Effectiveness of Advanced Organizer Learning Strategies on the Achievement of Fiqh with Varied Cognitive Styles

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ABSTRACT: This study aimed to ascertain the treatment variable's primary influence and interaction effect on learning achievement in the Fiqh course. This study used a quasi-experimental approach, namely the nonequivalent control group design. The participants of the study were divided into two classes, namely Class A and Class B. A random process is conducted in the selection of the study subject class. In contrast, allocating students within each class is considered a fixed entity (intact group) that cannot be altered. The gathered data underwent statistical inference processing utilizing the two-lane 2x2 variant analysis technique. The findings indicated significant variations in learning outcomes in Fiqh courses between two groups of students instructed using different advanced organizer strategies, namely mind maps and concept maps. Additionally, no significant disparity in student achievement in Fiqh courses was observed between students with field dependence and field independence cognitive styles. Furthermore, no interaction effect was found between the learning strategies of advanced organizer types (mind maps and concept maps) and field dependence and field independence cognitive styles on learning achievement in Fiqh courses. The descriptive statistics analysis indicates that implementing the mind map advance organizer strategy (mean 78.59) exhibits a higher level of effectiveness than the concept map advance organizer strategy (mean 67.61) in enhancing student academic performance. It can be inferred that the advanced organizer technique known as the mind map type is consistently more effective than the concept map type, irrespective of variations in cognitive styles. In essence, using mind maps as an advanced organizer by students renders the consideration of cognitive style unnecessary, as it does not exert a differential impact on enhancing academic performance.


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Temuan menunjukkan adanya variasi yang signifikan dalam hasil belajar mata kuliah Fiqh antara dua kelompok siswa yang diinstruksikan menggunakan strategi advanced organiser yang berbeda, yaitu peta pikiran dan peta konsep. Selain itu, tidak ada perbedaan yang signifikan dalam prestasi siswa dalam mata kuliah Fiqh yang diamati antara siswa dengan gaya kognitif ketergantungan lapangan dan kemandirian lapangan. Selanjutnya tidak ditemukan adanya pengaruh interaksi antara strategi pembelajaran tipe advanced organiser (peta pikiran dan peta konsep) serta gaya kognitif field dependency dan field independensi terhadap prestasi belajar pada mata kuliah Fiqh. Analisis statistik deskriptif menunjukkan bahwa penerapan strategi mind map advance organiser (rata-rata 78,59) menunjukkan tingkat efektivitas yang lebih tinggi dibandingkan strategi peta konsep advance organiser (mean 67,61) dalam meningkatkan prestasi akademik siswa. Dapat disimpulkan bahwa teknik pengorganisasian tingkat lanjut yang dikenal sebagai tipe peta pikiran secara konsisten lebih efektif daripada tipe peta konsep, terlepas dari variasi gaya kognitif. Intinya, penggunaan peta pikiran sebagai pengatur tingkat lanjut oleh siswa menjadikan pertimbangan gaya kognitif tidak diperlukan, karena tidak memberikan dampak yang berbeda pada peningkatan kinerja akademik.

**Keywords:** Advanced Organizer, Cognitive Style, Learning Achievement.

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I. **INTRODUCTION**

The accelerated advancement of science and technology in the current era of education has transformed educators' responsibilities within the realm of learning. The function of the lecturer transforms from being solely a provider of knowledge to encompassing additional duties as a facilitator, motivator, evaluator, and tutor. The shift from lecturer-centred learning to student-centred learning occurs. Implementing diverse instructional techniques transforms traditional lecture-based learning into a more dynamic and engaging educational approach (Moallemi, 2023).

The shift in the learning paradigm is seen in the evolving perspectives on the processes of learning and instruction. According to (Gu & Wang, 2006), there has been a prevailing shift in the perception of learning and teaching worldwide, with an increased focus on the social and constructivist dimensions. This implies that the contemporary perspective on teaching and learning places greater importance on the social and constructivist aspects. The pedagogical approach employed by the instructor is evident in the learning methodology used during the educational process. Using adequate learning strategies might benefit academic performance in the studied disciplines. The decline in student learning achievement can have consequences for the diminished proficiency of pupils in acquiring the necessary topic competencies. This scenario may lead to producing graduates with substandard quality from tertiary institutions.

