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Utilization of the Excel Application for Processing Student Summative Scores in PAI Learning

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ABSTRACT

Education plays a central role in the advancement of a nation, while technological progress becomes crucial in the context of education and the increasingly significant evaluation of educational quality. This article aims to explore and implement technology, particularly Excel software, in optimizing grade processing. Using qualitative descriptive research methods, this study provides an explanation of the use of Excel as an assessment tool in learning. By utilizing Excel features such as formulas, filters, and formatting, this research demonstrates that this technology can be a powerful tool in creating a structured, easy-to-understand, and adaptable system tailored to individual needs. The results of this study highlight the potential of Excel as an effective tool in simplifying the summative grading process in Islamic Education (PAI), offering educators the opportunity to design more measurable and adaptive assessments according to student needs. Therefore, the implications of this research suggest that the use of Excel technology in the context of Islamic Education can significantly contribute to enhancing the quality of learning and educational evaluation overall.

***Keywords**: Excel, Summative Assessment, Technology*

INTRODUCTION

Education plays a central role in the progress of a nation, with the quality of education in various institutions influencing the future of young generations and economic growth. Therefore, the advancement of technological civilization through education is crucial, and the assessment of education quality becomes highly significant. It is known that many educators still lack knowledge regarding information technology (Sahelatua, 2018).

The Ministry of Education and Culture stated that almost 60% of teachers in Indonesia are not familiar with information technology (Makdori, 2021). Yet, in today's era, the utilization of information technology is essential for conducting the learning process. For instance, grading in learning, which is a crucial element in the learning process (Aisida, 2021; Al Ayyubi et al., 2024; Khasanah et al., 2023; Sugandi et al., 2019; Taadi et al., 2019). The quality of learning and assessment are interrelated, where good assessment reflects quality learning, and vice versa. Hence, educators need to design a continuous grading system from the beginning to the end of student learning activities (Mutaqin et al., 2024; Sabarudin et al., 2023, 2024).

The process of grading in learning is key to ensuring the success of the learning itself. One such technology is Excel, which has become a highly useful tool in grading due to its ability to provide an organized structure and allow for automatic calculations. The use of Excel in assessment aligns with the growing trend of digitalization in the education world today. The main focus of this research is the utilization of Excel as an effective tool for learning assessment. By using Excel features such as formulas, filters, and formatting, researchers suggest that this technology can be a highly useful tool in creating a structured, easily understandable, and flexible grading system tailored to individual needs. Previous research supports the use of Excel in the educational context.

For example, a study by Smith et al. (2020) showed that the use of Excel in grading can increase the efficiency and accuracy of assessments. Additionally, research by Johnson (2019) found that Excel helps teachers monitor student progress in more detail and in real-time. Another study by Brown and Lee (2018) also highlighted that Excel allows for better adjustments to the specific needs of each student, which in turn can improve learning outcomes.

The Concept of ICT Usage for Assessment

According to William & Sawyer, information technology is a combination of computers and high-speed communication lines that transmit data, voice, and video. This definition highlights two main aspects of information technology: computer technology, which involves all devices related to computer use, and communication technology, which includes remote devices such as telephones, facsimiles, and televisions. Simply put, information technology is a science aimed at managing information so that it can be easily searched or accessed again. In practice, computer technology is used to manage information quickly and efficiently, while communication technology helps in conveying information remotely (Kementerian Negara Riset dan Teknologi, 2006).

The rapid development in the field of information technology holds great potential for improving the quality of education. The Internet, as a result of these advancements, provides unlimited access to various information that can be utilized for educational development. With the Internet, learning is no longer limited by space and time constraints. Information and Communication Technology (ICT) in the context of science and technology (IPTEK) refers to all aspects of technology involved in the acquisition, collection, processing, storage, dissemination, and presentation of information. This includes the use of technology to process, retrieve, organize, store, and manipulate data to produce relevant, accurate, and timely information for various purposes, including personal, business, and government needs. The significant role of ICT in our lives is undeniable, as it is almost always used for both learning and problem-solving (Amadiana, D. N., Asbari, M., & Laksana, 2023).

In learning evaluation, the focus of assessment is on how the learning process occurs and the results achieved (Abraham et al., 2018; Ahlerup & Hansson, 2011; Andrew et al., 2019; Fitriati et al., 2014; Karliani & Triyani, 2021; Li & De Costa, 2023; Suyadi et al., 2022). This includes evaluating the learning activities of teachers and students as well as the achievement of learning objectives by students. Therefore, in this evaluation, the collected information includes learning activities

and student learning outcomes. Information about learning activities tends to be descriptive, while data on learning outcomes are more oriented towards numbers and statistics (Reeves, 2005).

