



An Investigation of the Intervention of Zimmerman & Hutchin's (2003) Information Synthesization vs. Visualization on Iranian Undergraduate ESP (Accounting) Learners' Reading Comprehension Achievement Across Gender

Somayeh Sheikhpour Ahandani,

*PhD Candidate in TEFL, Department of English,
Tonekabon Branch, Islamic Azad University, Tonekabon, Iran
E-mail: s.sheikhpour@gmail.com*

Mohammad Reza Khodareza (Corresponding Author),

*Assistant Professor of TEFL, Department of English,
Tonekabon Branch, Islamic Azad University, Tonekabon, Iran
E-mail: m.khodareza@toniau.ac.ir*

Abstract

This study investigated the intervention of Zimmerman & Hutchins (2003) Information Synthesization vs. Visualization on Iranian Undergraduate ESP (Accounting) learners' reading comprehension achievement across gender. 120 ESP University students majoring in Accounting in Iran participated in this study and were assigned to 4 homogeneous groups, 30 male and 30 female students in experimental groups, 30 male and 30 female students in comparison groups. An ESP reading comprehension administered to all participants as a pre-test showed that 4 groups were not significantly different in ESP reading comprehension ability. For treatment, Accounting reading comprehension passages were taught through focusing on Information Synthesization strategy in the experimental group and in the comparison groups it was taught through focusing on Visualization strategy. At the end of the treatment, the post-test was administered. The results revealed that Information Synthesization had more effect on improving the students' ESP reading comprehension ability than Visualization, and also gender does not interact with ESP reading comprehension ability of the participants.

Keywords: Reading Comprehension, English for Specific Purpose, Visualization, Synthesizing Information

ARTICLE INFO

Article history:

Received: Friday, January 3, 2020

Accepted: Monday, May 18, 2020

Published: Tuesday, June 16, 2020

Available Online: Tuesday, June 9, 2020

DOI: 10.22049/jalda.2020.26730.1160

Online ISSN: 2383-2460; Print ISSN: 2383-591x

Introduction

Most people experience the phenomenon of language learning, and depending on their purpose and future goals, it may be an enjoyable practice or rise out of necessity. English is a language whose mastery is a requisite and need for higher education in academic setting and better working conditions (Tabrizi & Zununi Vahed, 2017).

From the early beginning of teaching English as a foreign language, reading comprehension skill was considered an important skill for teachers and learners and researchers. In university and academic contexts, the ability to read, understand, and interpret textbooks and reading materials is a crucial element for obtaining information in all areas; so, skillful reading is an intricate process that includes an association of various abilities and strategies at the same time to make up for the shortcomings of each other in understanding a text; therefore, to obtain proper reading comprehension, students need to use proper strategies (Küçüköğlü, 2013).

Although many researchers from long ago up to now have introduced different strategies for promoting reading comprehension, ESP students have so many problems in applying them in the ESP context. In ESP reading comprehension, readers should have scientific knowledge in addition to general English and linguistic knowledge. According to Zimmermann and Hutchins (2003), good readers use seven strategies to create meaning during the reading process: they create mental images by using visual, auditory and other relevant sensory images, use pertinent background knowledge to improve understanding, ask questions to illuminate, make predictions and focus attention on the important points, make inferences by using their prior knowledge and information from the text to make predictions, determine and distinguish the most important ideas of the text, synthesize information of the text to gain the general meaning, and use problem-solving strategies to understand better.

The researcher selected two strategies out of these seven common sense strategies for reading comprehension, which were introduced by Zimmermann and Hutchins (2003): Visualization and Synthesizing Information; the purpose of the study was to investigate these two strategies in ESP contexts and to see which one played a more important role in ESP reading comprehension.

Although there have been ample evidences and studies on the effects of applying different strategies for the EFL learners' language skills which indicate the effectiveness of strategy instruction, the notion of the impact of using strategy on ESP reading comprehension at university level has not been much scrutinized in the Iranian context. The rationale for investigating this model and for choosing visualization and synthesizing information for investigating was the problems students and those who try to read ESP texts encounter; they should learn to accompany using different reading strategies by translating and struggling with new vocabularies. So, the researchers investigated these 2 strategies to see the effect of constructing mental

images and synthesizing information on ESP reading comprehension during the process of reading.

