IMPLEMENTATION OF SQL QUERY CONSTRUCTION TO IMPROVE DATABASE CONCEPT UNDERSTANDING WITH CLOSE-ENDED APPROACH

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01

INTRODUCTION

Problems

01 To make an effective query, **students need to understand how to extract them**, and **it becomes harder** as the database complexity grows.

(Phillip Garner, 2015).

02 The query complexity is **limited to the short-term memory of the code writer** when retrieving data.

(de Jong, 2010)

03 **SQL Query Formulation can be a challenging task** due to its declarative form of SQL syntax.

(Taipalus, 2019)

Solutions

01 To increase understanding, the **practice should** not only be limited to code creation but also **reflects the student's thinking by case study descriptions and problem-solving.**

(Marion et al., 2007)

02 A close-ended approach that has **predefined answers allows students to think logically** about solving case studies within the appropriate context and scope of the problem.

(Lin & Lien, 2013).

03 A **drag-and-drop implementation reduces typing errors** and gives flexibility for the users to adjust code in order.

(Heift, 2003; Price & Barnes, 2015; C.Phewkum, 2019)

Research Problem

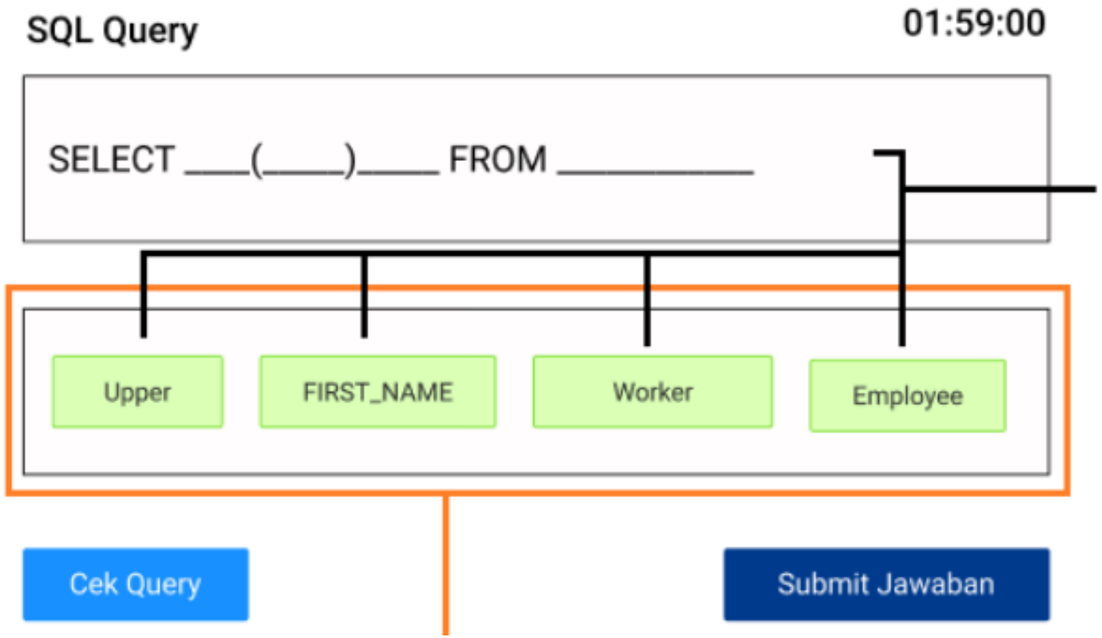
How is the effect of SQL Code construction with drag-and-drop and close-ended approach on students' understanding of SQL SELECT Statements concepts?

