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The Effect of Teacher-led vs. Student-directed Inquiry-based Learning on Argumentative Writing Enhancement

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Abstract

Though an entrenched and well-established domain of investigation, inquiry-based learning seems to have remained a partly under-researched concept in pedagogy and language learning. Informed by this dearth of research on the issue, the researchers in the current study probed into the effectiveness of inquiry-based approach for bettering intermediate EFL learners' argumentative writing. Utilizing a quasi-experimental design, the current researchers selected three intact classes comprised of 45 institute learners aged between 18 and 20 and assigned them to two experimental groups and a control group. To conduct the study, a homogeneity test, and pretest and posttest of argumentative writing (each containing a 250-word essay adopted from IELTS Task 2) were administered to all he participants. Two kinds of Inquiry-based approach, teacher-led vs. student-directed, were carried out with the two experimental groups. Data analysis through one way ANOVA and Tukey test pointed to a significant difference among the three groups on the posttest. In addition, it was found that both teacher-led and guided modes of inquiry-based learning were equally helpful for boosting learners' writing ability. The implications of the results are discussed in detail throughout the paper.

Keywords: argumentative writing, inquiry-based learning, student-directed inquiry, teacher-led inquiry

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1. Introduction

In view of the significant role played by Inquiry-based Learning (IBL) in the new era, Dewey encouraged teachers to use inquiry as a practical method for streamlining their classes. Being in compliance with student-centered and communicative approaches to learning, inquiry-based instruction advocates the kind of learning in which the teacher must act as a facilitator rather than the direct imparter of knowledge to learners as passive receptacles. Thus, assuming responsibility for one's learning and activating the inner criteria for evaluation of one's progress are among the key objectives of inquiry-based learning. Having its roots also in Socrates' philosophy of education, IBL capitalizes not only on gaining knowledge through active engagement with the concepts to be learnt, but also learning how to live properly in the society (Friesen & Scott, 2013).

It ought to be stated that IBL is a form of teaching which has emanated from the constructivist approach that states learners should be self-reliant and dependent on their inner criteria for learning, evaluation and gaining knowledge. Indeed, "Constructivism's central idea is that learning is an active process in which learners construct new ideas or concepts based upon their experiences and prior knowledge" (Kanselaar, 2002, as cited in Rooney, 2012, p. 5).

To maximize the effectiveness of inquiry-based approach and to reach deep understanding, inquiry ought to take a distance from traditional approaches that emphasize student-fronted classes and support students by scaffolding activities. It must be noted that by employing scaffolding activities, IBL provides the learners with the necessary strategies, tools, and guidance to improve their achievement, and by way of doing so, prioritizes formative assessment and self-assessment. Though inquiry may take different forms, the leading classification of inquiry-based learning components seems to be the one put forth by Banchi and Bell (2008) in which they introduce four categories of inquiry-based learning, i.e. confirmation-inquiry, structured-inquiry, guided inquiry and open/true inquiry. In what follows, a brief explication is provided for each of these four categories:

The first type of inquiry, dubbed Confirmation Inquiry, requires the teacher to teach a particular scientific theme or topic. Students are provided with the questions which are known in advance, and are led through the task with a pre-programmed procedure and pre-designed questions. In this type of IBL, the teacher enjoys complete control over every phase. All decisions on the topic are led by the teacher and the students are supposed to perform on related activities.

In much the same way, in Structured Inquiry the teacher assumes the domineering role and initiates the questioning and outlines the procedure. Thus, teachers can highly impact on students' learning and make learning a less daunting and enjoyable experience. Then, teacher support can direct students during the phases of inquiry. As such, students should work on the solution through collection of data. Alternative phases include questions, hypotheses, opertionalism and data collection, and the students are required to perform the rest of the phases.

In the third type of IBL, i.e. Guided Inquiry, the educator has responsibility for selecting the topic or theme and creating the hypotheses. As the name speaks for itself, teacher's responsibility is reduced to that of facilitator. In case need is felt for further assistance to be provided for the learner, the teacher can guide the process and help students.

Finally, the last category of inquiry, known as Open/True Inquiry, contrary to structured one, is highly student-fronted and hence a lower level of teacher control is exercised here. It is the most demanding level of inquiry, for the learners are supposed to derive questions, design the procedure and discuss related results.

