

The Relationship between Iranian EFL Learners' Linguistic and Logical Intelligences and the Frequency of Fallacies and Evidence in their Argumentative Writing: A Gender-based Study

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Abstract

The learners' ability to write a well-organized argumentative essay has gained prominence within the last decades. The multiple intelligences play a significant role in enhancing the precision of both language and thought during the writing process. The current study aimed at investigating the possible relationship between linguistic and logical intelligences and the frequency of informal fallacies and evidence types in Iranian EFL learners' argumentative essays. To the end, a total of 110 upper-intermediate EFL learners were asked to respond to the relevant items of Multiple Intelligences Developmental Assessment Scale (MIDAS) and to write an argumentative essay. The informal fallacies and four categories of evidence were identified using two models of argumentation. Among several categories of informal fallacies and evidence, only statistical evidence was absent in argumentative essays. The results of Pearson product-moment correlation coefficient revealed a significant relationship between the participants' linguistic and logical intelligences and the frequency of informal fallacies and evidence types in their argumentation. However, no significant difference was found between male and female EFL learners in terms of the frequency of informal fallacies and evidence types in their argumentative essays. The findings contribute to enhancing the efficiency of writing materials and courses by considering the learners' individual differences.

Keywords: argumentation, evidence, informal fallacy, linguistic intelligence, logical intelligence

Introduction

The learners' ability to write a well-organized argumentative essay has gained prominence within the last decades (Alagozlu, 2007). In this sense, enabling language learners to think critically and meet three standards of relevance sufficiency, and acceptability (RSA) in their argumentation seems to be of utmost significance (Johnson, 1998). This would avoid "error in reasoning" (Johnson, 1998, p.251) and thereby, enrich the learners' argumentative essays (Walton, Reed, & Macagno, 2010).

However, proficiency in writing is influenced by individual variables (Rubin, 1975). Among these variables, one which has received scant attention especially in EFL context is the learners' multiple intelligences (Lei, 2010). Indeed, being aware of the learners' intelligence profiles would help the instructors to make more informed decisions about their teaching techniques based on the students' strengths and weaknesses. The facilitative role of linguistic and logical intelligence types has been proven in enhancing the precision of both language and thought during the writing process (Grow, 1990; Marefat, 2007). The significance of the argumentative writing in academic context and the critical role of individual differences may prompt this question whether the EFL learners' linguistic and logical intelligences would relate to the strength of their argumentation.

Intelligence was traditionally conceived as a single fixed construct (Smith, 2001) determined through one's ability to answer some IQ test items (Po-Ying, 2006). However, Gardner (1983) challenged this view and put forth Multiple Intelligences Theory to widen "the scope of human potentials beyond the confines of IQ scores" (Armstrong, 2000, p.1). He defined intelligence as "the ability to find and solve problems, to respond successfully to new situations and to learn from one's past experiences" (Gardner, 1983, p.21). Gardner (1983) identified several types of intelligence including verbal-linguistic, musical, logical-mathematical, spatial-visual, bodily-kinesthetic, interpersonal, intrapersonal, natural and existential. From his viewpoint, an individual should be considered as "a collection of aptitudes" (Gardner, 1993, p.27). Accordingly, all human beings have at least eight types of intelligence and no two people, even identical twins, are of the same intelligence profile (Gardner, 2005).

Apart from its theoretical implications, multiple intelligences theory has been documented to be of pedagogically useful contribution to unravelling the students' strengths and weaknesses (Gardner, 2005). In other words, multiple intelligences theory has revolutionized the existing perceptions of the teaching practice and students' minds (Armstrong, 2000).