02

Application Concept

SQLearn

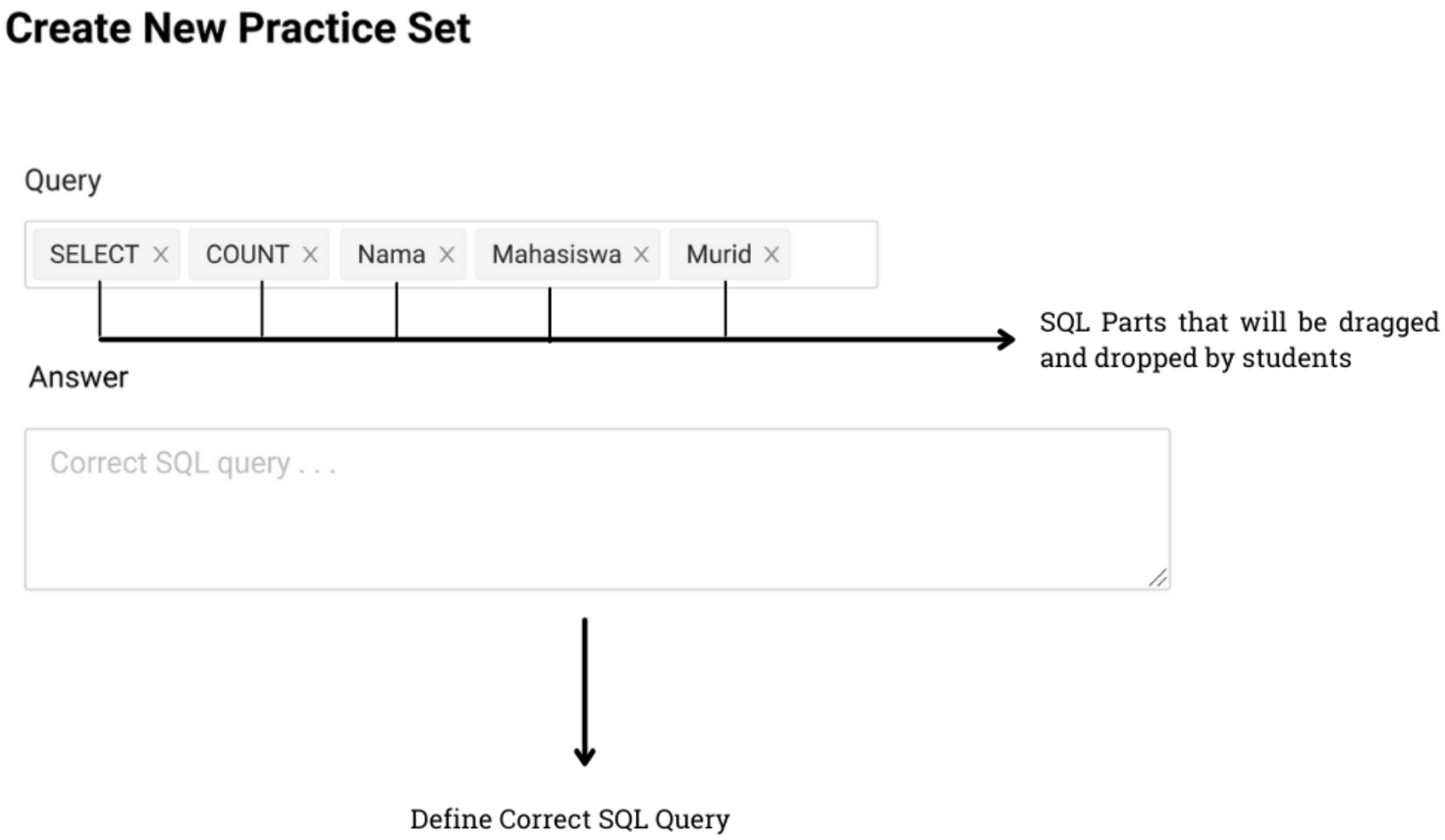
Application Concept - Students



Drag-and-drop the options to reconstruct SQL statements until is valid

Predefined options
(Close-ended approach)