It should be pointed out that the researchers in the current study adopted the framework proposed by Banchi and Bell (2008) elaborated above. However, owing to the analogous nature of confirmation and structured types of inquiry, these two categories of IBL were blended into a single category termed teacher-led inquiry. Likewise, as guided and open inquiry had a lot in common, they were also merged into one category dubbed student-directed inquiry for the sake of the study. It's worth noting that the former (teacher-led inquiry) relied more on teacher intervention, while the latter (student-directed inquiry) drew more heavily on learner control and initiation.

Critical thinking has an important effect on being successful in academic settings. In the past, in the Iranian writing classes, product was highlighted and there was scant attention to the process writing, and effective arguments both with and against propositions (Hashemi et al., 2014). In this regard, argumentative writing is an important and significance skill especially through school and also after it (Crowhurst, 1990; Nippold, 2000). One reason underpinning the salience and significance of argumentative writing might be its centrality in most standard examinations including Test of English as a Foreign Language (TOEFL) and International English Language Testing System (IELTS). Despite the ubiquity of current preparation courses, mock tests and widespread tips and guidelines, argumentative writing still proves to be one of most demanding and challenging types of writing for students at different levels of proficiency. One potential reason for this difficulty might be the need for negotiation between the

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writer and the reader, as well as the power of persuasion for the readers regarding the arguments and counter-arguments raised in writing (e.g., Jalilifar et al., 2012).

1.1 Statement of the Problem

In the literature on L2 writing, a myriad of approaches and strategies have been recommended to help L2 learners write in an efficient way. Among the available techniques for improving writing, it seems that inquiry-based learning is likely to make the greatest contribution to learners' writing enhancement. Though numerous studies, to date, have addressed different aspects of IBL like its implications for enhancing speaking (e.g., Irham & Jayanti, 2020), and improving thinking skills (e.g., Wale & Bishaw, 2020), as well as the perceptions concerning its efficacy and challenges (e.g., Al Maharma & Abusa'aleek, 2022; Salehi & Alavinia, 2021), very few investigations have probed the contribution of this approach to furthering one's writing skill, among which reference can be made to the studies by Derseh (2020), Nabhan (2017), and Tavanapour and Chalak (2021). However, the findings appear to be inconclusive regarding the effectiveness of inquiry-based instruction for learners' achievement, in general, and writing enhancement, in particular. Therefore, the present study tried to fill in the gap by shedding more light on the impact of the inquiry-based approach on Iranian high school learners' argumentative writing betterment. Altogether, as regards of the main objectives of the current research, the researchers were after performing an in-depth probe into the contribution of IBL to enhancing EFL learners' writing skill, in general, and fostering argumentative writing ability, in particular.

2. Literature Review

The literature related to IBL includes a step-by-step involvement with the process of learning not the mere product. Barrows (1996) pointed out that IBL is a student-fronted approach, yet goes on under the supervision of a teacher, who is just like an orchestra leader and facilitator in the course of learning in a small group. It should be borne in mind that to solve related problems, students don't receive any information from any resources including teachers and based on their own information should make every effort to solve the problems.

In the case of design-based learning, Barron and Darling-Hammond (2008) argued that students would bring along artificial tasks for which they need to employ related knowledge which has been drawn from a specific discipline, produce ideas and test their own production. Another line of thinking about inquiry-based learning focuses on the student as a researcher. There have been few studies regarding inquiry-based learning and its effect on instructional betterment. Among the few studies conducted, reference can be made to Amaral et al.'s (2002) research which concluded achievement is highly affected by the practice of inquiry-based approach.

In an investigation on the efficacy of inquiry-based approach for learning, Luke (2006) embarked on a research in the Spanish context. Working with the university sophomores, he strove to probe the potential effect of inquiry-based teaching on learners' enhancement in terms of autonomy, self-directed learning and curricular negotiation. He concluded that though inquiry-based instruction leads to better outcomes in terms of autonomous learning, in the initial stages, the learners' attempts must be scaffolded by the teachers.

Wix and John-Steiner's (2008) research advocated a novel line of inquiry-based learning, referred to as peer inquiry aimed at the co-construction of knowledge. In the dialogical approach they introduced, peer inquiry functioned as the main thread integrating learners' attempts in the co-construction of knowledge. The study also delved into learners' attitudes about the process and reflected their positive voices about the issue.

