

Application of an Educational Program for Al Jouf University Students Regarding Scientific Writing and Presentation Skills

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Abstract: This study was undertaken to evaluate an educational program regarding scientific writing and presentation skills among university students. This interventional study used a one-group, pretest/posttest design and was conducted in Al Jouf University among four colleges in Saudi Arabia. Baseline students' assessment was conducted for developing educational program. Interventional, one group, pretest/posttest study was designed to evaluate the effectiveness of the educational program. Three parts evaluation sheet with total scores of 30 was used for 113 students for the development of the program and 52 students for test pretest phase. Wilcoxon signed ranks showed statistically significant improvement in the combined overall program skills score from a median of 56.7 pre to a median of 86.7 post, $z = 6.231$, $p < 0.001$). When compared to preprogram intervention, post interventions 51.9 % of students achieve excellent performance. While pre intervention no students (0.0 %) achieve this score. Regarding to scientific writing skills, Wilcoxon signed ranks showed statistically significant improvement in the score from a median of 60 pre to a median of 90 post, $z = 6.122$, $p < 0.001$). None of students had excellent performance changed to 73.1%. Regarding to oral presentation skills, Wilcoxon signed ranks showed statistically significant improvement in the score from a median of 50 pre to a median of 80 post, $z = 6.153$, $p < 0.001$). None of students had excellent performance changed to 48.1%. Such educational program needs to be incorporated into classroom delivery of the students' curriculum. Scientific writing skills book needed to be developed to be recommended as a basic educational strategy for all university faculties.

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Key words: scientific writing, presentation skills, university students and an educational program.

1. Introduction

At universities students have to possess well-developed academic skills, such as making oral presentations, extracting the key information from the scientific texts or taking notes, in order to succeed in their studies⁽¹⁾.

Oral communication and presentation skills are important components of accounting education. Students can improve their oral presentation skills when they know the expectations for effective presentations, give multiple group and individual presentations, and experience consistent instructor feedback^(2,3).

Scientific writing undoubtedly is an inseparable and a very important part of academic skills, which students must possess if they want to finish their studies successfully. Moreover, scientific writing is an asset in their further careers⁽⁴⁾.

Scientific writing is a means to explore, to learn and to comprehend what students are learning about in a subject like Life Sciences. Therefore if English Second Language speakers lack the required writing skills then content is compromised, because knowledge of content is demonstrated by means of

effective communication, writing in this particular case (Kokkala & Gessell, 2003)⁽⁵⁾.

Many of the writing-to-learn activities were used by teachers in universities courses. Use of in-class writing assignments, reports, weekly one-page exercises, plans and case studies. These examples involve writer and reader-based prose, academic, and applied forms of writing, and are tailored to support specific course objectives⁽⁶⁾.

Writing a thesis/dissertation is a most formidable task for many graduate students. This is not only because of the daunting size of the document but also because of the high standard to which the thesis/dissertation is held⁽⁷⁾. The writing challenge is not only demonstrating knowledge related to the research but also using that knowledge to argue logically and coherently the meaning of the research⁽⁸⁾. Many graduate students do not begin to learn how to approach this task until they are in the process of writing a thesis/ dissertation. The situation becomes more complicated with the fast growing number of non-native graduate students in the fields of science and technology^(7,8).

Clear communication of research findings is essential to sustain the ever evolving biomedical research field⁽⁹⁾. Serving as the mainstay for this purpose, scientific writing involves the consideration of numerous factors while building up an argument that would convince readers and possibly enable them to arrive at a decision⁽¹⁰⁾. Those who report research must attend to the soundness of the subject matter, to the nature of the intended audience, and to questions of clarity, style, structure, precision, and accuracy. These factors, along with the weight of responsibility to the scientific community, make scientific writing a daunting task⁽¹¹⁾.

In the past, responsibility for teaching students to write was relegated solely to English departments. Thus, teachers in other disciplines may question current efforts to merge the teaching of writing skills with that of subject matter in courses outside the English department. In addressing this doubt, previous researches concluded that writing is too important to be left entirely to English teachers; it should be made as a unique subject in the curriculum⁽¹²⁾. More specifically, recent researches listed three reasons for incorporating scientific writing skills into courses. First, students need to learn to write within the context of their particular discipline. Second, students are more likely to take writing seriously when they see the need arising from requirements within their chosen field. Finally, writing enhances the learning process. For teachers, the latter reason may be the most compelling; students “write to learn,” not just “learn to write.” For all these reasons, many universities have established programs entitled “scientific writing skills Across the Curriculum”. These programs facilitate incorporation of writing into courses across disciplines^(13,14).