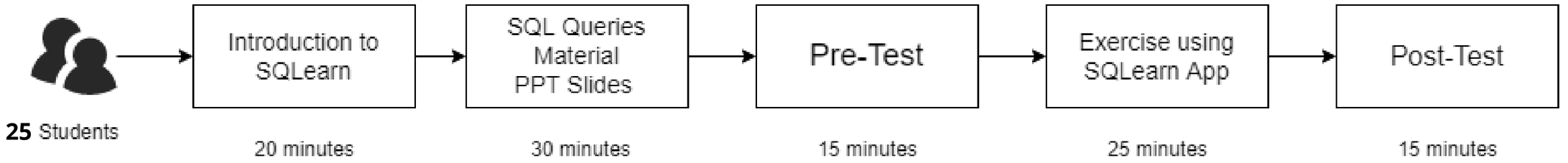
Application Concept - Lecturers



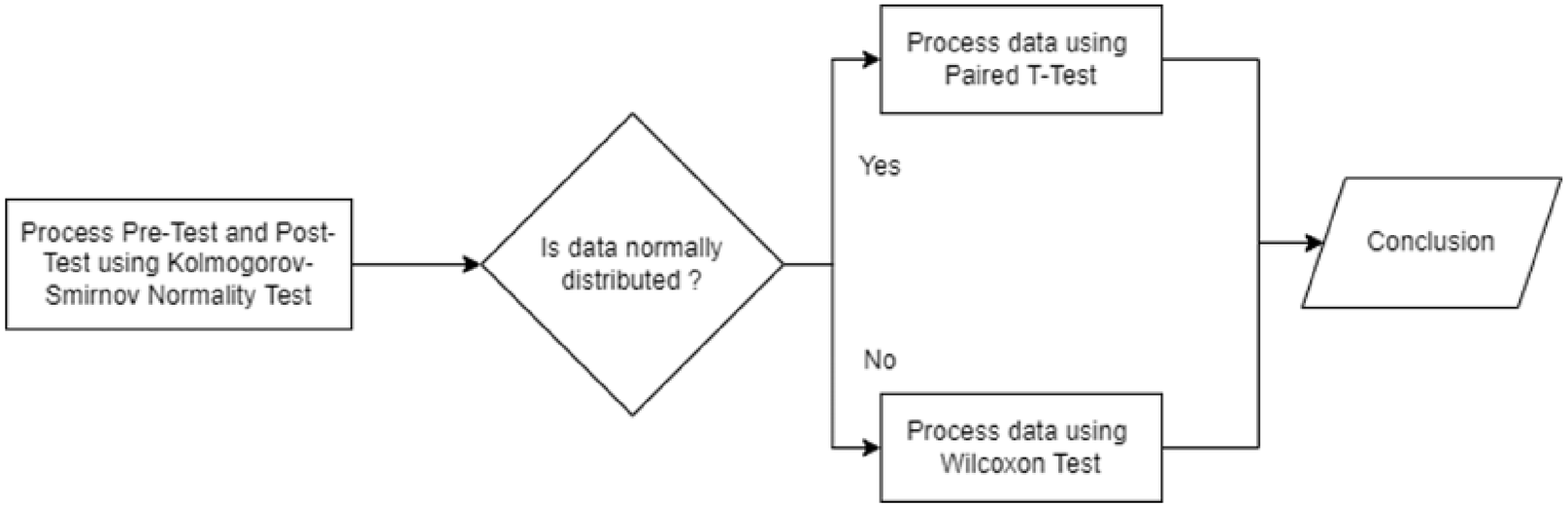
03

RESEARCH METHODOLOGY

Data Collection | Design Experiment