In the current state of the profession, it has been observed that educators need to allocate more focus towards the learning strategies employed in their instructional practices. Frequently, instructors use pedagogical approaches that need more diversity and exhibit monotony. This statement does not align with employing learning strategies, posing that not all learning strategies are appropriate for attaining specific objectives and contextual
conditions. The idea above was proposed by Killen (Sanjaya, 2011), asserting that no teaching strategy can be universally superior to others in all situations. Therefore, educators must possess the ability to employ a diverse range of teaching tactics and make reasoned judgments regarding the circumstances in which each strategy is likely to yield the most favourable outcomes.

The central gap that occurs above requires changes in the learning process in tertiary institutions. Every lecturer in tertiary institutions in teaching courses, especially Fiqh courses which have quite a lot of material should choose the right learning strategy. Among the aspects of the learning strategy that are important to note is the presentation of information aligned with the strategy for organizing content or material. To understand the Fiqh course, lecturers have only used lectures without variations and group discussions. However, the learning done in the two ways mentioned above must be more effective in producing depth of material for students. This is because the presentation of material and its organization could be more varied, exciting and attractive to students. This results in the non-optimal functioning of students' cognitive structures and their weak memory of Fiqh material. Of the various kinds of content-organizing strategies, there is an early learning strategy which is a significant content-organizing element, namely the advance organizer. An advance organizer is an initial learning strategy that is abstract and is intended to prepare a conceptual framework that students can use to obtain a clear picture of what will be learned (Gu & Wang, 2006).

An advance organizer is a cognitive strategy to enhance learning and facilitate memory retention when acquiring new information. It serves as a means to reinforce students' cognitive structure, thereby fostering meaningful learning experiences (Elfeky et al., 2020). Ausubel suggests that the advance organizer is specifically designed to bolster students' mental framework about specific subject matter while aiding in the organization, clarification, and retention of this knowledge (Weil, 2015). By guiding students towards the upcoming material and facilitating the retrieval of pertinent information, the advanced organizer learning strategy assists in assimilating new knowledge (Istiadah, 2020).

The empirical findings from various research studies have consistently demonstrated the advantages of utilizing advanced organizer learning strategies. Comparisons between learners who employ progressive organizers and those who do not always reveal significant differences in learning outcomes. These differences are often observed at a significant level of 0.01 (Bely et al., 2019; Thahir et al., 2020). Additionally, Ausubel, (1963) highlighted the positive impact of advanced organizers on students with limited verbal abilities. Furthermore, (Mayer, 1979) asserted that progressive organizers can serve as a valuable model for teachers and instructional designers.

Numerous studies have demonstrated the impact of utilizing concept maps as advance organizers on student learning outcomes, as evidenced by the research conducted by (Cutrer et al., 2011). Similarly, extensive research has been undertaken on mind map advance organizers, with most studies confirming their effectiveness in influencing student learning outcomes. Sinulingga & Munte, (2012) have contributed to this body of research through their investigation. Furthermore, Willerman & Mac Harg, (1991) assert that using mind maps as advance organizers contributes to the existing literature on strategies to enhance student motivation and achievement.

The results of this study indicate that the mind map and concept map advanced organizer strategies are suitable for use in learning. In this research, the chosen subject is the Fiqh
course. The considerations that underlie the choice of this course are, (1) much research has been done on advanced organizer strategies, but research on advanced organizer strategies using mind maps and concept maps has not been widely disclosed, (2) advanced organizer strategies have been widely applied in various fields with specific knowledge. Application in the field of fiqh has yet to be done much. Fiqh is part of the fiqh course, (3) Fiqh is a subject full of verbal material and requires high understanding and memory. Hence, it is necessary to organize the suitable material, (4) learning achievement of the Fiqh course obtained by students after completion of the course could be more satisfactory, (5) Fiqh is part of fiqh which discusses marriage and its problems. This is very close to the life of students who are ready to marry. In the field, there are many problems related to promiscuity among students. Improving students' verbal skills, intellectual abilities and cognitive strategies in the Fiqh course is expected to positively impact students in behaving and socializing and making decisions related to marriage problems which are currently rife.

The student's cognitive style significantly influences the presence of an advanced organizer. Witkin and Ruël define cognitive styles as unique functioning methods based on an individual's intellectual abilities, as demonstrated through perceptual and academic activities (Ruël, 2017; Witkin, 1976). Huber & Pewewardy, (1990) propose that cognitive style is a learning style component encompassing a person's consistent behaviours in receiving, thinking, problem-solving, and information storage. Scholars have endeavoured to identify dimensions or categories of cognitive styles, ultimately agreeing on two types: field dependence (FD) and field independence (FI).