English lectures at university teach basic and generic writing skills but not necessarily scientific writing skills. This practice that started at high school level created a backlog that resulted in a perpetual cycle of deficiency in writing skills that is acutely experienced at university level with its higher demands of scientific writing courses⁽¹⁵⁾. Enabling students to write scientifically is imperative to the enhancement of teaching and learning in science.

Despite its relevance to academic performance, education about this essential skill is not currently evidence based and relies on a combination of mentorship and trial and error^(16,17). This is problematic because considerable time is required to become proficient using that method, which slows down the dissemination of knowledge and creates a barrier for many skilled individuals who aspire to a career in academics⁽¹⁸⁾.

The mastery of scientific writing and oral presentation skills is important in professional life.

Therefore it is a key competency for lifelong learning in general and higher education in particular. So, this study was undertaken to evaluate an educational program regarding scientific writing and presentation skills among university students.

2. Material & Methods

☒ Study design:

Baseline students' assessment was conducted for developing educational program. Interventional, one group, pretest/posttest study was designed to evaluate the effectiveness of an educational program for university students regarding scientific writing and presentation skills.

☒ Setting:

The study was conducted in four colleges of Al Jouf University, Al Jouf region, Saudia Arabia.

- Scientific colleges: college of science (female) , college of science (male)
- Health colleges: college of applied sciences, nursing department, male female

☒ Subjects:

Study subjects were included in two phases of the study:

1- **The program development phase:** Al Jouf university students in either 7th or 8th level presenting research project for graduation with total of 113 students distributed as

- **College of science:**
Physics section: 23 male and 26 female students,
Chemistry section: 13 male and 29 female students.

- **College of Applied Medical Sciences:**
Nursing section: 10 male and 12 female students

2-Interventional, pretest/posttest phase: Al Jouf university students in either 7th or 8th level presenting research project for graduation with total of 52 students distributed as:

- **College of science: Physics section:** 4 male and 9 female students, **Chemistry section:** 5 male and 10 female students.

- **College of Applied Medical Sciences: Nursing section:** 9 male and 15 female students.

☒ Tools:

1- Evaluation sheet regarding scientific writing and presentation skills assessment with total scores of 30 scores. It consists of three parts:

- **Part one:** questions about demographics, including Students age, academic levels, duration for the research project, faculty and department.
- **Part two:** scientific writing skills assessment including 20 items with total score for 20 scores.
- **Part three:** presentation skills assessment including 8 items with total score of 10 scores.

2- The Education program was 4 hours long of theoretical content.

3- Illustrations materials including emphasis on the weak points with poor students' performance regarding scientific writing and presentation skills.

3. Methods

All tools were developed by the researchers based on the literature and were revised by four specialists. Consent from students to participate in the study obtained. A pilot study conducted on 5 students to test the tool for clarity and feasibility and accordingly the necessary modifications were done prior to data collection for the actual study. The research was carried out in three phases: **1-Baseline students' assessment phase:**

Every student was evaluated for the research project using evaluation sheet with total scores 30 distributed as follows: Scientific writing skills with total score 20 and presentation skills of total score 10. Statistical analysis for the results was carried out.

1. **Program development phase:** Based on results of the program development phase, the educational program was developed considering the level of students' performance as well as the performance strengths and weaknesses regarding scientific writing and presentation skills.

2. **Interventional, pretest/posttest phase:**

- **Pretest:** At the beginning of the educational semester, every student presenting graduation research project was evaluated using tool one from all the previous mentioned colleges.

- **Conducting The Education program:** it was administered to all students in six groups and divided between 2 days with the same content. It was designed parallel to the Illustrations materials.

- **Posttest:** At the end of the semester, every student was reevaluated using tool one from all the previous mentioned colleges.

- **Procedures and Data Analysis**

The data were analyzed using SPSS, version 11.5, software. Percentages, means, variance analysis for repeated measures, the Friedman test, and the Wilcoxon signed-rank test were used for data analysis.