Summative Assessment

Summative assessment in the Kurikulum Merdeka is an evaluation process conducted at the end of a learning period, such as the end of a semester or academic year, to holistically measure students' competency achievements, encompassing cognitive, affective, and psychomotor aspects. According to experts like McMillan (2008) and Popham (2014), this assessment aims to provide a comprehensive overview of students' learning outcomes after completing a unit or semester, focusing on the final results (Iswanto, 2017).

Summative assessment also serves to give meaningful feedback for students' personal development and as a basis for determining graduation or class promotion. Additionally, this assessment is used to guide teachers in designing more effective learning strategies in the future. In the context of the Kurikulum Merdeka, summative assessment plays a crucial role in providing feedback to educators and education policymakers to enhance the quality of education. Other education experts, such as Black and Wiliam (1998), emphasize that summative assessments must be conducted objectively, validly, and reliably to accurately reflect students' true abilities and provide precise information for curriculum and teaching strategy improvements (Black & Wiliam, 1998).

Digital Technology in Summative Assessment

Digital technology in summative assessment has revolutionized educational evaluation methods by providing more efficient and accurate tools (Tretjakova & Oļehnoviča, 2022). The role of digital technology in summative assessment is significant in improving the efficiency and accuracy of measuring student achievements. Technology enables the assessment process to be faster, reducing the time teachers need to manually grade. With the help of specialized software, assessment results can be automatically analyzed, providing quicker feedback to students. Technology also offers various assessment formats, such as computer-based tests and interactive quizzes, which can make the learning process more engaging.

Additionally, data generated from technology-based assessments can be used to track students' progress over time. This allows teachers to more accurately identify students' weaknesses and strengths (Black, 2010). The use of technology in summative assessment also helps reduce human bias, making the assessment more objective. Students can access assessments anytime and anywhere, providing flexibility in the learning process. Data security is also more assured with the right technology, reducing the risk of loss or manipulation of assessment results. Finally, integrating technology into summative assessments can prepare students for modern work environments that also rely on technology (Syafriafdi, 2020).

Microsoft Excel

Microsoft Excel is a spreadsheet software included in the Microsoft Office Suite. This software allows users to calculate and process data automatically with various available formulas, functions, and features. Some of the functions and uses available in Microsoft Excel include (1) performing mathematical operations such

as addition, subtraction, multiplication, and division on numerical data, (2) applying complex mathematical and logical formulas for deeper data analysis, (3) utilizing various built-in Excel functions to complete specific tasks such as data formatting, statistical processing, and creating informative charts, (4) managing data in table form with neat structure and format, (5) visualizing data in the form of graphs and charts for easier interpretation and understanding, (6) as well as organizing and managing large amounts of data with various features such as filters, sorting, and pivot tables to make the process efficient and effective (Setemen, 2019).

Microsoft Excel uses a file called a workbook that consists of worksheets and cells. This workbook is an Excel file that can contain one or more worksheets. A worksheet is a sheet that consists of columns and rows that form cells. Cells are the smallest unit in a worksheet that can be filled with data, formulas, or functions. With its various functions and features, Excel can be used for various purposes in multiple fields, including corporate administration, data analysis, and scientific research (Rusman, 2013).

Thus, this article focuses on efforts to optimize grade processing through the use of Excel technology, as a step towards improving the quality and effectiveness of learning. In ensuring the effectiveness of the learning process, learning outcomes play an undeniable role (Waycott, Jenny & Bennett, Sue & Kennedy, Gregor & Dalgarno, Barney & Gray, 2010). However, challenges arise in compiling grades that are not only objective but also efficient and adaptable to the individual needs of students. Therefore, it is important to seek methods that enable the optimization of the grading process. In this context, technology, especially software like Excel, offers great potential in enhancing the quality and efficiency of managing learning outcomes (Wati, 2020).

