

Excel As an ICT Tool For Increasing Teacher Proficiency Towards Quality Education: A Panacea for Addressing Challenges Confronting Nigeria Education System

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Abstract

The importance of Information and Communication Technologies (ICT) in education has attracted the attention of both educators and administrators all over the World. Many and different ICT tools have been used by teachers especially in teaching and learning process, these include hardware and software. Teachers need to acquaint themselves with various ICT skills around to make their work efficient and contain the challenges pose by the ever increasing number of students; in terms of computation of result, preparation of result sheet and academic status for prompt decision making. Most researches conducted especially in Nigeria are geared towards investigating how ICT impacts teaching and learning, utilization and readiness of teachers to use ICT in teaching and learning, However, researches on developing teachers' proficiency on ICT tools specifically, especially in Nigeria are limited based on the knowledge of the researchers. It is against this backdrop that the researchers demonstrated some of the usage and benefit of excel as an ICT tool, for result computation, score sheet preparation and ranking. The paper recommended among the others; the need for proficiency training for teachers especially on excel programme and the need to encourage teachers to incorporate ICT tools such as excel in their computations.

Key word: *ICT, Excel formula, teacher Proficiency, demonstration, benefit of excel.*

1. Introduction

The importance of Information and Communication Technologies (ICT) in education has attracted the attention of both educators and administrators all over the World. Many countries now regard the mastering of ICT and the utilization of its basic concepts as part of the core of teaching and learning process of education (UNESCO, 2011). It is evident that the usage of ICT in teaching and learning has revolutionised the way teachers teach and also the way learners learn; the ICT has simplified the teaching and learning process and has allowed the exploration of more and many areas which were not possible before. The use of information and communication technology (ICT) creates a powerful learning environment and it transforms the learning and teaching processes in which students deal with knowledge in an active, self-directed and constructive ways (Volman & Van Eck, 2001). Many and different ICT tools have been used by teachers especially in teaching and learning process, these include hardware and software. There are evidences of researches on the effectiveness of the various ICT tools as they affect teaching and learning process.

However, there are many advantages a teacher or an education administrator may gain that can improve the overall success of educational process using ICT and which many of them do not utilise or are ignorant of the use of ICT in educational evaluation and school administration. Record keeping, result computation, preparation of students results and many more are some of the areas where ICT tools can be efficiently used and which most teachers either find difficult to use or are not aware of. The British Educational Communications and Technology Agency, BECTA (2004) pointed that other derivable benefits of ICT tools in

education include; assisting in reducing teachers' workloads through its use in lesson preparation and worksheet, writing students report, and individual education plan, collating and analyzing students' attainment information for target setting; recording and analysing attendance and disciplinary information.

Teaching is becoming one of the most challenging professions due to rapid expansion of knowledge which requires modern technologies that necessitate the use of ICT (Ameen, Adeniji, and Abdullahi, 2019). Teachers need to acquaint themselves with various ICT skills around to make their work efficient and contain the challenges pose by the ever increasing number of students; in terms of computation of result, preparation of result sheet and academic status for prompt decision making.

In Nigeria, the need for qualified teachers with the necessary skills and knowledge needed to adequately carry out teaching jobs as well as for professional growth, make teacher education prominent(Osunde and Omoruyi, 2004).Teachers are supposed to possess both competencies in using ICT to impart knowledge and also to carry out other classroom functions effectively. However, Wasiu and Tenneh (2018), pointed that many Nigerian teachers still have been unable to find effective ways to use technology. One possible explanation for this problem is that the use of technology in the classroom has not been widely encouraged and the teachers are not well trained on how to use ICTs as educational tools; in the same vein, teachers need training not only in computer literacy but also in the application of various kinds of software for effective teaching and learning (Ololube, 2006). Furthermore, most researches conducted especially in Nigeria are geared towards investigating how ICT impacts teaching and learning (i.e. Ifeanyi, 2016; Nwigbo & Madhu, 2016;Adeyemo, 2010), utilisation and readiness of teachers to use ICT in teaching and learning (i.e. Ameen, Adeniji & Abdullahi, 2019;Ololube,

2006; Olaleye & Abiodun-Oyebanji, 2010; Amadi, Mekuri&Aleru, 2015) and availability of ICT facilities in schools (i.e.Edoja&Ityobee, 2020;Olabo, Ayodeji, Kazeem& Samuel, 2020;Okai, 2019;Nwosu, John &Akorede, 2018; Adeyinka, 2011). However, researches on developing teachers' proficiency on ICT tools specifically, especially in Nigeria are limited based on the knowledge of the researchers. It is against this backdrop that the researchers intended to demonstrate some of the usage and benefit of excel as an ICT tool, for result computation, score sheet preparation and ranking. Teachers in educational institutions need to be well equipped to anticipate and respond to challenges and opportunities ICT s present and represent, participate productively and equitably in an increasingly technology-rich, knowledge-driven world (Ifeanyi, 2016).