4. Results

Baseline students' assessment phase

Table 1: Students distribution according to Faculties departments.

| Department | N | % |
|----------------|----|------|
| Physics Male | 23 | 20.4 |
| Chemistry Male | 13 | 11.5 |
| Nursing Female | 12 | 10.6 |

| | | |
|--------------------------|------------|--------------|
| Nursing Male | 10 | 8.8 |
| Science Female Physics | 26 | 23.0 |
| Science Female Chemistry | 29 | 25.7 |
| Total | 113 | 100.0 |

Table 2: students' distribution according to specialty

| Specialty | n | % |
|--------------|------------|--------------|
| Physics | 49 | 43.4 |
| Chemistry | 42 | 37.2 |
| Nursing | 22 | 19.5 |
| Total | 113 | 100.0 |

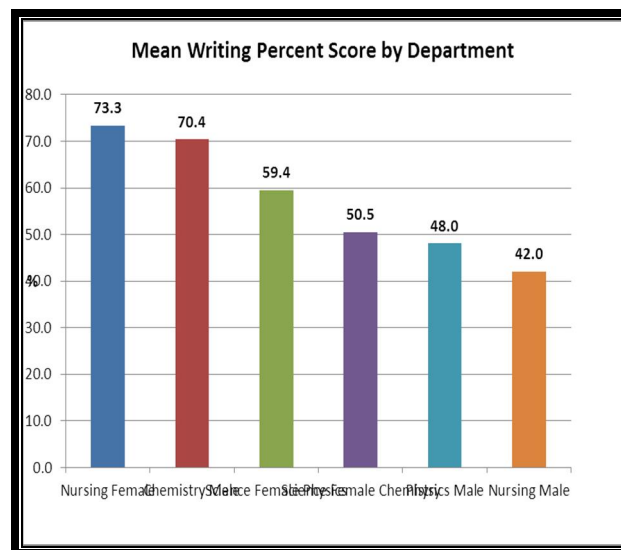


Figure (1): students mean writing percent score by departments

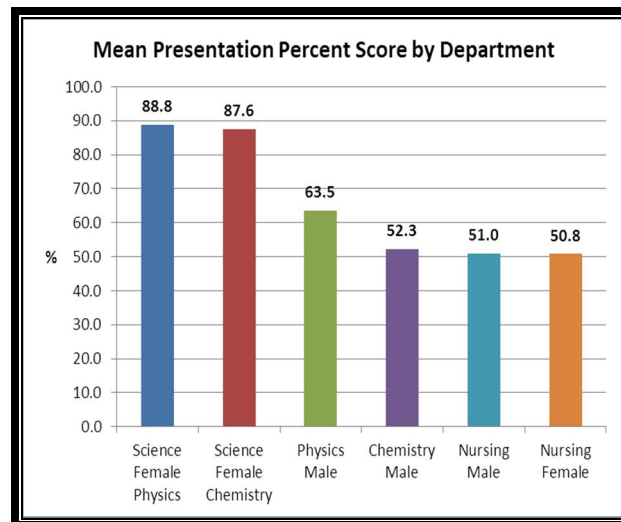


Figure (2): students mean presentation percent score by departments

Table 3: Distribution of students (males and females) enrolled in scientific (physical and chemistry departments) and nursing faculties according to the scientific writing skills.

| | Science Faculty | | | | | | Nursing Faculty | | | Overall |
|----------------------------------|------------------|-----------------|---------------|-------------------|-----------------|---------------|-----------------|-----------------|---------------|-------------------------|
| | Physical Science | | | Chemistry Science | | | Males (10) | Females (12) | Total (22) | Grand Total (113) |
| | Males (23) | Females (26) | Total (49) | Males (13) | Females (29) | Total (42) | | | | |
| Scientific writing skill: | | | | | | | | | | |
| Grade: | | | | | | | | | | |
| Poor | 91.3 | 57.7 | 73.5 | 23.1 | 69.0 | 54.8 | 70.0 | 0.0 | 31.8 | 58.4 |
| Fair | 8.7 | 0.0 | 4.1 | 0.0 | 6.9 | 4.8 | 0.0 | 16.7 | 9.1 | 5.3 |
| Good | 0.0 | 7.7 | 4.1 | 23.1 | 20.7 | 21.4 | 0.0 | 33.3 | 18.2 | 13.3 |
| Very Good | 0.0 | 7.7 | 4.1 | 23.1 | 3.4 | 9.5 | 30.0 | 25.0 | 27.3 | 10.6 |
| Excellent | 0.0 | 26.9 | 14.3 | 30.8 | 0.0 | 9.5 | 0.0 | 25.0 | 13.6 | 12.4 |
| | 45(15) | 50(35.8) | 50(20) | 80(22.5) | 50(22.5) | 55(26.3) | 47.5(65) | 72.5(18.8) | 65(23.8) | 55(30) |
| Median (IQR) | | | 0.9 | | | | | | | 0.1 |
| MannWhitney Test P | | | | | | 0.001 | | | 0.009 | |