Numerous studies have been conducted on cognitive styles, focusing on field dependence (FD) and field independence (FI) cognitive styles. According to (Globerson et al., 1990), the collective findings of various experts' research consistently indicate differences in learning acquisition between individuals with FD and FI cognitive styles. Researchers such as Febrilia and Junita have examined FD and FI cognitive styles as variables in their studies (Febrilia et al., 2019; Junita, 2016). These researchers' findings consistently demonstrate that students with the FI cognitive style exhibit higher learning achievement levels than students with the FD cognitive style.

It is crucial to note that the attainment of planned outcomes in the learning process and the quality of the process are influenced by the interplay between conditional variables and the methods employed. Consequently, there is a need for empirical studies to investigate this phenomenon. According to Watson & Reigeluth, (2008), it is contended that the ideas and theories of instructional design can be expressed in either a descriptive or prescriptive manner. Explanatory learning theories and principles posit condition variables and learning procedures as predetermined factors while regarding learning outcomes as observable variables. The independent factors in this context refer to the conditions and learning methods, whereas the dependent variables pertain to the learning outcomes. The learning theory employed in this work is descriptive, focusing on examining variables arising from the interplay between methods and conditions. Therefore, the independent factors in this study are the condition and technique variables, while the dependent variable is the learning outcomes. The parameters of these two variables interact to influence the observed effect on the dependent variable.

This research investigates the potential impact of mind maps and concept maps' advanced organizer strategies on learning achievement. Additionally, it seeks to explore the influence of student cognitive style on learning achievement. Furthermore, it
examines the potential interaction between mind maps and concept maps, advanced organizer strategies, and cognitive style on Fiqh's learning achievement.

II. METHOD

This study employed a quasi-experimental research design for two primary reasons. Firstly, the placement of experimental units lacked randomization, resulting in nonrandom assignment. Secondly, conducting experiments with stringent controls, as typically seen in exact field settings, is particularly challenging in the context of educational research (a social science field). Quasi-experimental findings are more applicable to real-world settings compared to purely experimental studies. Fields involving human subjects, such as education, necessitate a design that ensures equitable treatment of individuals. Consequently, in a design of this nature, it is not feasible to implement randomization and strict control measures, as the experimental units must be accepted as they naturally occur within the existing system.

The employed design model is a modified nonequivalent control group design, also known as a nonrandomized control group pretest-posttest (Campbell & Stanley, 1963; Moore, 1983; Tuckman, 1978). Additionally, the design utilized in this study is a 2X2 factorial design, as outlined by Kerlinger, (1990).

<table>
<thead>
<tr>
<th>Cognitive Style</th>
<th>Advance Organizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>FD (1)</td>
<td>MM (1)</td>
</tr>
<tr>
<td></td>
<td>CM (2)</td>
</tr>
<tr>
<td>FI (2)</td>
<td>Y_{1,1,1}, Y_{1,1,2}, ..., Y_{1,1,n}</td>
</tr>
<tr>
<td></td>
<td>Y_{1,2,1}, Y_{1,2,2}, ..., Y_{1,2,n}</td>
</tr>
<tr>
<td></td>
<td>Y_{2,1,1}, Y_{2,1,2}, ..., Y_{2,1,n}</td>
</tr>
<tr>
<td></td>
<td>Y_{2,2,1}, Y_{2,2,2}, ..., Y_{2,2,n}</td>
</tr>
</tbody>
</table>

Figure 1. 2 x 2 Factorial experiment design pattern

Keterangan; MM : MindMap  
CM : Concept Map  
FD : Field Dependence  
FI : Field Independence  
Y : Learning achievement  
n : Subject

The main effect of the treatment variables is divided into two types: (1) the main effect of learning with the advanced organizer type of mind map and learning using the advanced organizer type of concept map without looking at the influence of field-independent cognitive style (FI) and field-dependent cognitive style (FD) so that. The effect of learning using the mind map type advance organizer can be compared to learning using the concept map type advance organizer. (2) the main effect of the field-independent cognitive style (FI) and field-dependent cognitive style without regard to the effect of learning using advanced organizer types of mind maps and concept maps.

The conceptual relationship between variables in this study is shown in Figure 3 below:

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Based on the findings presented in Figure 2, a clear depiction of the relationship between research variables, both independently and interactively, is evident. The first independent relationship pertains to the association between the utilization of an advanced organizer and learning achievement. The second independent relationship focuses on the correlation between cognitive style and learning achievement. Lastly, the interaction relationship explores the interplay between advanced organizer cognitive style and learning achievement.

