The Effect of Learning Style on Student Academic Achievement at PTKIN in South Sulawesi

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Abstract

This study aimed to investigate the effect of learning style (visual, auditory, kinesthetic) on the academic achievement of students at four Islamic State Institutions in South Sulawesi: Alauddin Makassar Islamic State University, Pare-pare Islamic State Institute, Palopo Islamic State Institute, and Watampone Islamic State Institute. Employing an ex post facto quantitative research design, a stratified random sample of 382 students was selected for the study. Data on learning styles were collected using a validated scale based on DePorter & Hernacky's theory. Data analysis used non-parametric statistics of the Kruskal-Wallis type. Descriptive and inferential statistical analyses examined the relationship between learning style and academic achievement. Results indicated that while visual learning styles with a sig value of 0.685 and kinesthetic learning styles with a sig value of 0.544 were not significantly correlated with academic performance ($p > 0.05$), auditory learning style was found to be a significant predictor of student success with a sig value of 0.047 ($p < 0.05$). Based on these findings, it is recommended that lecture-based methods, which cater to auditory learners, be prioritized in instructional strategies to enhance academic outcomes for students at these institutions.

Keywords: academic achievement; learning style

INTRODUCTION

Education plays a crucial role in shaping an individual's personality. The current education system emphasizes not only competences in knowledge but also in creativity, imagination, and mindset (Hasanah & Tobib, 2023). At the tertiary level, students are encouraged to develop their potential and strive for the highest academic achievements. They must be able to adapt to ongoing changes, as this helps them to reach their personal goals and aspirations.

Academic achievement, typically measured by the Achievement Index (IP), server as a pivotal indicator of student success in higher education institutions, including colleges and universities. Its significance has driven extensive research, highlighting its role as a barometer of student engagement and learning outcomes. Numerous studies have explored the factors influencing academic achievement, reflecting the ongoing pursuit of strategies to enhance student performance and foster educational excellence.

A survey conducted by the Asian South Pacific Bureau of Adult Education and the Global Campaign for Education revealed that Indonesia's educational performance is notably lower than the regional average. The nation secured a mere 42 out of a possible 100 points, ranking tenth among fourteen Asia Pacific countries (Yaumi, 2012). These findings are corroborated by research from Said, Rusdi, and Muhammad in (Mulyaningsih, 2014) which indicated unsatisfactory student academic achievement during the 2007-2008 academic year. Specifically, 39.07% of students attained scores below the minimum passing standard of 65 points.

The survey of PISA (2018) Programme for International Student Assessment results showed that Indonesian students achieved an average score of 371 in reading, 379 in mathematics, and 389 in science, far below the OECD average of 487, 487, and 489, respectively. While in 2015, Indonesia had a higher score, namely 403 for reading, 396 for mathematics, and 397 for science, Indonesia, in 2018, ranked 74th in reading ability (score: 371), 73rd in mathematics (score: 379), and 71st in science (score: 396). Indonesia's PISA results in 2018 declined compared to those in 2015 (OECD, 2019).

Becoming an outstanding student is one of the achievements among those holding student status. However, achieving this is uneasy task; it requires a strong commitment, hard work, and the right plan or strategy. It is important to note that outstanding students are not only proficient in academics but also demonstrate good skills and personality (Muchlis, Abna, Yusuf, Syamsu, & Chalid, 2022)

A multitude of factors contribute to the aforementioned academic performance Challenges. Sudjana (2006) posited that while individual student ability accounted for 70% of learning outcomes, environmental factors influenced the remaining 30%. Learning style emerged as a critical component of this individual ability. Additionally, research by Kismiantini, Setiawan, Pierewan, & Montesinos-López (2021), involving 9,196 students and 308 schools in Indonesia, showed that Indonesian students tend to have low academic achievement, especially in mathematics.

DePorter & Hernacky Mike (2007) defined learning style as an individual's capacity to assimilate, structure, and process incoming information. This aligns with Nasution (2003) definition of learning style as an individual's consistent approach to perceiving stimuli, acquiring information, memorizing, reasoning, and problem-solving. In essence, it can be said that learning style refers to an individual's technique for acquiring and understanding knowledge.

Philbin, Meier, Huffman, & Boverie (1995) asserted that learning style is primarily influenced by experience, gender, and ethnicity. Nugraheni & Pangaribuan (2006) expanded on this by suggesting that an individual's learning style is shaped by a complex interplay of personality factors, including neurological cognitive processes, psychological attributes, sociocultural background, educational experiences, and academic specialization. In other words, a person's learning style is undeveloped independently but involves internal and external factors.

To identify prevailing learning style tendencies, researchers have developed various measurement models. Kolb's Learning Style Inventory (LSI) is one such model, although it has been criticized for its limited ability to assess actual behavior and weak measurement of psychomotor aspects (Kolb & Kolb, 2013). Conversely, Canfield's Learning Style Inventory offers the advantage of identifying a balanced combination of learning conditions,

areas of interest, and learning modes as individual learning style preferences (Eide, Geiger, & Schwartz, 2001). The Myers-Briggs Type Indicators (MBTI) is another commonly employed model in this domain.