Data Processing | Flow



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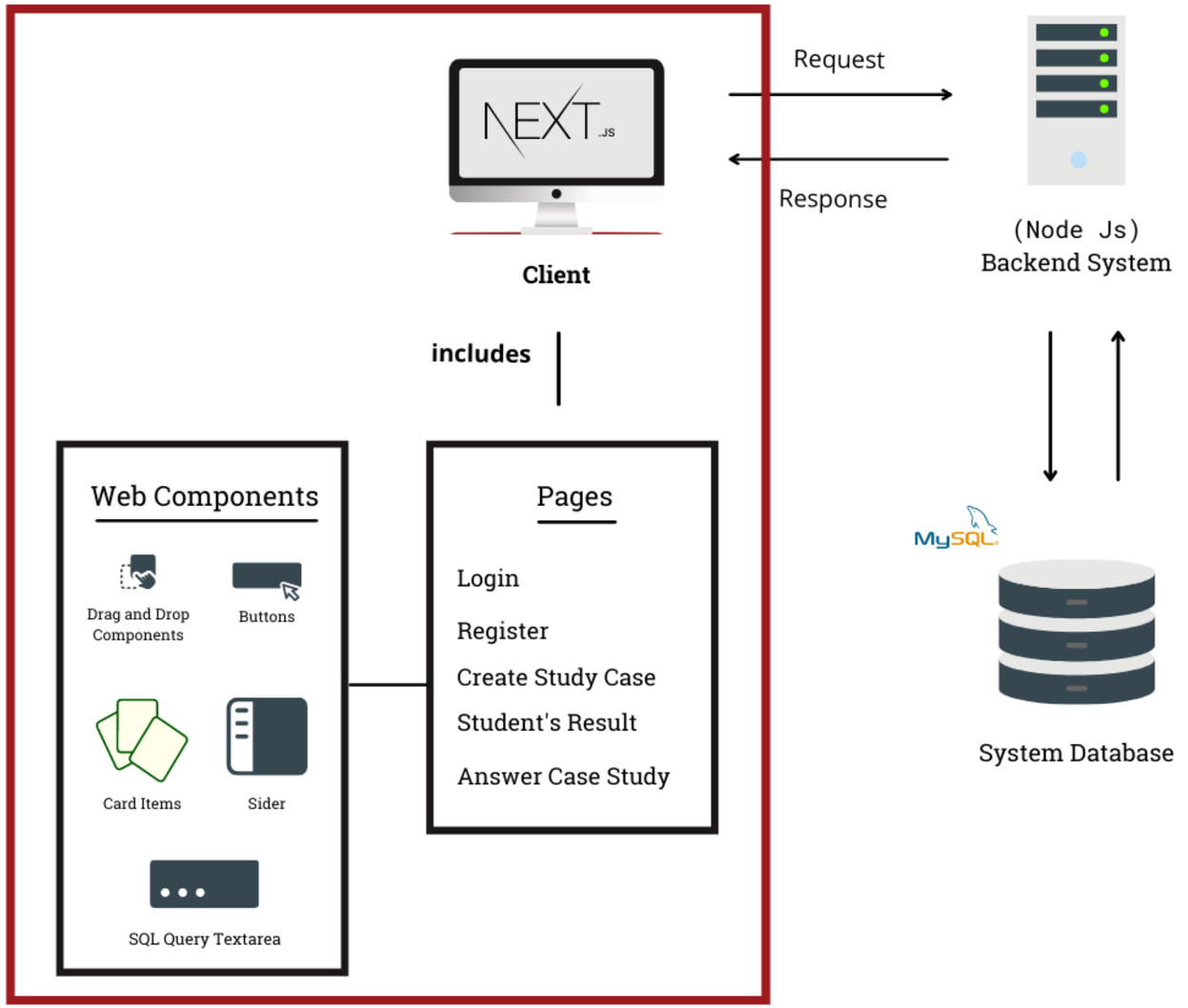
SYSTEM DESIGN AND ANALYSIS