The present study was conducted at Tulungagung State Islamic University (UIN) within the Tarbiyah program during the second semester of the 2020/2021 academic year. The research participants were divided into two classes, namely Class A and Class B. The class selection to be included in the study was conducted randomly. In contrast, the allocation of students to each class was determined by factors beyond the researchers' control (i.e., intact group). Each class consisted of approximately 25-30 students. Within these groups, there were varying numbers of students classified as FI (Field Independent) and FD (Field Dependent), with the specific figures not equal.

The research instruments utilized in this study were categorized into two distinct types: (1) instruments designed to assess cognitive style and (2) instruments designed to measure learning achievement. Both types of instruments took the form of tests. The decision to employ tests as research instruments necessitates a thorough explanation based on the considerations outlined. The researchers used the Group Embedded Figures Test (GEFT) to measure students' cognitive styles. This test gauges students' ability to identify a simple shape concealed within a complex pattern. The test, presented in the form of pictures, comprises three sections. The first section serves as a practice round and does not contribute to the assessment of cognitive style. Participants were allocated two minutes to complete this section. The second and third sections, on the other hand, constitute the actual cognitive style tests. Participants were given nine and a half minutes to complete each section. Each correct response was awarded a score of 1, while incorrect responses received a 0. Consequently, the maximum attainable score on the GEFT is 18.

The classification system devised is employed to ascertain the cohort of students exhibiting the FD cognitive style and the FI cognitive style. Scores from 0 to 11 are allocated to the FD group, whereas scores from 12 to 18 are assigned to the FI group.

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The instrument used to assess learning achievement measures the dependent variable resulting directly from the treatment. The learning achievement test instruments are administered in the form of both pretests and post-tests. The instrument employed to gauge learning achievement is a descriptive test or essay. The essay test encompasses eight questions, each carrying a maximum score of five, thereby yielding an ideal top score of 40 for the test as a whole. An assessment rubric is employed to assign scores to this essay test, encompassing a score range of 0 to 5. Calculating each student's learning achievement involves dividing the total score attained by the student by 40 and subsequently multiplying the quotient by 100.

This study examines the human capacities defined by Gagne & Rothkopf, (1975), encompassing verbal information, intellectual skills, and cognitive strategies. It is widely acknowledged that multiple scholars have put forth various theories and explanations about the process of learning. Gagne focused on human capabilities, while Bloom (1979) referred to it as a taxonomy of educational objectives.

(Ho): In this study is tested using a two-way analysis of variance (ANOVA) technique, as suggested by Aka, (2019).

III. RESULT AND DISCUSSION

Pretest Result

The data obtained from the pretest results of two groups of students, namely class A (taught using the advanced organizer learning strategy type mind map) and class B (taught using the advanced learning strategy type concept map), were subjected to statistical analysis using the two independent samples t-test. This statistical analysis aims to assess the degree of similarity between the two groups of students. The pretest t-test group statistics are provided below.

<table>
<thead>
<tr>
<th>Class</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre test score</td>
<td>A</td>
<td>27</td>
<td>32.3704</td>
<td>9.28252</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>28</td>
<td>31.8929</td>
<td>9.81057</td>
</tr>
</tbody>
</table>

According to the data in Table 1, the average pretest score of class A students who will get instruction using the AOMM approach is 32.37 with a standard deviation of 9.28. On the other hand, the average pretest score of students in class B, who will be taught using the AOCM technique, is 31.89 with a standard deviation of 9.81.

The disparity in the mean pretest averages between the two groups cannot currently be utilized as a metric to determine whether the pretest outcomes for class A are significantly distinct from those of class B. To ascertain the level of dissimilarity or lack thereof between the two classes, a statistical examination using the t-test is conducted on two independent samples. The findings of the t-test analysis for the two independent samples are presented in table 2.
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Table 2. Pretest t-test output (Independent Samples Test)

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>T-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig.</td>
<td>T</td>
</tr>
<tr>
<td>Pre test scores</td>
<td>Equal Variances assumed</td>
<td>.240</td>
</tr>
<tr>
<td>Equal Variances</td>
<td>.185</td>
<td>52.982</td>
</tr>
</tbody>
</table>

Based on the results of the independent t test, Table 2 shows the significance value for the pretest score of students in class A (who will be taught using the AOMM strategy) compared to the pretest score of students in class B (who will be taught using the AOCM strategy) of 0.854 (p>0.05). This means that the pretest scores of students in classes A and B do not show any significant differences (p>0.05) so the null hypothesis is accepted.