METHDOS

According to Mukhtar, the qualitative descriptive research method is an approach utilized by researchers to gain an understanding or theory related to a phenomenon studied at a certain point in time (Mukhtar, 2013). In this research method, the researcher adopts a descriptive approach to outline the steps in using technology through Microsoft Excel for creating assessment sheets in the context of evaluating learning in PAI subjects. First, the basic format of the assessment sheet is created by establishing relevant assessment criteria in accordance with the set learning objectives. Then, Excel's calculation features, such as formulas and functions, are used to automatically calculate scores and grades based on students' answers or performance. Next, the researcher explains by adjusting the format and layout of the assessment sheet as needed, utilizing Excel's design and formatting features. The workflow of this method involves analyzing and describing the use of Excel for creating assessments in a learning context.

RESULTS AND DISCUSSION

The Urgency of Using Excel for Summative Assessment

The use of technological media to accomplish tasks brings both advantages and disadvantages. Technology indeed provides many conveniences in human

life. In this advancing era of globalization, it is important to pay attention to the impact of technological advancements on education. Nowadays, the educational world must continually adapt to technological developments to improve the quality of learning. Information technology, which includes computer and telecommunication technologies, plays a crucial role in enhancing the quality of education globally (Baharudin, 2010).

To maximize the use of Information and Communication Technology (ICT) in education, several characteristics are generally applied(Yunita & Sholeh, 2021):

1. Tutorial Context: ICT is used to present structured lesson materials according to pre-established plans, through detailed explanations and demonstrations, as well as practical exercises.
2. Exploratory Learning: ICT is used to search for and access information from the internet and to display demonstrations of specific concepts or events sequentially with the help of software and hardware.
3. Application Tool: ICT significantly helps students complete specific tasks, such as creating and analyzing diagrams in mathematics lessons.
4. Communication Facilitator: ICT acts as a facilitator for communication between educators and students, allowing them to send and receive information during the learning process.

The use of Excel technology in education offers advantages, including the ability to convert and store data in a flexible format. Excel can handle up to 1 million rows and 16,000 columns, making data processing easier. With features like PivotTable, users can create table summaries and update data automatically.

1. Advantages of Microsoft Excel in Student Learning Data Processing:
2. Ease of Use: Its simple and intuitive interface with various menus and shortcuts makes it easy for educators to access the necessary features.
3. Data Accuracy: Excel processes data with high precision and automatic functions that reduce the risk of human error.
4. Analytical Capability: Excel provides various functions and formulas to analyze data statistically, mathematically, and logically, facilitating the identification of patterns, trends, and relationships in the data.
5. Visualization Capability: With various types of charts, Excel allows educators to present data visually, clarifying understanding and facilitating communication with relevant parties.

In general, the use of ICT offers significant benefits in evaluating learning, demonstrating that the use of technological media in the educational context can enhance the assessment process. First, ICT enables more measurable and objective assessments through the use of online learning management systems (LMS) or specialized assessment software. These systems allow teachers to create and manage various types of tests, quizzes, and assignments digitally, which can be evaluated automatically or semi-automatically. This helps improve efficiency and accuracy in assessment. Additionally, ICT in learning assessment provides easier and more inclusive access for students with various learning needs. Various accessibility features and technological support allow students with disabilities to participate in and complete assessments more effectively (Gunawan, 2014).

Despite its various advantages, Microsoft Excel also has some drawbacks. This spreadsheet software is not available for free. It requires significant resources, including random access memory (RAM) and substantial CPU processing power. Thus, creating an additional column to classify answers to questions or creating filters for respondents may be necessary. Users also need to compose complex Excel formulas, both logically and textually. As an alternative, SPSS offers features that make filtering or grouping new answers easier, which some people may prefer.

Steps to Create a Grade Sheet with Excel

Microsoft Excel can be a valuable tool for summative assessment in various contexts, including the creation of grade sheets. With Excel, structured and easily readable grade sheets can be created, providing columns for data such as student names, gender, questions, answers, grades, and comments. Additionally, Excel's table and chart formats allow for effective visualization of assessment data, helping to clearly identify areas needing improvement.

How to Create a Grade Sheet in Microsoft Excel:

1. Open the Microsoft Excel application. Open the Excel program on your computer/laptop.
2. Click Blank workbook, to create a new workbook.

