Journal of Mandalika Literature, Vol. 7, No. 2, 2026, e-ISSN: 2745-5963
Akreditasi Sinta 5, https://sinta.kemdikbud.go.id/journals/profile/12219
Available online at: http://ojs.cahayamandalika.com/index.php/jml

# The Influence of VARK Learning Style and SAMR Model toward Students' Reading Comprehension in Digital Era

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***Article History***

*Received: 09-01-2026*

*Revised: 30-3-2026*

*Published: 31-05-2026*

***Key Words:***

*VARK Learning Style; SAMR Model; Reading Comprehension; Digital Learning; Islamic Boarding School.*

***Abstract****: This study evaluated the impact of VARK learning styles and the SAMR model on students' reading comprehension during the digital era. Using a quasi-experimental design, the study involved 130 students, who were assigned to experimental and control groups. Students in the experimental group used digital platforms—StoryWeaver and StoryJumper— for reading instruction, which were implemented in a SAMR model framework. This included Substitution, Augmentation, Modification, and Redefinition. Data collection involved pre-tests and post-tests (for both groups) and close-ended questionnaire of VARK and SAMR (for experimental group), which were analysed in SPSS using One-Way ANOVA to evaluate the impact of the learning styles (Visual, Auditory, Reading/Writing, and Kinaesthetic) and SAMR levels (Modification and Redefinition) on reading comprehension.*

**Kata Kunci:**
Gaya Belajar VARK; Model SAMR; Pemahaman Membaca; Pembelajaran Digital; Pondok Pesantren Modern

**Abstrak:** Penelitian ini mengevaluasi dampak gaya belajar VARK dan model SAMR terhadap pemahaman membaca siswa di era digital. Dengan menggunakan desain kuasi-eksperimental, penelitian ini melibatkan 130 siswa, yang ditugaskan ke kelompok eksperimental dan kontrol. Siswa dalam kelompok eksperimental menggunakan platform digital—*StoryWeaver* dan *StoryJumper*— untuk instruksi membaca, yang diimplementasikan dalam kerangka model SAMR. Ini termasuk Substitusi, Augmentasi, Modifikasi, dan Redefinisi. Pengumpulan data melibatkan pra-tes dan pasca-tes (untuk kedua kelompok) dan kuesioner tertutup VARK dan SAMR (untuk kelompok eksperimen), yang dianalisis dalam SPSS menggunakan ANOVA Satu Arah untuk mengevaluasi dampak gaya belajar (Visual, Pendengaran, Membaca/Menulis, dan Kinestetik) dan tingkat SAMR (Modifikasi dan Redefinisi) terhadap pemahaman bacaan.

## Introduction

All students learn differently, some of them understand the material better when they see visual information, while others learn by listening, reading, or doing hands-on activities. The VARK learning style is effective in educational contexts because it promotes differentiated instruction, which allows teachers to create classes that appeal to variety in learning styles. When it comes to reading comprehension, combining visual, aural, reading/writing, and kinesthetic skills can help students engage and understand more effectively. The VARK learning styles (Visual, Auditory, Read/Write, and Kinesthetic) capture a variety of their learning preferences (Vijaykumar et al., 2015).

Fleming devised a model called VARK. Pritishkumar & Micheal (2014) stated that the VARK learning style diagnosis paradigm relies on the human sense. VARK is an acronym for four learning styles: visual (V), auditory (A), read/write (R), and kinesthetic (K). According to Fleming (2001), learning style refers to an individual's preferred methods of information collection, organization, and thought. VARK focuses

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on how we might receive and transmit knowledge through our senses (Subagja & Rubini, 2023).

Living in a digital era where technology is a powerful instrument in education, SAMR (substitution, augmentation, modification and redefinition) becomes relevant. According to Puentedura (2006), the SAMR (substitution, augmentation, modification and redefinition) is a four-tied method to selecting, implementing and assessing technology in K-12 schools (Hamilton et al., 2016). Insan, AM, & Hijrah (2024) stated that The SAMR model allows teacher to modify English learning to engage student more deeply, it optimizes classroom activities and inspires teachers for the current learning model (Intan & AM, 2024). Instead of just assigning a digital version of a textbook (Substitution), teachers can use multimedia explanation (Augmentation), interactive discussion websites and platforms (Modification), or virtual collaboration with students from other schools (Redefinition).