Post-test Results

Table 3. Post-test descriptive statistics

<table>
<thead>
<tr>
<th>Learning strategies</th>
<th>Cognitive Style</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOMM</td>
<td>FD</td>
<td>79.1111</td>
<td>6.60387</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>FI</td>
<td>78.3333</td>
<td>11.42752</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>78.5926</td>
<td>9.94701</td>
<td>27</td>
</tr>
<tr>
<td>AOCM</td>
<td>FD</td>
<td>66.9000</td>
<td>4.95424</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>FI</td>
<td>68.0000</td>
<td>9.88165</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>67.6071</td>
<td>8.36367</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>FD</td>
<td>72.6842</td>
<td>8.41990</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>FI</td>
<td>73.1667</td>
<td>11.76071</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>73.0000</td>
<td>10.64581</td>
<td>55</td>
</tr>
</tbody>
</table>

Table 3 presents the study's results, explicitly comparing students' average post-test scores with different cognitive styles (FD and FI) in two learning strategies (AO with MM and AO with CM). The findings indicate that, in the AO learning strategy with MM, the average post-test score of FD cognitive style students (M= 79.11; SD= 6.603) is higher than that of FI cognitive style students (M= 78.33; SD=11.427). Conversely, in the AO learning strategy with CM, the average post-test score of FD cognitive style students (M=66.90; SD= 4.954) is lower than that of FI cognitive style students (M= 68.00; SD=9.881). Overall, when considering the entire sample, the average post-test score of students in the AO learning strategy with MM (M= 78.59; SD=9.947) is higher than that in the AO learning strategy with CM (M=67.60; SD=8.363).

A more precise depiction of the post-test results based on learning strategies can be seen in graph 1 below.

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Based on the data presented in graph 1, it is evident that the mean post-test score for the advance organizer learning strategy implemented with a mind map (78.59) surpasses the mean post-test score for the advance organizer learning strategy implemented with a concept map (67.61). This disparity in scores between the two learning strategies is statistically significant. Subsequently, graph 2 illustrates the post-test outcomes categorized by cognitive style.

Based on the data presented in graph 2, it can be observed that the average score for the FD cognitive style (mean FD value = 72.68) appears to be slightly lower compared to the average score for the FI cognitive style (mean FI value = 73.17). However, it is essential to note that the numerical disparity between the two cognitive styles is not statistically significant.

**Hypothesis Testing**

Once the parametric assumptions have been tested and confirmed to be met, the subsequent stage involves the analysis of the research data. The chosen technique for data analysis is the 2X2 two-way analysis of variance. This particular approach is employed to examine three distinct research hypotheses, which are outlined below:

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**Figure 3.** Graph post-test results based on learning strategy

**Figure 4.** Graph post-test results based on cognitive style
1. A disparity in academic performance between two groups of undergraduate PAI A students has been observed in the Fiqh course. One group was instructed to use the advanced organizer strategy of the mind map format, while the other group was taught to use the advanced organizer strategy of the concept map format.

2. A disparity exists in the academic performance of students enrolled in the Fiqh course among groups with either field reliance or field independence cognitive types among the undergraduate PAIa student population.

3. The present study investigates the impact of advanced organizer learning strategies, specifically concept maps and mind maps, on learning achievement in the Fiqh course, considering the cognitive styles of field independence and field dependence.

The research data were analyzed using the computer program SPSS 20.0 for Windows. The results of the data analysis were obtained by the application of two-track variant analysis procedures, with the independent variables being advanced organizer learning strategies and cognitive styles. The following are the findings of the data analysis.