The independent variables were gender; male and female participants; Synthesization (IS); and Visualization (V). The dependent variables were Iranian Undergraduate ESP (Accounting) Learners' Reading Comprehension Achievement. Considering the impact of Information Synthesization (IS) and Visualization (V) will take a forward step in ESP reading comprehension pedagogy. To this aim, the following research questions have been proposed:

Q1: Is there any statistically significant difference between the effect of Information Synthesization (IS) and Visualization (V) on ESP reading comprehension ability?

Q2: Is there any statistically significant difference between the performance level of the male and female participants on ESP reading comprehension ability regardless of the treatment they received on ESP reading comprehension performance?

Q3: Does gender interact with treatment in such a way as to produce a statistically significant effect on the ESP reading comprehension ability of the participants?

Research Hypotheses of the present study are as follows. The null hypotheses are:

H01: There is not any statistically significant difference between the effect of Information Synthesization (IS) and Visualization (V) on ESP reading comprehension ability.

H02: There is not any statistically significant difference in the performance level of the male and female participants on ESP reading comprehension ability regardless of the treatment they receive on their ESP reading comprehension performance.

H03: Gender does not interact with treatment in such a way as to produce a statistically significant effect on the ESP reading comprehension ability of the participants.

Literature Review

Reading is a skill that is used unconsciously for many reasons, but strategies are activities selected deliberately for particular purposes. An emerging skill can become a strategy when it is used intentionally. Reading strategies determine the ways readers interact with written text, and they reveal the ways readers use the strategies to be able to have effective reading comprehension (Carrell, Gajdusek, & Wise, 1998). McNamara and Magliano (2009) emphasized that the process of reading is a task of reader and text factors together that take place within a larger social context.

Several studies have investigated the effects of reading strategy training on reading comprehension. The results of these studies also indicated that strategy

instruction helps less skilled EFL readers overcome their problems and difficulties in reading (Kalua, 2012). Jayanti and Dewi (2018) predicted that the students' sociocultural factor and the way they use reading strategy affect the students' reading ability. So comprehension as the purpose of reading is the ability to understand the main idea of a text by making a connection between written symbols which are the formal schemata and the knowledge and information, which are the content schemata (Brown, 2001).

Reading comprehension of a scientific text is crucial for scientific achievement. A better understanding of scientific text increases scientific achievement. English for specific purposes is considered to have 2 dimensions, one emphasizes the learner's need and the other emphasizes the linguistic aspects of subject matter. So, an ESP reader needs to identify the language features, and also the information they need to receive in this endeavor. This activity tries to identify social, cognitive, and cultural contexts (Dudley-Evans & Jo St John, 1998). Ajideh, Zohrabi, and Pouralvar (2018) investigated the effect of explicit instruction of metacognitive reading strategies on ESP reading comprehension among university students in Iran. The results of independent t-test revealed that the students in the experimental groups who received explicit instruction of metacognitive reading strategies through the Cognitive Academic Language Learning Approach (CALLA) for strategy instruction outperformed those in the control groups and showed greater achievement in their ESP reading comprehension ability.

Visualization is a strategy that good readers apply for comprehending a text. The strategy of visualizing is the mind's ability to imagine what is happening as if they are watching a movie. They use all their senses to create mental images of what they are hearing or reading to help them to have a better comprehension of the text (Pitches, O.N.Z.M, & BA, 2008). Creating mental images while reading a text improves student's understanding and the strategy of visualizing is helpful in the comprehension of texts. Teachers can use interactive whiteboards to assist them in teaching concepts or skills (Somekh et al., 2007). Teachers have an important role in motivating students to visualize what they read in a text and ask them to talk or write about the image that comes to their minds after visualizing the text (Küçüköğlü, 2013). The results of some studies in Iran confirmed that reading comprehension while using visualization would cause to better comprehension among EFL learners. Visualization increased the motivation of learners to improve their reading comprehension (Niknejad & Rahbar, 2015). Visualizing the events mentioned in a text is important for constructing a rich and coherent mental representation of the text and involves all sensory modalities. Visualization can encourage readers to create non-linguistic representations of text. So, teachers, educators and readers use visualization strategies to improve reading comprehension (De Koning & van der Schoot, 2013).