Since the introduction of multiple intelligences theory, a burgeoning research has increasingly shown the effectiveness of its application in educational programs. The works of several researchers have also supported the link between language learners' multiple intelligences and their overall language proficiency (Yeganefar, 2005), their reading achievements (McMahon, Ross, & Parks, 2004), their use of language learning strategies (Akbari & Hosseini, 2008), and their self-efficacy beliefs (Ahmadian & Ghasemi, 2017). Furthermore, a large bulk of studies has revealed how taking advantage of multiple intelligences in writing classrooms would provide the learners with ample learning opportunities and enable them to present well-structured written products (Grow, 1990; Borek, 2003; Marefat, 2007; Eng & Mustapha, 2010).

On the other hand, argumentation is "a verbal, social, and rational activity aimed at convincing a reasonable critic of the acceptability of a standpoint by putting forward a constellation of propositions justifying or refuting the proposition expressed in the standpoint" (van Emmeren & Grootendorst, 2004, p.1). The argumentation theorists' concern has always been delving into the "internal organization" of the argumentation. To the end, they have adhered to argumentation schemes as "forms of argument (structures of inference) that enable one to identify and evaluate common types of argumentation in everyday discourse" (Walton et al., 2010, p. 11). These schemes, in Walton and Reed's (2005) terms, envisage "stereotypical patterns of reasoning" (p. 1) and include *deductive*, *inductive*, and *defeasible* (also called *presumptive* or *abductive*) forms of argument (Walton et al., 2010). The third category of the forms of argument was entitled under the heading of fallacies (Walton, 2006). Fallacy is "an error in reasoning" (Johnson 1998, p.251) including formal fallacies which are detected by examining the form, and the informal ones which can be identified through examining the content of the argument. Both formal and informal fallacies

encompass "a particular kind of egregious error" and undermine the strength of an argument (Tindale, 2007, p.1). Although Johnson (1998) asserted that experts had achieved no clear consensus over the uniform classifications of the informal fallacies, he presented nine types of informal fallacies as follows:

- Ad Hominem: The argument that is posed against the person (Johnson, 1998).
- Appeal to Tradition: This fallacy, also called "argument from popular opinion", is committed in the case an argument is commonly embraced and accepted by the majority of people (Walton, 2006).
- Begging the Question: This fallacy is based on the assumption that the conclusion is often accused of "circular reasoning" because the support for the conclusion is itself supported by the conclusion (Johnson, 1998, p.271).
- Faulty Analogy: The fallacy of faulty analogy is identified when a conclusion is drawn based on bearing resemblance to some other thing an argument (Johnson, 1998).
- Fallacy of Either/Or (Black & White Fallacy or False Dichotomy): This fallacy is committed when it is erroneously assumed that there are only two alternatives to solve a problem (Johnson, 1998) and the argument goes ahead by showing unacceptability of one of the alternatives and concluding the truth of the other.
- Hasty Generalizations and Sweeping Generalizations: This type of fallacy occurs when a sweeping generalization is made based on an inadequate and unrepresentative sample (Johnson, 1998).
- Post hoc (False Cause & Effect Fallacy): This fallacy is identified when a conclusion is drawn based on assuming an unsound causal relationship between A and B (Johnson, 1998).
- Red Herring: This fallacy has roots in "the practice of using a herring, a particularly smelly fish when cooked, to divert hunting dogs from the scent of a fox" (Johnson, 1998, p.275).
- Violation of RSA Standards (relevance, Sufficiency, Acceptability): This fallacy occurs when the argument lacks related, adequate, and reasonable evidence (Trapp, Driscoll, & Zompetti, 2006). Indeed, the

argument is not well supported by irrefutable, convincing, and credible line of reasoning.