This approach allows teachers and students to create more dynamic and engaging reading comprehension activities, adapting to diverse VARK learning styles through methods that were previously unachievable with traditional approaches.

Recognizing diverse learning styles and integrating technology into instruction are particularly important in bilingual educational environments such as Darel Azhar Islamic Boarding School, where language instruction uses direct method (Rozak, 2018), and students are expected to master both English and Arabic, especially when it comes to reading comprehension. Students who are taught in methods that correspond to their preferred learning styles can receive and remember material efficiently.

Darel Azhar teachers keep up with the current language learning trends in this technological era, they have easy access to technology and internet. Darel Azhar provides them with a computer laboratory for instruction, where students can study language in a modern method. The classroom is not only limited to textbooks and printed material, but the students can access e-books, audiobooks, educational films, and interactive learning environments. However, simply accessing the internet and digital tools does not ensure better learning outcomes. This is where the SAMR (substitution, augmentation, modification and redefinition) becomes relevant. Regardless of these opportunities, many Darel Azhar Students remain to struggle with reading comprehension, according to their English Teacher.

Many students struggle to acquire reading competency, which is generally due to a lack of engagement or teaching techniques that do not align with their learning styles. Knowing these difficulties in learning English, we know that students showed low enthusiasm and interest throughout reading comprehension activities. This lack of motivation stemmed from a misalignment between the teacher's learning strategies and the student's chosen learning style. As a result, the students struggled to understand texts and extract information effectively. Many strategies for increasing students' reading interest are time-consuming. To construct effective reading comprehension interventions, it is crucial to consider individual differences among students. Students' learning style, language skills and prior experiences all influence students' reading comprehension ability. Teachers can create a more inclusive and supportive learning environment by adapting teaching strategies and activities to specific student requirements.

Several previous studies have explored the application of VARK learning styles in language learning contexts (Vijaykumar et al., 2015; Subagja & Rubini, 2023). Other studies have examined the integration of technology in education using the SAMR

model (Hamilton et al., 2016; Cáceres-Nakiche et al., 2024). However, these studies tend to investigate these approaches separately. Research that examines the interaction between VARK learning styles and SAMR-based digital learning activities in improving reading comprehension is still limited. Moreover, studies conducted in Islamic boarding school environments, where students experience intensive language immersion, remain scarce. Therefore, this study attempts to fill this gap by examining the influence of VARK learning styles and the SAMR model on students' reading comprehension in a bilingual Islamic boarding school context.

**Research Objectives**

Based on the background and research gap described above, this study aims to examine the influence of VARK learning styles and the SAMR model on students' reading comprehension. Specifically, this research investigates:

1. Whether different VARK learning styles influence students' reading comprehension,
2. Whether different SAMR levels affect students' reading comprehension improvement, and
3. Whether there is an interaction between VARK learning styles and the SAMR model in improving students' reading comprehension.

**Research Method**

This study used quantitative methods to assess the influence of the VARK learning styles and SAMR model on students' reading comprehension. Quantitative research tests objective ideas by investigating the relationship between variables. These variables can be measured with tools and studied statistically. The final written report follows a structured format with an introduction, literature and theory, methodology, findings, and discussion (Creswell, 2014).

This study employs quasi experimental design. A quasi-experimental design does not allocate individuals to groups at random. As a result, the researcher is unable to draw judgement about cause and effect. Thus, the participants cannot be assigned to the group (Gile, 2015).

*Research Design*:

This study used the nonequivalent group design because the researcher used the purposive sampling. The nonequivalent group design is a quasi-experimental design because the participants are assigned to the treatment condition nonrandomly. Non-random assignment occurs when administrators assign treatments based on convenience or other criteria. Non-equivalent group designs occur when treatments are assigned to pre-existing groups of individuals designed for a different purpose, without random assignment (Reichardt, 2005).

