

Auditory and kinaesthetic learning styles and L2 achievement: A correlational study

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ABSTRACT

This study investigated undergraduate non-English major university students' auditory and kinaesthetic learning styles and their relationships to second language (L2) achievement in English. It was conducted to resolve the conflicting findings in the literature on the directions and strength of the relationships between learners' learning styles and their achievements and to investigate the field in relatively under-researched Indonesian participants. The study used a survey as the method of data collection and found out that learners used auditory slightly more dominantly from kinaesthetic, yet both learning styles were merely used at low to moderate levels. The study further found very weak and statistically not significant associations between these learning styles and L2 achievements, suggesting that contrary to various learning theories highlighting the importance of learners' learning styles in L2 learning, these learning styles may not be an important determinant of L2 achievement. Based on the findings, possible future studies are suggested concerning the implications, contributions, and limitations of the study.

Keywords: *Auditory learning style; Kinaesthetic learning style; L2 achievement; Correlation*

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1. Introduction

Arguably, Second Language (L2) learning and L2 learners' Individual Differences (IDs) are closely related. IDs refer to the traits or characteristics of individual learners believed to influence their ultimate L2 learning attainment (Dornyei, 2005). Among several prominent ID components such as learners' aptitude, motivation, anxiety, gender, and learning strategies, learners' learning styles have been quite widely discussed in the literature.

Learning styles are believed to influence the success of L2 learners (Castro & Peck, 2005). Learning style is defined as learners' profile of the habit of how they interact and respond to their learning environment (Moenikia & Babelan, 2010). It is also seen as an approach used by learners to transform information into their learning experiences and that is the way of how they learn better (Ajideh, Zohrabi, & Pouralvar, 2018). Concerning that, how the individuals learn a language is an important key to mastering an L2 (Tabatabaei & Mashayekhi, 2013). As language learning happens consciously and needs attentive engagements (Tabatabaei & Mashayekhi, 2013), knowing their learning styles can help learners use various supporting techniques to improve their L2 learning (Liu & He, 2014).

Numerous previous studies about learning styles have been conducted, indicating the important role of learning styles in L2 learning. For example, Vaishnav (2013) study found that learners' learning styles strongly correlated with their academic achievement. In contrast, a study conducted by Yildirim, Acar, and Bull (2014) found no correlation between learners' learning styles and their academic achievement. In the Indonesian context, studies conducted by Aboe (2018) and Naning and Hayati (2011) reported no relationship between learning styles and L2 achievements of students of the English Language Department (ELED). A contrasting finding, however, was found by Setyoningsih (2019) in the Indonesian Junior High School context in which she found out that learning styles significantly and very strongly correlated with L2 achievements. Our recent previous study (Masela & Subekti, 2020) involving Indonesian 127 university students in a mixed-method study on visual learning style found that learners had a high level of visual learning style and preferred the use of various visual aids in L2 classes.

Despite the possible contributions of the previous studies, the learning styles of Indonesian undergraduate students are under-researched. Besides, as it is that English as L2 proficiency of Indonesian Senior High School graduates is quite unsatisfying (Yulia, 2013), Indonesian undergraduate students' proficiency could also be further affected. There could be various factors affecting the lack of success in English instruction. For instance, class instructions not accommodating learners' learning style could be one of them. Learners may not be optimally facilitated in learning because teachers do not provide them with media or ways through which they could learn better. Besides, learners may use a combination of learning styles rather than just one style, and so despite our previous study on visual learning style (Masela & Subekti, 2020),

investigating other learning styles could still be meaningful. Also, as seen in the conflicting findings on the relationship between learners' learning styles and their L2 achievements, conducting another study in this specific area could be worthwhile.

Considering the mentioned rationales, the present study seeks to find the answers to four research questions:

Q1. How is the level of university students' auditory learning style?

Q2. How is their level of kinaesthetic learning style?

Q3. What is the relationship between their auditory learning style and L2 achievement?

Q4. What is the relationship between their kinaesthetic learning style and L2 achievement?

