

Teaching Research Skills to Undergraduate Students Using an Active Learning Approach: A Proposed Model for Preparatory-Year Students in Saudi Arabia

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This study highlights how teaching a research methods course to undergraduate students can be a successful endeavor when active learning is the main method of learning and teaching. In this study, the effectiveness of using active learning in the experimental group to achieve the learning outcomes and final product of a freshman-year writing and research course was researched. The sample included two groups of female students (n=256 students), one control group (n=137) which received traditional lecture and assignment type instruction and one experimental group (n=119) which received instruction through active learning techniques. The effectiveness of active learning was measured by quantitative analyses of overall final exam scores and individual writing and research skills of the two groups. Results of the study indicated that active learning significantly improved the overall skills of the participants as demonstrated by an increase in final exam scores and individual writing and research skills. The research discusses the most and least improved skills, as well as pedagogical implications for teaching a writing and research course using active learning.

According to Hunter and Tse (2013), “Many students begin university studies with little or no knowledge of the principles underpinning academic discourse” (p. 227). One of the necessary skills within academic discourse is writing academic papers. Academic writing is perhaps the most difficult and last skill to gain fluency, but one of the most essential for students in the long run (Al-Buainain, 2009). For students with a first language of Arabic (L1), there are several factors which explain the challenge of academic writing in English (L2), including the absence of productive writing and lack of student-centered strategies in their prior educational experiences, i. e., K-12 education. In addition to academic writing, according to Hosein and Rao (2017), research skills in the undergraduate curriculum require additional instructional focus but are still being taught with pedagogical approaches that are “surprisingly teacher directed” (p. 109). To effectively implement a student-centered approach in writing and research skills—skills that require the ability to create and synthesize knowledge—students have to be engaged, responsible, and willing participants in their own learning process.

One of the methods that is known to be particularly effective in moving students to the center of the learning process is active learning (AL), which is defined thusly: “[S]tudents talk and listen, read, write, and reflect as they approach course content through problem-solving exercises, informal small groups, simulations, case studies, role-playing, and other activities – all of which require students to apply what they are learning” (Meyers & Jones, 1993, p. xi). As Saudi Arabia moves towards a knowledge-based economy and higher education is shifting from a teacher-centered to learner-centered learning paradigm (Lumpkin, Achen, & Dodd, 2015), students' skills to communicate effectively both orally and written while

being able to generate and synthesize knowledge and take responsibility for their own learning process are paramount (Dewing, 2008, p. 273).

In this paper, we explore how applying a student-centered approach through active learning to teach writing and research to undergraduate students with no prior research and limited experience in writing in English is an effective way to enhance students' writing and research skills. This study could be seen as providing a model, a “framework that highlights the critical role of practices, structure and formative feedback in the learner's preparation” (McAlpine, 2004, p. 119) for teaching writing and research skills in Saudi Arabia's preparatory year (a preparatory program offered in the first year at the university). This research also has possible broader international relevance because providing a student-centered method of teaching research methods to undergraduate students will help to fulfill an aim that is common to many higher education contexts worldwide.

General Context: The Preparatory Year in Saudi Arabia

Over the last ten years, Saudi Arabia's higher education institutions have planned and implemented preparatory programs in all state universities. These programs are part of the Kingdom's larger initiative to equip students with the necessary education and skills to facilitate a Saudi-led, knowledge-based economy. The preparatory program is a full academic year immediately after the student graduates from high school and before he or she chooses a particular program of study in the university. The aim of this year is to bridge the gap between high school and the university by preparing students for university-level studies and the higher-education social context

(Alaqaeli, 2014). As Alaqaeli explained, some of the objectives of the preparatory year include:

...increasing retention and graduation rates, enhancing institutional internal efficiency levels...rationalizing admission through proper students' guidance to various scientific disciplines, providing college students with the necessary language and practical skills,...improving and regulating institutional resources equipment and capabilities,...and preparing the student to engage in the academic, social and research aspects of university life (p. 46).