The pretest-posttest control group design is used in this study. Where the experimental group takes part in some type of treatment or intervention and the control group does not take the treatment. The design also includes a pretest-posttest, in which both experimental and control group participate (Rogers & Révész, 2020).

*Table 1. Pre-test/post-test control group design*

| Groups | Pre-test | Experiment | Post-test |
|---|---|---|---|
| Experimental group | O | X | O |
| Control group | O | | O |

The participants of this study were 130 eighth-grade students from Darel Azhar Islamic Boarding School in Lebak, Banten, Indonesia. Eighth grade students in Indonesia are generally between 13 and 14 years old and are classified as junior high school students. The participants consisted of both male and female students who were enrolled in the English reading course during the academic year.

The participants were divided into two groups: an experimental group consisting of 75 students (Classes 8B, 8C, and 8D) and a control group consisting of 55 students (Classes 8E and 8F). Purposive sampling was used in this study because the researcher selected intact classroom groups based on administrative considerations and classroom availability. Classes with relatively higher reading comprehension scores were selected as the experimental group to ensure that students were ready to participate in digital learning activities implemented through the SAMR model.

Data Instruments:

1. Reading comprehension test (pre-test and post-test): The reading comprehension test consisted of 40 multiple-choice questions designed to measure students' ability to identify main ideas, supporting details, vocabulary meaning, and inference from reading passages. Each correct answer was scored as one point, resulting in a maximum score of 40. The test items were adapted from junior high school English reading materials aligned with the Indonesian curriculum. The reliability of the test was measured using Cronbach's Alpha.
2. VARK questionnaire: Students' learning styles were identified using the VARK Questionnaire developed by Fleming (2001). The questionnaire consists of 16 items designed to classify learners into four learning styles: Visual, Auditory, Reading/Writing, and Kinesthetic. The questionnaire was translated and adapted to the Indonesian context to ensure that students clearly understood the questions.
3. SAMR questionnaire: A SAMR questionnaire was administered to identify students' experiences with digital learning activities during the implementation of the SAMR model. The questionnaire consisted of 23 close-ended items measured using a Likert scale. The items were designed to measure students' perceptions of technology integration during learning activities, particularly at the Modification and Redefinition levels.

*Data Analysis Techniques*:

In this study, the data were analysed using *SPSS version 25.0*. According to Talikan et al. (2025), SPSS is one of the most widely used statistical software in educational research, particularly for examining differences in variables before and after treatment (Talikan et al., 2024).

This study uses descriptive statistics to examine and describe the core properties of the data, providing a clear overview of the research variables. It is related to Greaslay (2008) that descriptive statistics summarize facts, such as the gender distribution and average age of patients (Greasley, 2008).

Cronbach's Alpha is used in this study to quantify the internal consistency of the test items, which ensures the instrument's reliability. Cronbach's alpha measures internal consistency, indicating how closely linked things are as a collection. The coefficient runs from 0 to 1. A high alpha value suggests that the items assess an underlying factor. This is not a statistical test, but rather a measure of dependability and consistency (Almquist & Kvart, 2019).

In addition, to determine whether there were significant differences in reading comprehension performance among the learning style groups (Visual, Auditory, Reading/writing, and Kinaesthetic), a *One-Way ANOVA* test was conducted in this research. It is related to Connoly (2007) that *One-Way ANOVA* test compares the scores of three or more independent groups on a scale variable (Connolly, 2007).

## Finding and Discussion

### Finding

The research results conducted at Darel Azhar Islamic Boarding School Lebak. The researcher used a quasi-experimental nonequivalent group design involving two groups: an experimental group and a control group. The experimental group was given the pre-test, experiment in using VARK Learning Style and SAMR Model, and post-test. Meanwhile, the control group was given the pre-test and post-test.
After the treatment, the study found:

### 1. Description of The Data

The following are the descriptive analysis of the respondents for both groups.