Synthesizing is the process of developing realization from reading by concentrating on a text. The strategy of synthesizing information varies from the simplest levels to the difficult one. Determining essential information or main ideas is part of summarizing and synthesizing (Pitches et al., 2008). Zafarani and Kabgani (2014) examine the effectiveness of the main idea strategy, summarization strategy, and the explicitness of the training on improving comprehension of English textual materials of Iranian ESP learners. Findings suggested that the explicit instruction on summarizing strategy can effectively contribute to improving the ability and aptitude of ESP learners in comprehending reading and can help them make a constructive attitude toward English reading in Iranian context. Martínez, Mateos Sanz, Martín and Rijlaarsdam (2015) investigated a study to improve learning from texts via synthesising texts strategies, which needs interaction between reading and writing activities. The findings revealed that the experimental group, who was trained in the processes of writing a synthesis via a strategy-oriented programme, outperformed the control group who used the more conventional tasks in dealing with the text. They had deep learning and more text-processing activities.

Janfeshan and Pourarian (2017) investigated the impact of gender on using reading sub-skills and reading comprehension skills of Iranian EFL learners. The result revealed that in making a logical inference, the males were better than females and in understanding the mood, tone, or impression of a reading passage, females outperformed the males. However, there were no significant differences between male and female in guessing the meaning from context and getting the main idea of a reading passage. This study had some pedagogical implications for Iranian EFL learners and teachers' choice of contexts. According to the results, English teachers can consider proper attention to individual differences.

Method

Participants

Participants of this study were 120 university students (60 male and 60 female) majoring in Accounting, who were selected on the basis of their proficiency level from among 186 students. To estimate the homogeneity of the participants, the Quick Placement Test of Oxford University Press and University of Cambridge Local Examinations Syndicate (2001) was administered. The result of this test was analysed and students whose average was close to each other were chosen. All the subjects participated in both tests (pre-test and post-test). There were all native speakers of Persian, ranging from the ages of 17 to 25. All the students had already passed their general English courses. They were assigned into two experimental groups (30 male and 30 female) and two comparison groups (30 male and 30 female).

Materials and Instruments

The pre-test consisted of two ESP reading comprehension passages of Accounting, each with 10 true / false items. The post-test was the same as the pre-test, which included two ESP reading comprehension passages of Accounting, each with 10 true / false items. The test was adopted from the first and second chapters of the book, *English for the Students of Accounting I* by Aghvami (2019), so the test was validated and for reliability, Cronbach's Alpha coefficient test was used to test the consistency of the data collected where Cronbach's Alpha coefficient was as high as 0.73 which was acceptable. The materials of this study were adopted from ESP reading comprehension books pertaining to the course for the students of Accounting. ESP Accounting course was taught in 2 ways: Visualization and Information Synthesization. For Information Synthesization, summarizing, and outlining, and for visualizing the texts, power point software and whiteboard were used.

Procedure

This study investigated the intervention of Zimmerman and Hutchin's (2003) Information Synthesization vs. Visualization on Iranian undergraduate ESP (Accounting) learners' reading comprehension achievement across gender. The design of the study is pre-test, treatment, and post-test. The independent variables were information synthesization and visualization. The dependent variables were male and female Iranian undergraduate ESP (Accounting) learners' reading comprehension achievement.

At first, a Quick Placement Test of Oxford University Press and University of Cambridge Local Examinations Syndicate (2001) was administered to select 120 homogenous participants from among 186 students. Then, the participants were randomly divided into 4 groups, 30 male and 30 female students in experimental groups, 30 male and 30 female students in comparison groups. A pre-test was administered first between all groups to assess their ESP reading comprehension ability. After the pre-test, the experimental groups and also the comparison groups received the specific treatment. In the experimental group, Accounting reading comprehension passages were taught, focusing on Information Synthesization; the teacher helped the students to gain the most important ideas. The teacher asked them to summarize the material. By developing questions such as "What happened in the chapter? Can you identify the most important ideas? What did you think about that idea?", if they had trouble recognizing important information, the teacher helped them by using clues that authors leave in the text to help readers determine the important ideas and synthesize information, such as "as a result" or "in conclusion". In the comparison group, Accounting reading comprehension passages were taught through focusing on visualization; the teacher used powepoint software films, slides, pictures, computers, books, printed materials, and chalk boards, to clarify the text and to show images about the topics of the texts. The treatment lasted 10 sessions. At the end of

the treatment which took three months, the post-test was administered between 4 groups to assess the effect of the treatment on ESP reading comprehension, to answer the research questions, and to compare the results.