2. Literature review

Learners learn differently and the way learners learn to influence their level of success (Afshar & Bayat, 2018; Castro & Peck, 2005). Beside the visual learning style, the most widely used learning styles in L2 learning are auditory and kinaesthetic (Bishka, 2010; Dornyei, 2005; Gilakjani, 2012).

Auditory learners learn best through oral language format. They are mostly using audios and lectures as auditory input because they understand information through speed, emphasis, and pitch (Gilakjani, 2012; Gilakjani & Ahmadi, 2011). Reading out loud in the classroom also helps them to gain information. They also learn better from interviews, discussions, and storytelling (Pritchard, 2009). Oluremi (2015) stated that when auditory learners want to recall their memory of something, they can hear from other people talk or just repeat that information and they will be able to remember it better. They learn better from interactions with others by listening and speaking and they whisper to themselves when they read something. They are also good at summarising orally from what they have read because, through it, they will understand and remember the information better. Auditory learners have difficulty in written directions but they gain more through listening (Oluremi, 2015).

Kinaesthetic learners learn from a hands-on approach. It means that by doing, these learners can understand better (Gilakjani, 2012; Gilakjani & Ahmadi, 2011). Some kinaesthetic learners prefer to walk around when they try to memorise something (Dornyei, 2005). They prefer situations where they can be physically active. They prefer lectures with fieldwork outside the classroom, so they can be free to learn and have hands-on-experiences in learning. It is difficult for typical kinaesthetic learners to just sit and learn as they prefer moving around whilst learning (Oluremi, 2015).

As learning styles become a major concern in L2 learning (Aliakbari & Qasemi, 2012), studies in the field have been conducted in various research contexts.

In Thailand, Brahmakasikara's (2013) study involving 67 undergraduate non-English major students taking an English foundation course named English III found that most of the students passing English III course were auditory learners (22.4%) with zero failure whilst kinaesthetic learners, at 11.9%, had the least number of students

passing the course, suggesting that in this research context learners with dominant auditory learning styles may be more advantaged in L2 learning.

Furthermore, studies in various Middle School contexts seemed to produce inconclusive findings on the relationships between learning style and achievements. In the Indian High School context, Vaishnav (2013) found that kinaesthetic learning style was more popular among his 200 participants than auditory and further revealed that both learning styles correlated positively and significantly with learners' academic achievement. The similar finding was obtained in Setyoningsih's (2019) study involving 123 Indonesian Junior High School students. She found out that there was a statistically strong relationships between learners' auditory learning style and L2 achievement, $r(121) = .92, p < .05$, and between their kinaesthetic learning style and L2 achievement, $r(121) = .87, p < .05$ (Setyoningsih, 2019). However, Yildirim et al.'s (2014) study in Istanbul, Turkey found a different finding from those of the mentioned two studies. They found no significant relationship between their 746 8th grader participants' learning styles, auditory, and kinaesthetic included, and academic achievement (Yildirim et al., 2014).

Relatively uniformed findings seemed to be found in the Indonesian English Language Education (ELED) context on the relationship between learning styles and achievement. Aboe's (2018) study in Ternate, Indonesia, found a very weak, statistically not significant relationship between auditory learning style and L2 achievement, $r(73) = .03$, as well as between kinaesthetic learning style and L2 achievement, $r(73) = .16$. Another study was conducted by Naning and Hayati (2011). They found that the participants had a more dominant auditory learning style than kinaesthetic and further found that their participants' learning styles did not correlate with their L2 listening achievement (Naning & Hayati, 2011).

In several other university contexts, learning styles were found to have no or weak relationship with academic achievement. In learning Spanish and French as L2 in the United States, a study by Bailey, Onwuegbuzie, and Daley (2000) involving 100 university student participants found that auditory learning style had very weak, not significant correlation with L2 achievement, $r(98) = .05$, whilst kinaesthetic had significant, weak correlation with L2 achievement, $r(98) = .22$. Furthermore, involving 329 university student participants, a study by Huang, Hoi, and Teo (2018) in China found that the participants preferred auditory learning style to kinaesthetic and further found that "no learning style preference was found to influence the students' English proficiency" (p. 1069). Huang et al. (2018) mentioned that cultural reasons specific to the Chinese educational context may be attributed to this finding which contradicted several theories on the role of learning styles in L2 learning (Castro & Peck, 2005; Dornyei, 2005).