*Table 2. The Experimental Group Description*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 8 B | 24 | 32,0 | 32,0 | 32,0 |
| | 8 C | 28 | 37,3 | 37,3 | 69,3 |
| | 8 D | 23 | 30,7 | 30,7 | 100,0 |
| | Total | 75 | 100,0 | 100,0 | |

The table above shows the participants for experimental group, there are three classes with 2 groups of genders. There were 75 students from three distinct classes at Darel Azhar Islamic Boarding School. The findings shows that Class 8C had the most participants, with 28% (37.3%), followed by Class 8B with 24 (32.0%), and Class 2D with 23 (30.7%). As a result, the study included a proportional representation of all three classes.

*Table 3. The Control Group Description*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 8 E | 31 | 56,4 | 56,4 | 56,4 |
| | 8 F | 24 | 43,6 | 43,6 | 100,0 |
| | Total | 55 | 100,0 | 100,0 | |

This table shows that 55 students from the control group participated in this study as respondents. It displays the student distribution by class. There were 31 students (56.4%) in Class 8E and 24 students (43.6%) in Class 8F. This suggest that a marginally higher percentage of the control group was made up of pupil Class 8E.

**2. Distribution of respondents' VARK Learning Style**

*Table 4. Distribution of respondents' VARK Learning Style*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Visual | 26 | 34,7 | 34,7 | 34,7 |
| | Audio | 16 | 21,3 | 21,3 | 56,0 |
| | Reading/ Writing | 14 | 18,7 | 18,7 | 74,7 |
| | Kinaesthetic | 19 | 25,3 | 25,3 | 100,0 |
| | Total | 75 | 100,0 | 100,0 | |

The table above shows the distribution of students' learning styles. The statistics suggest that the visual learning style was the most popular, with 26 students (34.7%) preferring this way of learning. The kinaesthetic learning approach was selected by 19 students (25.3%), whereas the auditory learning style was picked by 16 students (21.3%). Meanwhile, reading/writing was the least desired learning type, with 14 pupils (18.7%). This result classified them to 4 groups of learning.

**3. Validity and Reliability Test**

The pre-test instrument showed Cronbach's Alpha of 0.922, post-test 0.952, VARK questionnaire 0.796, and SAMR questionnaire 0.920, indicating good to excellent reliability. Corrected item-total correlations above 0.30 confirmed validity.

**4. The Pre-test Result in Reading Comprehension**

*Table 5. The Pre-test Result in Reading Comprehension*

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Control | 55 | 5 | 14 | 8,44 | 2,201 |
| Experimental | 75 | 4 | 35 | 19,07 | 7,459 |

The pre-test results indicate that the experimental group (M = 19.07, SD = 7.459) had substantially higher initial reading comprehension scores than the control group (M = 8.44, SD = 2.201). This suggests that the two groups were not equivalent at the beginning of the study. However, the comparison between pre-test and post-test scores was used to examine the improvement within each group after the implementation of the SAMR-based learning activities.

## 5. The Post-test Result in Reading Comprehension

*Table 6. The Post-test Result in Reading Comprehension*

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Control | 55 | 6 | 16 | 10,98 | 2,578 |
| Experimental | 75 | 10 | 40 | 28,84 | 7,347 |

The table shows that the control group (N = 55) had scores ranging from 6 to 16, with a mean of 10.98 and a standard deviation of 2.578. In comparison, the experimental group (N = 75) had higher scores (range from 10 to 40), with a mean of 28.84 and a standard deviation of 7.347. Overall, the experimental group outperformed the control group, with more fluctuation in scores.

*Table 7. The Post-test Result in Reading Comprehension Based on VARK Learning Style*

| **Learning Style** | **Mean** | **N** | **Std. Deviation** |
|---|---|---|---|
| Visual | 32,04 | 26 | 5,730 |
| Audio | 24,25 | 16 | 7,802 |
| Reading/Writing | 24,86 | 14 | 8,056 |
| Kinaesthetic | 31,26 | 19 | 5,162 |
| Total | 28,84 | 75 | 7,347 |

The table above shows the post-test descriptive statistics of students' reading comprehension performance based on their VARK learning styles. The results show that visual learners had the highest mean score of 32.04 with a standard deviation of 5.730, indicating outstanding performance and relatively consistent outcomes in this group. This shows that learners who prefer visual representations were able to absorb textual information more effectively by incorporating visually supported media into the learning process.