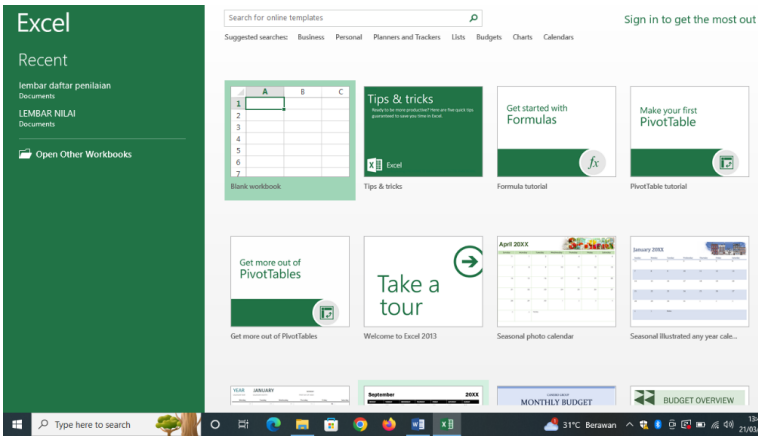


Figure 1. Blank Workbook display

1. Create a Value List title.

• Click box "A1" and type "List of Values".

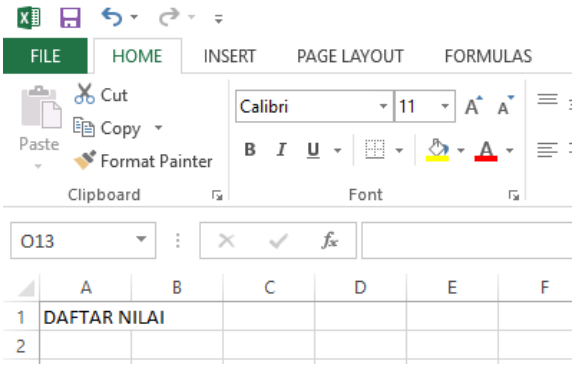


Figure 2. Initial View

1. Create Columns. Create columns for the list of grades, including Number, Student Name, Gender, Assignment Grade, Exam Grade, Semester Grade, Total Grades, Final Grade, and Average.

• Click box "A3" and type "NO". This column contains the student's absence number.
• Click the "B3" box and type "NAME". This column contains the student's name.
• Click the "C3" box and type "L/P". This column contains the gender of the students.
• Click the "D3" box and type "VALUE". This column contains assignment grades and exam grades in semesters one and two.
• Click the "D4" box and type "SEMESTER 1".
• Click the "D5" box and type "UH".
• Click the "E5" box and type "UTS".
• Click the "F5" box and type "UAS".
• Click the "G5" box and type "NS1".
• Click the "H4" box and type "SEMESTER 2".
• Click the "H5" box and type "UH".
• Click the "I5" box and type "UTS".
• Click the "J5" box and type "UAS".
• Click the "K5" box and type "NS2".
• Click the "L3" box and type "TOTAL VALUE".
• Click the "M3" box and type "FINAL VALUE".
• Click the "N3" box and type "AVERAGE".

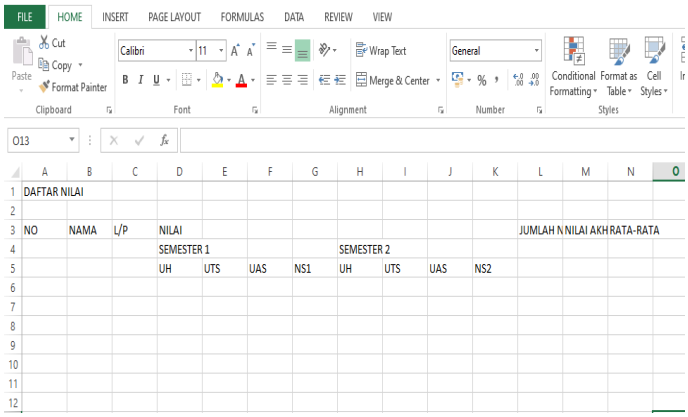


Figure 3. Initial Column Display

1. Tidy up the columns, by adjusting the column width, also combining several lines, and making them center-aligned.

How to combine multiple lines:

• Block sections that will be made into one line
• Click "Merge & Center". If the sentence in the row is long so it doesn't get cut off in one column, you can add it with "Wrap Text".