3. Method

3.1. Research design

This research uses a quantitative method by distributing questionnaires as the instrument of data collection (Gray, 2014). There are numerous studies about learning styles that use quantitative methods (Bailey et al., 2000; Huang et al., 2018; Vaishnav, 2013; Yildirim et al., 2014), indicating the popularity of these methods in the field. The questionnaires were adapted from Barsch's learning styles inventory (Barsch, 1991) which originally consisted of 23 statements. Of these 23 items, only 14 items indicating auditory and kinaesthetic learning styles were used. These 14 items were rearranged that the questionnaires had two sections; the first consisting of seven items indicating auditory learning style whilst the second consisting of six items indicating kinaesthetic learning style. There were three possible responses in the original questionnaire: "never", "seldom", and "often." In this present study, however, the responses were modified into five: "almost always" equal to 5 points, "often" equal to 4, "sometimes" equal to 3, "seldom" equal to 2, and "almost never" equal to 1. The questionnaires were translated from the original English language to the Indonesian language to facilitate the participants because the Indonesian language was the language they were much more familiar with. It could also help ensure the reliability of their responses. Before the questionnaires were administered to participants, they were piloted to five non-participant students to maintain the validity and reliability and were adjusted based on their feedback before distribution to the actual participants was done. The participants would need around five minutes to complete the questionnaires.

3.2. Research participants

The participants were 24 undergraduate students from non-English departments at a university in one of the cities in Indonesia. They were General English Level 3 students from various departments. General English was a mandatory programme intended for undergraduate students from non-English majors. This programme had no credit and the purpose was to facilitate the undergraduate students with general English knowledge necessary before they took mandatory and credited English classes in their respective departments. This programme was held every semester and consisted of two meetings per week starting from the first semester after the students were accepted at the university. There are three levels of General English which are General English levels 1, 2, and 3. To get into the three levels, the students are required to take a placement test once they are registered in the university. Based on the results of the test, the students are placed in one of the three levels. For the purpose of the study, Level 3 was chosen because it was assumed that this group of students had more English exposure than those of the preceding levels and thus may respond to the questionnaire items related to their learning styles with more conviction.

3.3. Ethical considerations

The permission to conduct the research was granted by the Head of the Language Training Centre organising the General English programme as the gatekeeper (Cohen,

Manion, & Morrison, 2007). As gatekeeper consent may not be ethically sufficient, informed consent forms detailing the purposes of the study and the participants' rights, were provided on the first page of the questionnaires with the purpose that they knew all information about the research before they filled the questionnaires (Israel & Hay, 2006). The participants were given some time to read and understand the informed consent form before they decided whether or not to participate in the present study and fill the questionnaires. The participants' identity such as names and scores were used for the research purpose only and were kept confidential.

3.4. Data collection and analysis

Data collection was conducted in the odd semester of the 2019/2020 academic year. Paper-based questionnaires were distributed to two General English level 3 classes. The obtained data from the questionnaires were then recorded in SPSS. Based on the signed consent form, the course secretary provided the participants' mid-semester grades, which were then also recorded in SPSS. To answer the first and second research questions on the levels of learners' auditory and kinaesthetic learning styles, descriptive statistics in the forms of means and percentages were used. To answer the third and fourth research question, Pearson Product Moment Correlation was employed.

4. Findings and discussions

The target participants of the present study were 50 students from two classes of General English level 3. However, only 28 of them filled the consent forms and questionnaires whilst the others were absent on the day the questionnaires were distributed. Out of these 28 participants, three participants did not have any mid-semester grades due to various reasons and one participant did not respond to all items in the questionnaire, and so the data from these four students were excluded. 14 participants were male (58.3%), whilst 10 were female (41.7%). Complete responses from participants have been included as an appendix to this study.