In another study, Jia et al. (2017) conducted a research on the influence of inquiry-based instruction on problem finding ability of Chinese learners. Implementing two distinct methodologies for applying inquiry-based approach, the researchers tried to gauge the potential effect of inquiry-based teaching on learners' creativity improvement in terms of problem finding ability. In the first methodology, the researchers applied lecturing and inquiry-based approach in isolation, whereas in the second one they integrated the two approaches. The results were in favor of the group which was exposed to lecturing and inquiry-based teaching simultaneously.

A quick glance through the literature on inquiry-based approach indicates that two major strands on which IBL research has focused are the implications of inquiry-based approach for improving language skills (Derseh, 2020; Irham & Jayanti, 2020; Nabhan, 2017; Tavanapour & Chalak, 2021), and the perceptions of educational stakeholders regarding its opportunities and challenges (e.g., Al Maharma & Abusa'aleek, 2022; Salehi & Alavinia, 2021).

In the first study falling within the first strand of research, Nabhan (2017) probed the implications of implementing inquiry-based approach along with ongoing assessment and blogging with regard to essay writing ability of the students. The purpose of the study was to address the problems the students faced in writing essays. Based on the

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findings, it was revealed that the experimental group outperformed the control group in essay writing as a result of the practice of IBL and ongoing assessment.

Addressing the efficacy of using Inquiry-based learning for fostering learners' speaking skill, Irham and Jayanti (2020) implemented an IBL-based instruction in a course focused on students' speaking and listening skills. A set of data collection tools, including questionnaires, interviews, field notes and oral tests were utilized in the study. In line with the findings, IBL brought about not only improved speaking performance but also higher self-esteem for learners.

In a study more relevant to the aims of the current research, Derseh (2020) explored the efficacy of IBL for enhancing EFL students' argumentative writing. To conduct the research, he selected 20 participants and using time series design, gathered data by means of focus group discussion, tests and reflective journals. As the findings indicated, implementing IBL led to a significant enhancement in students' argumentative essay writing performance.

In a similar vein, Tavanapour and Chalak (2021) considered the viability of Iranian EFL learners' writing enhancement, particularly as regards grammatical accuracy, through the application of IBL. In so doing, 90 intermediate EFL learners were involved in a quasi-experimental design of research. The findings pointed toward a significant degree of enhancement within the experimental group resulting from exposure to IBL.

As regards the second strand, reference can be made to Al Maharma and Abusa'aleek's (2022) work, in which the challenges facing EFL teachers in Jordan while using inquiry-based approach were investigated. Using survey method, they conducted the study on 50 teachers. As the findings disclosed, though the teachers were aware of the efficacy of IBL, they referred to the major challenges and impediments on the way of implementing it, including the availability of proper materials and resources.

In a similar vein, Salehi and Alavinia (2021) examined the perceptions of EFL teacher educators as to the importance, opportunities and challenges attributed to IBL. To carry out the study, a total of 100 teacher educators were randomly selected from the context of Farhangian universities in Iran, and administered the questionnaire and interview. The results, all in all, divulged the positive attitudes of participants toward IBL.

Finally, Inoue et al. (2019) touched upon the role of expertise in running appropriate inquiry-based classes. In doing so, they selected eight leading math teachers from a Japanese elementary school. To gather data, they made use of class observation and interview. As the results depicted, the classes these experienced instructors taught were characterized by a number of key features including whole-person development, adaptability, inclusiveness and collective inquiry. This collaborative nature of practice in writing skill is also highlighted by other researchers including Ameri-Golestan and Nezakat-Alhossaini (2017).

In recent years, inquiry has entered novel domains including teachers' professional development through collaborative practice of inquiry. As a case in point, Voet and De Wever (2017) devised a training program for IBL for pre-service teachers working in the field of history. The findings pointed toward the effectiveness of inquiry-focused training via workshops on student teachers' self-efficacy development as well as attitude change.

In like manner, DeLuca et al. (2017) probed elementary school teachers' perspectives concerning the practice of collaborative inquiry. To conduct the study, 292 teachers chosen from 15 school districts were recruited and asked to voice their attitudes toward collaborative inquiry. The results obtained via survey and focus group interviews pointed to a number of factors enhancing collaborative inquiry, including autonomy, interactivity, improved student outcomes and access resources, as well as some hindering facets, such as students' unwillingness, teachers' lack of confidence, colleague's unwillingness, along with fear and negative perception of the concept.