To delineate clusters of factors which might influence the quality of language learners' argumentative writing products, several studies have been conducted. In this regard, Helms-Park and Stapleton (2003) found no significant correlation between the overall quality of the argumentative essays and the overall voice intensity. Furthermore, scholars have conducted comparative analyses of argumentative essays (Hirose, 2003; Liu, 2005) to examine the possible L1 transfer. In addition, a growing body of empirical evidence has pointed to gender as a source of variation (Herring & Paolillo, 2006; Jones & Myhill, 2007). Not only the language learners' gender but also their problems in expressing their ideas in writing in a foreign language has also evoked serious lines of research in analyzing language learners' argumentative writing products (Alagozlu, 2007). In this regard, Alagozlu (2007) collected Turkish EFL students' argumentative essays and analyzed them in terms of critical thinking elements and individual voice since she had recognized their difficulty in producing their own claims and lack of encouragement to think critically. Moreover, under the influence of recent trends in educational settings, Ong and Zhang (2010) assessed the effect of task complexity on the fluency and lexical complexity of EFL students' argumentative writing.

More recently, Qin and Karabacak (2010) analyzed the structures of L2 university students' argumentative papers in light of Toulmin's (2010) model of argument structure including six elements of claim, data, counterargument claim, counterargument data, rebuttal claim, and rebuttal data. The results of the study demonstrated that an average paper had at least one claim supported by four pieces of data whereas fewer uses of the other four elements have shown to be a predictor of the overall quality of these papers. Moreover, having analyzed the critical thinking elements and individual voice, Alagozlu (2007) also identified the most frequent types of informal fallacies in Turkish EFL students' argumentative essays as *oversimplification*, *straw man fallacy*, *irrelevant conclusion*, *hasty generalization*, *begging the question*, and *ad hominem*. Her analysis of the argumentative writing products demonstrated less number of the reasons

and evidence types than the number of the claims. In other words, their arguments were not well-supported because of inadequacy of evidence.

In a seemingly similar attempt, Atai and Nasser (2010) also tried to explore the most frequent types of informal fallacies in the argumentative essays of Iranian EFL learners. Observing "*violation of RSA*" as the most frequently used informal fallacy in the EFL Iranian students' argumentative essays, they found out that the participants' gender, age, and discipline would make no significant differences in the frequency of use and types of informal fallacies in their writing products. However, one of the fallacies—the Violation of RSA, was observed more frequently in language learners' essays in disciplines of Humanities and Social Sciences and Languages and Arts.

Furthermore, extensive research on persuasiveness of different types of evidence has been conducted. According to Alagozlu (2007), evidence types are used to boost the argument and entail “an inference, from a set of statements, called premises to a statement called a conclusion of the inference” (Walton, 2006, p.726). Evidence has been classified into nine categories including personal experience, research studies, statistics, citing authorities, comparisons and analogies, pointing out consequences, facts, logical explanations, and precisely defining words (Ramage & Bean, 1999; as cited in Alagozlu, 2007). Before Hoeken and Hornikx's (2003) study of all four types of evidence for the first time, a plethora of researchers had extensively investigated the persuasiveness of anecdotal and statistical one (Levasseur & Dean, 1996). Since then, evidence types have been the subject of much research mainly in relation to cultural differences (Hornikx & Hoeken, 2007).

In this regard, a review of the existing literature indicates that much research has been conducted on both the learners' multiple intelligences and the quality of their argumentative writing. Yet, little is known about the quality of EFL learners' argumentative essays in terms of the frequency of informal fallacies and evidence types and their possible link to the learners' linguistic and logical intelligences in an EFL context. Hence, the current study attempted to bridge this gap through addressing the following questions:

1. Is there any significant relationship between Iranian EFL learners' linguistic and logical intelligences and the frequency of informal fallacies in their argumentative essays?
2. Is there any significant relationship between Iranian EFL learners' linguistic and logical intelligences and the frequency of evidence types in their argumentative essays?

To pursue the line of research considering the possible differences in the use of informal fallacies and evidence types which might be caused by the learners' gender, the following questions were also posed:

3. Is there any significant difference between Iranian male and female EFL learners in terms of the frequency of informal fallacies in their argumentative essays?
4. Is there any significant difference between Iranian male and female EFL learners in terms of the frequency of evidence types in their argumentative essays?