A detailed examination of these objectives is beyond the scope of this research paper. Nevertheless, it is worthwhile to gain an understanding of the rationale for the program and of the skills that are emphasized therein. Saudi high schools generally rely on memorization and rote learning as the predominant methods of instruction and ways of knowing (Alghamdi, 2013a, 2013b; Hamdan, 2005); these methods of teaching and learning have been the norm in Saudi Arabia (Smith & Abouammoh, 2013). Moreover, most high school curricula are primarily theoretical, and therefore most students graduate from high school with minimal skills and little more than "passive knowledge" to the extent that they are not prepared for the university context and for the broader Saudi and global environments. Consequently, the preparatory year program has been developed to emphasize many of the skills that are typically overlooked in high schools such as foundational English, mathematics, study skills, writing and research, leadership, communication, professional development, and technological skills.

Regarding English language skills, one of the foundational skills highlighted in the preparatory year, language proficiency differs based on students' prior educational experiences. Students who attended their primary and secondary years in private education have several classes of English per week from Kindergarten (number of hours and subjects vary from school to school) for a minimum of 12 years of English instruction with courses such as math and science taught in English. Public education students currently have nine years of English instruction beginning in 4th grade (*EF partners with Saudi Arabia*, 2013). Several international and Saudi schools have introduced international programs where English is the primary medium of instruction. Preparatory programs in Saudi higher education then assess and ensure that students have the basic foundation English language proficiency, learning, and communication skills, which is the foundation for the writing and research course discussed in this research.

Teaching Academic Writing Skills in English

Writing is a complex, yet essential skill to master in higher education as cited and researched in several studies. Indeed, "effective writing is 'central to the work of higher education'" (Monroe, 2003, p. 4, as cited in Hunter & Tse, 2013, p. 228), supporting the notion that academic writing is integral to all fields in higher education. In particular, some studies (such as Al-Khairi, 2013, p. 1; Javid, Farooq, & Gulzar, 2012; Javid & Khairi, 2011) have concluded that students with an L1 of Arabic in higher education require more development of English language skills, which tends to delay their academic progress. In addition to being an essential skill in academic communication, writing is the most complicated cognitive task (Smith, 1989; Widdowson, 1983); it requires careful deliberation, regulation, and concentration (Al-Khairi, 2013).

Researchers studying English (L2) academic writing for students who have an L1 of Arabic have traditionally focused on language-based errors: grammar, discourse markers, etc. However, increasingly, studies that highlight student-centered processes, learning foundations, and teaching implications for improving L2 academic writing skills have been the focus. One of the issues that is found in such research, which has teaching and curricular implications, is the lack of strong writing skills in the students L1 of Arabic, which makes English writing an even more difficult productive skill (Benseman, Sutton, & Lander, 2005). Al-Buainain's study (2009) on the written work of 40 Qatari university students highlights frequent errors for students with an L1 of Arabic in written English. The author posits that students are struggling in academic writing in Arabic, which can lead to challenges in their written English.

As academic writing is a learned, productive language skill, the lack of L1 academic writing proficiency highlighted by the literature suggests an absence or minimal teaching of student-centered approaches, be they active learning or another, in previous educational experiences.

Perhaps the most substantial commentary regarding academic writing in Saudi higher education is from university students themselves. Unrah and Obeidat's (2015) qualitative research focused on Saudi university students' adjustments to studying in the US. In the interviews, several participants agreed that, concerning academic writing, "[B]efore coming to the US, they did not learn to write in a systematic way. They were taught 'stream of consciousness' writing rather than a systematic method involving organization of ideas and content" (p. 51). In addition, the students also mentioned the emphasis on memorization in Saudi higher education. Regarding written language testing, one of the participants said, "[S]tudents would memorize five paragraphs and then would come to the

exam and write one of the paragraphs from memory" (p. 50). The authors' research emphasizes the absence of previous, organized academic writing instruction and even mention this as an implication for preparatory year instructors and administrators to consider when preparing for courses.