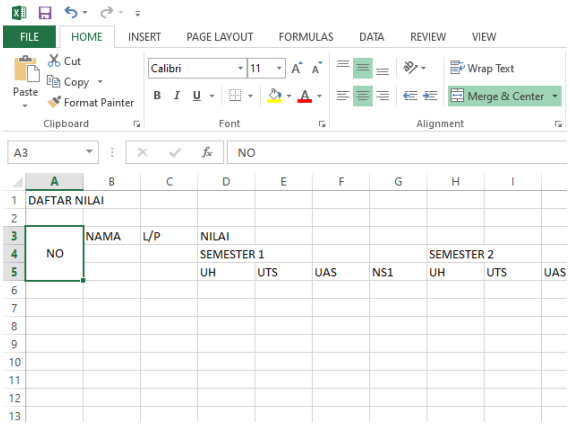


Figure 4. Display after Merge & Center

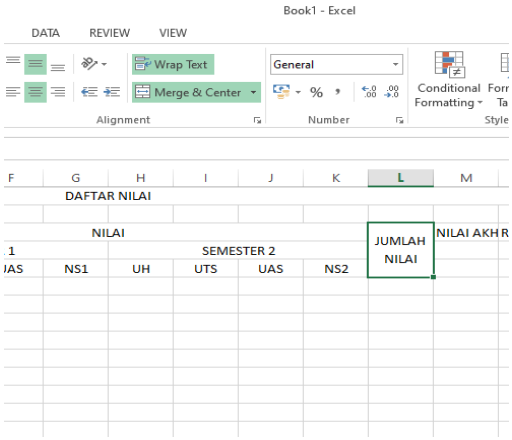


Figure 5. Display after Merge Center + Wrap Text

- Results after trimming are as follows:

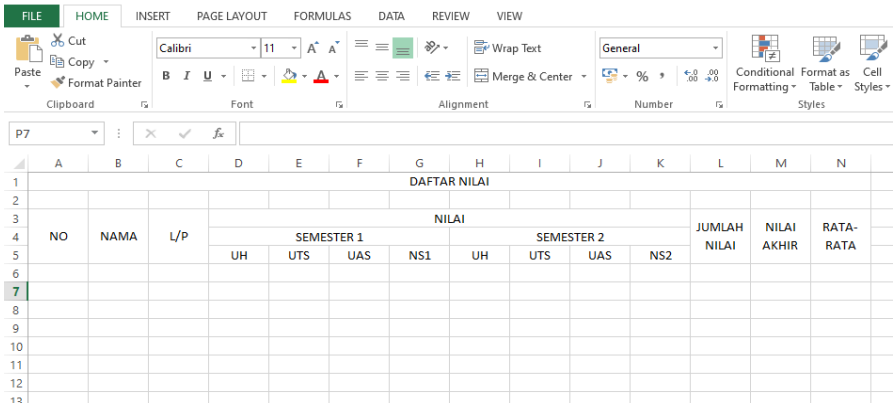


Figure 6. Column appearance after trimming

1. Add a border, and you can see the value list table.
- Column blocks that will be bordered
- Click the Home menu
- Click Borders
- Select All Borders.

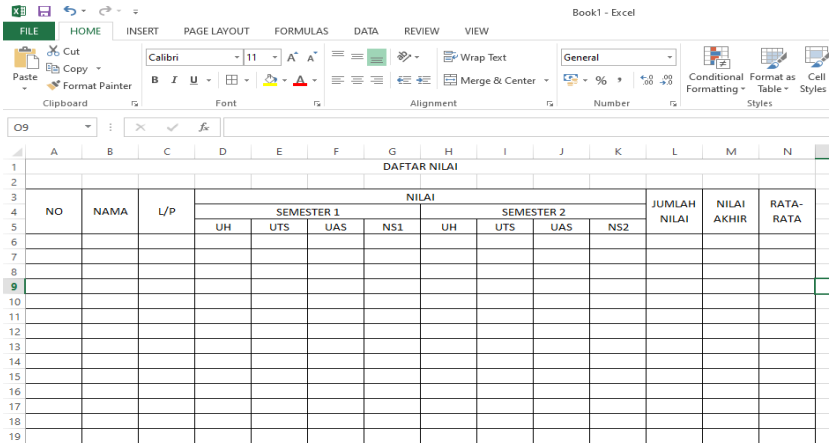


Figure 7. Appearance after adding a border

1. Give a number to the "NO" column.
- Block two numbers sequentially
- Then drag the "+" image down, and
- Center it so it's neat.