2. Microsoft Excel

Microsoft Excel is a versatile software which offers a wide range of applications ranging from data management to statistical analysis (Gomes, Passeri and de Albergaria Barbosa, 2006). It also provides tools for simple statistical analysis, such as t-tests, F-test, correlation and regression (Slezák, Bokes, Námer and Waczulíková, 2014). There are various data management a teacher performs which include but not limited to preparation of students' score sheet, result computation, students' grade analysis and students ranking. In schools, the spreadsheet can be used as a tool for keeping grades, creating charts and graphs of all kinds, as well as for data analysis (Poole, Jackson and Randall, 2002).As educators, we exist in a data driven environment where student assessment is key to measuring student performance; Microsoft Excel is a spreadsheet that can help teacher recordtest scores, sort, calculate averages, record attendance, class projects and display information (Thrash, n.d)

The excel spreadsheet contains table with various numbers of rows and columns (figure 1). These rows and columns are used to put the values. It is easy to manipulate these values using some arithmetic operations with the help of excel formulas. One can build formulas into selected cells which automatically carry out calculations on designated sets of data.

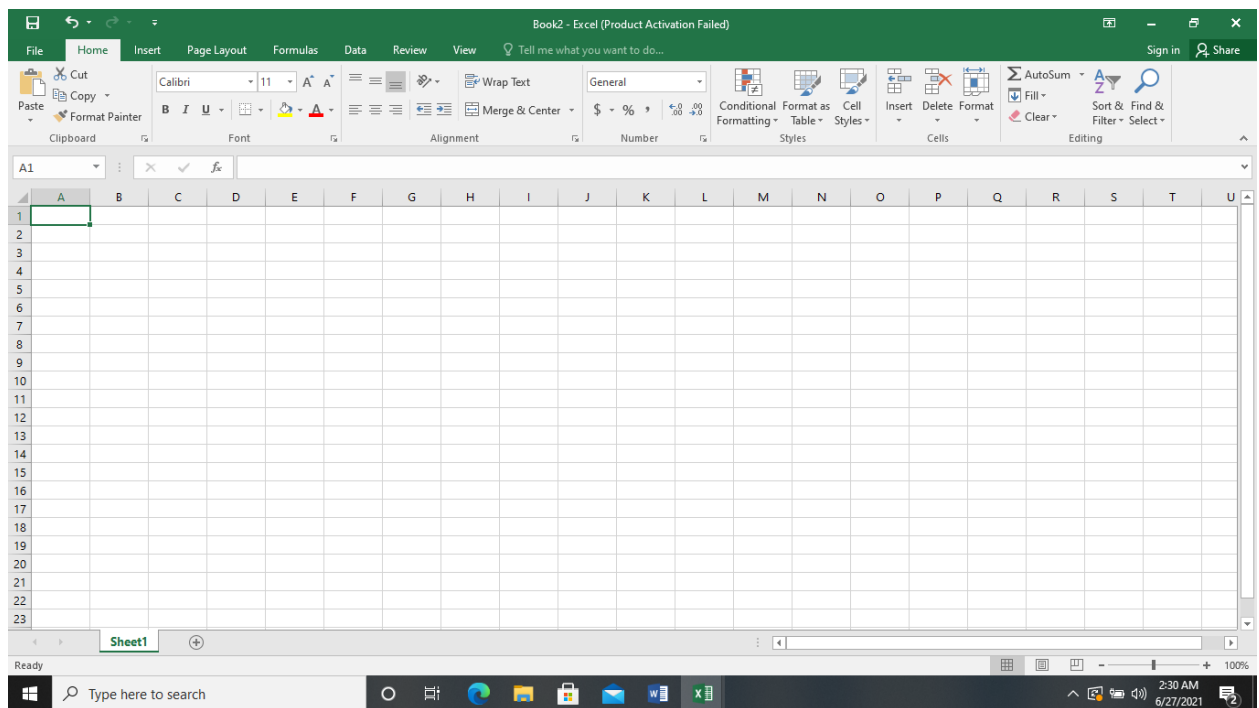


Figure 1: Excel screen

Excel Formula

A formula in Excel is an expression that returns a specific result. For example: “=3 + 5, returns 8”. All formulas in Excel return a result, even when the result is an error. Formulas, are defined by the user, and may include the built-in functions (Poole, Jackson, & Randall, 2002). Both functions and formulas accomplish the same task: they tell Excel to do some kind of calculation. For example, at the end of a semester to calculate a total point value or averages,