Method

Participants

The participants consisted of 110 (55 male and 55 female) Iranian EFL learners aged between 17 and 23. They have been studying English at the institutes for almost four years. Upper-intermediate language learners were included in the sample since the study focused on their ability to support their claims and a reasonable level of proficiency was required in order to prevent their reasoning from being tainted by their lack of proficiency. In addition, their nationality and first language background were controlled; they were all Iranian EFL learners with Persian as their first language. Table 1 shows the demographic background of the participants.

Table 1
Demographic Background of the Participants

No. of Students	110
Gender	55 male and 55 female
Proficiency Level	Upper-intermediate
Native Language	Persian
Nationality	Iranian

Instruments

To collect the required data, the following instruments were used.

Quick Version of Oxford Placement Test (OPT): OPT was administered to determine the participants' language proficiency. This test includes 60 items and the participants were given 30 minutes to answer them. According to the scoring criteria for OPT, those who scored between 36 and 45 were chosen as the participants of the study.

Multiple Intelligences Developmental Assessment Scale (MIDAS): MIDAS, designed by Shearer (1996), was used in this study. The relevant items to the intelligence types under the study were excerpted to determine the participants' intelligence scores. They consisted of 20 and 17 Likert-type items (from *a* to *f*, with *e* being the highest and *f* being "I don't know") tapping the linguistic and logical intelligences, respectively.

According to Shearer (2005), MIDAS enjoys high-intermediate to high range of internal consistency and is considered as a valid and reliable scale for measuring one's multiple intelligences. The Cronbach's alpha coefficients of 0.88 and 0.89 were obtained for these two sections measuring linguistic and logical intelligences in the current study.

Writing Task: The students were asked to write an argumentative essay of at most 250-word length within one and half an hour. To choose an appropriate topic for the argumentative writing, five topics were selected from among the frequent topics presented in IELTS writing tasks. Five writing instructors, with 7-12 years of experience, were asked to rank the topics based on their appropriateness to elicit a sound argumentative essay. The topic used for the writing task of this study was ranked as the most appropriate one by all the writing instructors. The participants were allowed to use any kind of dictionary they needed in order not to be constrained by linguistic problems in their own reasoning process. The students were also asked to fill out the box in a separate piece of paper eliciting their demographic information.

Procedure

Quick Oxford Placement Test was administered to assure the homogeneity regarding the participants' level of proficiency. Then, the participants with upper-intermediate level of proficiency were asked to provide their answers to the excerpted items from MIDAS in order to determine their linguistic and

logical intelligence scores. The researcher was present in order to clarify the probable cases of ambiguity to the participants. The participants were also asked to provide the information considering their demographic information. They were assured of the anonymous use of the data and they voluntarily participated in the study.

Finally, they were asked to write an argumentative essay in a different session. A word limit was set for the length of their essays and those essays of less than 100-word length were omitted from the sample of the study (5 out of 115 essays). The teachers were asked to include the writing task in a natural setting to prevent sensitization of the students to the research objectives. The essays of those learners who had not completed the multiple intelligences scale were omitted from the sample.

Design

The current study is a correlational research. Like *ex post facto*, the variables are not manipulated. However, this type of research differs from *ex post facto* in pursuing the relationships among two or more variables within a single group of the participants. An advantage of correlational research is its power in revealing the strength of relationships among variables (Ary, Jacobs, Sorensen, & Razavieh, 2010). The study was conducted in a private language learning setting, language institutes in Iran, where the learners are taught English as a foreign language.

Data Analysis

First, T-units of each essay were identified. In this regard, Johnson's (1998) definition of statement was taken into consideration. Then, the arguments were exposed to identify their consistent premise(s) and conclusion by means of some clue words. Johnson introduced some words such as "since, because, for, for the reason that, in that, due to the fact that..." (p. 9) to identify a premise and such words as "therefore, thus, hence, it follows that, it must be that..." (p. 8) to identify a conclusion. Accordingly, the informal fallacies were identified based on Johnson' (1998) techniques of exposing the arguments and methods of identifying the informal fallacies.