System Architecture



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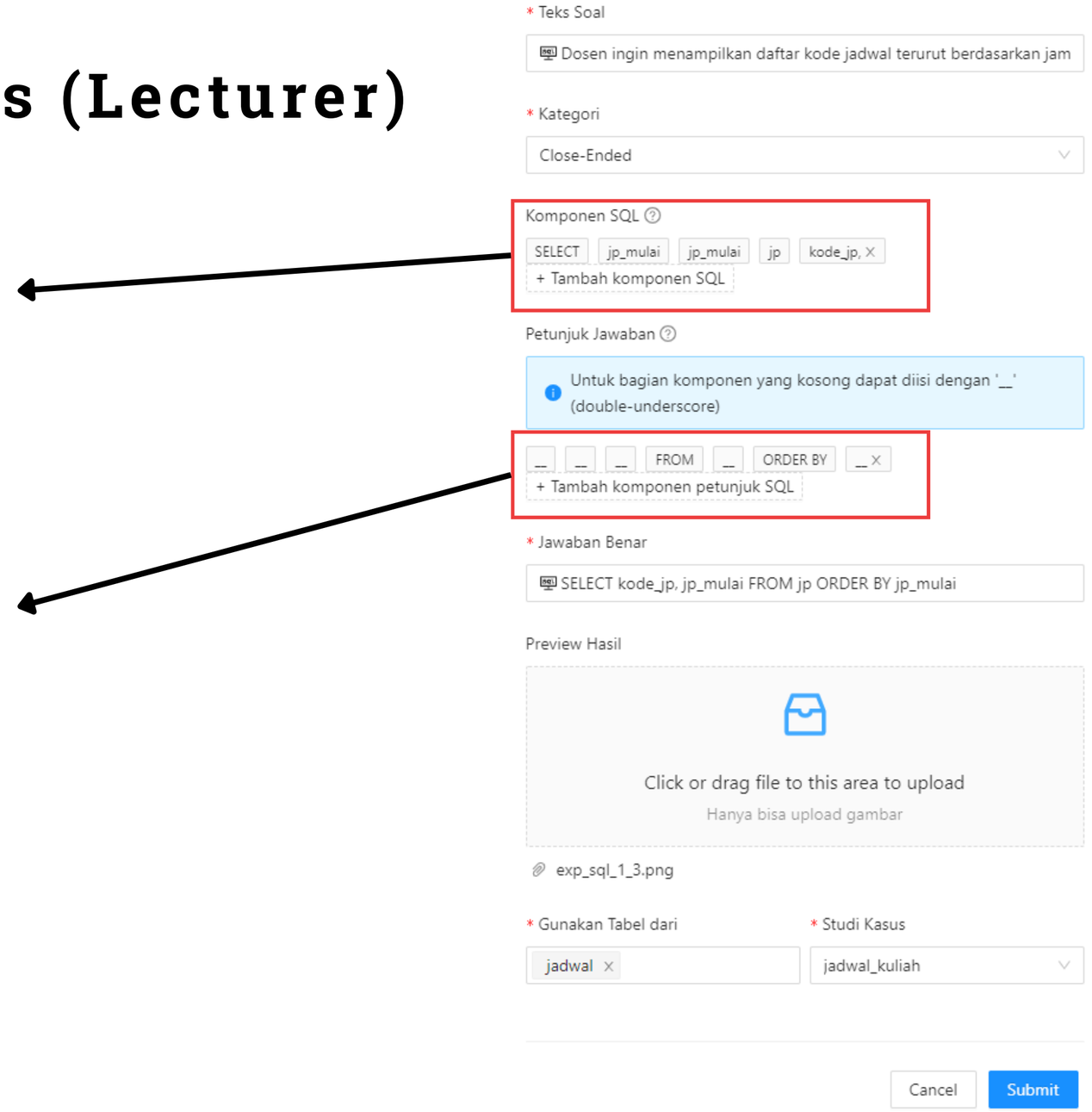