In still another attempt, Lachuk et al. (2019) researched the effect of collaborative inquiry on developing preservice teachers' integrity and trustworthiness. As they concluded, the practice of collaborative inquiry had proved helpful in changing the teachers' mentalities regarding the concept, and led them to integrate the inquiry-based practice in their teaching career. Based on the sketchy account of the literature provided above and to the researchers' best knowledge concerning the studies browsed, it seems that despite its utmost importance for improving learning, inquiry-based learning has remained an under-researched area in education. Furthermore, in the field of TEFL and language learning, few attempts have been made to explore its effects on different language skills and particularly on writing enhancement. Thus, to fill the gap in this regard, the researchers in the current study strove to investigate the effect of Inquiry-based approach on Iranian EFL learners' writing enhancement. In line with the aims of the present study, the following research question was formulated:

RQ: Is there any significant difference between the effects of two different modes of inquiry-based approach (teacher-led vs. student-directed) on Iranian senior language school students' argumentative writing enhancement?

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3. Methodology

3.1 Design of the Study

In dealing with the research question set forth in the study, a quantitative, quasi-experimental design was employed. Overall, through this design, the impact of Inquiry-based approach on argumentative writing was gauged via running one-way ANOVA, post-hoc Tukey test, and Kruskal Wallis test. Indeed, this design was opted for on account of the fact that there were three groups of participants in the study, and except random selection, all the other requirements of an experimental design were met. In other words, randomization was not possible to be applied in the study due to the administrative regulations of the language school where the study was conducted.

3.2 Participants

To conduct the study, three intact classes (a total of 45 learners) were selected through convenience sampling. Each group was composed of 15 participants learning English as a foreign language in TAK English language institute in Khorramabad, Iran. The participants were at intermediate level of proficiency and their age ranged from 18 to 20. They attended the classes three times a week.

It is worth noting that only female students were employed in the study and because of the inaccessibility of male participants, they were put aside. The three classes were non-randomly selected and assigned to one control group, and two experimental groups. Indeed, the participants were selected based on convenience sampling. It should be stated that the first researcher in the current study was the instructor of all three classes. He did his best to teach in the same way throughout the term to make sure that apart from the variable related to treatment, the writing instruction would proceed in an identical manner in all three groups.

3.3 Instruments

After administering the homogeneity test, the participants were asked to write a 250-word argumentative essay (selected from IELTS Task 2) about the given topic in 45 minutes. This piece of writing served as the pre-test of the study. The purpose of administering the test was to measure the participants' prior writing skill before the administration of treatment on argumentative mode of writing.

At the culmination of the treatment, a post-test was given in which the learners were asked to write a 250-word argumentative essay (another excerpt from IELTS Task 2) in order to measure the effect of the different kinds of instructions they received on their ability to write an argumentative essay. The point that should not be overlooked is that an attempt was made to select a topic which was at the same level of difficulty as the pretest topic. As pointed out above, the purpose of administering the posttest was to measure the improvement of the participants' performance on argumentative writing after receiving different kinds of treatment.

3.4 Procedure

At the outset of the study, all participants were told that all information and details of data collection would be kept confidential. The first step in the current research was administering the proficiency test (Oxford Placement Test) for the sake of homogenizing learners. Successive to this, the students were randomly assigned to one control and two experimental groups. Each group contained 15 participants and all the participants were female. In the third session which was allotted to pretest, all three groups were given a topic in argumentative mode of writing.

They were asked to write and complete the argumentative essay in at least 250 words on the same session and within the allotted time which was 45 minutes. Afterwards, the treatment via inquiry-based approach was implemented in the experimental groups for a matter of 6 weeks. Each session of the treatment was held in 45 minutes and three times a week for the experimental groups. In fact, while all groups experienced the same regular writing class with the same writing exercises and assignments, the researchers applied different kinds of inquiry-based treatment for each of the experimental groups.

In running the treatment via inquiry-based learning, the guidelines and the framework offered by Banchi and Bell (2008) were adopted, in which four major categories of IBL were put forth, i.e. confirmation inquiry, structured inquiry, guided inquiry and open/true inquiry. However, as stated before, due to the similarity existing between confirmation and structured inquiry, on the one hand, and guided and open inquiry, on the other, the first two categories were labeled teacher-led inquiry in the current study, whereas the other two categories were dubbed student-directed inquiry for the sake of the study. It's worth reiterating that in the former (teacher-led inquiry) more teacher intervention was applied, whereas in the latter more learner control and initiation was exercised.

