourth level in favor of the third, where the differences in averages (11.731) and the order of differences between levels as shown in Table (6):

Table 6. The Result Of A Test Of Differences By Level Of Study

Dimension	Variable classes	Average differences
The total score of the Palestinian students' attitudes towards physics is attributed to the second level of the study	Second	118.00
	Fourth	118.88
	Third	130.618

Dimension Variable Variance Classes

The total score of the Palestinian students' attitudes towards physics is attributed to the second level of the study. Results showed that students in the first and second levels combine information and adapt to the new reality that differs from the previous stages of education, the formation of social relations, the regularity of studies and grades, and The third-year brings students to a level of cognitive maturity that motivates them to study and improve the rate, especially as the information becomes accumulative, i.e. their previous experience in the courses helps them understand and deal with the rest of the courses. Fourth Tui is very difficult to improve grades.

Results related to the fourth hypothesis: There are no statistically significant differences in the overall score of the Palestinian university students' attitudes towards physics due to the variable of the university (Islamic, Al-Azhar, Al-Aqsa). To answer this hypothesis, the researchers used the One-Way ANOVA test. The results showed statistically significant differences in the overall score of the trend due to the university variable. Table (7) shows the results of the overall grade.

Table 7. The Value Of The Analysis Of The Single Variance "P" Of The Total Score Of The Trend Was Attributed To The University Variable

Source of variance	Total squares	Freedom degrees	Mean squares	t-value	level of significance
Between groups	5096.205	2	2548.103	5.302	statistically significant
Within groups	57679.176	131	443.315	440.299	5.787
Total	62775.381	133			

The differences between the Islamic University and Al-Aqsa University in favor of Al-Aqsa University, where differences were found in the averages (13,540), and differences between the averages between the University of Al-Azhar and Al-Aqsa for the benefit of the maximum (4.760), while differences in the averages between the

Islamic University and Al-Azhar University for the benefit of Islam (8.780), it is clear from the above that students of the Faculty of Science at Al-Aqsa University more positive attitudes towards physics than students Islamic University and Al-Azhar University, then students of the Faculty of Science at the Islamic University and then students of the Faculty of Science at Al-Azhar University. The researchers explain the result that the number of students at Al-Aqsa University is large and the nature of the plan. The study is different in universities and their different methods of teaching.

View for The Results Of The Second Question

The question: What are the strengths of specialization in terms of (courses, teachers, books, teaching methods, calendar, academic guidance, etc.)? To answer this question, the researchers developed an open question and then a qualitative analysis of the answers. The answers were as follows:

- The presence of specialized teachers with a high degree of efficiency by 55%.
- The academic plan is comprehensive and accurate by 40%.
- A variety in the means of evaluation by 60%.
- Academic guidance is provided at 20%.
- Use of modern books by 20%.

View for the results of the third question:

The question: What are the weaknesses in the specialization in terms of (courses, teachers, books, teaching methods, assessment, academic guidance, etc.)? To answer this question, the researchers developed an open question and then a qualitative analysis of the answers. The answers were as follows:

- Taking care of the theoretical aspects away from practical aspects by 70%.
- Not using modern techniques in teaching by 50%.
- Non-diversity in teaching methods by 30%.
- 15% lack of clarity of books.
- Similar in many courses by 10%.
- Difficulty of courses by 40%.
- Massive amount of information so that affects comprehension and understanding by 30%.
- The difficulty of courses due to the English language by 40%.
- Shortness in the methods of the calendar by 20%.
- Non-consideration of the interests of students by 20%.
- Lack of academic guidance by 10%.
- - 40% of students' activities and duties.

View for the results of the fourth question:

Does the question provides appropriate proposals for the formation of a positive trend among students towards scientific courses in general and physics in particular?

To answer this question, the researchers developed an open question and then a qualitative analysis of the answers. The answers were as follows:

- The need to pay attention to modern teaching methods, especially that the scientific courses need a variety of methods.
 - Arabization of some science courses.
 - The use of cooperative education.
 - Balancing the theoretical and practical aspects.
 - Reconsidering the study plan so that practical courses are increased.
 - Activation of academic guidance.
 - Taking into consideration the needs and tendencies of students.
 - Use of various evaluation methods.
- Follow-up textbooks and accreditation by the department before the assignment of students.

CONCLUSIONS

A set of recommendations have been extracted which could increase and improve the degree of physics towards the students of the Faculty of Science in the Palestinian universities. These recommendations are summarized as:

The scientific colleges should pay attention to the needs of students and their desires in the educational process to increase their attitudes towards them.

- Increasing the practical courses balancing theoretical courses.
- Review the university books continuously by the quality unit to ensure that the pace of scientific development and suitability.
- Evaluation of examinations by competent committees and follow-up results.
- Re-examination of the teaching methods used.
- Use of modern technology in the teaching process.
- Engaging some difficult scientific courses to enable students to understand and absorb them.

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