Data Analysis

To answer the research questions, Statistical Package for Social Sciences (SPSS) was used as the statistical tool for analyzing the data of the study through Two-Way Analysis of Variance (ANOVA).

Results and Discussion

The descriptive statistics of the pre-test scores of ESP reading comprehension ability obtained at the beginning of the study to set up a baseline from which the possible gains on the post-test could be examined and interpreted were summarized in table 1.

Table 1. Descriptive Statistics of the Pre-Test Scores

Study Groups	Gender	Mean	Std. Deviation	N
Control Group	Male	47.76	5.34	30
	Female	48.33	5.38	30
	Total	48.05	5.32	60
Experimental Group	Male	47.47	6.32	30
	Female	46.94	6.10	30
	Total	47.22	6.16	60
Total	Male	47.62	5.80	60
	Female	47.65	5.74	60
	Total	49.13	5.75	120

As the table shows, the mean score for the male participants in the control group was $\bar{x} = 47.76$, and this number was $\bar{x} = 48.33$ for the female participants. The mean score of females was 0.57 points higher than males. Similarly, it is shown that the mean score for the male participants in the experimental group was $\bar{x} = 47.47$ and this number was $\bar{x} = 46.94$ for the female participants. Furthermore, the mean score of males was 0.53 points higher than females. However, the mean scores are highly close to each other, so the descriptive statistics implied that, before applying the treatment, the two groups were homogeneous regarding their ESP reading comprehension ability.

Likewise, the mean scores reported for the performance level of two groups, regardless of their gender, was $\bar{x} = 48.5$ for the control group, and $\bar{x} = 47.22$ for the experimental group. Therefore, it can be argued that the participants demonstrated poor performance on the pre-test, which suggested that they would need to receive treatment on the ESP reading comprehension ability. Similarly, the mean scores reported for the performance level of the two groups, with regard to their gender, was $\bar{x} = 47.62$ for the male participants and $\bar{x} = 47.65$ for the female participants. Given the small difference that exists between the two mean scores, it can be contented that there was no significant difference between means of the two groups on the pre-test of ESP reading comprehension ability. In other words, the groups were almost at the same level of ESP reading comprehension at the beginning of the study and before their receiving the specific treatment.

The descriptive statistics of the post-test scores of ESP reading comprehension ability, which were obtained at the end of the experiment period, were revealed in table 2. All the participants took a post-test of ESP reading comprehension; the aim of the post-test was to evaluate the progress of the learners throughout the study as well as to find out which technique of treatment proved more beneficial in developing the participants' ESP reading comprehension skills.

Table 2. Descriptive Statistics of the Post-Test Scores

Study Groups	Gender	Mean	Std. Deviation	N
Control Group	Male	75.47	7.56	30
	Female	74.53	4.50	30
	Total	75.00	6.18	60
Experimental Group	Male	92.07	4.08	30
	Female	90.17	5.02	30
	Total	91.12	4.64	60
Total	Male	83.77	10.31	60
	Female	82.35	9.19	60
	Total	83.06	9.75	120

For the post-test of ESP reading comprehension, the mean score for the male participants in the control group was $\bar{x} = 75.47$, and this number was $\bar{x} = 74.53$ for the female participants. Similarly, it is shown that the mean score for the male participants in the experimental group was $\bar{x} = 92.07$, and this number was $\bar{x} = 90.17$

for the female participants. Likewise, the mean scores reported for the performance level of the two groups, regardless of their gender, was $\bar{x} = 75.00$ for the control group and $\bar{x} = 91.12$ for the experimental group.