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3.4.1 Scoring Rubrics for Measuring Writing

In scoring the participants' written work on pretest and posttest, the scoring rubrics offered by the University of Oregan, Department of Education (2010-2011) were found to be handy. In this set of rubrics for rating learners' writing, seven criteria were offered, i.e. ideas and content, organization, voice, word choice, sentence fluency, conventions and citing sources. Each criterion on the scale was given 6 points. Thus, the total score of the participants would amount to a total of 42 which was regarded as the maximum score for the test.

Despite the accurate guidelines provided by the above-mentioned scoring rubrics, to further diminish the degree of subjectivity of scores, two raters were asked to score all learners' written production on both pretest and posttest. Thus, interrater reliability indices were obtained (see Tables 1 and 2 below).

Table 1. Inter-rater reliability coefficients for the scores given by two raters on pretest

Scorers	Pearson Coefficient of Correlation
Pretest	r = .92

Table 2. Inter-rater reliability coefficients for the scores given by two raters on posttest

Scorers	Pearson Coefficient of Correlation
Posttest	r = .90

3.4.2 Data Collection

As stated earlier, to collect the data for the current study, use was mainly made of two excerpts of IELTS Task 2, which were argumentative in nature, and the participants were required to write in at least 250 words and complete the task in a matter of 45 minutes. Successive to the pretest of argumentative writing and after obtaining the initial data about their pre-treatment argumentative writing performance, a six-week treatment was carried out, after which the data were gathered for posttest of argumentative writing using another similar version of IELTS Task 2. The details of data analysis are provided in the next section.

3.5 Data Analysis

In exploring the research question which probed the would-be effect of IBL on learners' writing enhancement in the argumentative mode, initially normality statistics were run. While the pretest data violated the normality conditions, the posttest scores were found to be normally distributed. Thus, Kruskal Wallis test was run for pretest, whereas one-way ANOVA was calculated for posttest data, followed by Tukey HSD test.

4. Results

In dealing with the research question, initially Kolmogorov-Smirnov test was run on pretest scores. As the score were found to violate the conditions for normal distribution, non-parametric statistics were used for analyzing the pretest data. Table 3 below shows the descriptive statistics for pretest scores, and Table 4 illustrates the test of normality results.

Table 3. Descriptive statistics for pretest scores

			Statistic	Std. Error
Pretest	Mean		17.0000	.32567
	95% Confidence Interval for Mean	Lower Bound	16.3437	
		Upper Bound	17.6563	
	5% Trimmed Mean		16.9198	
	Median		17.0000	
	Variance		4.773	
	Std. Deviation		2.18466	
	Minimum		13.00	

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	Maximum	23.00	
	Range	10.00	
	Interquartile Range	3.00	
	Skewness	602	.354
	Kurtosis	208	.695

As revealed in Table 3, the mean of pretest scores is 17.00, and the variance and standard deviation of the scores are 4.77 and 2.18, respectively. Furthermore, the maximum and minimum scores on the test are 23 and 13, respectively.

Table 4. Test of normality for pretest scores

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Pretest	.167	45	.003

As is seen in Table 4, the pretest scores are not normally distributed ($p < .05$); therefore, the non-parametric equivalent of one-way ANOVA, i.e. Kruskal Wallis test, is run on pretest achievement scores. Tables 5 and 6 show the mean ranks for the scores of three groups on pretest achievement test and Kruskal Wallis test results, respectively.

Table 5. Mean ranks for pretest scores

	Group	N	Mean Rank
Pretest	Cont.	15	20.13
	Exp 1 Teacher-led inq.	15	19.53
	Exp 2 Student-directed inq.	15	29.33
	Total	45	

As can be inferred from Table 5, the mean ranks obtained for control group and experimental groups 1 and 2 (teacher-led and student-directed inquiry) are 20.13, 19.53, and 29.33, respectively. This is indicative of the fact that the second experimental group outperformed the other two groups with a wider margin. However, to see whether the differences are statistically significant, the results of Kruskal Wallis test in Table 6 are to be consulted.

Table 6. Kruskal Wallis results for pretest scores

	Pretest
Chi-Square	5.381
df	2
Asymp. Sig.	.068
a. Kruskal Wallis Test	
b. Grouping Variable: Group	

As is seen in Table 6, there is no significant difference among the three groups in terms of argumentative pretest scores and hence it might be safe to claim that subsequent differences among the groups might be attributable to treatment effect. A similar process was followed for the posttest scores to ensure the normality of distribution of scores. Table 7 below shows the descriptive results and Table 8 illustrates the results of Kolmogorov Smirnov test.