The Cronbach's alpha coefficient of the seven auditory learning style items was at .60 whilst that of the kinaesthetic learning style items was at .53. Cronbach's alpha coefficient indicating reliability ranges from 0 to 1 and the closer a coefficient to 1, the more reliable the questionnaire is. Concerning that, though it could be stated that the questionnaires used in the study were not very reliable, the coefficients were at an acceptable level.

4.1. Research question 1. How is the level of university students' auditory learning style?

As seen in Table 1, the mean of participants' responses was at 3.17 indicating that there was a tendency that the learner participants "sometimes" employed auditory learning styles. It could also be interpreted that in general, the participants used auditory learning styles moderately. The means of each item could also be observed in Table 1.

Table 1

Participants' responses on auditory learning style items.

	Means	SD
Q1.1	3.24	1.20
Q1.2	3.08	1.0
Q1.3	2.88	.78
Q1.4	3.28	.89
Q1.5	2.96	.95
Q1.6	2.36	1.15
Q1.7	3.40	1.08
Mean	3.17	

As seen in Table 1, item number 6 produced the lowest mean score whilst item number seven produced the highest mean score of all.

First, item number 6 "I prefer listening to the news on the radio rather than reading about it in a newspaper" produced mean score 2.36. 66.7 % of the participants either "seldom" or "almost never" applied the auditory characteristics indicated in the item. This specific response should be interpreted with caution. First, the participants might have preferred reading than listening, indicating a less dominant auditory learning style. Secondly, participants may consider this questionnaire item somehow not applicable to their condition. The participants who were in their late teenage age may not be familiar with the activities of listening to the radio or reading newspapers anymore and were more familiar with listening to podcasts or reading online news, thus the majority of the participants responding either "seldom" or "almost never".

The second was item number 7 "I follow oral directions better than written ones" yielding the highest mean score of all at 3.40. 33.3% of the participants' stated that they "sometimes" followed oral directions better than written ones, indicating that the participants liked oral directions better than written directions. Auditory learners learn best when they obtain information in the audio form in which they can interpret it through the pitch, emphasis, and speed (Gilakjani & Ahmadi, 2011). Besides, oral directions enabled auditory learners to gain the most information from what they hear and they understand the flow of that information (Ajideh et al., 2018). As auditory learners are better in listening and speaking exchange when they want to remember something, they can recall what they heard before and it makes them better in discovering the information (Gilakjani, 2012; Gilakjani & Ahmadi, 2011; Oluremi, 2015).

4.2. Research Question 2: How is the level of university students' kinaesthetic learning style?

As seen in Table 2, the overall mean score of the participants' responses was at 2.88 level indicating that they either "sometimes" or "seldom" employed kinaesthetic

characteristics indicated in the questionnaire items. This overall mean score was slightly lower than that of the auditory learning style at 3.17, indicating that even though both learning styles were used at a relatively same moderate level, learners used kinaesthetic learning style slightly less than their auditory. This finding was similar to the findings of several previous studies in various research contexts and educational levels (Huang et al., 2018 in the Chinese university context; Naning & Hayati, 2011 in the Indonesian ELED context; Vaishnav, 2013 in the Indian Middle School context), suggesting a relatively uniformed finding across contexts and educational levels that auditory learning style was more widely used than kinaesthetic one.

Table 2

Participants' responses on kinaesthetic learning style items.

	Means	SD
Q2.1	3.64	1.08
Q2.2	1.96	.93
Q2.3	2.44	1.12
Q2.4	2.60	1.19
Q2.5	3.08	.95
Q2.6	3.52	1.23
Mean	2.88	

As seen in Table 2, item number 1 produced the highest mean score whilst items number 2 produced the lowest mean score, and thus these two items would be commented further.

Item number 1 "I enjoy working with tools" produced a mean score of 3.64. Among 24 participants, 66.7% of the participants stated that they "often" or "sometimes" enjoyed working with tools, indicating that these learners learned better when they physically engaged in "hands-on experience" activity (Gilakjani, 2012). These hands-on activities could be in the form of classroom demonstrations such as role-plays and fieldwork outside the classroom where they are given space to interact with others (Gilakjani & Ahmadi, 2011).