for each student a teacher can create a formula on the spreadsheet to do the work on the values in appropriate cells.

Creating Excel Formula

To create a formula:

1. Select a cell
2. Enter an equals sign (=)
3. Type the formula, and press enter.

Instead of typing cell references, you can point and click, as seen below. Note references are color-coded:

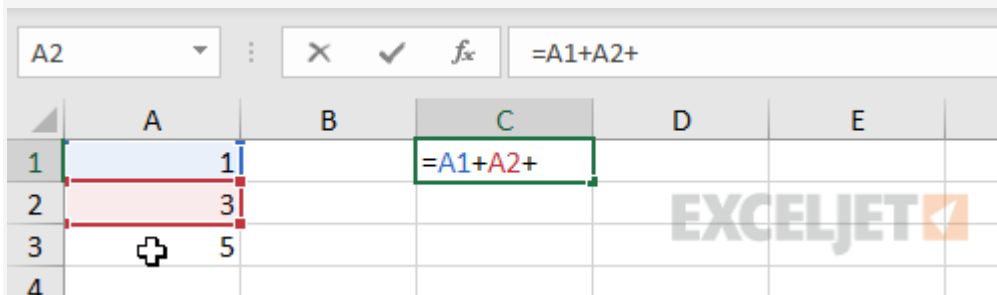


Figure 2: Excel formula and functions (Bruns, 2021)

All formulas in Excel must begin with an equals sign (=). No equals sign, no formula. Bruns (2021), gives some excel formulas as;

=SUM(number1, [number2], ...) ...

=SUM(A2:A8) – A simple selection that sums the values of a column.

=SUM(A2:A8)/20 – Shows you can also turn your function into a formula. ...

=AVERAGE(number1, [number2], ...) ...

=AVERAGE(B2:B11) – Shows a simple average, also similar to (SUM(B2:B11)/10)

Copying and pasting formulas

The excel spread sheet allows one to copy a formula for use on a set of data for several students. For instance, after creating a formula that will produce a total or sum of the eventual scores for particular student, it is possible to copy the formula from the reference cell to the relevant cells in the same TOTAL column. A formula may be copied by simply clicking the cell that contains the formula and dragging the “Auto fill” cursor (figure 3) to the cells where you want the formula duplicated. However, there are several ways one may follow to copy a formula in excel spread sheet.

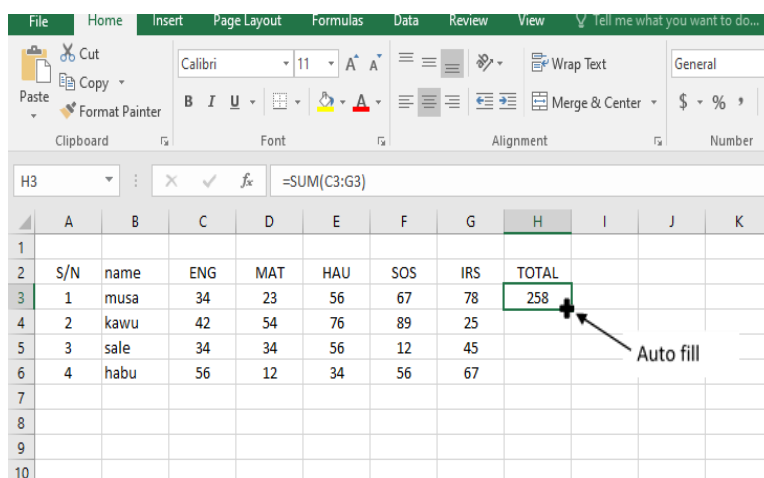


Figure 3: coping a formula to adjacent cells

Excel formula may be copied down to other cells by selecting the cell containing the formula and moving to the right hand lower corner where a heavy black plus sign (+) appears (figure 3), by pressing and dragging the plus sign the formula is copied to the subsequent cells.