Table 4. Results of two-path variance analysis

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>1670.211</td>
<td>3</td>
<td>556.737</td>
<td>6.381</td>
<td>.001</td>
</tr>
<tr>
<td>Intercept</td>
<td>265237.058</td>
<td>1</td>
<td>265237.058</td>
<td>3039.94</td>
<td>.000</td>
</tr>
<tr>
<td>Learning Strategy</td>
<td>1577.334</td>
<td>1</td>
<td>1577.334</td>
<td>18.078</td>
<td>.000</td>
</tr>
<tr>
<td>Cognitive Style</td>
<td>.322</td>
<td>1</td>
<td>.322</td>
<td>.004</td>
<td>.952</td>
</tr>
<tr>
<td>Learning Strategy*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Style</td>
<td>10.943</td>
<td>1</td>
<td>10.943</td>
<td>.125</td>
<td>.725</td>
</tr>
<tr>
<td>Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4449.789</td>
<td>51</td>
<td>87.251</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>299215.000</td>
<td>55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6120.000</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results of the variety analysis presented in Table 4 indicate a statistically significant difference (p<0.05) in post-test values between the advance organizer mind map (AOMM) learning strategy and the advance organizer concept map (AOCM). The null hypothesis (Ho) was rejected, suggesting that there is indeed a difference in the effectiveness of these two learning strategies. To further evaluate their respective influences, we examine the average (mean) values in the descriptive statistics.

Table 5. Descriptive statistics of two-track variance analysis

<table>
<thead>
<tr>
<th>Learning Strategy</th>
<th>Cognitive Style</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOMM</td>
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<tr>
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<td>66.9000</td>
<td>4.95424</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>FI</td>
<td>68.0000</td>
<td>9.88165</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>67.6071</td>
<td>8.36367</td>
<td>28</td>
</tr>
</tbody>
</table>

DOI: https://doi.org/10.35723/ajie.v8i1.502
Table 5 presents the findings regarding the average post-test scores achieved by students in two different instructional conditions: the advanced organizer-type mind map (AOMM) and the advanced organizer-type concept map (AOCM). The average post-test score for students in the AOMM condition was 78.59, while for students in the AOCM condition it was 67.60. Notably, the mean post-test score for students in the AOMM condition was higher than that for students in the AOCM condition. These results suggest that using a mind map-type advance organizer has a more favourable impact on students' learning outcomes when compared to implementing a concept map-type advance organizer.

Based on the findings presented in Table 5, the analysis of variance reveals that the cognitive style variable yields a significance value of 0.952 (p>0.05). Consequently, the null hypothesis (Ho) is accepted, concluding that there is no statistically significant difference in post-test scores between the FD and FI cognitive styles. Although the mean post-test score associated with the FI cognitive style surpasses the FD cognitive style, the disparity in mean scores between the two cognitive styles is insufficient to establish statistical significance.

The obtained significance level or probability value for the interaction between learning strategies and cognitive style is 0.725, which exceeds the predetermined threshold of 0.05. Consequently, the null hypothesis is upheld, indicating no discernible interaction between the advanced organizer learning strategy and cognitive style of academic achievement in the Fiqh course among undergraduate PAIa students. The absence of an interaction between advanced organizer learning strategies and cognitive style on learning achievement supports the validity of the leading independent variable, advanced organizer learning strategies, in influencing learning achievement. This implies that research findings indicating no interaction between advance organizer learning strategies and cognitive style on learning achievement further strengthen the conclusion that there are disparities in student learning achievement when taught using different advance organizers.

Based on the subsequent test findings, it is evident that the significant values of the two dimensions under examination exhibit disparity.

### Table 6. Significance of two dimensions of advance organizer

<table>
<thead>
<tr>
<th>(I) Learning Strategy</th>
<th>(J) Learning Strategy</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.^a</th>
<th>95% Confidence Interval for Difference^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOMM</td>
<td>AOCM</td>
<td>11.272*</td>
<td>2.651</td>
<td>.000</td>
<td>5.950 - 16.595</td>
</tr>
<tr>
<td>AOCM</td>
<td>AOMM</td>
<td>-11.272*</td>
<td>2.651</td>
<td>.000</td>
<td>-16.595 - -5.950</td>
</tr>
</tbody>
</table>

Based on estimated marginal means

* The mean difference is significant at the 0.5 level.

a. Adjustment for multiple comparisons: Least S (Equivalent to no adjustments)
Based on the data shown in Table 6, it is evident that the post-test scores of students instructed using the AOMM learning method (mean = 78.59) exhibit a discernible disparity in comparison to those taught using the AOCM learning strategy (mean = 67.61). The observed discrepancy between the post-test scores acquainted with the AOMM learning strategy and the AOCM learning strategy is 11.27 units. This difference is statistically significant, as evidenced by a p-value of 0.000 (p < 0.05), leading to the rejection of the null hypothesis (Ho). Therefore, the post-test scores taught with the AOMM learning strategy are considerably distinct from those acquainted with the AOCM learning strategy.