*Table 8. Tukey HSD post-hoc test results for post-test scores*

| **Learning Style** | **N** | **Subset for alpha = 0.05** | |
|---|---|---|---|
| | | 1 | 2 |
| Audio | 16 | 24,25 | |
| Reading/Writing | 14 | 24,86 | |
| Kinaesthetic | 19 | | 31,26 |
| Visual | 26 | | 32,04 |
| Sig. | | ,993 | ,985 |

The table provides insight into the Tukey HSD post-hoc test results regarding the post-test score comparisons for the four VARK learning style groups. Auditory as well as reading/writing learners are clustered in the first subset and recorded mean scores of 24.25 and 24.86. In comparison, kinaesthetic and visual learners are in the second subset with mean scores of 31.26 and 32.04. As for the recorded

significance scores for the respective subsets of 0.993 and 0.985, they are greater than 0.05 which means that the differences in post-test reading comprehension scores across the four learning styles are not statistically significant.

**6. Comparative Analysis of Pre-test and Post-test Scores**

*Table 9. Comparative Analysis of Pre-test and Post-test Scores*

| **Learning Style** | | **Nilai Pre-test** | **Nilai Post-test** |
|---|---|---|---|
| Visual | Mean | 19,12 | 32,04 |
| | N | 26 | 26 |
| | Std. Deviation | 7,685 | 5,730 |
| Audio | Mean | 17,63 | 24,25 |
| | N | 16 | 16 |
| | Std. Deviation | 7,464 | 7,802 |
| Reading/Writing | Mean | 18,93 | 24,86 |
| | N | 14 | 14 |
| | Std. Deviation | 8,251 | 8,056 |
| Kinaesthetic | Mean | 20,32 | 31,26 |
| | N | 19 | 19 |
| | Std. Deviation | 6,896 | 5,162 |
| Total | Mean | 19,07 | 28,84 |
| | N | 75 | 75 |
| | Std. Deviation | 7,459 | 7,347 |

The table demonstrates the pre-test and post-test results for the four learning styles. Regardless of the VARK style each student preferred, the post-test results for the SAMR-based learning intervention demonstrated positive results for each students' reading comprehension. The mean score for visual learners improved from 19.12 (SD = 7.685) on the pre-test to 32.04 (SD = 5.730) on the post-test, which reflects reading comprehension skills improvement. Auditory learners also improved in score mean values from 17.63 (SD = 7.464) to 24.25 (SD = 7.802) just as reading/writing learners improved from 18.93 (SD = 8.251) to 24.86 (SD = 8.056). The greatest significant improvement was seen in kinaesthetic learners, whose scores rose from 20.32 (SD = 6.896) in the pre-test to 31.26 (SD = 5.162) in the post-test.

The total mean score increased from 19.07 to 28.84 with very consistent standard deviations of 7.459 and 7.347. These findings indicate that the use of the VARK learning style approach within the SAMR model has a positive effect on

students' reading comprehension, especially for the visual and kinaesthetic learners most attracted to the interactive and technology-based learning materials.

### *7.* Improvement by VARK Learning Style

*Table 10. The main gain scores of students' reading comprehension across different learning styles (VARK)*

| Learning Style | Mean | N | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Visual | 12,9231 | 26 | 3,71939 | 5,00 | 19,00 |
| Audio | 6,6250 | 16 | 3,42296 | 1,00 | 14,00 |
| Reading/Writing | 5,9286 | 14 | 1,77436 | 3,00 | 10,00 |
| Kinaesthetic | 10,9474 | 19 | 3,40708 | 5,00 | 17,00 |
| Total | 9,7733 | 75 | 4,38231 | 1,00 | 19,00 |

The gain scores of students' reading comprehension across the four VARK learning styles ensuing the SAMR-based learning intervention is indicated in the previous table. After treatment, all learning style groups demonstrated improvements in reading comprehension. Visual learners, however, had the most pronounced improvement, achieving an average gain score of 12.92 (SD = 3.719) with scores between 5.00 and 19. This means that students with a visual orientation predominantly benefited from the merging of digital and visual components throughout the SAMR paradigm.