Table 4: Distribution of students (males and females) enrolled in scientific (physical and chemistry departments) and nursing faculties according to the presentation skills.

| | Science Faculty | | | | | | Nursing Faculty | | | Overall |
|---------------------------------------|------------------|-----------------|---------------|-------------------|-----------------|---------------|-----------------|-----------------|---------------|-------------------------|
| | Physical Science | | | Chemistry Science | | | Males (10) | Females (12) | Total (22) | Grand Total (113) |
| | Males (23) | Females (26) | Total (49) | Males (13) | Females (29) | Total (42) | | | | |
| Interactive presentation skill | | | | | | | | | | |
| Grade: | | | | | | | | | | |
| Poor | 0.0 | 0.0 | 0.0 | 46.2 | 0.0 | 14.3 | 70.0 | 75.0 | 72.7 | 19.5 |
| Fair | 65.2 | 0.0 | 30.6 | 46.2 | 0.0 | 14.3 | 10.0 | 8.3 | 9.1 | 20.4 |
| Good | 34.8 | 3.8 | 18.4 | 7.7 | 0.0 | 2.4 | 10.0 | 8.3 | 9.1 | 10.6 |
| Very Good | 0.0 | 15.4 | 8.2 | 0.0 | 24.1 | 16.7 | 10.0 | 8.3 | 9.1 | 11.5 |
| Excellent | 0.0 | 80.8 | 42.9 | 0.0 | 75.9 | 52.4 | 0.0 | 0.0 | 0.0 | 38.1 |
| | 60(10) | 90(0) | 80(30) | 60(20) | 90(5) | 90(30) | 50(22.5) | 50(17.5) | 50(20) | 70(30) |
| Median (IQR) | | | | | | | | | | |
| MannWhitney Test P | | | <0.001 | | | <0.001 | | | 0.95 | <0.001 |

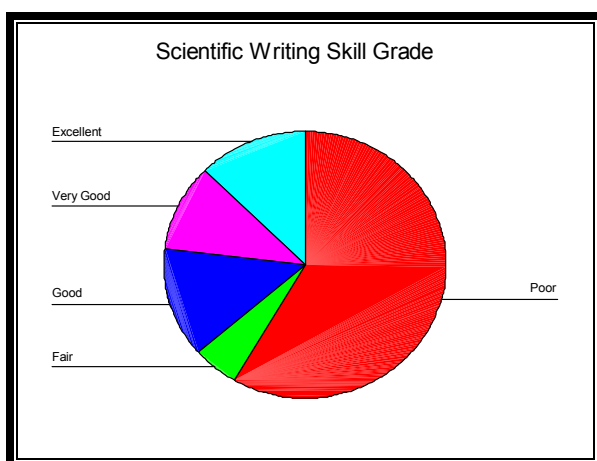
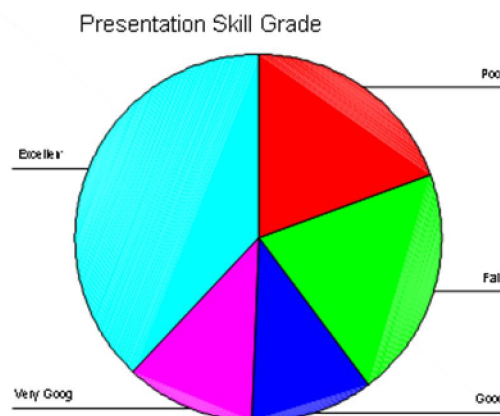
**Figure (3): students distribution for scientific writing skills score****Pre and post test phase**
Figure (4): students distribution for presentation skills score.