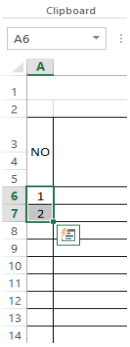


Figure 8. Automatic numbering display

1. Tidy up the appearance again, the column above is still one size so adjust it to make it neater. For example, the "NAME" column is expanded, the "NO" and "VALUE" columns are reduced.
- Block all data contained in the border
- Double click (double click) at the top of the "VALUE" column, located in the middle between columns E and F

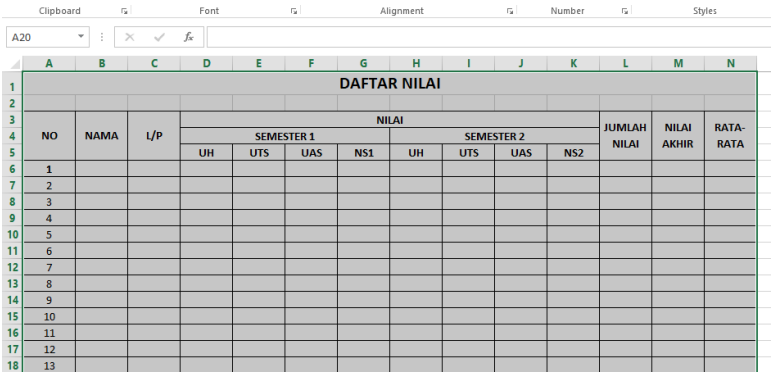


Figure 9. Column box adjustment display

• Display the results

DAFTAR NILAI

NO	NAMA	L/P	NILAI								JUMLAH NILAI	NILAI AKHIR	RATA-RATA
			SEMESTER 1				SEMESTER 2						
			UH	UTS	UAS	NS1	UH	UTS	UAS	NS2			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													

Figure 10. Display of results after double clicking the box

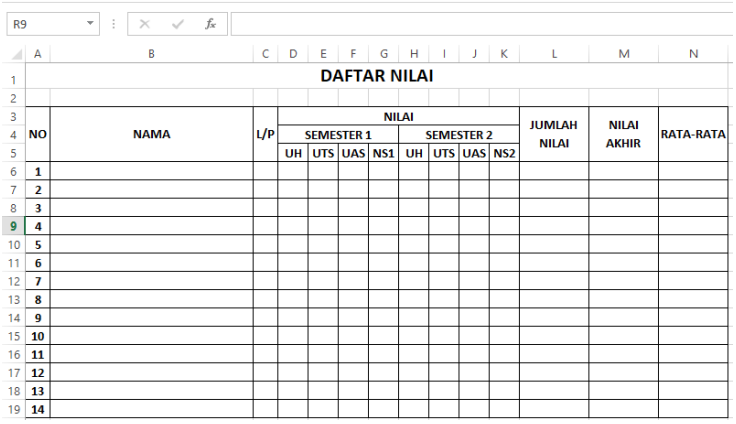
• Then adjusted again, to make the “NAME” column longer. And for the "VALUE" column, block it again so that it is the same size by clicking on the top of column K then sliding it to the right, and for the column "TOTAL VALUE, FINAL VALUE, AND AVERAGE" the size is also equalized.

DAFTAR NILAI

NO	NAMA	L/P	NILAI								JUMLAH NILAI	NILAI AKHIR	RATA-RATA
			SEMESTER 1				SEMESTER 2						
			UH	UTS	UAS	NS1	UH	UTS	UAS	NS2			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													

Figure 11. Display of equalizing the size of the value column box

• The appearance will be like this, and look neat



DAFTAR NILAI

NO	NAMA	L/P	NILAI								JUMLAH NILAI	NILAI AKHIR	RATA-RATA
			SEMESTER 1				SEMESTER 2						
			UH	UTS	UAS	NS1	UH	UTS	UAS	NS2			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													

Figure 12. Display of results after adjustment

1. Give color to the column.
- Block the part that will be colored
- Click the Home menu
- Click Theme Colors
- Choose the color according to your wishes

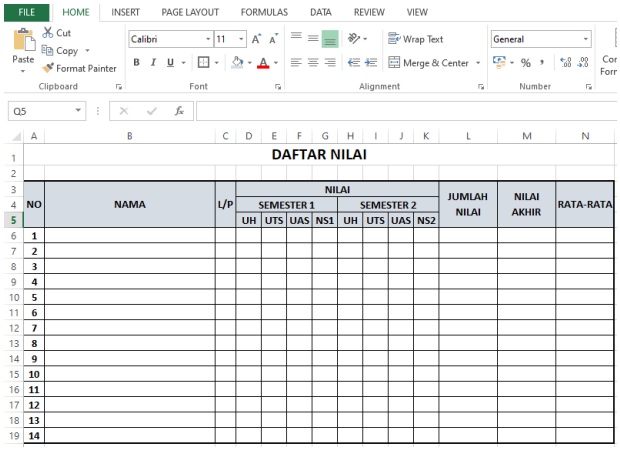


Figure 13. Column box display after coloring

1. Increase the format quota, adjust the number of students.
- Column and row blocks that have been given borders
- Then drag it down until it matches the number of students.
- Open Print Preview to see the results display