Having identified the informal fallacies, four types of evidence categorized in Hoeken and Hornikx (2003) were identified and counted

within language learners' argumentative essays including a) Statistical, b) Anecdotal, c) Causal, and d) Expert evidence types.

In order to check the reliability of the evaluation and identification procedure, another rater (one of the researcher's colleagues) was asked to check the identified informal fallacies and evidence types in all argumentative essays. In this regard, whenever the disagreement occurred, both the researcher and the other rater discussed the issue till they came to an agreement upon the identified fallacy or evidence and a total agreement of 0.91 was obtained.

Having exposed and evaluated the arguments in terms of both the informal fallacies and evidence types, the researcher fed the data into SPSS. To see if there was a significant relationship between EFL learners' linguistic and logical intelligences and categories of informal fallacies and evidence types, Pearson product-moment correlation test was conducted. Moreover, since the informal fallacies and evidence types constitute nominal data, two statistical non-parametric tests of Chi-squares were conducted to see if the participants' gender would make a significant difference in the frequency of different categories of these two argumentation elements.

Results

Table 2 illustrates the descriptive statistics for the participants' linguistic and logical intelligences.

Table 2
Descriptive Statistics for Linguistic and Logical Intelligences

Intelligence types	N	Minimum	Maximum	Mean	SD
Linguistic intelligence	110	35	78	59.00	1.03
Logical intelligence	110	25	80	50.82	1.25

Table 3 displays the descriptive data for the gender and categories of informal fallacies and evidence types. The fallacies included ad hominem (F1), appeal to tradition (F2), begging the question (F3), faulty analogy (F4), fallacy of either/or (F5), hasty generalizations (F6), post hoc (F7), red herring (F8), and violation of RSA standards (F9). The evidence types

included statistical (E1), anecdotal (E2), causal (E3), and expert (E4) evidence.

Table 3

Descriptive Data for the Gender and Categories of Informal Fallacies and Evidence Types

Gender/Fallacies, Evidence	F1	F2	F3	F4	F5	F6	F7	F8	F9	E1	E2	E3	E4
Male	28	5	2	16	5	23	33	5	65	0	22	15	12
Female	20	2	3	18	8	25	26	3	51	0	22	26	7

As Table 3 indicates, both male and female learners made the most use of the last category of informal fallacies, violation of RSA standards. Furthermore, male learners made the most use of anecdotal evidence while their female counterparts included more cases of causal evidence.

In order to explore the possible relationship between Iranian upper-intermediate EFL learners' linguistic and logical intelligence types and the frequency of informal fallacies in their argumentative writing, Pearson product-moment correlation was conducted. The results revealed that there was a significant correlation between the two intelligence types and the use of informal fallacies (See Table 4). Nevertheless, the relationship between linguistic intelligence and the frequency of informal fallacies was stronger ($r= 0.782$, $p<0.05$) compared to that between logical intelligence and the frequency of informal fallacies ($r=0.204$, $p<0.05$).

Moreover, as Table 4 displays, there was a significant relationship between eight categories of informal fallacies and linguistic intelligence. However, a weak relationship was found between faculty analogy and linguistic intelligence. Moreover, there was a significant relationship between eight categories of informal fallacies and logical intelligence. However, a weak relationship was found between the frequency of violation of RSA and logical intelligence.