Analysis of the post-test results, as seen in the table, revealed that the mean scores on the post-test were much higher than those of the pre-test, suggesting that the participants made significant progress as a result of the treatment effect; however, a further look shows that the mean scores varied greatly, implying that the two treatment conditions might have differentially effected the participants' ESP reading comprehension abilities. The experimental group obtained a much higher mean score, suggesting that Synthesization had proved more effective on students' ESP reading comprehension ability than visualization. Similarly, the mean scores reported for the performance level of the two groups, with regard to their gender, was $\bar{x} = 83.77$ for the male participants and $\bar{x} = 82.35$ for the female participants. The mean score for males was 1.42 points higher than females. This suggests that there might have been no significant difference between the total scores of the two groups on the post-test of ESP reading comprehension. In other words, the groups were almost at the same level of ESP reading comprehension after receiving the treatment.

The inferential analysis of the pre-test scores was summarized in Table 3. The significant value for Levene's test is .593 which is higher than 0.05 alpha levels ($p > 0.05$). This suggests that the variance across the two study groups was the same, or the two groups were homogeneous, belonging to the same population at the beginning of the experiment. It shows that the assumption of homogeneity of variances is justified, and that the difference between the means is not statistically significant.

Table 3. Test of Homogeneity of Variances Based on the Pre-Test Means

	Levene Statistic	df1	df2	Sig.
Pre-Test Scores	.636	3	116	.593

The Levene's test provides the necessary conditions for the use of parametric tests like ANOVA analysis whose results were summarized in Table 4.

Table 4. ANOVA Analysis Results Reported for the Pre-Test Means

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
--------	-------------------------	----	-------------	---	------	---------------------

Corrected Model	29.400 ^a	3	9.800	.291	.832	.007
Intercept	272272.133	1	272272.133	8.077E3	.000	.986
Gender	.033	1	.033	.001	.975	.000
Groups	20.833	1	20.833	.618	.433	.005
Gender* Groups	8.533	1	8.533	.253	.616	.002
Error	3910.467	116	33.711			
Total	276212.000	120				
Corrected Total	3939.867	119				
a. R Squared = ,007 (Adjusted R Squared =,018)						

As can be seen in the table, the sig value for the ANOVA analysis reported for the mean difference between the two groups on the pre-test regardless of treatment is 0.975, which is again above 0.05 alpha levels ($p > 0.05$). Likewise, the sig value for the ANOVA analysis reported for the pre-test means of the two groups regardless of their gender is 0.433 which is above 0.05 alpha levels ($p > 0.05$). The implication is that there was no significant difference among these groups regarding their ESP reading comprehension ability before the administration of the treatment. This suggests that the variance across the two groups was the same, or the two groups were homogeneous, belonging to the same population at the beginning of the experiment.

The inferential analysis of the post-test was summarized in Table 5. As mentioned before, at the end of the experiment period, all the participants took a post-test of ESP reading comprehension. The post-test aimed to evaluate the progress of the learners over the course of the study as well as to find out which technique was more beneficial in furthering the participants' knowledge of ESP reading comprehension.

Table 5. Test of Homogeneity of Variances Based on the Post-Test Means

		Levene Statistic	df1	df2	Sig.
Post-Test Scores	Based on Mean	4.913	3	116	.003

As can be seen in the above table, the sig value for the Levene's test is 0.139, which is above the 0.05 alpha levels ($p > 0.05$). It means that the amount of variability seen in the post-test scores was the same across the two study groups. In other words, it can be contended that the scores in one condition did not vary too much compared to the scores in the other condition, which suggests that the assumption of homogeneity of variances is justified, and hence the condition is met for using parametric tests like ANOVA. Table 6 revealed the results of the ANOVA analysis for the post-test means:

Table 6. ANOVA Analysis Results Reported for the Post-Test Means

Tests of Between-Subjects Effects						
Dependent Variable: Post ESP						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7859.625 ^a	3	2619.875	87.759	.000	.694
Intercept	827842.408	1	827842.408	2.773E4	.000	.996
Gender	60.208	1	60.208	2.017	.158	.017
Groups	7792.408	1	7792.408	261.025	.000	.692
Gender* Groups	7.008	1	7.008	.235	.629	.002
Error	3462.967	116	29.853			
Total	839165.000	120				
Corrected Total	11322.592	119				

a. R Squared = .694 (Adjusted R Squared = .686)