Prastiti & Pujiningsih (2009) discovered a correlation between specific learning styles and enhanced academic performance, attributing this to increased student satisfaction during lectures. The learning process encompasses various modalities, including auditory, visual, and kinesthetic learning. Ula (2013) and Nugroho & Raharjo (2025) stated that learning style is an individual's approach or strategy to concentrate on the process and master information or knowledge.

Rahman & Yanti (2016) explained that learning style is a specific pattern of individual's receiving, developing and accepting new information. Ghufron & Risnawati (2014) emphasized that learning styles are very individual to getting knowledge and information. This opinion was strengthened by Budiningsih (2004) learning style is a method that individuals have to obtain information so this learning style is an integral part of the active learning system. Based on these perspectives, it can be concluded that learning style refers to an individual's preferred method of obtaining information.

DePorter & Hernacky Mike (2007) classified learning styles into three types, namely: a) visual learning style, individuals with this style learn best through visual observation. Suparna et al. (2016) suggested that the learning process for visual learners can be enhanced using materials that include pictures, diagrams, color-coded highlights, and illustrated books; b) auditory learning style, these individuals prefer to listen to sounds or music while studying, enjoy discussions, and often read aloud. Uno (2006) explained that auditory learners benefit from recording learning materials and engaging on discussions with peers or teachers; c) kinesthetic learning style, learners with this style respond best to physical movement and often prefer learning through hands-on activities or demonstrations. Hartati (2014) added that kinesthetic learners enjoy understanding material by associating it with certain body movements.

Wahyuni (2017) emphasized that an individual's ability to recognize their own learning style would increase the effectiveness and learning outcomes. One crucial aspect in education is the interaction between teachers and students; however, even more essential is the teacher's understanding their students' learning styles (DePorter & Hernacky Mike, 2007). Specifically, Hawk & Shah (2007) explained that characteristics of individual learning styles greatly influence the learning process and academic achievement.

This opinion is strengthened by Bire, Geradus, & Bire (2014) who argued that the initial step to improve academic achievement is recognizing students' learning style modalities. Their research at SMKN Kupang showed a significant influence of visual, auditory, and kinesthetic learning styles on students' academic performance. Similarly, Susilo (2006) stated that each student has a unique learning style, influenced by many factors, that encourage to achieve optimal academic performance.

Winkel (2009) explained that academic achievement is evidence of success after engaging in learning efforts or student learning performance, generally described in the form of average grades or scores. This opinion is echoed by Elliott, Kratochqill, & Travers (2000), who also stated that academic achievement refers to learning performance typically represented by grades or scores in average. Academic achievement reflects not only intellectual ability, but also motivation and cognitive factors that support the learning

process. According to Lens, Lacante, Vansteenkiste, & Herrera (2005), students with high academic achievement tend to have stronger competitive motivation compared to students with lower achievement. Similarly, Sabornie, Cullinan, Osborne, & Brock (2005) emphasized that several domains involved in individual academic achievement, including the cognitive domain.

Previous researches have explored the relationship between learning styles and academic achievement. For instance, Rijal & Bachtiar (2015) conducted research on the relationship between attitudes, learning independence and learning styles with biology learning outcomes. Papilaya & Huliselan (2016) identified the learning styles of students in the Guidance and Counseling study program at Pattimura University using a survey approach. Kurniawan & Hartono S (2020) researched the influence of learning styles on the academic achievement. Jona & Tjakrawala (2022) also identified and studied learning styles with student academic achievement. Although these studies differ in scope, methodology, and research populations, they consistently found that learning styles are correlated with academic achievement. Furthermore, novelty this study includes research samples from PTKIN students at South Sulawesi and academic achievement variables focused on student IPK and this research is quantitative with an ex post facto approach.

Accurate identification of one's learning style was instrumental in facilitating effective learning and subsequent academic improvement. Consequently, a comprehensive investigation into the identification and impact of learning styles on student academic achievement within PTKIN institutions in South Sulawesi was warrante. By considering these factors, this study focuses on how learning styles (visual, auditory, and kinesthetic) influence the academic achievement of students at PTKIN South Sulawesi, which is measured based on Indeks Prestasi Kumulatif (IPK). Based on phenomena and these problems, the objective reseach this study to determine the effect of learning styles (visual, audio, and kinethetic) on the academic achievement within PTKIN institutions students in South Sulawesi.

RESEARCH METHOD

This research employed an ex post facto design, a research methodology used to investigate events that have already transpired. As defined by Sugiyono (2014) dan Sudaryono (2016), ex post facto research involved examining past occurrences and subsequently identifying the underlying causal factors. Similarly, Ridwan (2019) characterized this research approach as a retrospective analysis aimed at determining the antecedents of a particular outcome.

This study examined the relationship between learning style (independent variable) and academic achievement (dependent variable). The study population encompassed all students enrolled in State Islamic Religious Universities in South Sulawesi, including Alauddin State Islamic University, Watampone State Islamic Institute, Pare-pare State Islamic Institute, and Palopo State Islamic Institute.

Sugiyono (2014) said that samples are part of the population. If the population is more than 100 respondents, then a research sample of 10% -55% can be taken (Arikunto, 2010). Based on these guidelines, a sample of 382 students can be taken with the sampling technique being stratified random sampling. namely a method of taking samples through

several levels to be homogeneous and not overlapping with other groups (Kadir, 2015; Siregar, 2017; Sugiyono, 2014).