SYSTEM IMPLEMENTATION AND TESTING

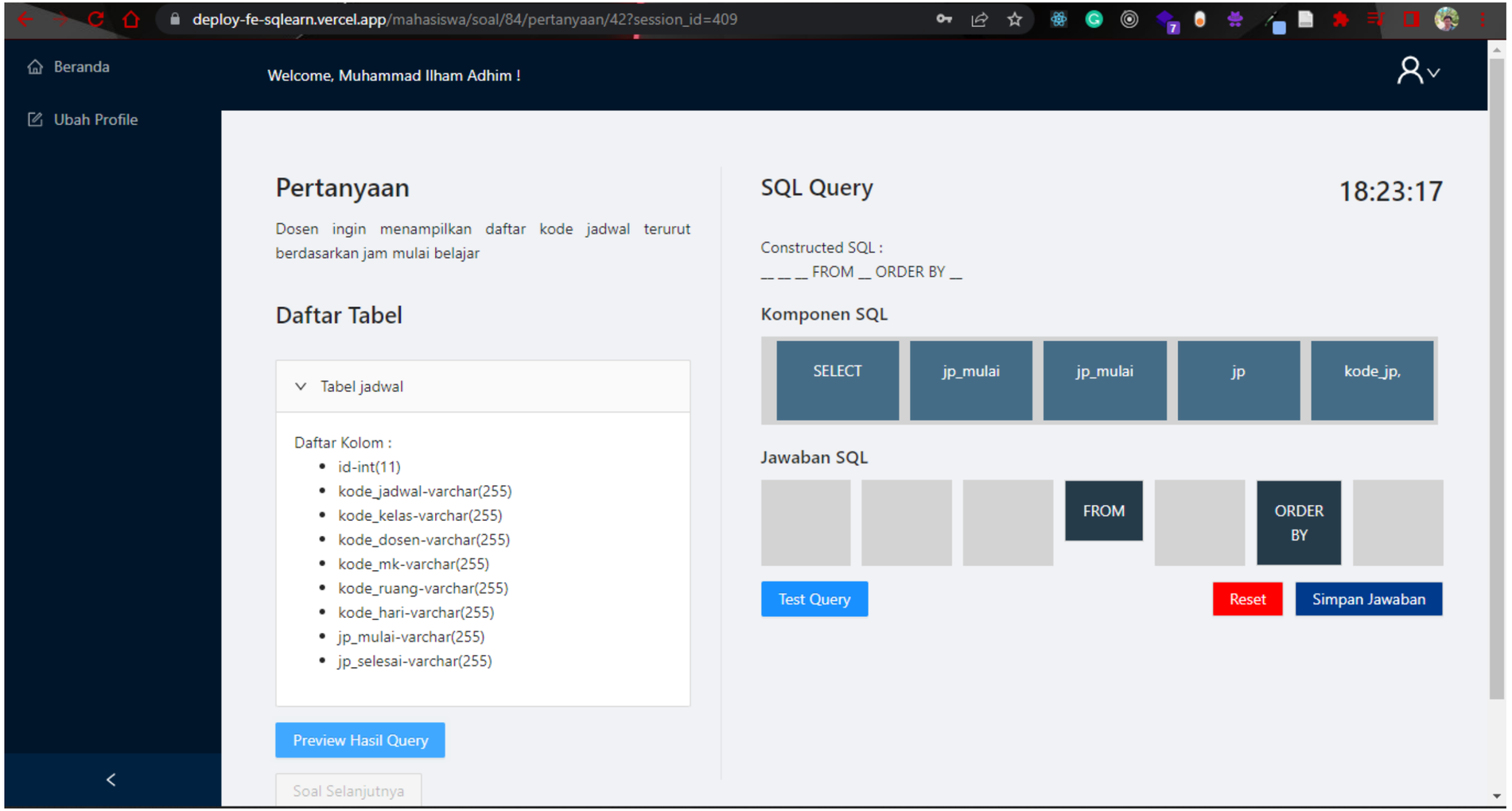
Close-Ended SQL Hints (Lecturer)