*Table 11. Anova Result of the main gain scores of students' reading comprehension across different learning styles (VARK)*

| Learning Style | N | Subset for alpha = 0.05 | |
|---|---|---|---|
| | | 1 | 2 |
| Reading/Writing | 14 | 5,9286 | |
| Audio | 16 | 6,6250 | |
| Kinaesthetic | 19 | | 10,9474 |
| Visual | 26 | | 12,9231 |
| Sig. | | ,922 | ,288 |

As for the reading comprehension gain scores across the four VARK learning styles, a one-way ANOVA test was conducted to establish if variance was significant. Among the reading/writing learners was the lowest mean gain score of 5.93, followed by auditory learners at 6.63. The kinaesthetic and visual learners scored higher gain values of 10.95 and 12.92, respectively. However, because the significance values of 0.922 and 0.288, the differences were not statistically significant. This suggests that while there was a higher mean increase for visual and kinaesthetic learners compared to auditory and reading/writing learners, the difference was not enough to be deemed statistically significant. This indicates that

although some learning styles achieved higher mean scores, the differences among the groups were not statistically significant.

## 8. Improvement by SAMR levels

*Table 12. The mean gain scores of students' reading comprehension at each SAMR level*

| SAMR Level | Mean | N | Std. Deviation |
|---|---|---|---|
| Modification | 9,67 | 39 | 3,969 |
| Redefinition | 9,97 | 34 | 4,939 |
| Total | 9,81 | 73 | 4,418 |

The table illustrates the mean gain scores of students' reading comprehension between two higher levels of the SAMR model—Modification and Redefinition. Students at the Redefinition level had a slightly higher mean gain score (M = 9.97, SD = 4.939) as compared to those at the Modification level (M = 9.67, SD = 3.969), as indicated by the data. Both groups of students, therefore, seem to have made substantial progress in reading comprehension as a result of engaging in SAMR-based digital learning activities. The very small difference between the two mean scores suggests that while the Redefinition activities, which required students to create and present an original story using digital tools, might have offered more opportunities for creativity and autonomy, the Modification activities, for example, the revision and retelling of the story using digital media, were just as effective in comprehension improving.

*Table 13. The ANOVA Result of the mean gain scores of students' reading comprehension at each SAMR level*

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 1,678 | 1 | 1,678 | ,085 | ,772 |
| Within Groups | 1403,637 | 71 | 19,770 | | |
| Total | 1405,315 | 72 | | | |

The ANOVA results in Table 13 indicate that the difference in students' reading comprehension gain scores between the Modification and Redefinition levels of the SAMR model was not statistically significant, F (1,71) = 0.085, p = 0.772. The average score at the Redefinition level (M = 9.97) was a little higher than that at the Modification level (M = 9.67), but the difference was not statistically significant. This result means that both levels of technological integration within the SAMR framework had the same effect on students' reading comprehension to be raised. Students in both groups benefited from digitally based learning activities which were designed to engage them actively, and develop their creativity and cooperation skills, whether they were simply editing existing materials or creating new ones. The data show that both the Modification and Redefinition levels of SAMR contributed significantly to students' reading

comprehension progress. However, the difference between the two levels was not statistically significant.

**9. Interaction between VARK Learning Style and SAMR Model**

*Table 14. The result of the interaction between VARK and SAMR*

| **Learning Style** | | **Mean** | **Std. Deviation** | **N** |
|---|---|---|---|---|
| Visual | Modification | 12,27 | 3,195 | 15 |
| | Redefinition | 13,82 | 4,332 | 11 |
| | Total | 12,92 | 3,719 | 26 |
| Audio | Modification | 7,38 | 3,777 | 8 |
| | Redefinition | 5,88 | 3,091 | 8 |
| | Total | 6,63 | 3,423 | 16 |
| Reading/Writing | Modification | 6,00 | 2,280 | 6 |
| | Redefinition | 5,86 | 1,574 | 7 |
| | Total | 5,92 | 1,847 | 13 |
| Kinaesthetic | Modification | 9,80 | 3,425 | 10 |
| | Redefinition | 12,38 | 3,249 | 8 |
| | Total | 10,94 | 3,506 | 18 |
| Total | Modification | 9,67 | 3,969 | 39 |
| | Redefinition | 9,97 | 4,939 | 34 |
| | Total | 9,81 | 4,418 | 73 |