Further to this point and emphasizing specific kinds or purposes of academic writing, such as writing for research, Deraney's (2015) content analysis research focused on academic essays of 25 students in a Saudi preparatory program. The author concludes that students in preparatory programs appear to learn writing in an organized manner by genre (narrative, descriptive, argumentative, etc.), often for the first time, but are not consistently taught or assessed by the organization or writing skills needed in that genre explicitly. Hyland (2007) writes that in genre writing, students need to know the process and skills of writing in that genre as well as the language. Other studies concur that Saudi learners have limited experience in academic writing for specific purposes like narrative, extended essays, and expository essays (Al-Eid, 2000; Bersamina, 2009). This is relevant in this research as it highlights that teaching students to write in a specific way, for a specific purpose, such as writing for research is a beneficial pedagogical approach.

Therefore, academic writing in Saudi higher education is complicated for several reasons, including the lack of language skills in English and organized, academic writing in students' previous educational experiences. It seems that teaching academic writing, include writing and research, is highly valuable in the Saudi context and requires attention from professors and curriculum designers for several reasons. The model suggested in this study for teaching writing and research using the student-centered approach, active learning, could potentially help strengthen students' writing and research skills.

The Active Learning Framework

Active learning (AL) happens when "students explicitly participate in their attainment of knowledge. Students often have difficulty connecting concepts and principles learned in class to specific cases or other frames of references" (Vandiver & Walsh, 2010, p. 31). In other words, students actively learn by "doing" and explicitly "thinking" as they are doing (Bonwell & Eison, 1991, p. 2). One of the hallmarks of active learning is that students are engaged in advanced thinking patterns, which include production, assessment, and analysis. Lumpkin and colleagues (2015) write that, often in contrast to traditional lecturing, active learning includes "any activity encouraging students to participate in learning approaches engaging them with course material and

enhancing critical thinking as they make applications" (p. 123). The concept of "application" has played an essential role in providing a definition of active learning in a general context (Meyers & Jones, 1993).

This research, similar to other studies, considers active learning from the constructivist paradigm of student ownership and created learning experiences, those in which students appreciate and recognize engaging learning activities. Active learning draws on the learners' own initiative and sense of responsibility for their progress (Niemi, 2002, p.763). When students collaborate to explore information, they receive encouragement to take larger tenure of their learning. Lumpkin and colleagues (2015) discuss that responsibility for learning in an active, constructivist classroom "requires teachers who value maximizing opportunities for students to learn, while urging students to accept that what is learned in any course will always be their responsibility" (p. 121). The authors' research found that through the ownership of active learning, students' perceive learning as creating "positive connections between active engagement and learning" and classrooms that are "more academically productive and enjoyable" (p. 131). The researchers encouraged educators to include more active learning strategies and assessment in their classes.

According to Meyers and Jones (1993), the core of AL as is the commitment of the minds of learners in recalling and applying their former knowledge and in making connections between new knowledge and prior knowledge—deep rather than surface learning (Trigwell, Prosser & Waterhouse, 1999). Active learning moves beyond the superficial memorization and helps learners solve learning problems and connect and apply what they are learning; AL helps them to expand their learning abilities rather than just learn the discrete skills. Active learning then encourages students to create and share their knowledge, which can help them learn from each other, and it develops a community of learners (Scott-Ladd & Chan, 2008).

Active learning and academic writing and research are mutually beneficial. As shown in the literature, writing, in any form, is a productive, not receptive, skill and consequently requires constant engagement, writer responsibility, and the ability to synthesize and construct knowledge to create meaningful texts. Vandiver and Walsh (2010) write that "teaching students to think critically, contextually, and independently about the research process, including how research findings are generated and applied to social problems, serves to benefit both the individual and the society" (p. 31). Further, Hosein and Rao's work (2017) on student-centered pedagogies in research methods with undergraduates in the UK found that their use of reflective essays focusing benefitted their students'

understanding of the research process and their place in it. The authors conclude that "student-centered pedagogies can empower the students to find their researcher's voice and enable them to have that journey to self-authorship in their development as a student researcher" (p. 119). This process of reflecting on and connecting knowledge will help students grow not only as researchers, but in their fields as well.