A stratified random sampling technique was employed, with strata defined by university level, faculty, and department to each institution. Based on that found the total of 382 students (152 male or 30. 79% and 230 female or 60.21%) constituted the research sample. As detailed sample research in the following Table 1.

Table 1. Sample Reseach Data

No.	Institutions	Total
1	Alauddin Islamic State University	264
2	Watampone Islamic State Institute	22
3	Palopo Islamic State Institute	62
4	Pare-pare Islamic State Institute	34
5	Total	382

Based on the student semester profile data, it was found that 16.23% of the respondents were second-semester students, 32.46% were in fourth semester, 43.19% were in sixth semester, 7.06% were in seventh semester, and 1.05% were in tenth semester. Based on the distribution of sample data, it can be seen that the number of samples from each institute is representative, even though the number is not balanced. The largest number of samples from Alauddin Islamic State University.

Data were collected through scale administration based on De Potter & Hernacky with learning style Theory as 24 item statements to assessment learning style variable. Data documentation of Student Achievement Index values to assessment of student achievement variable. The research scale used is the Likert's Scale with four options, namely Very Appropriate (Sangat Sesuai), Appropriate (Sesuai), Not Appropriate (Tidak Sesuai) and Very Not Appropriate (Sangat Tidak Sesuai).

Descriptive and inferential statistical analyses were conducted using SPSS 24.00 for Windows. Based on validity data of learning style result was 0.0843 while try out for 30 respondens, means that from each statement item, as many as 24 items for the academic achievement variable have valid category data. So, there is not a single statement item that is dropped. Based on reliability data of learning style result was 0.762, this meaning that the data is reliable, according this Table 2.

Tabel 2. Reliability od Results

Cronbach's Alpha	N of Items
0.762	24

The guide to interpreting the degree of reliability of the research instrument is determined based on the Guilford criteria. The Cronbach's Alpha criteria were found to be 0.762, which means that the results of the 24 statement items are in the reliable category so that this instrument can be used to collect data from research respondents. According on normality test found that the data is haven't normally distribution. For each variable which is explained in detail in Tables 3-6.

Tabel 3. Test of Normality Learning Style Visual

	Kolmogorov - Smirnov[a]			Shapiro – Wilk		
	Statistic	Df	Sig	Statistic	df	Sig
Learning style visual	.093	382	.000	.982	382	.000

a. Lilliefors Significance Correlation

After conducting the Kolmogorov-Smirnov and Shapiro-Wilk tests, the statistical data shown in table 5 above is a sig value of .000 with the rule that if the sig value> 0.05 then the data is normally distributed, conversely if the sig value <0.05 then the data is not normally distributed. Therefore, the visual learning style variable is not normally distributed.

Tabel 4. Test of Normality Learning Style Audio

	Kolmogorov - Smirnov[a]			Shapiro – Wilk		
	Statistic	Df	Sig	Statistic	df	Sig
Learning style audio	.102	382	.000	.977	382	.000

a. Lilliefors Significance Correlation

Based on conducting the Kolmogorov-Smirnov and Shapiro-Wilk tests, the statistical data shown in table 5 above is a sig value of .000 with the rule that if the sig value> 0.05 then the data is normally distributed, conversely if the sig valu few e <0.05 then the data is not normally distributed. Therefore, the audio learning style variable is not normally distributed.

Tabel 5. Test of Normality of Learning Style Kinesthetic

	Kolmogorov - Smirnov[a]			Shapiro - Wilk		
	Statistic	Df	Sig	Statistic	df	Sig
Learning style kinesthetic	.090	382	.000	.982	382	.000

a. Lilliefors Significance Correlation

Based on conducting the Kolmogorov-Smirnov and Shapiro-Wilk tests, the statistical data shown in table 5 above is a sig value of .000 with the rule that if the sig value> 0.05 then the data is normally distributed, conversely if the sig value <0.05 then the data is not normally distributed. Therefore, the kinesthetic learning style variable is not normally distributed.

Tabel 6. Test of Normality of Academic Achievement

	Kolmogorov - Smirnov[a]			Shapiro - Wilk		
	Statistic	Df	Sig	Statistic	Df	Sig
Academic Acievement	.491	382	.000	.041	382	.000

a. Lilliefors Significance Correlation

Based on conducting the Kolmogorov-Smirnov and Shapiro-Wilk tests, the statistical data shown in table 6 above is a sig value of .000 with the rule that if the sig value> 0.05 then the data is normally distributed, conversely if the sig value <0.05 then the data is not normally distributed. Therefore, the academic achievement variable is not normally distributed.

RESEARCH RESULTS

Based on the prerequisite test, namely the normality data test, the statistical results obtained show that the research data is not normally distributed. Therefore, in hypothesis testing, nonparametric statistical analysis of the Kruskal Wallis Test type is used.