Table 5: Distribution of students enrolled in science (physical & chemical departments) and nursing faculties according to their characteristics.

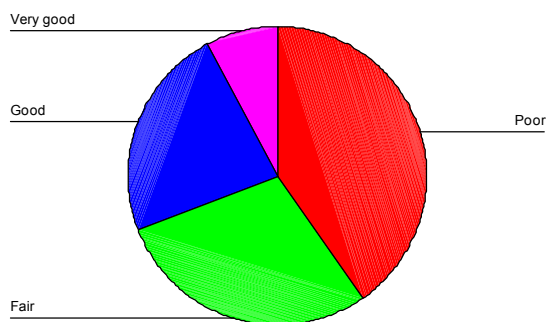
| | Distribution |
|---------------------|----------------|
| Age (years): | |
| N | 52 |
| Minimum-maximum | 21-24 |
| Mean \pm SD | 22.8 \pm 0.8 |
| Median(IQR) | 23(1) |
| Gender: | |
| Males | 18(34.6) |
| Females | 34(65.4) |

| | |
|------------------|----------|
| Faculty: | |
| Science: | 28(53.8) |
| Physical | 9(17.3) |
| Chemical | 19(36.5) |
| Nursing | 24(46.2) |
| Level: | |
| 7 th | 2(3.8) |
| 8 th | 50(96.2) |
| Duration: | |
| 1 | 4(7.7) |
| 2 | 5(9.6) |
| 3 | 24(46.2) |
| 4 | 19(36.5) |

Table 6: Distribution of students enrolled in science (physical & chemical departments) and nursing faculties according to their grades and percent scores of scientific writing skills before, after and the difference in relation to the education program.

| | Science Faculty | | | | | | Nursing Faculty | | Total | |
|----------------------------------|---------------------|----------|----------------------|-----------|-----------------|-----------|-----------------|-----------|----------|-----------|
| | Physical department | | Chemistry department | | Science Faculty | | Pre (24) | Post (24) | Pre (52) | Post (52) |
| | pre (9) | post (9) | Pre (19) | Post (19) | Pre (28) | Post (28) | | | | |
| Scientific writing skill: | | | | | | | | | | |
| Grade: | 11.1 | 0.0 | 47.4 | 5.3 | 35.7 | 3.6 | 45.8 | 8.3 | 40.4 | 5.8 |
| Poor | 44.4 | 0.0 | 15.8 | 0.0 | 25.0 | 0.0 | 33.3 | 0.0 | 28.8 | 0.0 |
| Fair | 22.2 | 0.0 | 26.3 | 10.5 | 25.0 | 7.1 | 20.8 | 16.7 | 23.1 | 11.5 |
| Good | 22.2 | 0.0 | 10.5 | 15.8 | 14.3 | 10.7 | 0.0 | 8.3 | 7.7 | 9.6 |
| Very Good | 0.0 | 100.0 | 0.0 | 68.4 | 0.0 | 78.6 | 0.0 | 66.7 | 0.0 | 73.1 |
| Excellent | 60(10) | 85(7.5) | 60(10) | 90(10) | 60(10) | 85(5) | 60(5) | 90(23.8) | 60(10) | 90(13.8) |
| Median (IQR) | 25(5) | | 25(10) | | 25(10) | | 30(15) | | 25(10) | |
| Difference | 2.724* | | 3.749* | | 4.581* | | 4.129* | | 6.122* | |
| Wilcoxon Signed Rank Test | 0.006 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | |

Scientific writing skill pretest grades



Scientific writing skill posttest grades

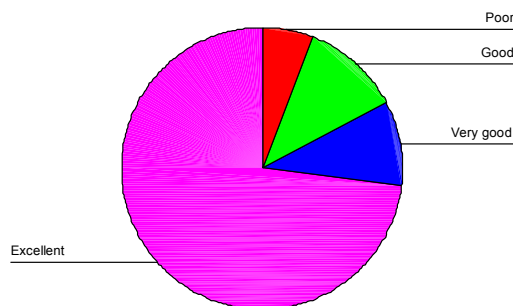
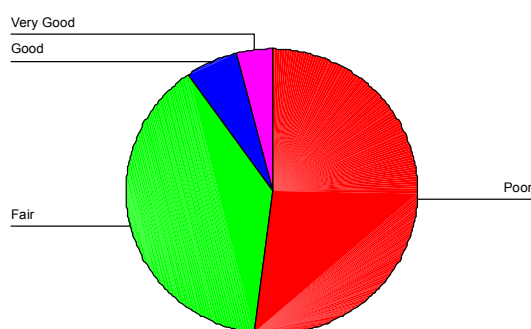
**Figure 5: Distribution of all students according to their grades of scientific writing skills before and after the education program.**