In concurrence with the literature, Unruh and Obeidat's (2015) work with Saudi students studying abroad supports the need for the active learning approach in Saudi higher education in general. In the study's implications, the authors advise instructors to "explicitly teach metacognitive and comprehension skills. Saudi students are also accustomed to taking a more passive role in their education and may need encouragement, at first, to actively shape their own academic experiences" (p. 54). The authors' call to teach metacognitive skills highlights the need for active learning that requires student-centered engagement and responsibility in Saudi higher education. Barnawi's (2016) work with Saudi students negotiating writing pedagogies in a college writing classroom further supports the idea of active learning. The author concludes that through active scaffolding and negotiated writing pedagogies, his students moved "from writing to display knowledge to writing in order to construct and transform knowledge, at levels such as self, content, and form" (p. 1).

Therefore, students' acquisition of skills and knowledge are better served if they learn about writing and research in an active, student-centered manner rather than in a passive, instructor-centered one. Active learning includes several techniques such as demonstration, collaboration with peers, presentations, debates, and cooperative/collaborative activities (Lammers & Murphy, 2002). All of these strategies were implemented in teaching the writing and research methods course in this research.

This research reports the possible model of using active learning on teaching academic writing skills, in this case, writing and research, in the preparatory program. A multiple-choice final exam aimed at 14 different skills was used to measure the skills. The research aims to answer two main questions and the implications of those answers:

1. Is there a difference in students' writing and research overall skills, as shown by performance scores, when taught using active learning as compared to those students who received traditional instruction?
2. In individual writing and research skills, is there a difference in students' performance scores considering the active learning and traditional methods?

Method

The study was conducted through a quasi-experimental design. Students were divided into two groups, experimental and control. The experimental group received instruction via active learning techniques while the control group received traditional instruction via lectures, assignments, and exams. The overall performance and individual writing and research skills were measured at the end of the course by a multiple-choice final exam based on 14 writing and research skills.

Setting

The research was conducted with participants from two universities, one public and one private, in Saudi Arabia. Both private and public were considered to expand the sample size and to produce more generalizable results. Students graduate from secondary school in either the Science Track or the Arts Track, depending upon their interests and plans for further education or employment. Education in Saudi Arabia is gender segregated; male professors teach men, and female professors teach women. Therefore, as the authors are female, this study was conducted on the women's campus only. The courses were taught by one instructor during the

Writing and Research Course

Students were required to take the writing and research (WR) course as part of their program of study. At the beginning of the semester students are given suggestions and a list of possible research questions, or they can develop their own research question: preferably one that is relevant to their social, community, or campus context. Some of the research topics selected previously include the effect of text language on students' academic writing, controversial speakers on the university campus, freedom of expression, the use of housemaids for raising children, and the choice for female students between marriage and higher education. The instructor emphasized five broad aspects of learning: (a) the identification of, analysis of, and responses to a problem; (b) the requirement to discover something new through problem solving; (c) the acquisition of an understanding of the material at a profound level by finding creative solutions; (d) the requirement for cooperation, mutual support, and teamwork; and (e) the appropriate utilization of technology in order to find an answer. Through these five broad areas, 14 writing and research skills, shown in Table 1, based on the learning outcomes are covered with the end result of a 3,500-5,000-word research paper.

Table 1
Writing and Research Course Skills

Skills
1. Differentiate between qualitative and quantitative research types
2. Write an academic research title accurately and correctly
3. Write a research proposal
4. Prepare an annotated bibliography before writing
5. Debate subject of research with peers or subject professor
6. Search on topic and keywords in Arabic and English search engines
7. Write about previous studies (basic literature review)
8. Write research introduction using specified criteria
9. Use APA format, citation and references
10. Write research hypotheses and questions
11. Use appropriate, basic statistical methods
12. Write and interpret results of appropriate research tools
13. Choose the research problem
14. Design appropriate research tools (survey, questionnaire, etc.)

Participants

All of the participants were female, ages 18-21, and enrolled in a first-year, English-language writing and research course. The participants were all female because the researchers have access to this population: as mentioned previously, education is gender-segregated in Saudi. The participants were those who agreed to participate in the research and who were enrolled in the course during the data collection from 2010-2012. The total number of participants were 256 (n= 137 in the control group; n=119 in the experimental group). The first language of the students (L1) was Arabic. An important note regarding the medium of instruction is that students must complete either the foundational preparatory year English language program or IELTS level 5.0 in writing of English language proficiency before being enrolled in the course.