As shown in the table, the sig value for the ANOVA analysis reported for the post-test means of the two study groups regardless of the treatment they received is 0.158, which is above the 0.05 alpha level ($p > 0.05$). The implication is that there was no significant difference between male and female subgroups regarding their ESP reading comprehension ability after the administration of the treatment. This suggests that there is no statistically significant difference in the performance level of male and female participants on measures of L2 ESP reading comprehension ability regardless of the treatment they received on their ESP reading comprehension performance. This supported the second null hypothesis.

On the other hand, the sig value for the ANOVA analysis reported for the means of the two study groups regardless of gender is 0.000, which is below 0.05 alpha values, suggesting that there was a statistically significant difference between the post-test scores of the two groups. In other words, there was a statistically significant difference between the post-test means as determined by the two-way ANOVA, which in turn suggests that the two groups belonged to two different populations at the end of the experiment. Thus, the results showed that there is a statistically significant difference in the performance level of the participants who received treatment through focusing on visualization and that of those who received treatment via focusing on synthesization in teaching ESP reading comprehension on measures of ESP reading comprehension ability. This rejected the first null hypothesis.

Finally, the level of significance for the ANOVA analysis reported for the means of the two study groups concerning the interaction effect of participants' gender with treatment is 0.629 which is above the 0.05 alpha level ($p > 0.05$). This suggests that gender does not interact with treatment in such a way as to produce a statistically significant effect on the ESP reading comprehension ability of the participants. This supported the third null hypothesis of the study.

The mean scores do not vary greatly on the post-test, and the mean difference is small. The implication is that the two groups belonged to the same population at the beginning of the study, and the comparison group participants obtained a much higher mean score in comparison to those in the control group. This suggests that synthesization proved comparatively more effective in furthering students' knowledge of the ESP reading comprehension ability. In addition, the two lines do not intersect, suggesting that gender did not moderate the effect of treatment in such a way considered to be statistically significant.

Discussion

Teaching and learning reading comprehension strategies could have considerable effect on improving reading comprehension. The current study focused on the effect of two models of reading comprehension strategies introduced by Zimmerman and Hutchins (2003), Information Synthesization and Visualization on reading comprehension of ESP context. The result indicated that Iranian university students who were trained through information synthesization received significantly higher grades on ESP reading comprehension than did the students in the comparison group, who were trained through visualization.

In the present study, however, both groups showed considerable improvement in their ESP reading comprehension ability, and scores were significantly higher in the experimental group, where the learners received treatment with information synthesization, in comparison with the comparison group, where the learners receive

treatment with visualization. As such, all the students in the experimental group, achieved a higher mean score compared to the other group students, implying that the use of information synthesization had proved to be comparatively more interesting and effective in furthering learners' ESP reading comprehension ability. In other word the data presented by this study implied that applying Information Synthesization strategy is more helpful in making the students pedagogically independent readers.

The results further revealed that there was no statistically significant difference in the performance level of male and female participants on measures of ESP reading comprehension ability, regardless of the treatment they received on their ESP reading comprehension ability, and indicated that gender did not interact with treatment in such a way as to produce a statistically significant effect on the ESP reading comprehension ability of the participants . By extension, the present study sought to identify and evaluate the relationship between using Information Synthesization strategy and visualization strategy and development of Iranian ESP reading comprehension ability. A few research studies have been conducted so far on reading comprehension strategies in ESP reading comprehension. Although the finding revealed a significant effect of Information Synthesization (IS) over Visualization (V) in relation to the reading comprehension of the ESP texts, the instructional effect would be greater if the instructional strategy of information synthesization was combined and integrated with visualization, and ESP reading comprehension would be better.

According to the results, the post-test scores of the students in comparison group were significantly different from their pre-test means. This finding is in line with the findings of previous researches on visualization (Kordjazi, 2014; Roohani, Jafarpour, & Zarei, 2015) suggesting that visualization could help ESP and ESL students enhance their reading comprehension and also support the researches on Information Synthesization (Goldman & Scardamalia, 2013; Lundstrom, Diekema, Leary, Haderlie & Holliday, 2015), indicating that information synthesization as reading comprehension strategy was beneficial for students to become information literate.