Description of Learning Style and Academic Achievement of PTKIN Students

This study aimed to describe the learning styles (visual, auditory, and kinesthetic) and academic achievement of PTKIN students in South Sulawesi based on statistical analysis of the respective score values. Preliminary findings indicated that visual learning style was the most prevalent among students, followed by kinesthetic learning style, with auditory learning style being the least common. Categorical intervals for data interpretation were determined using the formula outlined in the Table 7.

Table 7. Learning Style Categorization Interval

Category	Rumus	Variable
Low	X < M – 1 SD	X < 16
Medium	M – 1 SD ≤ X < M + 1 SD	16 ≤ X < 24
High	M + 1 ≤ SD	24≤X

Statistical analysis revealed that visual learning style was the predominant learning style among students, followed by kinesthetic, with auditory learning style being least prevalent. Regarding academic achievement, the data indicated that the majority of students (204) achieved cum laude status, followed by (153) students in the satisfactory category. A smaller proportion of students attained sufficient (13) and very good (12) classifications.

Data analysis indicated that the majority of students (n=204) achieved cum laude status, followed by 153 students in the satisfactory category. A smaller proportion of students attained sufficient (n=13) and very good (n=12) classifications. A detailed overview of student academic achievement at PTKIN is shown in Table 8.

Table 8. Description of Academic Achievement

Category	Total
Cum laude	204
Very Excellent	153
Execellent	12
Enaugh	13
Total	383

The Impact of Learning Style on Student Academic Achievement

Results of the Kruskal Wallis test indicated no significant relationship between visual learning style and academic achievement (asymp sig = 0.365 > 0.05, with the rule that if the sig value < 0.05 then the data is there the effect between variabel learning style on academic achievement conversely if the sig value > 0.05 then the data is not the effect between variable), A detailed overview of student academic achievement at PTKIN is shown in Table 9.

Tabel 9. Test Statistics^{a,}

	Visual
Chi- Square	3.180
Df	3
Asymp.Sig	.365

a. Kruskal Wallis Test
b. Grouping Variable: academic achievement

The analysis revealed a significant relationship between audiotory learning style and academic achievement among PTKIN students in South Sulawesi (asymp sig = 0.135 > 0.05, with the rule that if the sig value < 0.05. Conversely, auditory learning style had a significant influence on academic achievement, as indicated by an asymp sig value of 0.047 (< 0.05). According to the rule, a sig value below 0.05 demonstrates the presence of an effect between the variables. A detailed overview of student academic achievement at PTKIN is shown in Table 10.

Tabel 10. Test Statistics ^{a,b}

	Audio
Chi- Square	7.954
Df	3
Asymp.Sig	.047

a. Kruskal Wallis Test
b. Grouping Variable: Academic Achievement

Finally, the analysis revealed no significant relationship between kinesthetic learning style and academic achievement among PTKIN students in South Sulawesi (asymp sig = 0.135 > 0.05, with the rule that if the sig value < 0.05. Conversely, kinesthetic learning style had a significant influence on academic achievement, as indicated by an asymp sig value of 0.138 (< 0.05). According to the rule, a sig value below 0.05 demonstrates the presence of an effect between the variables. A detailed overview of student academic achievement at PTKIN is shown in Table 11.

Tabel 11. Test Statistics ^{a,b}

	Kinesthetic
Chi- Square	5.515
Df	3
Asymp.Sig	.138

a. Kruskal Wallis Test
b. Grouping Variable: Academic Achievement

Analysis of the statistical results revealed that among the three learning styles investigated, only auditory learning style had a significant impact on student academic achievement. Based on the results of the Kruskal Wallis test analysis, the data shows that only auditory learning style has a significant influence on students' academic achievement. So, it can be said that the type of learning style that has the most influence on the academic achievement of PTKIN students in South Sulawesi.

DISSCUSSION

Based on the results of the statistical analysis, among the three types of learning styles (visual, auditory, and kinesthetic) only the auditory learning style was found to have

a significant influence on the academic achievement of students studying at PTKIN South Sulawesi. Specifically, audio learning style yielded a p-value = 0.047, indicationg a significant relationship, whereas the visual and kinesthetic learning styles had p-values = 0.365 and 0.135, respectively, suggesting no significant influence.

These findings aligned with Purnamasari's (2020) research, which reported a significant effect of auditory learning style (p = 0.002) on students' learning outcomes in Islamic Religious Education at State Senior High School 1 Tinambung. In contrast, Nurintan found no significant effect from visual (p = 0.685) and kinesthetic (p = 0.544) learning styles. Furthermore, Nurintan further explained that teachers play an important role in carrying out learning activities that are in accordance with this audio learning style, such as explaining material with a clear voice.

Based on the results of this study, the audio learning style can contribute to improve students' academic achievement. Therefore, several methods that can be applied by lecturers such as oral presentations, group discussions, audio recordings, and interactive lectures. Supporting to this, Halim (2015) confirmed that students with this audio learning style follow instructions, solve problems through discussion, prefer lectures and seminars over reading books, and are more comfortable expressing their ideas verbally rather than in writing.

The results of this study are also in accordance with research conducted by Anas & Munir (2013) who found that there was no influence of visual learning style on mathematics learning outcomes compared to audio learning style and kinesthetic learning style on mathematics learning outcomes of grade VII students at SMPN Soppeng. The research conducted by Rahman & Yanti (2016) also obtained data that the audio learning style has a significant influence on the Integrated Social Science Studies learning outcomes of class VII students Junior High School at Peudada, although the analysis results showed a determination coefficient of only 4.53%.