Instrument

All students were provided the same 20-question multiple-choice final exam regardless of which group, experimental or control, to which they were assigned. The test instrument was formed by the primary researcher and checked for content validity by two professionals in ESL and education. The topics for the exams were based on the main topics and skills covered in the course syllabus shown in Table 1. While the format was multiple choice, the questions presented students with high-level choices and scenarios such as,

"Which of the following is considered a poor thesis statement?," "Choose two acceptable academic titles from the following," and "Quotes should be used in your research paper to..."

Procedures

After the two groups were taught using the respective method, active learning or traditional lecture, the students were given the same final exam based on the 14 skills. The average scores of the two groups were then compared overall on the final exam and individually on the skills using descriptive statistics and a paired t-test. Based on the exam scores, the rank of skills (highest to lowest) was determined.

Experimental group. The experimental group was taught using active learning strategies from the beginning until end of the course. The students developed research papers and were engaged in all stages of the research process. The students chose their topics based on several examples, personal interest, and future career goals, which were then discussed in class and individually approved by the instructor. This was followed by a class visit to the library to conduct research using databases, various peer-reviewed sources of data including journal articles, and online books in order to write a research proposal. Every week there was a discussion about part of the research, such as the abstract, the introduction, the literature review, the selection of books and peer-reviewed articles, search engines, APA citation, research tools and methods, and

the final research report. The research paper was completed in stages with due dates and criteria from topic selection, proposal, introduction, literature view, etc., resulting in an eight-tiered assignment structure. This encouraged the students to be actively engaged in the writing of their research papers. Even though this took a long time, it was a meaningful experience. This method of turning in material in stages prevented plagiarism, as the students were required to be actively engaged with the contents of their paper on a weekly basis. At the end of the term each student was required to present her research findings to the class and to answer questions from the professor and the other students in the same manner as a researcher presenting a paper at an academic conference. Throughout the course the students were encouraged to discuss their research findings with their classmates and their professor both inside and outside the classroom; the latter approach was facilitated by Blackboard Discussion Forum. The students were given an additional incentive to participate in the online discussions because 10 percent of the final grade was based on the level and quality of their participation on the discussion board. This participation is considered to be an aspect of AL because it involves engagement in helping others and in sharing knowledge.

Control group. The control group was taught using the traditional method which involved primarily lecturing to transfer knowledge about how to write an academic research paper. Students were given lectures on each part of the research process with brief discussion accompanied by a PowerPoint in each class with limited time for asking questions. The students received assignments throughout the course, and the research paper was turned in at the end of the term.

Validity

Content validity of the final exam was identified by three academic professionals, one of whom was the researcher, who reviewed and revised the final exam prior to testing. For grading, as the instructor of both the groups was the same, it was imperative to estimate the inter-rater reliability. Two academic colleagues with extensive experience and doctorates in English Language and Literature and Teaching English as a Second Language (TESOL) scored the final exam. The inter-rater correlation for the final exam was .99.

Results and Discussion

This research investigates two main questions and their implications:

Question 1: Is there a difference in students' writing and research overall skills as shown by performance scores when taught using active learning as compared to those students who received traditional instruction? The results show that there is a statistically significant difference between the average scores of students from the experimental group (taught using active learning) and students from the control group (taught using traditional techniques of education) when comparing final exam performance scores as shown in Table 2. This result is also in agreement with those of other studies that indicate that AL techniques improve students 'level of significance' in the material of the course (Taylor, Anderson, & McConnell, 2003).

While other factors, such as level of language proficiency and educational background, may have contributed to the differences between the control and experimental group, the data supports the literature showing the effectiveness of active learning. As the questions on the exam were primarily application and scenario questions, deep rather than surface learning (Trigwell et al., 1999) was activated, and students had to apply what was learned in the classroom.

Question 2: In individual writing and research skills, is there a difference in students' performance scores between the active learning group and traditional methods group?

As shown in Table 3, the data illustrates that there is a difference in each of the 14 writing and research skills between the experiment and control groups. Those students taught via active learning made significant gains, with an average of 10.5-point higher score in the skills, than those taught with lecture-based instruction.