Table 4
The Results of Correlation between Learners' Use of Nine Categories of Informal Fallacies and their Linguistic and Logical Intelligences

	Linguistic intelligence	Logical intelligence
Ad hominem	0.564*	0.947*
Appeal to tradition	0.535*	0.387*
Begging the question	0.802*	0.290*
Faulty analogy	0.116	0.740*
False dichotomy	0.487*	0.972*
Hasty generalization	0.903*	0.779*
Post hoc	0.304*	0.219*
Red herring	0.520*	0.395*
RSA	0.607*	0.082
Total (Informal Fallacies)	0.782*	0.204*

*P<0.05

Similarly, the results revealed that there was a significant relationship between the frequency of evidence types and linguistic intelligence ($r=0.593$, $p<0.05$) and logical intelligence ($r=0.524$, $p<0.05$). Furthermore, the results indicated that there was a significant correlation between the frequency of causal and expert evidence types and EFL learners' linguistic intelligence while a significant relationship was observed between the frequency of anecdotal and causal evidence types and their logical intelligence (See Table 5).

Table 5
The Results of Correlation between Learners' Use of Four Categories of Evidence and their Linguistic and Logical Intelligences

Evidence types	Linguistic intelligence	Logical intelligence
Statistical	A	A
Anecdotal	0.096	0.608*
Causal	0.783*	0.587*
Expert	0.311*	0.199
Total (Evidence Types)	0.593*	0.524*

a Not available in the argumentative essays

*P<0.05

In addition, the results revealed that there was no statistically significant difference between male and female EFL learners considering the frequency of informal fallacies in their argumentative essays (See Table 6). Likewise, no significant difference was found considering the frequency of evidence types in terms of the EFL learners' gender.

Table 6
Chi-Square Test for Informal Fallacies and Evidence Types for Male and Female Learners

	Value	Df	Sig.
Informal Fallacies	0.780	8	1.388
Evidence Types	0.543	3	1.017

Discussion

The study strived to unravel the possible link between Iranian EFL learners' linguistic and logical intelligence types and the quality of their argumentative writing in terms of the frequency of informal fallacy and evidence types. The results of the study revealed that Iranian EFL learners make use of both informal fallacies and evidence types in their argumentative essays to convince their audience. While all categories of informal fallacies and three types of evidence were frequently coded in the argumentative essays, no cases of statistical evidence were found. This might point to the difficulty in gathering reliable statistical data to defend a particular stance in an argument.

With regard to the first and second research questions, the findings of the current study demonstrated a significant relationship between linguistic intelligence and the frequency of informal fallacies and evidence types in EFL learners' argumentative essays. These results might be attributed to the correspondence between linguistic intelligence and the verbal aspect of argumentation which is represented through language use (van Emeren & Grootendorst, 2004). It might be further postulated that linguistic intelligence and the use of informal fallacies and evidence types belong to a general ability- convincing the audience and communicating one's ideas within a community.

Moreover, the moderately positive correlation between the linguistic intelligence scores and the frequency of evidence types might indicate that

more linguistically intelligent learners would provide more convincing argumentation. However, the highly positive relationship between the linguistic intelligence scores and the frequency of informal fallacies may suggest that being linguistically intelligence would not necessarily result in a rationally sound argument.

The results of the current study confirmed that not only may the EFL learners' linguistic intelligence predict their overall proficiency (Yeganefar, 2005) and strategy use (Akbari & Hosseini 2008), but also it may determine the quality of their argumentation in terms of the frequency of informal fallacies and evidence types (Atai & Nasser, 2010). The findings were also in line with those of previously conducted studies in which EFL learners' multiple intelligences were proved to influence their writing skills (Grow, 1990; Borek, 2003; Eng & Mustapha, 2010) and contrasted those of Marefat (2007) who found out no significant link between this intelligence type and the EFL learners' writing scores.

Furthermore, a seemingly significant but weak correlation was observed between the learners' logical intelligence and their use of informal fallacies. It should be noted that despite the low correlation value, the significance of this relationship should not be ignored since such a correlation might be very important when it comes to the educational research (Hatch & Lazarathon, 1991). Additionally, the frequency of use of evidence types revealed a significant correlation with the learners' logical intelligence.