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Table 7. Descriptive statistics for posttest scores

			Statistic	Std. Error
Posttest	Mean		26.1778	.69797
	95% Confidence Interval for Mean	Lower Bound	24.7711	
		Upper Bound	27.5844	
	5% Trimmed Mean		26.3889	
	Median		27.0000	
	Variance		21.922	
	Std. Deviation		4.68212	
	Minimum		15.00	
	Maximum		33.00	
	Range		18.00	
	Interquartile Range		7.50	
	Skewness		-.610	.354
	Kurtosis		-.421	.695

As revealed in Table 7, the mean of posttest scores is 26.17, and the variance and standard deviation of the scores are 21.92 and 4.68, respectively. Furthermore, the maximum and minimum scores on the test are 33 and 15, respectively.

Table 8. Test of normality for posttest scores

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Posttest	.129	45	.057

As illustrated in Table 8, the conditions for normality are met ($p > .05$), and hence parametric statistics via ANOVA can be run on posttest scores. Tables 9 to 10 show descriptive statistics, Levene's test results and ANOVA results for posttest scores.

Table 9. Descriptive statistics for posttest scores

Posttest								
					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Cont.	15	20.7333	2.96327	76511	19.23	22.3743	15.00	26.00
Exp 1 Teacher-led inq.	15	29.2667	2.46306	63596	27.27	30.6307	25.00	33.00
Exp 2 Student-directed inq.	15	28.5333	2.47463	.63895	27.1629	29.9037	24.00	32.00
Total	45	26.1778	4.68212	69797	24.7711	27.5844	15.00	33.00

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As is evident in Table 9, the mean scores obtained for the control group, and teacher-led and student-directed inquiry groups equal 20.73, 29.26, and 28.53, respectively. Furthermore, the standard deviations obtained for these three groups (control groups experimental groups one and two) are 2.96, 2.46, and 2.47, respectively. Table 10 below show the results of Levene's statistics for posttest scores.

Table 10. Levene's statistics for posttest scores

Posttest			
Levene Statistic	df1	df2	Sig.
.131	2	42	.878

Table 10 indicates the degree of freedom for the three groups which is 42 (three digits below the total number of participants in three groups), and the obtained *p*-value for Levene's test, which is .878 and hence above the alpha level of .05, and statistically non-significant. Table 11 below lists the results of one-way ANOVA for posttest scores.

Table 11. ANOVA results for posttest scores

Posttest					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	670.978	2	335.489	47.992	.000
Within Groups	293.600	42	6.990		
Total	964.578	44			

As Table 11 depicts, there is a significant difference among the performances of three groups on posttest ($p < .5$), and hence treatment via inquiry-based approach seems to have proven beneficial in bringing about the desired improvement among the experimental groups. Consulting the obtained mean scores (Table 9) also corroborates this claim. Further analysis through robust tests (Table 12) further supports this significant difference among the groups on posttest.

Table 12. Results of robust tests of equality of means for posttest scores

Posttest				
	Statistic[a]	df1	df2	Sig.
Welch	41.639	2	27.821	.000
Brown-Forsythe	47.992	2	40.666	.000
a. Asymptotically F distributed.				

Faced with this significant difference among the groups on posttest, the researchers then conducted multiple comparisons through Post Hoc Tukey test, the results of which are illustrated in Table 13 below.

Table 13. Post Hoc Tukey test results for posttest scores

Dependent Variable: Posttest						
Tukey HSD						
					95% Confidence Interval	
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Ssig.	Lower Bound	Upper Bound

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Cont.	Exp 1 Teacher-led inq.	-8.53333*	.96543	.000	-10.8789	-6.1878
	Exp 2 Student-directed inq.	-7.80000*	.96543	.000	-10.1455	-5.4545
Exp 1 Teacher-led inq.	Cont.	8.53333*	.96543	.000	6.1878	10.8789
	Exp 2 Student-directed inq.	.73333	.96543	.730	-1.6122	3.0789
Exp 2 Students-directed.	Cont.	7.80000*	.96543	.000	5.4545	10.1455
	Exp 1 Teacher-led inq.	-.73333	.96543	.730	-3.0789	1.6122

*. The mean difference is significant at the 0.05 level.

As the data in Table 13 indicate, there is a significant difference between the performances of both teacher-led and student-directed inquiry groups and that of control group. That is to say, both experimental groups have significantly outperformed the control group on posttest as a result of the applied treatment. Thus, the null hypothesis of research positing no significant difference between the effects of two different modes of inquiry-based approach (confirmation and structured vs. guided and open) on Iranian senior high school students' writing enhancement, was rejected.