3. Preparation of Score Sheet

Excel application offers an opportunity for teachers to prepare a score sheet for their students. It allows the teacher to create a sheet containing details information about each student such as

Basic information that are unique to each student are entered manually; name, registration number, continuous assessment and examination scores for each student are first entered.

Figure 5 gives dummy set of students representing set of students and their numbers.

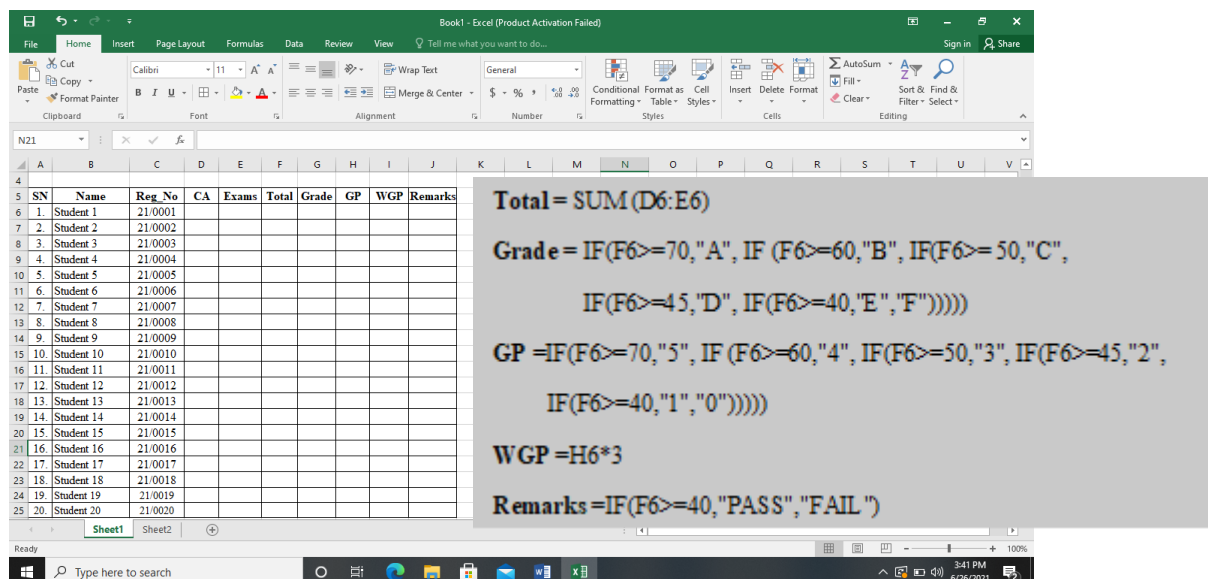


Figure5: excel sheet showing students details

4. Entering Excel Formulas

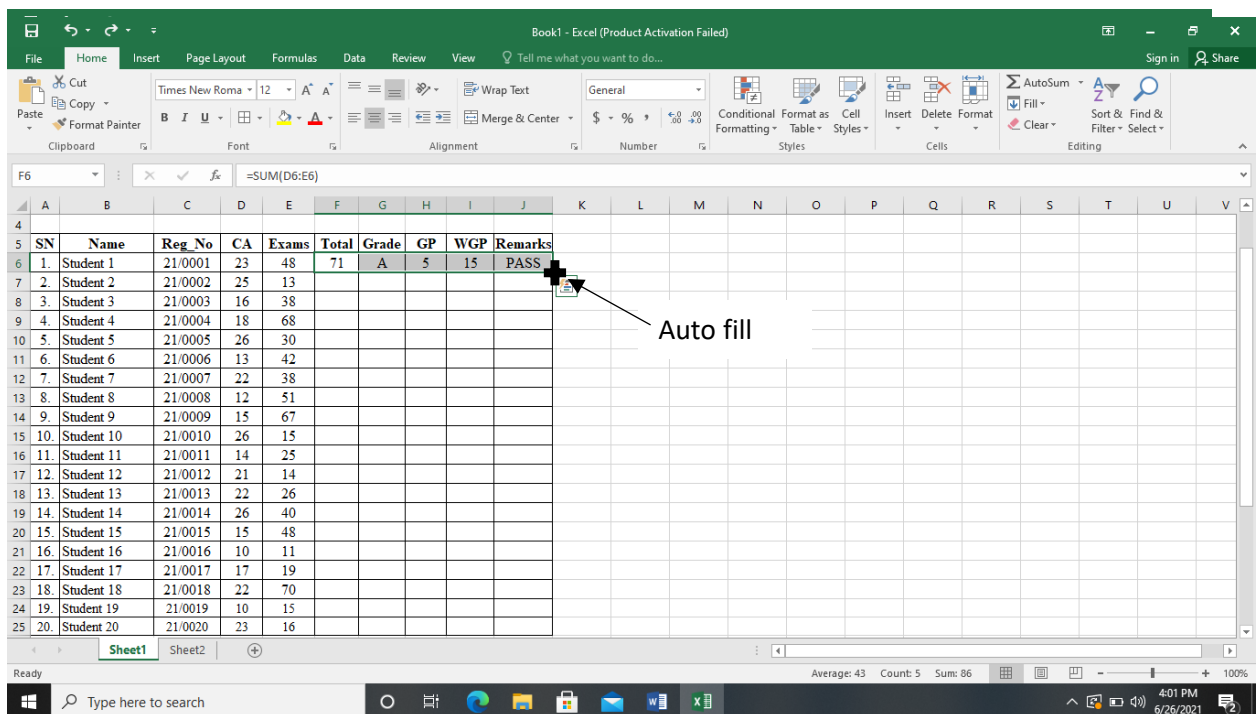
All formulas in Excel must begin with an equals sign (=). No equals sign, no formula. Bruns (2021). Excel formulas are created by first pressing equal sign (=) in the cell beneath the title describing the calculations to be performed in the cell; after leaving the cell one will notice the result of the calculations in the cell not the formula. To view the formula for editing, the cell is selected and the formula appears in the formula bar at the top of the excel screen. Formulas are written based on what the user wants; however, excel has many predetermined formulas which sometimes appear the moment one begin to write them and by clicking on them the excel

completes the remaining. For instance, for the dummy score sheet created the relevant formulas are shown on figure 6.

Figure 6: Excel function formulas

Filling Excel Formulas

One of the advantages of using excel in computation is that once a formula is created it can be copied and fill to the remaining cells that require it. In figure 7, shows how formula can be copied to other adjacent cells. The first thing a teacher needs to do is to create all the formulas for needed for a single individual, then later here copies them to others. A formula is copied by