Within the realm of writing, logical intelligence was defined as "logical organization and development" and "precision of thought" (Grow, 1990, p.20). In this sense, the findings demonstrated the contributing effect of this intelligence type on the reasoning process particularly considering the use of evidence types in argumentative writing.

Considering the third and fourth research questions, no statistically significant difference was observed between male and female EFL learners in terms of the frequency of informal fallacies and evidence types. The results confirmed those of previous studies (Atai and Nasser, 2010) in that both male and female learners took advantage of various categories of informal fallacies in a quite similar way. However, the findings of the current study were at odd with those of Nasser and Atai (2010) in that no significant difference was found between male and female EFL learners in

terms of the frequency of evidence types in their argumentative essays. In this regard, the findings disconfirmed those of numerous studies which pointed to the possible influence of gender on the frequency of evidence types (See Nasserri & Atai, 2010).

The findings of the present study might lead to the conclusion that both linguistic and logical intelligence are related to the frequency of informal fallacies and evidence types in EFL learners' argumentative writings. Previous studies have pointed to the facilitative role of implementing activities gearing to the learners' multiple intelligences in enhancing the quality of their written products (Grow, 1990; Borek, 2003; Eng & Mustapha, 2010). According to the results of this study, it is expected that informing EFL learners of their linguistic and logical intelligence types would lead to more logical argumentation.

The findings confirmed seemingly similar nature of the two intelligence types, informal fallacies and evidence types since argumentation encompasses verbal and analytical activity (van Emeren & Grootendorst, 2004). The presence of informal fallacies in the Iranian upper-intermediate EFL learners' argumentative essays would sensitize EFL teachers in general and writing instructors in particular in order to enable the EFL learners to write more evidence-laden as well as fallacy-ridden argumentative essays. In this regard, the instructors could inform them of the errors in reasoning and provide them with more strategies to make use of more evidence types in their argumentation .

Furthermore, the findings would raise the writing instructors' awareness to allocate more time and attention to the individual differences especially the learners' several intelligence types and to provide them with opportunities to know themselves through offering more learner-centered instruction in line with the current trends in educational contexts. Moreover, asking the learners to take a multiple intelligences inventory especially the relevant items to the intelligence types under the study before taking a writing course can inform the instructors so that they take advantage of the individuals' capabilities in order to enhance the efficiency and effectiveness of their instruction .

In addition, being cognizant of individual differences in terms of their intelligence types seem to moderate the instructors' and learners' expectations and set more realistic goals. Hence, the term 'weak students' would gradually be replaced with 'students of different capabilities'. Besides, providing a deeper understanding of the EFL learners' demands, the findings of the present study would lend support for the material developers and syllabus designers to cater the writing sections of the instructional materials to the learners' intelligences by injecting more variety into the relevant activities.

In addition to the pedagogical implications, the present study evokes new lines of research especially the interdisciplinary studies in TEFL. Moreover, regarding the vitality of argumentative text types in the academic context (Ne'meth & Kormos, 2001), conducting studies on this text type is first and foremost suggested. Furthermore, it is the hope of the present researcher that this study is replicated with the learners of the other levels of proficiency to find out whether similar results can be obtained. Moreover, it is possible to explore the relationship between the occurrence of informal fallacies and evidence types and other types of intelligence, for example, interpersonal intelligence since argumentation is also a social activity (van Emmeren & Grootendorst, 2004). In addition, future research can be carried out taking the oral argumentation into account to see how MI would probably explain the occurrence of informal fallacies and evidence types in discussing a topic orally.

Considering the effect of cultural variation on the persuasiveness of evidence types, this study can be also replicated with the learners from other cultural and L1 backgrounds to check whether similar findings can be obtained. Besides, the relationship between the language learners' linguistic and logical intelligence types and the frequency of informal fallacies and evidence types can be examined not only through the production tasks but also by means of some recognition tasks to see if MI can contribute to distinguishing between sound and weak reasoning.

Declaration of interest: none

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