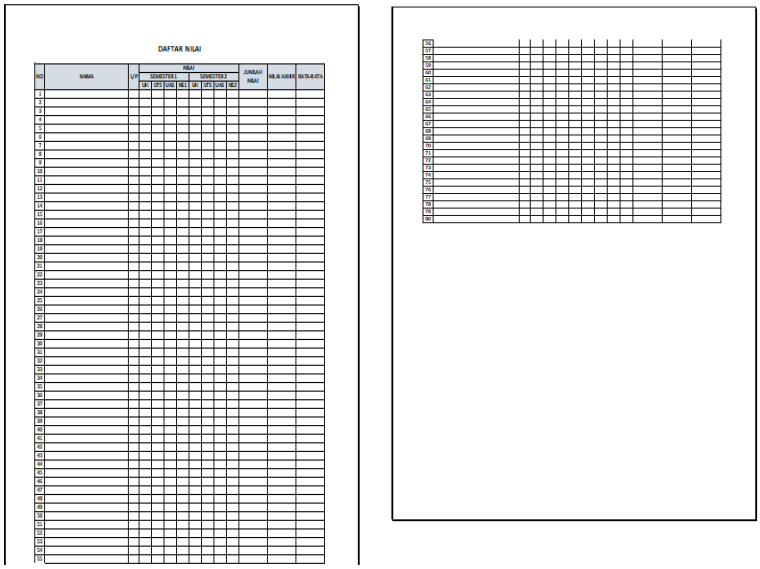


Figure 14. Display of adding format lines

1. Give a title to the next page, because in the display on the next page there is no title "LIST OF VALUES".
- Click the Page Layout menu
- Click Print Titles
- Select Rows to repeat at top
- Click the arrow.

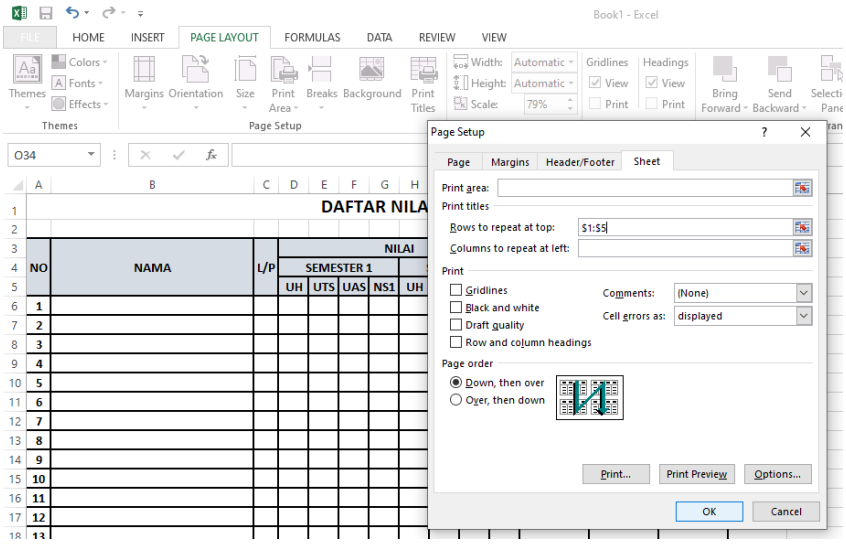


Figure 15. Display in page setup

- Next, you are directed to retrieve data that will be repeated on each page
- Title data block, so that it always appears on the next page
- Then release and click the arrow.