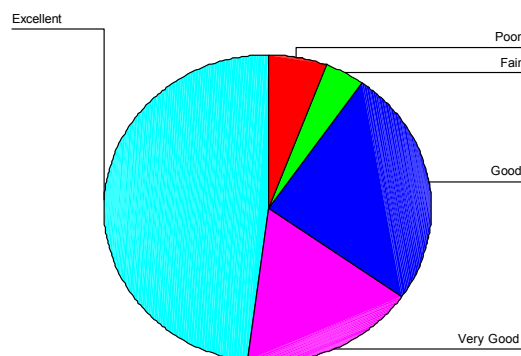
Table 7: Distribution of students enrolled in science (physical & chemical departments) and nursing faculties according to their grades and percent scores of interactive presentation skills before and after the education program.

| | Science Faculty | | | | | | Nursing Faculty | | Total | |
|--|---------------------|----------|----------------------|-----------|-----------------|-----------|-----------------|-----------|----------|-----------|
| | Physical department | | Chemistry department | | Science Faculty | | Pre (24) | Post (24) | Pre (52) | Post (52) |
| | pre (9) | post (9) | Pre (19) | Post (19) | Pre (28) | Post (28) | | | | |
| Interactive presentation skill: | | | | | | | | | | |
| Grade: | 11.1 | 0.0 | 42.1 | 10.5 | 32.1 | 7.1 | 75.0 | 4.2 | 51.9 | 5.8 |
| Poor | 66.7 | 0.0 | 42.1 | 5.3 | 50.0 | 3.6 | 25.0 | 4.2 | 38.5 | 3.8 |
| Fair | 11.1 | 0.0 | 10.5 | 47.4 | 10.7 | 32.1 | 0.0 | 16.7 | 5.8 | 25.0 |
| Good | 11.1 | 11.1 | 5.3 | 26.3 | 7.1 | 21.4 | 0.0 | 12.5 | 3.8 | 17.3 |
| Very Good | 0.0 | 88.9 | 0.0 | 10.5 | 0.0 | 35.7 | 0.0 | 62.5 | 0.0 | 48.1 |
| Excellent | 60(5) | 90(0) | 60(10) | 70(10) | 60(10) | 80(20) | 50(7.5) | 90(17.5) | 50(10) | 80(20) |
| Median (IQR) | 30(10) | | 20(10) | | 20(20) | | 40(17.5) | | 30(20) | |
| Difference | 2.716* | | 3.685* | | 4.513* | | 4.329* | | 6.153* | |
| Wilcoxon Signed Rank Test | 0.007 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | |

Interactive presentation skill pretest grades



Interactive presentation skill posttest grades

**Figure 6: Distribution of all students according to their grades of presentation skills before and after the education program.****Table 8: Distribution of students enrolled in science (physical & chemical departments) and nursing faculties according to their grades and percent scores of overall program skills before and after the education program.**