The skills with the highest difference between control and experimental group, as shown in Figure 1, are skills 6 (19.27-point difference; $t = 13.32$) and 12 (19.08-point difference; $t=12.99$). Searching topics on search engines (skill 6) requires application of skills and evaluation of sources. Writing and interpreting results of research (skill 12) requires not only application but synthesis of skills gained and some creation of new material in writing results.

Table 2
Final Exam Averages for the Control Group and Experimental Group

	Mean	SD	<i>t</i> value	Level of Significance
Control group	77.04	16.49	6.47	0.01
Experimental group	89.93	15.16		

Table 3
Control and Experimental Group Scores in Each of the 14 Writing and Research Skills*

Skills	Control group n=137		Experimental group n=119		t value
	Mean	SD	Mean	SD	
1. Differentiate between qualitative and quantitative research types	81.02	13.15	94.10	8.26	9.56
2. Write an academic research title accurately and correctly	78.56	12.96	87.99	17.39	4.52
3. Write a research proposal	87.63	11.39	99.71	13.10	7.89
4. Prepare an annotated bibliography before writing	70.43	10.74	82.39	10.39	9.02
5. Debate subject of research with peers or subject professor	87.35	10.35	92.70	12.52	3.74
6. Search on topic and keywords in Arabic and English search engines	80.47	10.94	99.74	12.04	13.32
7. Write about previous studies	76.91	19.23	82.45	21.45	2.25
8. Write research introduction using specified criteria	77.57	6.84	83.25	11.53	4.85
9. Use APA format, citation and references	82.64	12.89	88.93	13.89	3.75
10. Write research hypotheses and questions	85.37	8.79	89.97	7.80	4.39
11. Use appropriate, basic statistical methods	77.53	11.94	93.99	15.33	9.13
12. Write and interpret results of appropriate research tools	80.63	12.39	99.71	11.10	12.99
13. Choose the research problem	86.44	10.77	92.39	9.30	4.74
14. Design appropriate research tools (survey, questionnaire, etc.)	74.30	10.80	89.70	11.52	10.98

* $\alpha=.01$

The skills that showed the least difference were skills 7, 5, and 9 respectively. Debating research topics with peers and professors (skill 5 with a 5.35-point difference; $t=3.74$) is hard to test on an exam, and the minimal difference could be attributed to an oral communication course which is required of all students before this course. Similarly, skill 9 (6.29-point difference; $t=3.75$), using APA format, can be taught through lecture and worksheets and requires little discussion: APA referencing and formatting can be memorized. However, noticeably, skill 7 (5.54-point difference; $t=2.25$), writing about previous relevant studies which requires application, evaluation and other active skills, also showed minimal gain. Perhaps, this is a difficult skill for both groups to gain in one semester, whether taught through active or traditional learning,

and the exam question(s) focusing on this skill could need modification as the standard deviation for both groups is the highest of all 14 skills.

Further in relation to answering Question 2, the skills were ranked according to average performance scores for the experimental group as shown in Table 4. Searching topic and keywords in Arab and English search engines, writing a research proposal, and writing and interpreting results of appropriate research tools had the highest skill rankings with very similar scores within a range from 99.74-99.71.

On the other end of the ranking, writing a research introduction using specific criteria, writing about previous studies (basic literature review), and preparing an annotated bibliography before writing ranked 12-14 respectively with scores ranging from 83.25-82.39.