Conversely, the study conducted by Jona & Tjakrawala (2022) presents a contradictory perspective. Their research aimed to determine the effect of learning style on academic achievement, with personality as mediating variable, using a sample of 89 economics and business students selected through purposive sampling. The results of this study stated there was a positive and insignificant effect between learning style and academic achievement, The implication of this study is the selection of appropriate learning styles to improve academic achievement. It is said to be contradictory because the research results of Jona & Tjakrawala (2022) found a positive and significant influence of all learning styles (visual, audio, and kinesthetic) on students' academic achievement, while the results of this study only found the influence of audio learning styles on students' academic achievement at PTKIN South Sulawesi.

Kurniawan & Hartono S (2020) determine the influence of learning styles on the academic achievement of prospective mathematics education teachers. The subjects in this research were 66 students of prospective mathematics education teachers in the 5th semester of Sunan Ampel State Islamic University, Surabaya, Indonesia. The research results showed that the most common student learning style was visual learning style (54.5%), then auditory learning style (24.2%) and finally kinesthetic learning style (13.6%). Furthermore, there are some students who choose more than one learning style, namely visual-auditory (3.1%), visual-kinesthetic (3.1%), and auditory-kinesthetic (1.5%). After

carrying out statistical tests, namely the chi square test, it was obtained that calculated $X2$ = 4.497 was greater than $X2$ table = 3.9403 at a significance level of 0.05. This shows that there is a relationship between learning styles and the academic achievement of prospective mathematics education teacher students. The research results Kurniawan & Hartono S (2020) showed that auditory learning style given contribution to academic achievement as much 24.2%, which means that there is a significant influence of auditory learning style on students' academic achievement. This is in accordance with the results of the research that has been carried out, namely that there is a positive influence of audio learning style on students' academic achievement at PTKIN South Sulawesi.

Purnamasari (2020) aglined that while linear regression analysis results a non-significant relationship between visual learning style and Pendidikan Agama Islam outcomes (p = 0.685), indicating minimal contribution of this learning style to student performance. This discrepancy might be attributed to external factors, such as the learning environment. An inadequately enclosed classroom potentially distracted students, as visual stimuli outside the room could divert their attention, hindering their engagement in learning activities. It is said to be appropriate because the results of Purnamasari's (2020) research show that there is no significant influence of visual learning styles on the learning outcomes of PAI students, while the results of this study also found the reality that there is no influence of visual learning styles on the academic achievement of students at PTKIN South Sulawesi.

The findings of this study aligned with the research of Anas & Munir (2013), who reported no significant impact of visual learning style on mathematics achievement among seventh-grade students at SMP Negeri Kab. Soppeng when compared to auditory and kinesthetic learning styles. Given the absence of a correlation between visual and kinesthetic learning styles and academic performance among students at State Islamic Religious Universities in South Sulawesi, it could be inferred that these students predominantly relied on auditory processing for learning. This suggested a preference for verbal interactions, listening to lectures, and auditory instructions both within and outside the classroom.

In contrast to the findings of present study, research conducted by Bire et al. (2014) described the influence of visual, audio and kinesthetic learning styles on students' academic achievement at SMK Negeri 5 Kupang. Data collection through questionnaires and documentation. The population was 113 students with a sample of 100 people through random sampling techniques. Hypothesis testing was carried out using multiple linear regression analysis. Based on the results of the determinant test, the relative contribution of visual, audio, and kinesthetic learning styles to students' academic achievement was 34.89%, while the relative contribution of each to academic achievement was visual learning style 26.4%, audio learning style 24.2%, kinesthetic learning style 26.2%.

Purnamasari (2020) corroborated this perspective by characterizing auditory learners as those who primarily acquired knowledge through listening. These individuals typically excelled in verbal discussions and benefited significantly from teacher explanations at SMAN 1 Tiambung, the prevalent lecture method aligned favorably with the learning preferences of auditory learners in PAI courses. Data analysis and hypothesis testing revealed a significant positive correlation between auditory learning style and PAI learning outcomes (p < 0.05). Moreover, the R^2 value of 0.158 indicated that auditory

learning style accounts for 15.8% of the variance in PAI achievement. These findings suggested a direct relationship between the strength of auditory learning style and academic performance in PAI.

The second reseach objective positing a significant impact of auditory learning style on academic achievement among students at State Islamic Religious Universities in South Sulawesi was supported by the findings. This suggested that auditory processing played a crucial role in knowledge retention at the tertiary level. As a result, instructional methods that emphasize lectures, verbal explanations, and discussion-based learning may prove particularly effective in enhancing student academic outcomes.

These results aligned with the research of Rahman & Yanti (2016), which demonstrated a significant correlation between auditory learning style and social science achievement among seventh-grade students at SMPN 1 Peudada. With an F-count of 4.064, the null hypothesis was rejected in favor of the alternative hypothesis, indicating a substantial influence of auditory learning style on Integrated Social Science Achievement. However, the R^2 value of 4.53% suggested that auditory learning style accounts for a relatively small portion of the variance in social studies outcomes. It is said to be appropriate because the results of the research by Rahman & Yanti (2016) found a significant correlation between audio learning styles and social science learning achievement, while this research also found the influence of audio learning styles on student academic achievement at PTKIN South Sulawesi.