Item number 2, "I find myself playing with coins or keys in the pocket", had the lowest mean score of 1.96. 79.1% of the participants either "almost never" or "seldom" played with coins or keys in the pocket. The participants' responses in this item should be interpreted carefully. First, though the activity of playing with coins or keys in the pocket could be considered kinaesthetic, there may be several factors as to why the majority of the participants either almost never or seldom did it. First, this specific kinaesthetic activity was simply not the participants' liking, meaning they preferred doing other kinaesthetic activities or those of other learning styles. Secondly, it may have something to do with the possibility that playing with coins or keys may be an

unlikely activity done in their classes and their Indonesian English teachers may not encourage that if that could cause some distracting noises during instruction.

4.3. Research Question 3: What is the relationship between learners' auditory learning style and L2 achievements?

Table 3 shows the result of the correlation between learners' auditory learning style and their L2 achievement as measured with their mid-semester grades. The study found a positive correlation between learners' auditory learning style and their grades, indicating the more frequently the participants employed auditory learning style, the higher their grades tended to be. Yet, the correlation was very weak, $r(22) = .18$ and it was statistically not significant $p > .05$.

Table 3

The correlation between auditory learning style and grades.

		Auditory learning style
Grades	Pearson Correlation	.18
	Sig. (2-tailed)	.39
	N	24

The finding on the weak association between learners' auditory learning style and achievement was in line with the results of several previous studies (Aboe, 2018 in Indonesia; Bailey et al., 2000 in the US; Huang et al., 2018 in China; Naning & Hayati, 2011 in Indonesia; Yildirim et al., 2014 in Turkey) and in contrast with several others (Setyoningsih, 2019 in Indonesia; Vaishnav, 2013 in India). The similarity and difference could have possible explanations. The findings on weak associations between auditory learning styles and achievement were found in university contexts (Aboe, 2018; Bailey et al., 2000; Huang et al., 2018; Naning & Hayati, 2011), including the case in the present study, whilst those on the strong association between the two variables were mostly found in Middle School context (Setyoningsih, 2019; Vaishnav, 2013). It may give some kind of indication that as learners advanced their educational level, the less their auditory learning style could be indicative of their academic achievement.

4.4. Research Question 4: What is the relationship between learners' kinaesthetic learning style and L2 achievements?

As seen in Table 1, the study found a negative relationship between learners' kinaesthetic learning style and their grades, $r(22) = -.15$, $p > .05$. Though the strength was weak and the correlation was not statistically significant, the negative relationship was somehow quite surprising. It indicated that the more frequently learners employed kinaesthetic learning style, the lower their L2 achievement tended to be.

Table 4

The correlation between kinaesthetic learning style and grades.

		Kinaesthetic learning style
Grade	Pearson Correlation	-.15
	Sig. (2-tailed)	.46
	N	24

This specific finding needed further comments. This finding was different from the finding of several previous studies that found significant positive correlations between their participants' kinaesthetic learning style and their achievements (Setyoningsih, 2019; Vaishnav, 2013). Even the present study's finding on the *negative* association between the two variables was different from some other previous studies' findings on the *positive* associations, albeit statistically not significant (Aboe, 2018; Bailey et al., 2000; Huang et al., 2018; Naning & Hayati, 2011). Slightly in line with the result on the negative association, however, Brahmakasikara's (2013) study in Thailand found that learners with kinaesthetic learning styles were the least successful in L2 achievement compared to those with other learning styles.

The rather surprising negative association in the present study, which was in line with Brahmakasikara's (2013) study, could be attributed to several factors. First, in the first place, the learner participants in the present study did not dominantly use kinaesthetic learning style seen from the low to moderate application of kinaesthetic activities. Secondly, the General English class instruction may not accommodate kinaesthetic learning style dominantly either, including in the mid-semester assessment from which learners obtained their grades. Thus, learners' grades were possibly obtained from assessment heavily relying on other learning styles. In this sense, the contrasting findings between the present study and the mentioned studies' findings could be attributed to the different characteristics of the participants, the educational contexts, and the typical L2 instructions.