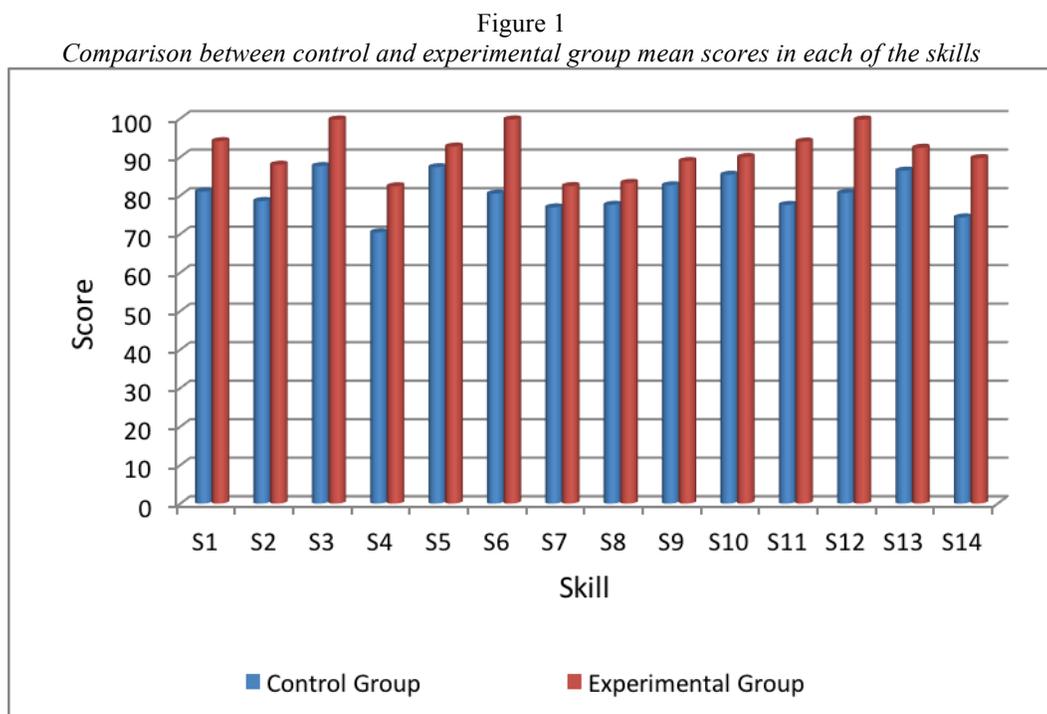


Table 4
Average and Ranking of the Experimental Group's Writing and Research Skills

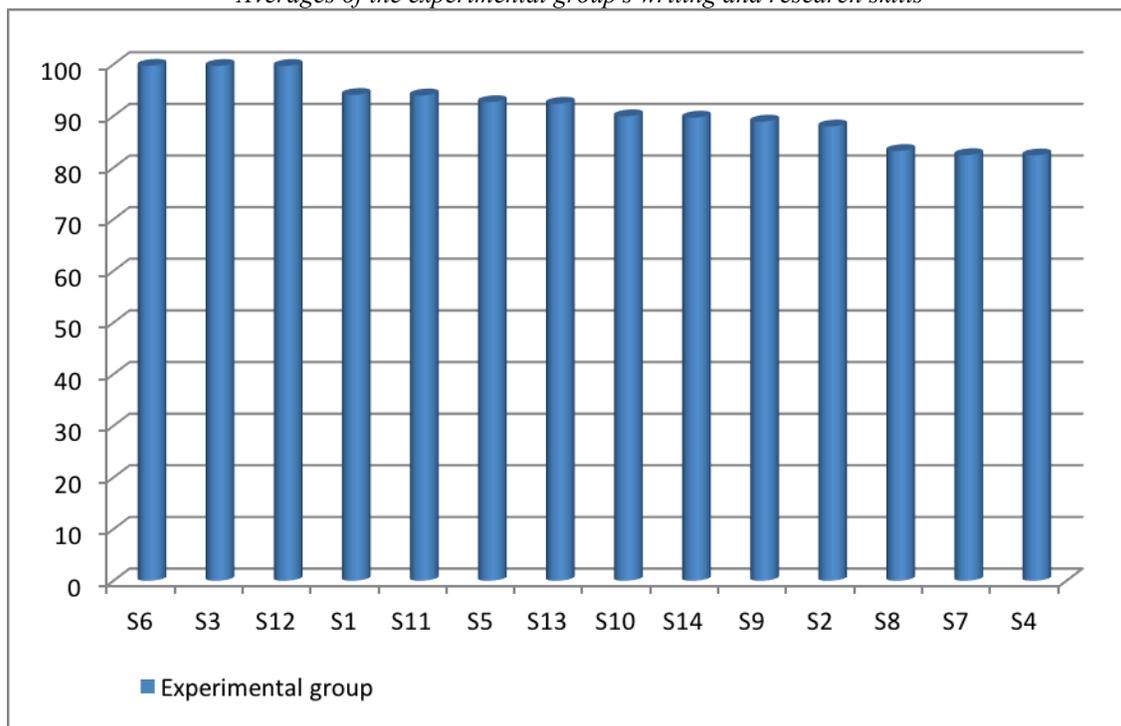
Skills	Average	Standard Deviation	Ranking
1. Differentiate between qualitative and quantitative research types	94.10	8.26	4
2. Write an academic research title accurately and correctly	87.99	17.39	11
3. Write a research proposal	99.71	13.10	2
4. Prepare an annotated bibliography before writing	82.39	10.39	14
5. Debate subject of research with peers or subject professor	92.70	12.52	6
6. Search on topic and keywords in Arabic and English search engines	99.74	12.04	1
7. Write about previous studies	82.45	21.45	13
8. Write research introduction using specified criteria	83.25	11.53	12
9. Use APA format, citation and references	88.93	13.89	10
10. Write research hypotheses and questions	89.97	7.80	8
11. Use appropriate, basic statistical methods	93.99	15.33	5
12. Write and interpret results of appropriate research tools	99.71	11.10	3
13. Choose the research problem	92.39	9.30	7
14. Design appropriate research tools (survey, questionnaire, etc.)	89.70	11.52	9