The third research objective asserting a significant impact of kinesthetic learning style on student academic achievement at State Islamic Religious Universities in South Sulawesi, was rejected. The findings of this study indicated no substantial correlation between kinesthetic learning style and academic achievement.

These results aligned with the research of Purnamasari (2020), which revealed a non-significant relationship between kinesthetic learning style and Islamic Religious Education outcomes. A p-value of 0.544, significantly greater than the alpha level of 0.05, supported this conclusion. Moreover, the R^2 value of 0.012 indicated a negligible effect of kinesthetic learning style on Islamic Religious Education achievement. It is said to be in accordance with the research results of Purnamasari (2020) because the results of this study also found the fact that there was no significant influence of kinesthetic learning styles on student academic achievement at PTKIN South Sulawesi.

The findings of this study were consistent with Alfarisi (2016) research, which reported no significant impact of kinesthetic learning style on student outcomes in productive subjects. It is said to be in accordance with the research results of Alfarisi (2016) because the results of the research that has been carried out also confirm that there is no significant influence of kinesthetic learning styles on the academic achievements of students at PTKIN South Sulawesi.

However, these results diverged from Suyono (2018) findings, indicating a significant influence of kinesthetic learning style on accounting students' performance at SMA Negeri 3 Tapung. Suyono's study suggested that learning style was a strategic approach employed by students to achieve learning objectives. Consequently, the measurement of learning styles should prioritize the strategies students utilize to optimize their learning outcomes.

Given that kinesthetic learners typically prefer hands-on activities and often struggle with prolonged periods of inactivity, the traditional lecture-based and reading-focused approach prevalent in Islamic Religious Education at SMA Negeri 1 Tinambung might not optimally cater to their learning preferences. The infrequent used of group work in the subject further limits opportunities for kinesthetic learners to engage actively in the learning process.

In this context, understanding one's learning style becomes essential so that the process of understanding information or knowledge material can be absorbed and stored well in their memory. This condition is in accordance with Honey & Mumford's view that the urgency of each individual knowing their learning style will provide several benefits including: a) it can increase individual awareness of learning activities that suit their own learning style; b) it can aid determine the right choice from the many learning activities to avoid the wrong learning experience, c) individuals can do various improvisations of their learning style. d) it can help individuals to plan their learning goals e) individuals can analyze the achievement of learning outcomes or academic achievements.

The adventages that can be obtained by knowing students' learning styles are that it will make lecturers wiser in responding to students' preferred learning styles by varying various learning methods and it is hoped that they will be able to support students' learning methods so that optimal academic achievement can be achieved. While previous studies had generally established a significant correlation between visual, auditory, and kinesthetic learning styles and student academic performance, the findings of this research diverged from this established trend. This study identified a significant influence of auditory learning style on student academic achievement at State Islamic Religious Universities in South Sulawesi, but no such impact for visual or kinesthetic learning styles.

Through the results of this study which only found the influence of audio learning styles on students' academic achievement, it certainly contributes directly to the learning methods applied by lecturers in the PTKIN environment. Lecturers are expected to be more dominant in applying discussion methods, explaining materials systematically with appropriate voice intonation. While from students, of course, they understand lecture materials faster by listening a lot, reading with sound, even studying while listening to music.

The characteristics of this audio learning style really use the sense of hearing as the main tool for absorbing information or knowledge as capital in understanding the knowledge or information. As an affirmation that students with an audio learning style find it easier to understand lecture material with the sense of hearing, prefer to hear the lecturer's voice when explaining the material and will find it easier to absorb material with the discussion method. These results suggested that individual differences in learning style, particularly the preference for auditory processing, significantly impacted the effectiveness of learning strategies among students in this context. The findings underscored the importance of recognizing the diverse ways in which students acquired and processed information, and the need for instructional approaches that accommodated these variations.

CONCLUSION

Based on the research findings, among visual, auditory, and kinesthetic learning styles, only the auditory learning style demonstrated a significant impact on student academic achievement at State Islamic Religious Universities in South Sulawesi. Given these results, it was strongly recommended that the institution maintain lecture and discussion methods in the learning process. The study's evidence confirmed that optimizing students' auditory capabilities through interactions with lecturers and peer-to-peer communication enhanced learning outcomes.

Based on the combined insights derived from existing research and the present statistical analysis, several key findings emerged:

1. Statistical analysis revealed no significant relationship between visual learning style and student academic achievement ($p = 0.365 > 0.05$). Conversely, a significant positive correlation was found between auditory learning style and academic echievement ($p = 0.047 < 0.05$). However, no significant association was observed between kinesthetic learning style and academic achievement ($p = 0.135 > 0.05$) among students at State Islamic Religious Universities in South Sulawesi.
2. The type of auditorial learning style was very influential on student academic achievement in the State Islamic Religious Universities in South Sulawesi.
3. The results indicate that lecture-based and auditory-focused teaching methods should be enhanced to accommodate students' dominant learning style, optimizing academic outcomes.
4. Further researchers are expected to consider things such as a) the respondents of this study only involved PTKIN, b) the respondents of this study were only based on the numbers written on the IPK to measure students' academic achievement, c) students' academic achievement is not only influenced by their learning style, but many other factors can make a big contribution, d) the data from this study were not normally distributed so that non-parametric analysis was used e) research sampling is not proportional for each institution at South Sulawesi. Therefore, further researchers can more attention to improve these limitations.