| | Science Faculty | | | | | | Nursing Faculty | | Total | |
|----------------------------------|---------------------|----------|----------------------|-----------|-----------------|-----------|-----------------|-----------|------------|------------|
| | Physical department | | Chemistry department | | Science Faculty | | Pre (24) | Post (24) | Pre (52) | Post (52) |
| | pre (9) | post (9) | Pre (19) | Post (19) | Pre (28) | Post (28) | | | | |
| Overall program skill: | | | | | | | | | | |
| Grade: | 11.1 | 0.0 | 57.9 | 0.0 | 42.9 | 0.0 | 66.7 | 4.2 | 53.8 | 1.9 |
| Poor | 44.4 | 0.0 | 21.1 | 5.3 | 28.6 | 3.6 | 33.3 | 4.2 | 30.8 | 3.8 |
| Fair | 44.4 | 0.0 | 21.1 | 21.1 | 28.6 | 14.3 | 0.0 | 20.8 | 15.4 | 17.3 |
| Good | 0.0 | 11.1 | 0.0 | 57.9 | 0.0 | 42.9 | 0.0 | 4.2 | 0.0 | 25.0 |
| Very Good | 0.0 | 88.9 | 0.0 | 15.8 | 0.0 | 39.3 | 0.0 | 66.7 | 0.0 | 51.9 |
| Excellent | 63.3(8.3) | 86.7(5) | 56.7(10) | 80(10) | 60(10) | 83.3(9.2) | 56.7(6.7) | 91.7(20) | 56.7(6.7) | 86.7(16.7) |
| Median (IQR) | 23.3(5) | | 23.3(10) | | 23.3(6.7) | | 31.7(15.8) | | 23.3(12.5) | |
| Difference | 2.687* | | 3.853* | | 4.658* | | 4.210* | | 6.231* | |
| Wilcoxon Signed Rank Test | 0.007 | | <0.001 | | <0.001 | | <0.001 | | <0.001 | |

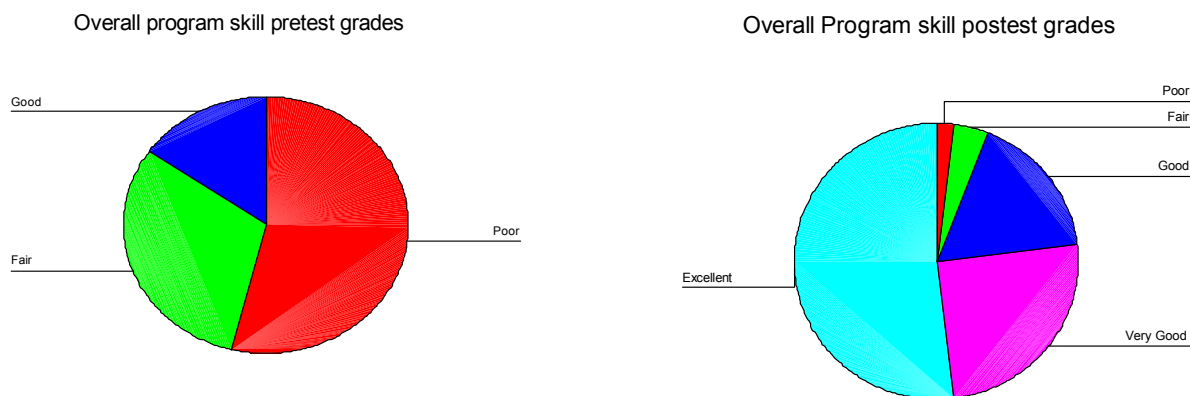


Figure 7: Distribution of all students according to their grades of overall program skills before and after the education program.

5. Discussion

The English language is increasingly gaining momentum in our modern time, partly because it has emerged as a main medium for publication in scientific research in different disciplines throughout the world⁽¹⁹⁾. The importance of English language is heightened by the challenges of present knowledge revolution manifested in almost all social, scientific, political, economic, cultural and technological fields, which made it necessary for students to be opened to other global cultures using, at the same time, his own intellect and knowledge for the ultimate goal of discovery, innovation and modernization⁽²⁰⁾.

Moreover, about one million students are learning English worldwide that manifested the importance of English teaching/learning for academic purposes^(22,23). Swales (2004) reported that English has become the language of research, commerce, education etc⁽²⁴⁾. Dudley-Evans and St. John (1998)⁽²⁵⁾ mentioned that success in the relevant fields depends on the factor that how effectively the students handle different writing genres like summaries, essays, reviews etc. This is applicable to the students of all disciplines in general and English-major students in particular

To our knowledge, this is the first time that such an educational program to improve scientific writing and oral presentation skills for university students has been developed and assessed in Saudi Arabia. Wilcoxon signed ranks showed statistically significant improvement in the combined overall program skills score from a median of 56.7 pre to a median of 86.7 post, ($z = 6.231$, $p < 0.001$). When Compared to preprogram intervention, post interventions 51.9 % of students achieve excellent performance. While pre intervention no students (0.0 %) achieve this score.