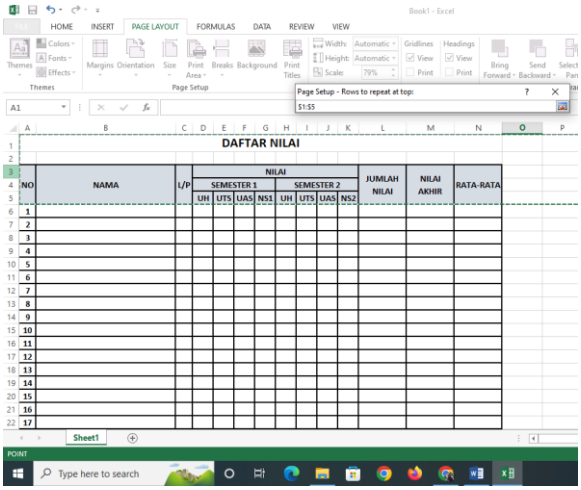


Figure 16. Display in the title block

- Open Print Preview to display the results, there is a title "LIST OF VALUES" on the next page.

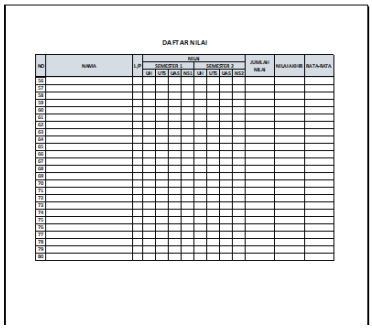


Figure 17. Display of the results of adding a title

1. Create a name, here write the name of the principal and homeroom teacher
- Write the name below the value list format
- The name of the principal is written on the left
- The name of the class teacher is written on the right
- There is a distance in the middle for the signature (initial)

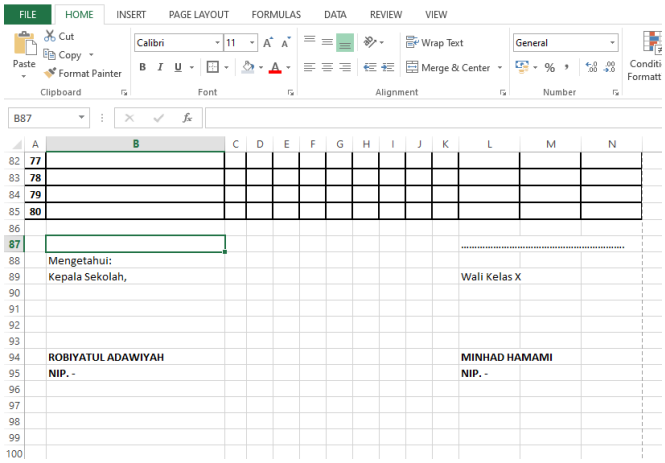


Figure 18. Making names of school principals and teachers

- Display in print preview

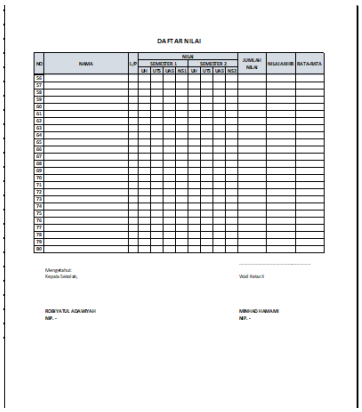


Figure 19. What it looks like in the print preview

- Done, the assessment sheet is ready

CONCLUSION

Education has a crucial role in the advancement of a nation. However, many educators still lack understanding of information technology, particularly in Indonesia, where nearly 60% of teachers do not have adequate knowledge in this area. This highlights the importance of utilizing information technology in the learning process, especially in processing student learning outcomes. This study aims to evaluate the effectiveness of using Excel applications in processing summative student grades in Islamic Religious Education learning.

The study results indicate that the Excel application can facilitate and expedite the creation of assessment sheets compared to manual methods. Additionally, this application helps improve the accuracy of assessments, reduces the likelihood of human error, and provides ease in visualizing student grade data. The use of Excel allows teachers to quickly analyze student learning outcomes, enabling them to make more informed decisions in efforts to improve the quality of PAI learning.

In the discussion, it was found that the use of Excel positively impacts teachers' work efficiency and enhances transparency and accountability in assessments. This is due to Excel's features that allow for automatic data processing and more organized and structured data storage. However, the study also found that some teachers are still not proficient in using Excel, necessitating further training to maximize the use of this application.

Based on the study results, it is recommended that intensive training on using Excel applications in grade processing be provided to teachers, especially those less familiar with this technology. Further research can be conducted to develop more comprehensive training modules and to observe the long-term impact of using Excel on improving student learning outcomes. Additionally, it may be worth exploring other applications that might be more user-friendly and have more comprehensive features for educational assessment purposes.

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