REFERENCES

Alfarisi, S. (2016). *Pengaruh gaya, motivasi, dan fasilitas belajar terhadap hasil belajar mata pelajaran Produktif siswa kelas X APK SMK Negeri 1 Turen Kabupaten Malang. Thesis*. Universitas Negeri Malang.

Anas, A., & Munir, N. P. (2013). Pengaruh gaya belajar VAK terhadap hasil belajar matematika siswa. *Prosiding Seminar Nasional*, *02*(1), 233–240.

Arikunto, S. (2010). *Prosedur penelitian suatu pendekatan praktek. Cet. XII*. Jakarta: Rineka Cipta.

Bire, A. L., Geradus, U., & Bire, J. (2014). *Pengaruh gaya belajar visual, auditorial, dan kinestetik terhadap prestasi belajar siswa*. (2), 168–179. https://doi.org/https://doi.org/10.21831/jk.v44i2.5307

Budiningsih, A. (2004). *Pembelajaran moral berpijak pada karakteristik siswa dan budayanya*. Jakarta: Rineka Cipta.

DePorter, B., & Hernacky Mike. (2007). *quantum learning. membiasakan belajar nyaman dan menyenangkan. (terjemahan)* (Vol. 2007). Bandung: PT. Mizan Pustaka.

Eide, B. J., Geiger, M. A., & Schwartz, B. N. (2001). The canfield learning styles inventory: an assessment of its usefulness in accounting education research. *Issues in Accounting Education*, *16*(3), 341. Retrieved from https://link.gale.com/apps/doc/A78054690/AONE?u=anon~62353231&sid=google Scholar&xid=82275e7c

Elliott, S. N., Kratochqill, T. R. L., & Travers, J. F. (2000). *Educational psychology: effective teaching, effective learning*. New York: McGraw-Hill.

Ghufron, M. N., & Risnawati, R. (2014). *Teori-teori psikologi*. Jogjakarta: Ar-Ruzz Media Group.

Halim, A. (2015). Pengaruh strategi pembelajaran dan gaya belajar terhadap hasil belajar fisika siswa SMPN 2 Secanggang kabupaten Langkat. *Pelangi Pendidikan*, *22*(1), 150. https://doi.org/10.24114/pelangi.v22i1.2760

Hartati, L. (2014). Pengaruh gaya belajar dan sikap siswa pada pelajaran matematika terhadap hasil belajar matematika. Jurnal Formatif. *Formatif*, *3*(3), 228.

Hasanah, U., & Tobib, A. S. K. (2023). Esensi merdeka belajar kampus merdeka dan eksistensi mahasiswa berprestasi. *Jurnal Kajian, Penelitian Dan Pengembangan Kependidikan*, *14*(3), 199–206. https://doi.org/10.31764/paedagoria.v14i3.13999

Hawk, T. F., & Shah, A. J. (2007). Using learning style instruments to enhance student learning. *Decision Sciences Journal of Innovative Education*, *5*(1), 1–19. https://doi.org/10.1111/j.1540-4609.2007.00125.x

Jona, M., & Tjakrawala, F. X. K. (2022). Pengaruh learning style terhadap academic achievement yang dimediasi oleh personality. *Jurnal Multiparadigma Akuntansi*, *4*(2), 570–579.

Kadir. (2015). *Statistika terapan: konsep, contoh dan analisis data dengan program SPSS Liserel dalam penelitian*. Jakarta: PT RajaGrafindo Persada.

Kismiantini, Setiawan, E. P., Pierewan, A. C., & Montesinos-López, O. A. (2021). Growth mindset, school context, and mathematics achievement in Indonesia: A multilevel model. *Journal on Mathematics Education*, *12*(2), 279–294. https://doi.org/10.22342/jme.12.2.13690.279-294

Kolb, D. A., & Kolb, A. Y. (2013). *The Kolb learning style inventory 4.0: Guide to theory, psychometrics, research & applications*. Retrieved from https://www.researchgate.net/publication/303446688

Kurniawan, A. P., & Hartono S. (2020). The effect of learning style on academic achievement of prospective teachers in mathematics education. *Journal of Mathematical Pedagogy (JoMP)*, *2*(1), 26. https://doi.org/10.26740/jomp.v2n1.p26-31

Lens, W., Lacante, M., Vansteenkiste, M., & Herrera, D. (2005). Study persistence and academic achievement as a function of the type of competing tendencies. *European Journal of Psychology of Education*, *20*(3), 275–287. https://doi.org/10.1007/BF03173557

Muchlis, N., Abna, N., Yusuf, R. A., Syamsu, A., & Chalid, L. (2022). Evaluasi pelaksanaan kegiatan pertukaran program Merdeka Belajar Kampus Merdeka (MBKM) pada mahasiswa kesehatan inbound di Universitas Muslim Indonesia. *An Idea Health Journal*, *2*(01), 01–05. https://doi.org/10.53690/ihj.v3i01.67

Mulyaningsih, I. E. (2014). Pengaruh interaksi sosial keluarga, motivasi belajar, dan kemandirian belajar terhadap prestasi belajar. *Jurnal Pendidikan Dan Kebudayaan*, *20*(4), 441–451. https://doi.org/10.24832/jpnk.v20i4.156

Nasution. (2003). *Berbagai pendekatan dalam proses belajar mengajar*. Jakarta: Bina Aksara.