Table 7. Table of significance of cognitive style

<table>
<thead>
<tr>
<th>(I) Cognitive Style</th>
<th>(J) Cognitive Style</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.²</th>
<th>95% Confidence Interval for Difference³</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>FD</td>
<td>FD</td>
<td>-.161</td>
<td>2.651</td>
<td>.952</td>
<td>5.483 - 5.161</td>
<td>5.161</td>
<td></td>
</tr>
<tr>
<td>FI</td>
<td>FI</td>
<td>.161</td>
<td>2.651</td>
<td>.952</td>
<td>-5.161 - 5.483</td>
<td>5.483</td>
<td></td>
</tr>
</tbody>
</table>

Based on estimated marginal means

a. Adjustment for multiple comparisons: Least significant difference (Equivalent to no adjustments)

Based on the findings presented in Table 7, it is evident that the post-test scores achieved by students taught with the FD cognitive style (mean = 72.68) exhibit a marginal difference in comparison to those acquainted with the FI cognitive style (mean = 73.17), with a difference of 0.161. The statistical analysis reveals a p-value of 0.952 (p > 0.05), leading to the acceptance of the null hypothesis (Ho). Consequently, the post-test scores attained through the FD cognitive style do not significantly deviate from those achieved through the FI cognitive style, as the observed discrepancy in scores is relatively small.

The disparities in the academic performance of pupils instructed using the AOMM and AOCM instructional approaches and those with the FD and FI cognitive orientations are visually depicted in the accompanying illustration.

![Figure 5. The impact of each FD and FI cognitive style learning approach](image-url)
Figure 3 illustrates the extent of the impact exerted by each learning approach, namely AOMM and AOCM, in conjunction with the cognitive styles of FD and FI. Based on the graphical representation, it is possible to derive a sequence by arranging the data points in ascending order, starting from the lowest average value and progressing towards the most significant average value.

1. The average value of the Advance Organizer Type Concept Map (AOCM) with FD cognitive style is 66.90, the lowest among the observed values.
2. The average score for an Advance Organizer Type Concept Map (AOCM) with a Field-Independent (FI) cognitive style is 68.0.
3. The average value of an Advance Organizer Type Mind Map (AOMM) with a Field-Independent (FI) cognitive style is 78.33.
4. The most excellent average score, precisely 79.11, is observed in the Advance Organizer Type Mind Map (AOMM) when paired with the FD cognitive style.

The findings of the hypothesis test indicate a significant disparity in learning outcomes in the Fiqh course between two groups of S1 Tarbiyah undergraduate students. One group was instructed using the mind map type advance organizer learning strategy, while the other group was taught using the concept map type advance organizer learning strategy. The overall mean score of student learning outcomes instructed using a mind map-style advance organizer surpasses the mean score of students taught with a concept map-style advance organizer. This implies that using a mind map-style advance organizer in the learning process has a more significant impact on student's academic performance than using a concept map-style advance organizer.

The results of this study align with prior research undertaken by (Farrand et al., 2002; Goodnough & Woods, 2002; Peterson & Snyder, 1998; Trevino, 2005). According to Wichert et al., (2011), using mind mapping as a cognitive strategy is a novel and productive approach for enhancing memory retention compared to conventional reading texts. The text group's baseline mean knowledge score was lower than the mind map group (2.6 vs 3.5; p = 0.08). On the study's initial day, the text group's average score was marginally lower than that of the mind map group (8.7 compared to 9.0; p = 0.26).

On the seventh day of the study, the average score in the mind map group was considerably higher than that of the text group, with mean scores of 8.9 and 8.5, respectively (p = 0.03). Bawanah, (2019) showed that the Mind Maps Teaching Method exhibited greater efficacy than the Conventional Teaching Method regarding instant achievement and retention of electric energy concepts. A notable disparity was observed in the initial achievement of students based on their gender, although no such distinction was found in terms of retention.

The results of this research and other comparable studies demonstrate that using mind maps in the context of learning, mainly when employed as an advance organizer, positively impacts learning outcomes. This includes the enhancement of student learning achievement in the Fiqh course. Utilizing a mind map as an advanced organizer offers numerous advantages compared to an idea map. Incorporating right brain attributes, such as visual imagery, colour, spatial dimensions, and distinctive characteristics, enhances and facilitates memorization capabilities. In addition, using a mind map as an advanced organizational tool can contribute to the equilibrium of cognitive functions between the learner's left and right cerebral hemispheres while acquiring knowledge.
By utilizing a mind map, one can effectively arrange and categorize essential information derived from various sources. This approach follows a radial structure that aligns with the innate cognitive processes of the brain, hence facilitating comprehension and retention. The rationale behind a mind map is based on three primary principles: radiant thinking, keywords, and total brain integration. Advanced organizer learning employs mind maps, which possess distinctive attributes that facilitate the best comprehension and retention of knowledge by engaging both brain hemispheres.