clicking on the cell containing the formula; moving to the right hand lower corner where a heavy black plus sign (+) appears (figure 7), by pressing and dragging the plus sign the formula is copied and filled to the subsequent cells.

Figure 7: Coping and filling excel formula

The screenshot shows an Excel spreadsheet with a table of student performance data. The formula bar at the top displays `=SUM(D6:E6)`, indicating that the formula is being applied to cell F6. The table has the following columns: SN, Name, Reg No, CA, Exams, Total, Grade, GP, WGP, and Remarks. The data rows are numbered 1 through 20.

SN	Name	Reg No	CA	Exams	Total	Grade	GP	WGP	Remarks
1.	Student 1	21.0001	23	48	71	A	5	15	PASS
2.	Student 2	21.0002	25	13	38	F	0	0	FAIL
3.	Student 3	21.0003	16	38	54	C	3	9	PASS
4.	Student 4	21.0004	18	68	86	A	5	15	PASS
5.	Student 5	21.0005	26	30	56	C	3	9	PASS
6.	Student 6	21.0006	13	42	55	C	3	9	PASS
7.	Student 7	21.0007	22	38	60	B	4	12	PASS
8.	Student 8	21.0008	12	51	63	B	4	12	PASS
9.	Student 9	21.0009	15	67	82	A	5	15	PASS
10.	Student 10	21.0010	26	15	41	E	1	3	PASS
11.	Student 11	21.0011	14	25	39	F	0	0	FAIL
12.	Student 12	21.0012	21	14	35	F	0	0	FAIL
13.	Student 13	21.0013	22	26	48	D	2	6	PASS
14.	Student 14	21.0014	26	40	66	B	4	12	PASS
15.	Student 15	21.0015	15	48	63	B	4	12	PASS
16.	Student 16	21.0016	10	11	21	F	0	0	FAIL
17.	Student 17	21.0017	17	19	36	F	0	0	FAIL
18.	Student 18	21.0018	22	70	92	A	5	15	PASS
19.	Student 19	21.0019	10	15	25	F	0	0	FAIL
20.	Student 20	21.0020	23	16	39	F	0	0	FAIL