Regarding to scientific writing skills, Wilcoxon signed ranks showed statistically significant improvement in the score from a median of 60 pre to a median of 90 post, ($z = 6.122$, $p < 0.001$). None of students had excellent performance changed to 73.1%. Regarding to oral presentation skills, Wilcoxon signed ranks showed statistically significant improvement in the score from a median of 50 pre to a median of 80 post, ($z = 6.153$, $p < 0.001$). None of students had excellent performance changed to 48.1%.

Baseline students' assessment showed a perceived scientific writing skills deficit, 58% of the students had poor performance and only 12.4 % had excellent performance regarding scientific writing skill. Much research has identified that Arab university student's lack the required English language proficiency that hinders their academic progress (Javid et al., 2012; Javid & Khairi, 2011; Rabab`ah, 2003)^(25,26,27).

While reviewing the related studies/literature, it has been noticed that some work, mostly dissertation, have dealt with the Saudi acquisition of specific linguistic features of L2, such as Morpheme acquisition Order (Al-Afaleg,1991)⁽²⁸⁾ and Studies on the psycho-linguistic theories of language acquisition, specifically in relation to the Saudi learner of English do not seem to exist⁽²⁸⁾.

There are a lot of problems that confront Arab students in their course of studying the English language. In Saudi Arabia, since Saudis speak their native language at home and during their interaction with their friends, peers, and classmates, there is a bleak chance to learn English through day-to-day interaction. In one study conducted by Abdul Haq (1982)⁽²⁹⁾, it was concluded that most Arab students usually fumble in their writing skills

The results of this study revealed that only 38.1% of students had excellent performance regarding oral presentation skills. Arends et al (2005) mentioned that speaking skill reflects the way of students' thinking that allows teachers to get acquainted with cognitive skills of their students when thinking loudly, which will help them to develop such a skill⁽³¹⁾. It will also allow them to develop their students' meta-cognitive skills including planning, monitoring, and evaluation, so that by time, they can acquire and develop new knowledge and amalgamate it with prior knowledge within their cognitive structure.

Furthermore, previous studies perceived the speaking skill as one's own ability to express all visions, thoughts and feelings fluently and correctly using verbal utterances⁽³¹⁾. Also, there are situations requiring people to use speaking in a spontaneous manner including the need for direct and indirect communications with others (Sesnan, 2000)⁽³²⁾.

Regarding to the results of the educational program development phase, the majority of students took zero in series of items regarding scientific writing and oral presentations scores. Alsamadani (2010)⁽³³⁾ explained that "...this difficulty and complexity arise from the fact that writing includes discovering a thesis, developing support for it, organizing, revising, and finally editing it to ensure an effective, error-free piece of writing"

Writing is considered a difficult skill to teach because it includes several components, for example, a) a comprehensive command of grammar, b) grasp on spellings and punctuation, c) use of appropriate vocabulary, d) suitable style to meet the expected readers' expectations and organizational skills.

English lecturers at university teach basic and generic writing skills but not necessarily scientific writing skills⁽³⁴⁾. This practice that started at high school level created a backlog that resulted in a perpetual cycle of deficiency in writing skills that is acutely experienced at university level with its higher demands of scientific discourse community (Langer, J. A. (2001).

Enabling students to write scientifically is imperative to the enhancement of teaching and learning in science. Halliday, et al (1993)⁽³⁶⁾ support this fact by stating that in order to learn and understand science the language of science also has to be learned and understood. This language of science has a special grammar that was developed to meet the requirements of scientific knowledge.

This is the first study involving scientific writing and oral presentations interventions among nursing, chemistry and physical students. The themes that emerged provide insight into the thought processes of novice researchers. Incorporating

educational program into the student curricula ensures that all students exit the program with a high level of competency and are adequately prepared for life-long learning^(37,38). Researchers have pointed out that many university students do not have the necessary skills to professionally practice academic writing. Although the studied students leaned concepts in conducting scientific research, but they lacking the skills for scientific writing and oral presentation^(39,40).

Recommendations

There is evidence, then, that intensive skills development programs can improve skills. Although we have shown benefits of a short scientific writing program, we would expect that a longer session might offer greater benefits. Such educational program needs to be incorporated into classroom delivery of the students' curriculum. Scientific writing skills book needed to be developed to be recommended as a basic educational strategy for all university faculties.

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