Nugraheni, E., & Pangaribuan, N. (2006). Gaya belajar dan strategi belajar mahasiswa jarak jauh: kasus di Universitas Terbuka. *Jurnal Pendidikan Terbuka Dan Jarak Jauh*, *7*(1), 68–82.

Nugroho, I. H., & Raharjo, I. B. (2025). The role of reading and listening concentration levels and learning style on vocabulary acquisition during online learning. *Journal on Education*, *07*(02), 10425-10437. https://doi.org/10.31004/joe.v7i2.8065.

OECD. (2019). *PISA 2018 Results (Volume I): what students know and can do, PISA*. Paris. https://doi.org/10.36709/selami.v4i48.8505

Papilaya, J. O., & Huliselan, N. (2016). Identifikasi gaya belajar mahasiswa. *Jurnal Psikologi Undip*, *15*(1), 56. https://doi.org/10.14710/jpu.15.1.56-63

Philbin, M., Meier, E., Huffman, S., & Boverie, P. (1995). A survey of gender and learning styles. *Sex Roles*, *32*(7–8), 485–494. https://doi.org/10.1007/BF01544184

Prastiti, S. D., & Pujiningsih, S. (2009). Pengaruh faktor preferensi gaya belajar terhadap prestasi akademik mahasiswa akuntansi. *Jurnal Ekonomi Bisnis*, *3*, 20–35.

Purnamasari, N. I. (2020). Pengaruh kecerdasan interpersonal, gaya belajar dan motivasi berprestasi terhadap hasil belajar Pendidikan Agama Islam kelas XI SMAN 1 Tinambung. *Inspiratif Pendidikan*, *9*, 260–272.

Rahman, A. A., & Yanti, S. (2016). Pengaru gaya belajar terhadap hasil belajar siswa pada mata pelajaran IPS Terpadu di kelas VII SMP Negeri 1 Peudada. *Jurnal Pendidikan Al-Muslim*, *4*(2).

Ridwan. (2019). *Belajar mudah penelitian untuk guru dan karyawan dan peneliti pemula*. Bandung: Alfabeta.

Rijal, S., & Bachtiar, S. (2015). Hubungan antara sikap, kemandirian belajar, dan gaya belajar dengan hasil belajar kognitif siswa. *JURNAL BIOEDUKATIKA*, *3*(2), 15. https://doi.org/10.26555/bioedukatika.v3i2.4149

Sabornie, E. J., Cullinan, D., Osborne, S. S., & Brock, L. B. (2005). Intellectual, academic, and behavioral functioning of students with high-incidence disabilities: a cross-categorical meta-analysis. *Council for Exceptional Children*, *72*(1), 47–63.

Siregar, S. (2017). *Metode penelitian kuantitatif, dilengkapi dengan perbandingan perhitungan manual & SPSS*. Jakarta: Kencana.

Sudaryono. (2016). *Metode penelitian pendidikan*. Jakarta: Kencana.

Sudjana, N. (2006). *Cara belajar siswa aktif*. Jakarta: Sinar Baru Algesindo.

Sugiyono. (2014). *Metode penelitian kuantitatif, kualitatif dan R&D*. Bandung: Alfabeta.

Susilo, M. J. (2006). *Gaya belajar menjadikan makin pintar*. Yogyakarta: Pinus.

Suyono, A. (2018). Pengaruh gaya belajar terhadap hasil belajar pada mata pelajaran akuntansi kelas XI IPS SMA N 3 Tapung Tahun Ajaran 2017/2018. *Peka*, *6*, 1. Retrieved from https://journal.uir.ac.id/index.php/Peka/article/view/1858

Ula, S. (2013). *Revolusi belajar: optimalisasi kecerdasan melalui pembelajaran berbasis kecerdasan majemuk*. Yogyakarta: Ar-Ruzz Media.

Uno, H. B. (2006). *Orientasi baru dalam psikologi pembelajaran*. Jakarta: Bumi Aksara.

Wahyuni, Y. (2017). Identifikasi gaya belajar (visual, auditorial, kinestetik) mahasiswa pendidikan matematika Universitas Bung Hatta. *Jurnal Penelitian dan Pembelajaran Matematika*, *10*(2). https://doi.org/10.30870/jppm.v10i2.2037

Winkel, W. S. (2009). *Psikologi pendidikan dan evaluasi belajar*. Jakarta: Gramedia.

Yaumi, M. (2012). *Pembelajaran berbasis multiple intelligences*. Jakarta: Dian Rakyat.