Regarding the first null hypothesis, the results revealed that the students' ESP reading comprehension scores were significantly higher for the comparison group than for those in the control group. Accordingly, it can be argued that Information Synthesization had proved more effective in improving the students' ESP reading comprehension ability. Therefore, the first null hypothesis was rejected.

Regarding the second null hypothesis, analysis of the post-tests means suggested that there was no statistically significant difference in the performance level of male and female participants on measures of ESP reading comprehension ability regardless of the treatment they received on their ESP reading comprehension performance. Therefore, the second null hypothesis is supported. Regarding the third null

hypothesis, like the second hypothesis, the results indicated that gender did not interact with treatment in such a way as to produce a statistically significant effect on the ESP reading comprehension ability of the participants. Therefore, the third null hypothesis, too, was supported.

The conclusion of this study is in line with the action research which was a productive experience done by Küçüköğlü (2013) who has seen an increased understanding of reading comprehension strategies and an improvement in reading comprehension of his students, so he recommended continuing using these strategies in other curriculums.

The main findings of the study obtained through analysis of the results of between-subjects effects were presented and elaborated on. The findings and conclusions of the present investigation were presented in two main sections discussing the results of descriptive and inferential analyses of the collected data. As the results showed, the control group's gain was not as dramatic as that of the comparison group irrespective of the gender group to which they belonged. It was suggested, therefore, that the Information Synthesization (IS) had proved more effective in harnessing the students' ESP reading comprehension ability.

Conclusion and Implications

The findings obtained in this study showed that successful ESP readers not only gain technical information pertaining to their major, but also, take advantage of proper strategy to develop and improve their quality of their study. Information synthesization and visualization are two strategies that help ESP readers to improve their reading comprehension. This study had some theoretical and pedagogical implications for teachers, researchers, materials writers, course and syllabus designers, curriculum and test developers, teacher trainers, learners and students in the field of language teaching and learning in ESP contexts, who can use the findings of this study to improve the condition and status of language teaching in Iran. The findings of the study might help syllabus designers to revise the objectives of syllabus design. It might necessitate a change of attitudes towards what it is that makes up a syllabus. This study has theoretical and pedagogical implications for those who teach ESP courses. In addition to this, the students themselves could benefit from the conclusion and apply it in reading comprehension. The finding of this study could help those dealing with foreign language teaching, such as syllabus designers, material developers, test makers, and the like. The other strategies of reading also can provide a basis for further research.

References

Aghvami, D. (2019). *English for the students of Accounting I*. Tehran: SAMT.

- Ajjideh, P., Zohrabi, M., & Pouralvar, K. (2018). The effect of explicit instruction of metacognitive reading strategies on ESP reading comprehension in academic settings. *International Journal of Applied Linguistics and English Literature*, 7(4), 77–86.
- Brown, H. D. (2001). *Teaching by principles: An interactive approach to language pedagogy (2nd Ed.)*. White Plains, NY: Pearson Education.
- Carrell, P. L., Gajdusek, L., & Wise, T. (1998). Metacognition and EFL/ESL reading. *Instructional Science*, 26(1–2), 97–112.
- De Koning, B. B., & van der Schoot, M. (2013). Becoming part of the story! Refueling the interest in visualization strategies for reading comprehension. *Educational Psychology Review*, 25(2), 261–287.
- Dudley-Evans, T., & Jo St John, M. (1998). Developments in English for Specific Purposes. A Multi-Disciplinary Approach. *Ibérica*, 0, 521–59329. [https://doi.org/10.1016/S0889-4906\(99\)00026-5](https://doi.org/10.1016/S0889-4906(99)00026-5)
- Goldman, S. R., & Scardamalia, M. (2013). Managing, understanding, applying, and creating knowledge in the information age: Next-generation challenges and opportunities. *Cognition and Instruction*, 31(2), 255–269. <https://doi.org/10.1080/10824669.2013.773217>
- Janfeshan, K., & Pourarian, M. M. (2017). *The impact of gender on using reading sub-skills in Iranian EFL learners reading comprehension*. 5(2), 47–60.
- Jayanti, F. G., & Dewi, A. S. C. (2018). *READING ABILITY AND STRATEGIES OF STUDENTS IN COASTAL*. 10(1), 36–42.
- Kalua, F. (2012). Reading for empowerment: Intertextuality offers creative possibilities for enlightened citizenry. *Reading & Writing-Journal of the Reading Association of South Africa*, 3(1), 1–5.
- Küçükoğlu, H. (2013). Improving reading skills through effective reading strategies. *Procedia - Social and Behavioral Sciences*, 70, 709–714. <https://doi.org/10.1016/j.sbspro.2013.01.113>
- Lundstrom, K., Diekema, A. R., Leary, H., Haderlie, S., & Holliday, W. (2015). Teaching and learning information synthesis: An intervention and rubric based assessment. *Communications in Information Literacy*, 9(1), 60–82. <https://doi.org/10.15760/comminfolit.2015.9.1.176>
- Martínez, I., Mateos Sanz, M. del M., Martín, E., & Rijlaarsdam, G. (2015). Learning history by composing synthesis texts: Effects of an instructional programme on learning, reading and writing processes, and text quality. *Journal of Writing Research*.