Table 14 presents the interaction results between VARK students' learning styles and SAMR levels (Modification and Redefinition) in terms of mean gain scores in reading comprehension. The descriptive statistics reveal that the means varied between learning styles and SAMR levels. In both levels, visual learners were able to increase their scores the most. At the Modification level, the mean was 12.27 and at the Redefinition level, it was 13.82, resulting in an overall average of 12.92. This indicates that visual learners gained the most from digital learning activities, especially those that involved visually rich material and technological integration. On the other hand, Reading/Writing learners had the lowest gain scores, with the mean being 6.00 at the Modification level and 5.86 at the Redefinition level, thus indicating very little growth when compared to other learning styles.

*Table 15. ANOVA Result for the Interaction between VARK and SAMR*

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Corrected Model | 687.663[a] | 7 | 98,238 | 8,898 | ,000 | ,489 |
| Intercept | 5713,531 | 1 | 5713,531 | 517,493 | ,000 | ,888 |
| Learning Style | 651,062 | 3 | 217,021 | 19,656 | ,000 | ,476 |
| SAMR Level | 6,548 | 1 | 6,548 | ,593 | ,444 | ,009 |
| Learning Style * SAMR Level | 41,610 | 3 | 13,870 | 1,256 | ,297 | ,055 |
| Error | 717,652 | 65 | 11,041 | | | |
| Total | 8428,000 | 73 | | | | |
| Corrected Total | 1405,315 | 72 | | | | |

Table 15 presents the results of a two-way ANOVA that examined the impact of VARK and SAMR levels (Modification and Redefinition) on students' reading comprehension gain scores. A significant main effect of Learning Style was observed, F (3,65) = 19.656, p <.001, with a partial eta squared of.476, which indicates a large effect size. This means that students' reading comprehension improvements differed significantly across the four learning styles (visual, auditory, reading/writing, and kinaesthetic). On the other hand, the effect of SAMR Level was not significant, F (1,65) = 0.593, p =.444, $\eta^2$ =.009, thus, there was no significant difference in gain scores between the Modification and Redefinition levels. In the same way, the interaction between Learning Style and SAMR Level was not significant, F (3,65) = 1.256, p =.297, $\eta^2$ =.055.

**Discussion**

In this part, researcher discuss the research findings conducted by researcher in more detail.

**1. VARK Learning Styles and Students' Reading Comprehension**

The findings demonstrate that all forms of VARK learning—visual, auditory, reading/writing, and kinaesthetic—significantly enhance students' ability to understand written content from practice to test. Although all learning groups experience significant increases, descriptive data indicates that visual and kinaesthetic learning achieve higher scores after completion. This illustrates how students' knowledge can increase more successfully when they participate in enjoyable and meaningful learning activities.

This idea is in line with Moussa who claim that learning styles are the essential approaches that students prefer to use to perceive and process information, as well as engage with their learning environment (Moussa, 2014). Identifying learning styles help instructors better understand learners' distinct qualities. Learning that is adapted to VARK preferences aids students in absorbing and processing information more effectively, claim Fleming and Mills (1992). Higher levels of understanding have been attained in this study as a result of the integration of multiple learning techniques, including study tasks, audio materials, visual aids, and hands-on activities.

**2. SAMR Model and Reading Comprehension**

In general, student experiences indicate that incorporating digital storytelling into the SAMR model allows them to learn in a more meaningful, collaborative, and enjoyable manner, though the level of effectiveness varies depending on individual learning style preferences and digital skills. It is related to Hamilton et al. (2016), They mentioned that Puentedura's concept about SAMR encourages teachers to use technology to "move up" from lower to higher levels of teaching, resulting in improved teaching and learning outcomes (Hamilton et al., 2016).