Generally, several important points should be highlighted regarding the present study's findings concerning previous studies in the field. First, it seems that it has been established in the literature and confirmed with the present study's finding that the auditory learning style is more dominantly used by learners across middle school up to university contexts. However, both learning styles are merely used in low to moderate levels by learners, which mean that learners use neither of these two learning styles dominantly when learning. Furthermore, the present study's finding on the very weak and not significant association between these two learning styles and achievements could somehow support the notion that these two learning styles play little to no part on learning (see also Aboe, 2018; Huang et al., 2018; Naning & Hayati, 2011; Yildirim et al., 2014). This may also be attributed to learners' minimum uses of these two learning styles in learning. However, Huang et al. (2018) mentioned that cultural values could also play a part in influencing how learners learn and this may explain why certain

learning styles are not dominantly used by learners. For example, in a learning context where learners are accustomed to sitting in a classroom and paying attention to their teachers' written and verbal explanations with relatively minimal needs of “movements”, kinaesthetic learning styles, focusing on hands-on experiences and experimentations, may not get sufficiently enhanced, thus partly explaining why kinaesthetic learning style is uniformly found to be the least favourite among some learners.

It should then be acknowledged that the results indicating learning styles did not significantly correlate with achievement in various Asian contexts, including in the present study, were in contrast with the established theory presented by many authors on the importance of learning style in influencing learning (Castro & Peck, 2005; Dornyei, 2005). This established theory may be rather Western-dominated where learners' various learning styles are better facilitated in instruction (Huang et al., 2018). Hence, in the Asian context such as Indonesia where learners' diverse learning styles are not as highly valued yet, it becomes explicable that their learning styles do not have a strong relationship with their academic achievement.

5. Conclusion

The study has several implications and contributions in the field of L2 learning styles. First, this study provided insights about Indonesian non-English major university students' learning styles, which were quite under-researched. This study may also give some kind of confirmation of relatively inconclusive findings on whether learners' auditory and kinaesthetic learning styles were associated with their achievements. With the result of the present study that these two learning styles did not significantly correlate with achievement, in line with several previous studies in various contexts predominantly in Asia, it may be safe to state that learning styles of learners in Asian contexts may not be a very important determinant of learners' success in learning. Hence, language teachers, rather than focusing on learners' preferred modality in learning, had better provide mixed-teaching strategies to cater to diverse learners' needs and also to familiarise learners with potential learning modalities they may not be familiar with and to stretch learners' potential ways of learning.

The present study also has limitations and these should be acknowledged. A few items in the Barsch's (1991) learning style questionnaire items on the kinaesthetic learning styles needed some modifications before the questionnaire was distributed to the participants to match learners' learning contexts. Unfortunately, the authors did not realise this at the beginning. Hence, the participants' responses to these items may be affected to a certain degree. For example, the statement "I chew gum or snack during studies" may not be relevant to the participants' learning context because it was unlikely that their English teachers would allow them to eat during class instructions. Whilst the word "studies" could also indicate independent studies at home, learners could interpret it solely as “studying in the classroom” which may affect their responses.

Finally, there are several suggestions on future studies in the field in relation to the present study's findings. Findings on very weak associations between learning styles and L2 achievement do not imply that the field of learning styles do not merit further investigations. It is perhaps how researchers approach the phenomena that should be enhanced with more viewpoints. For example, researchers could design context- and culture-specific learning style questionnaires. This is because already established questionnaires consisting of general statements on certain learning styles may not be relevant to participants' learning contexts and cultures. Also, the present study is quantitative. As a result, it did not take into account specific aspects such as class instruction including methods, types of assessment, and frequent activities as possible factors affecting learners' learning style preferences. Hence, future studies could investigate learners' learning styles in relation to class instruction in qualitative studies employing the combination of observations and interviews.

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