SQL Parts

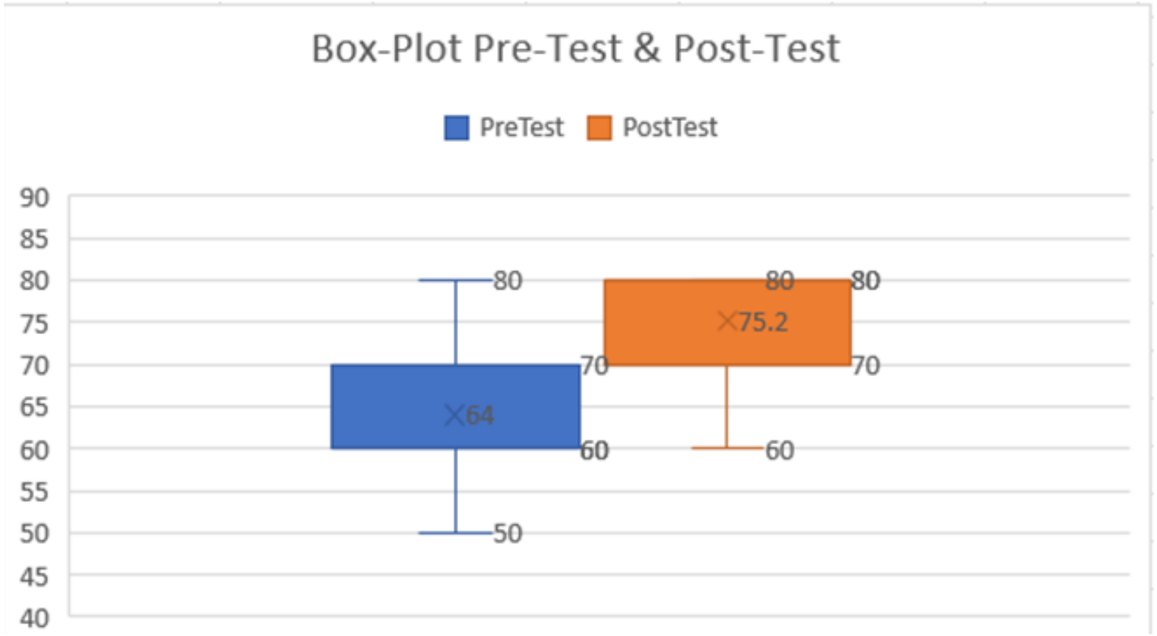
SQL Hints

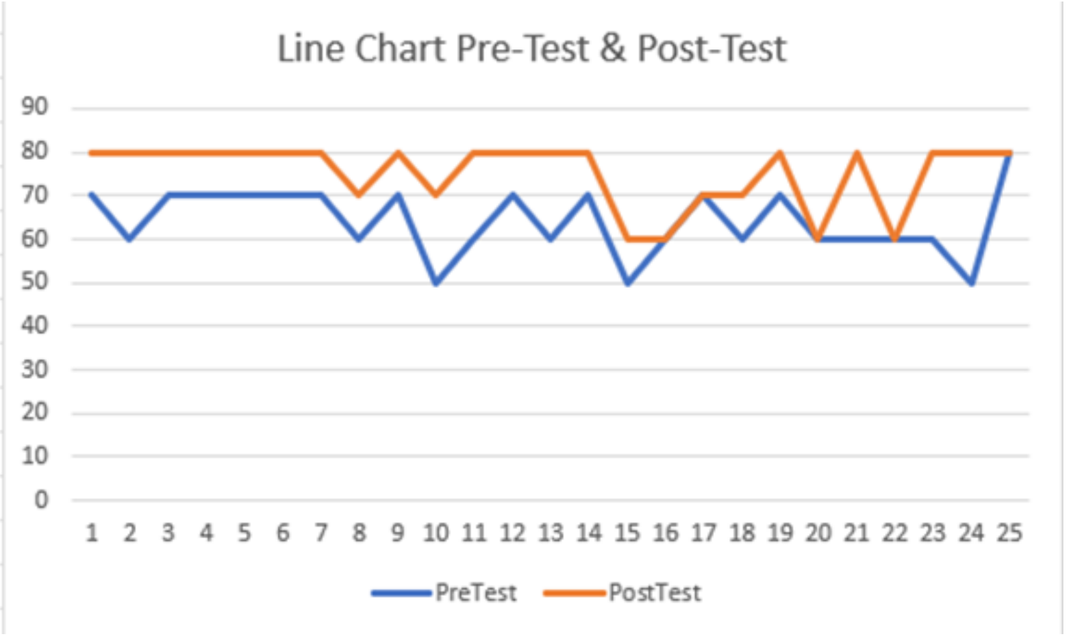


Drag-and-Drop Implementation (Students)



Data Collected





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RESULT AND DISCUSSION

Result | Normality Test

One-Sample Kolmogorov-Smirnov Test			
		Pre-Test	Post-Test
N		25	25
Normal Parameters	Mean	64.0000	75.2000
	Std. Deviation	7.6376	7.7028
Most Extreme Differences	Absolute	0.264	0.413
	Positive	0.220	0.267
	Negative	-0.264	-0.413
Test Statistic		0.264	0.413
Asymp. Sig. (2-tailed)		0.000	0.000

Decision-Making Basis

a. If the value of Asymp. Sig. (2-tailed) > 0,05. Data is normally distributed.

b. If the value of Asymp. Sig. (2-tailed) < 0,05. Data is **not** normally distributed.

Result | Wilcoxon Test

Ranks				
		N	Mean Rank	Sum of Ranks
Pre-Test & Post-Test	Negative Ranks	0	0.00	0.00
	Positive Ranks	20	10.50	210.00
	Ties	5		
	Total	25		

Wilcoxon Signed Ranks Test

Test Statistics	
	PostTest - PreTest
Z	-4.064
Asymp. Sig. (2-tailed)	0.000

Wilcoxon Signed Ranks Test Statistics

Decision-Making Basis

a. If the value of Asymp. Sig. (2-tailed) < 0,05. There is significance average difference between pre-test scores and post-test scores.

b. If the value of Asymp. Sig. (2-tailed) > 0,05. There is **no** significance average difference between pre-test scores and post-test scores.

Discussion

01 Drag-and-drop method and SQL Query construction in **SQLearn can be used as SQL query exercise** in database subject

02 Drag-and-drop method and SQL Query Construction with close-ended approach in **SQLearn has significant positive impact towards students understanding in SQL Query topic** in database subject

Conclusion

Based on this research result of SQL Query Construction practice with a close-ended approach and drag-and-drop implementation, it is concluded that this method has a significant positive impact on students' post-test scores in SQL Queries topic in database subject.

Suggestion

01 Logs recorded in the database can be optimized and being used for mapping students understanding in more detail.

02 Broaden drag-and-drop implementation so that it is not limited to SELECT statements.

Thank you