5. Discussion

The researchers in the current study explored the potential impact of IBL on learners' argumentative writing betterment. As the findings helped reveal, the implemented methodology for teaching through two alternative modes of inquiry-based learning proved to be beneficial in producing the expected changes in learners' argumentative writing. The findings of the current research are in partial keeping with those obtained by Luke (2006). As stated earlier, his main objective was finding out whether learner autonomy can be improved through the practice of inquiry-based learning. As Luke stated, one of the major requirements for the success of IBL is attending to learners' needs and interests. In the current study, in like manner, one of the major preoccupations of the researchers was taking into account the learners' needs in terms of topic selection for writing. In addition, in implementing the principles of guided inquiry which was mainly highlighted in the second experimental group in the current study, the findings are found to corroborate the ones obtained by Luke who claimed that for producing a more successful practice of IBL, the researcher "is to find ways to guide and support learners in their initial excursions into these novel frameworks and environments" (p. 83).

The findings also provide support for the study carried out by Fahim and Hashtroodi (2012) in which the positive influence of critical thinking skills was argued for in producing more enhanced writing in argumentative mode. It can be argued that since critical thinking is one of the major components of IBL, their findings are in compliance with the current research where the effect of IBL on argumentative writing enhancement has been indicated. In like manner, Hahemi et al.'s (2014) research advocated the usefulness of critical thinking skills for improving argumentative writing.

Besides, the findings are thought to corroborate the ones gained by Jia et al. (2017), where the researchers advocated the efficacy of IBL for bringing about more creativity and better problem finding ability. They also found that integrating inquiry-based learning with students' experience of lecturing can prove to be more helpful in producing the desired outcomes in terms of creativity and problem-solving skill. The current finding also resonates with the one reported by Nabhan (2017). Though the method of implementing IBL in the current study and Nabhan's study are different (we worked within the framework of Banchi and Bell's model and he adopted a model integrated with ongoing, formative assessment), the effects IBL had on the learners' writing enhancement are comparable regardless of the method of inquiry-based approach opted for.

Moreover, the study finding is consistent with the one obtained by Derseh (2020), as he also concluded that IBL can bring about noticeable writing betterment. Though Derseh does not provide vivid explication on how inquiry-based approach was implemented in his research, and despite the fact that the design and instruments used in the current study are different from his, both his study and ours focused on the gains in argumentative wiring resulting from the practice of IBL, and in this respect both studies came up with similar results.

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Furthermore, the current researchers' finding corroborates the one attained by Tavanapour and Chalak (2021). Though they were mainly concerned with gains in terms of grammatical accuracy as a measure of writing ability and we had a more comprehensive set of rubrics for learners' writing performance, both studies were quasi-experimental in nature and came up with comparable conclusions as regards learners' writing betterment.

After all, moving in line with Aulls et al.'s (2015) claim, we might say that though at the first glance, inquiry-based and non-inquiry-based instruction may not seem to be drastically different, it does make a big difference to teach based on inquiry, which is characterized by a number of privileges, including improved planning and assessment, co-constructed, inclusive learning, and the more active student-fronted, learner-initiated and whole-person type of learning. Thus, drawing on the collective results gained through different studies, it might prove more kosher to opt for classes founded on the tenets of inquiry. This way, not only will our learners feel more responsible for their own learning, but they may also approach the learning task as a more enjoyable, thriving experience.

All in all, the studies and findings reported substantiate the prominent role of IBL in producing more enhanced writing. Informed by the collective results of the research studies, as well as the finding obtained in the current study, school and institute teachers are advised to reconsider the influential role of IBL in furthering learning, in general, and writing skill, in particular. Thus, it is hoped that through familiarizing the teachers with the benefits of IBL for enhancing learning outcomes, the researchers would be able to integrate such novel and fruitful teaching approaches into pedagogy. In this regard, mention can be made of Inoue et al.'s (2019) claim in which they properly stressed the critical role of expertise in successful practice of inquiry-based instruction.