The hypothesis test findings indicate no statistically significant disparity in learning achievement within the Fiqh course between PAIa undergraduate students with a field-dependence cognitive style and those with a field-independence cognitive style. The influence of cognitive style on student learning achievement in the Fiqh course may not be significant. Numerous investigations have examined the cognitive styles of field independence (FI) and field dependence (FD). Based on prior research findings, it was widely observed that disparities in learning outcomes were evident between those exhibiting the field-dependent (FD) cognitive style and those displaying the field-independent (FI) cognitive style. Individuals with a fixed mindset tend to show lower performance levels than those with a growth mindset across various learning contexts.

The outcomes of this study diverge from established knowledge, necessitating the provision of a coherent explanation or rationale. Most research examining disparities in academic achievement and learning outcomes between students enrolled in complete immersion (FI) programs and those in full-day (FD) programs is primarily conducted within the same academic discipline. The study's findings indicate that students with a growth mindset (FI) exhibit higher levels of intellectual accomplishment than those with a fixed mindset (FD). The present study focuses on the Islamic social sphere, encompassing the interactions and relationships among individuals within this domain. This discipline is highly preferred among students with a cognitive style that aligns with the FD approach, as it helps mitigate any challenges encountered during examinations. On the other hand, students enrolled in financial investments experience challenges during examinations due to their lack of affinity for the subject matter. This condition results in a need for more meaningful differences in learning accomplishment between the two groups.

Furthermore, the facilitation of learning for students exhibiting a field-dependent cognitive style is significantly enhanced when the instructional content is pre-organized. This is mainly supported by implementing an advanced organizer learning method, such as a mind map, leading to a notable improvement in their academic performance. In contrast, students who possess a field-independence cognitive style and demonstrate a greater capacity for autonomously structuring and organizing learning material do not see any discernible improvement in their academic performance due to employing the mind map type of advanced organizer learning technique. The lack of significant differences in learning successes between FI (fully inclusive) and FD (fully segregated) children can be attributed to this state, wherein FD pupils can attain learning outcomes comparable to those of FI students, who are typically perceived as academically superior.

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To ascertain the presence or absence of an interaction effect inside this research study, the subsequent post-test mean plot graph is provided.

![Post-test mean plot graph](image)

**Figure 6. Post-test mean plot graph**

Due to the two lines’ proximity and nearly parallel appearance, there needs to be more significant interaction between the variables under investigation, namely learning techniques (AOMM and AOCM) and cognitive style (FI and FD). Therefore, it can be inferred that there are no statistically significant variations in the average post-test scores between the AOMM learning method and the AOCM learning strategy when considering the FI and FD cognitive styles. The graph illustrates that while the lines tend to overlap, they also demonstrate a parallel trajectory. This suggests that there needs to be more interaction between the variables of learning approach and cognitive style.

Based on the considerations above, it can be inferred that the advance organizer technique known as the mind map type (AOMM) is consistently more effective than the concept map type (AOCM) advance organizer, irrespective of variations in cognitive styles. In essence, using mind maps as an advanced organizer by students renders the consideration of cognitive style unnecessary, as it does not exert a differential impact on enhancing academic performance.

**IV. CONCLUSION**

Based on the comprehensive description, rigorous hypothesis testing and thorough discussion, The findings indicated significant variations in learning outcomes in Fiqh courses between two groups of students instructed using different advanced organizer strategies, namely mind maps and concept maps. Additionally, no significant disparity
in student achievement in Fiqh courses was observed between students with field dependence and field independence cognitive styles. Furthermore, no interaction effect was found between the learning strategies of advanced organizer types (mind maps and concept maps) and field dependence and field independence cognitive styles on learning achievement in Fiqh courses. The descriptive statistics analysis indicates that the implementation of the mind map advance organizer strategy (mean 78.59) exhibits a higher level of effectiveness than the concept map advance organizer strategy (mean 67.61) in enhancing student academic performance. The results of this research, along with other comparable studies, demonstrate that using mind maps in the context of learning, mainly when employed as an advance organizer, positively impacts learning outcomes. This includes the enhancement of student learning achievement in the Fiqh course.

V. REFERENCES


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