**3. The Relationship between VARK Learning and SAMR Model on Reading Comprehension.**

According to the findings, students' reading comprehension improved when the SAMR model and the VARK learning style framework were combined. While the SAMR model emphasises the use of technology to improve learning experiences, the VARK Learning Model focusses on individual learning preferences. These two models address different facets of the learning process. Together, they produced a more engaging and customised setting that could accommodate a wide range of learners.

Different students of various learning styles have positively responded to the technology usage at different SAMR levels. Visual learners have benefited from digital reading of the texts, slides, and pictures that were in line with their preference of visual information. Auditory learners have got the most of the listening features and pronunciation tools which have been integrated into the reading activities, thus enabling them to process the information through sound. Reading/writing students have considered online readings, note-taking, and comprehension questions as good tools for reinforcing their understanding.

The higher improvement among visual and kinaesthetic learners may be explained through Mayer's Cognitive Theory of Multimedia Learning, which suggests that learners process information more effectively when verbal and visual materials are combined. According to Mayer (2009), students learn more effectively when information is presented through multiple channels such as visual and verbal elements. Digital storytelling activities used in this study combine text, images, and interactive media, which may explain why visual and kinaesthetic learners showed higher improvement. Digital storytelling activities used in the SAMR model provide both visual and interactive elements, allowing students to process information through multiple cognitive channels.

The findings are particularly relevant for Islamic boarding school contexts, where students are required to develop language proficiency in multiple languages simultaneously. The integration of technology-supported learning activities can

provide more flexible and engaging opportunities for students to practice reading skills in English.

## Conclusion

This study was conducted to determine the evaluation of the influence of VARK Learning Style and SAMR Model. This study was conducted at Darel Azhar Boarding School situated in Rangkasbitung, Lebak, Banten. 130 students who were divided into two groups, experimental and control group are the objective of this research. The researcher compiled questionnaires and tests as an instrument for this study to identify students' experience using VARK Learning Style and SAMR Model for reading comprehension.

Post-test results revealed that the experimental group taught with the SAMR-based digital storytelling approach had higher average reading comprehension scores than the control group taught with traditional approaches. This implies that incorporating technology into the SAMR model can increase students' reading comprehension.

The four learning styles (visual, auditory, reading/writing, and kinaesthetic) did not differ statistically significantly in the experimental group. However, descriptive results revealed that visual and kinaesthetic learners had bigger score increases than auditory and reading/writing learners. This suggests that digital storytelling exercises with visual and interactive features are more suited to these learning styles.

For SAMR Model, students got higher two levels, Modification and Redefinition. The findings revealed that students learning at the Modification level saw slightly greater score improvements than those studying at the Redefinition level. This suggests that moderate levels of technology integration may be as effective as more complex ones.

The findings of a two-way ANOVA test revealed no significant interaction between learning style and SAMR level on reading ability improvement. This suggests that the impact of technology integration is very similar across various learning styles.

Students in the experimental group had favourable learning experiences using digital storytelling-based learning. They felt more motivated, engaged, and loved the learning process that included visual and creative elements. Visual and kinaesthetic learners seemed to profit more from interactive digital activities, whereas auditory and reading/writing learners needed more time to adjust. However, some students mentioned time restrictions and limited digital abilities as key barriers to participation in this learning.

*Practical Implications*:

The findings of this study provide several practical implications for English teachers in Islamic boarding schools. First, teachers are encouraged to design reading activities that accommodate different learning styles by incorporating visual, auditory, and interactive materials. Second, the SAMR model can be used as a framework to gradually integrate technology into language learning activities. Digital storytelling platforms such as StoryWeaver and StoryJumper can enhance students' engagement and improve reading comprehension.

*Recommendation for future research*:

This study has several limitations. First, the research used a quasi-experimental design without random assignment, which may limit the generalizability of the findings. Second, the study focused only on short-term learning outcomes. Future studies are

recommended to conduct longitudinal research to examine the long-term impact of technology-integrated learning. Researchers may also apply mixed-method approaches to explore students' learning experiences in more depth.

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