Figure 2 shows the ranking of scores and the consistency in the highest three and lowest three skills.

Preparing an annotated bibliography, writing an introduction, and reviewing literature while formulating

a research hypothesis proved to be difficult for both groups, which is not surprising based on the literature which suggests that typically Saudi students, in prior educational experiences, have not been taught

Figure 2
Averages of the experimental group's writing and research skills



systematic and organized writing (Unrah & Obeidat, 2015). However, these skills, particularly reviewing scientific studies in their field, are useful tools which guide students toward overall research objectives (Ball & Pelco, 2006, p. 147). As shown by the results, these three skills showed gains with active learning instruction but limited improvement, implying that more practice and critical thinking is required in the students' prior and current educational experiences.

Conclusion and Implications

In this study, students who were taught using an active learning pedagogy showed improvement in overall writing and research skills. This course offered the experimental group the experience of active learning, which was embraced by the students through increased interest and motivation (Bonwell & Sutherland, 1996; Robinson, 2000). Throughout the term students in the experimental group were coached by their instructor using AL to produce bits and pieces of the research paper. Thus, they were able to see the full picture of what is required to collect data and to write an academic-level research paper. Moreover, the students' grammar, sentence structure, and overall writing—which were not measured from the final exam but were observed during the course of each semester—

developed on a weekly basis, which leads to limitations as well as implications of this research.

Future research regarding writing and research skills could expand to focus on the content of the final research project. Also, a larger sample size including both male and female students could be researched for more generalizable results. Further, the students' perceptions on this approach, active or traditional, can be considered prior to and after the actual instruction. It is important for the students' overall monitoring of their own learning to know which approaches lead to enhanced learning and reflection.

One positive instructional implication from the study is that the students who were taught using AL exhibited a high level of autonomy. According to Vandiver and Walsh (2010), "Autonomous learning has been defined as the ability to take charge of one's learning. This form learning is connected with the students who took an active role in learning process...the autonomous learner is viewed as an independent, self-directed lifelong learner..." (p. 32). The students in the study showed that they could work independently to produce writing and research skills more proficiently than those taught using traditional methods. In the end, students learned how to conduct original research by utilizing AL strategies and skills.

Finally, and perhaps most significantly, a model for teaching writing and research is highlighted by the study. Any model for teaching WR, shown by the lowest ranking skills for the experimental group, the productive skill of writing—writing proposals, annotated bibliographies, and introductions—all require a “formula” or genre instruction and more productive practice through active learning and reflection. As shown through the literature, the students' writing in their L1 or previous experiences in L2 have been limited, particularly in genre or purposeful writing instruction. At the end of the term, several students reported that they would not have been able to write an academic research paper all at once and that the eight-tiered assignments helped them greatly to do hands-on work rather than passively listen to lectures as in a traditional class setting. These assignments within the framework of active learning could form a model to further produce meaningful student writing and research.

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