- McNamara, D. S., & Magliano, J. (2009). Toward a comprehensive model of comprehension. In *Psychology of Learning and Motivation - Advances in Research and Theory* (1st ed., Vol. 51). [https://doi.org/10.1016/S0079-7421\(09\)51009-2](https://doi.org/10.1016/S0079-7421(09)51009-2)
- Niknejad, S., & Rahbar, B. (2015). Enhancing EFL learners' reading comprehension ability through multimedia-based visualization. *Journal of Applied Linguistics and Language Research*, 2(6), 119–127.
- Pitches, N., O.N.Z.M., & BA, Me. A. (2008). *Comprehension strategies instruction incorporating vocabulary and fluency in the middle years of schooling; research evidence that supports the comprehension strategies instruction (CSI) resource*. South Pacific Press and Pacific Learning.
- Roohani, A., Jafarpour, A., & Zarei, S. (2015). Effects of visualisation and advance organisers in reading multimedia-based texts. *3L: Language, Linguistics, Literature*, 21(2), 47–62.
- Somekh, B., Haldane, M., Jones, K., Lewin, C., Steadman, S., Scrimshaw, P., ... Woodrow, D. (2007). Evaluation of the primary schools whiteboard expansion project - summary report. *Report to the Department for Children, Schools and Families*, (October), 1–12. <https://doi.org/10.1121/1.3628663>
- Tabrizi, A. N., Zununi Vahed, F. (2017). *Learner strategies and test-wiseness of the intermediate and advanced Iranian TOEFL iBT test takers*. *Journal of Applied Linguistics and Applied Literature: Dynamics and Advances*, 5(2), 91–100.
- Zafarani, P., & Kabgani, S. (2014). Summarization strategy training and reading comprehension of Iranian ESP learners. *Procedia - Social and Behavioral Sciences*, 98, 1959–1965.
- Zimmerman, S., & Hutchins, C. (2003). *7 keys to comprehension*. New York: Three Rivers Press.

Authors' Biographies



Somayeh Sheikhpour Ahandani received her B.A. degree in English Translation from the Islamic Azad University, Rasht Branch, Iran, in 2004 and her M.A. degree in English Teaching from Islamic Azad University, Takestan Branch, in 2006; she is currently a Ph.D. candidate at Islamic Azad University, Tonekabon Branch. Since 2011, she has been a faculty member at Islamic Azad University, Astaneyeh Ashrafiyeh Branch. She can be reached via her email address: s.sheikhpour@gmail.com



Mohammad Reza Khodareza is an Assistant Professor at Islamic Azad University, Tonekabon Branch, in Tonekabon, He is interested in Teaching English as a Foreign Language, Applied Linguistics, and Pragmatics. He received his PhD degree from Esfehan university. He can be reached via his email address: M.khodareza@toniau.ac.ir