6. Conclusion and Implications

The researchers in the present probe were after finding the potential effect of inquiry-based learning on learners' writing enhancement in terms of argumentative mode of writing. Drawing on the findings of research, it can be claimed that teachers' attempt in implementing IBL in learning contexts, particularly in EFL classes may prove quite beneficial in tackling learners' writing difficulties. Argumentative mode of writing as one of the most demanding genres of writing was found to be improved through the practice of IBL in the current study. Thus, English language teachers might be advised to take more account of this fruitful teaching technique for augmenting learning outcomes. The success of inquiry-based approach in leading to better learning outcomes, particularly in writing skill, is thought to be attributable to the prominence it gives to critical thinking and problem-solving skills.

In light of the above-mentioned findings, the results obtained in the current study can be beneficial for school and institute teachers, learners, course designers and education administrators. Every educational activity should be in harmony with context and the needs of the students. Students are used to receiving their lessons in the conventional manner by traditional teachers who are dominating them in their classes. Increasing the opportunity for students to be involved in inquiry-based activities can improve engagement with content and assist in the development of analysis and critical thinking skills. Also, with the trend in education to move away from teacher-centered instruction to a more student-centered approach, IBL gives teachers the opportunity to help students learn the content and course concepts by having them explore a question.

Another principal implication gleaned from the study findings is the need for endeavors targeted toward the effective education of the current young generation in all stages of learning in order to give the pupils knowledge and skills needed for their personal and social life within the modern society, and make their knowledge helpful for their future employability. One of the main means to create the challenging and stimulating environment on an international scale is thought to be the inquiry-based instruction.

The findings of the current study may also prove helpful in aiding teachers and educational administrators to create more room and devise better options for the implementation of IBL. As the results of the study at hand indicated, inquiry-based learning can underlie better learning outcomes, particularly when it comes to writing enhancement. Thus, the teachers (both at the schools and institutes) might be advised to make more active use of the techniques of inquiry-based approach to produce more enhanced learning outcomes. Argumentative writing is typically the most problematic genre of writing for learners. IBL, as indicated in the current study, can help alleviate learners' problems with this painstaking mode of writing. After all, as IBL has got its roots in Dewey and Socrates' groundbreaking theories of thought and reflection, it is thought that the findings of the current study may help all educational stakeholders have second thoughts about implementing the major tenets of these approaches, i.e. critical thinking and problem-solving abilities.

Like all other studies, the current research was not void of limitations. First and foremost, the selection of participants was one of the major sources of problem, as it is usually difficult to gain the students' consent to take part in research studies. Furthermore, the partially small size of the sample in the current study may be regarded as another limitation.

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For getting a more understandable knowledge, the results should be obtained with a larger sample. Moreover, as the researchers in the current study dealt with writing skill, the whole process of running the study was a time-consuming and demanding one. Furthermore, finding a way to get around the problem of subjectivity of writing scores was another major issue with which the researchers were faced. Next, the present study was conducted only on female students aged between 18 and 20. Thus, the findings cannot be far-reaching to other learners whose gender and age range might be different. Finally, the duration of experiment was not long enough to completely determine the effectiveness of IBL strategies instruction. Due to time pressure, the implemented methodology for teaching through IBL which was initially programmed for eight to ten weeks had to be reduced to six weeks for the treatment, owing to both the demanding nature of the task and procedure and lack of cooperation on the part of participants.

In view of the limitations of the study, the findings of this research might provide some incentive for replication, expansion, or evaluation in future in order to study different unknown perspectives of IBL. Some experimental studies are further required to acknowledge the role of IBL skills with reference to willingness to write (motivation, for example), individual styles of learning, the genre of writing, teacher's feedback on writing, and so forth. Future researchers might also need to probe if IBL is applicable to other settings so as to reveal how it will improve students' performance. Currently, writing as an important component in EFL context is not given enough attention by both learners and teachers in some institutions and universities in Iran. This study opens up more space for conducting several other relevant pieces of research regarding writing in the classes that enable learners to generate better writing skills. Finally, the future researchers might be recommended to research the effect of IBL on other genres of writing style (narration for example) including different age ranges and both genders.

Eventually, based on the findings of the study, teachers might be advised to integrate inquiry-based approach as the epitome of critical thinking and learner autonomy into their instructional agenda. Moving in this line may produce a more constructive and nurturing learning environment for learners, due to the fact that more learner choice, autonomy and interest can be generated through the appropriate practice of inquiry-based approach. At the end, it is hoped that through the findings of the current research, the teachers might be pushed toward opting for more novel approaches of teaching in line with constructivist, humanistic and social constructivist psychologies. Students in the new era are in more dire need of autonomous learning and critical thinking, and education in the new sense must move toward preparing learners for better social functioning in the postmodern epoch.

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