Calculating Summary

Teachers usually calculate summary on every score sheet to show the distribution of grades and also the percentages of students that pass and fail. The summary is usually shown below the score sheet depending on how schools want it; vertical form of horizontal form. In this paper the researchers use a vertical format, the formulas are shown on figure 8.

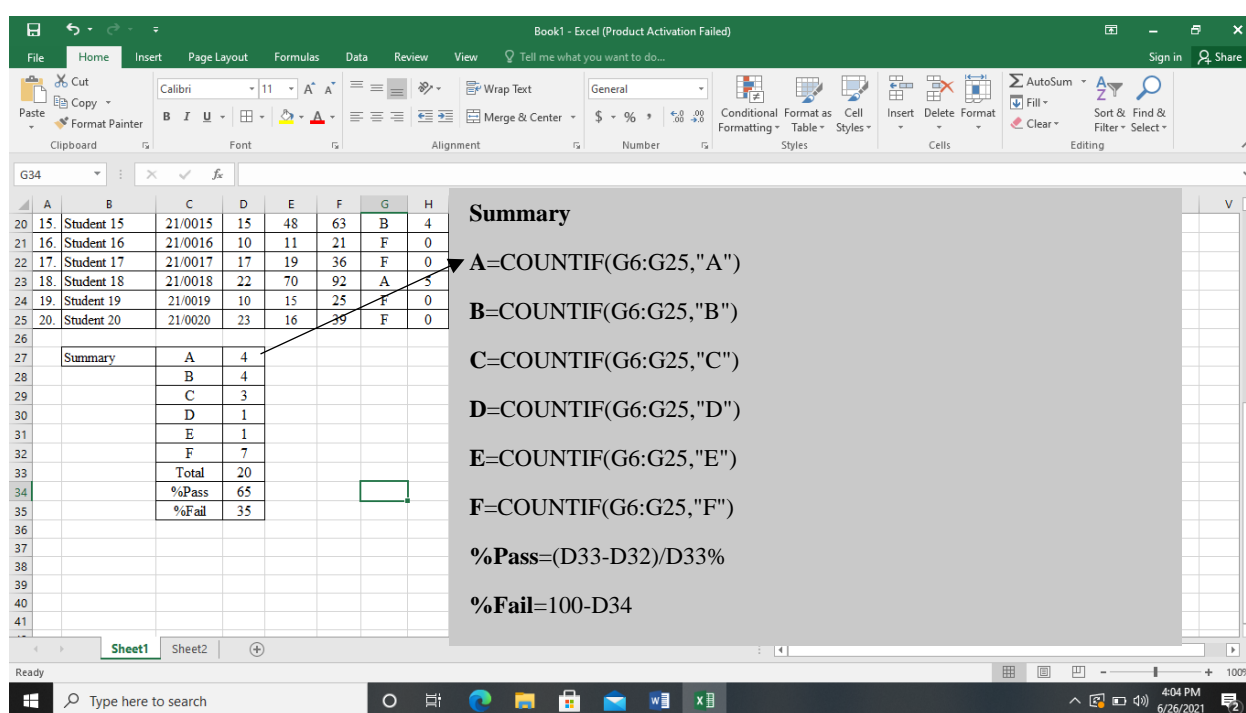


Figure 8: calculation of summary

Using Excel to Rank Students

Ranking students is usually done at primary and secondary levels. It is relevant for teachers in the colleges to know to create formula for ranking students, to enable them guide their students in the colleges before they finish their training as teachers. Excel sheet allows one to rank students using their total score or averages, it further handles the case of tie; excel automatically adjust when there is a tie and skip the next position. Figure 9 shows how to create a formula

that ranks students, however, in this paper the researchers decided to use average column for the ranking. Note the ranking (under position) heading is showing “1” because only single student entry is shown, with more entries the position changes after copy and auto fill figure 10 and 11.

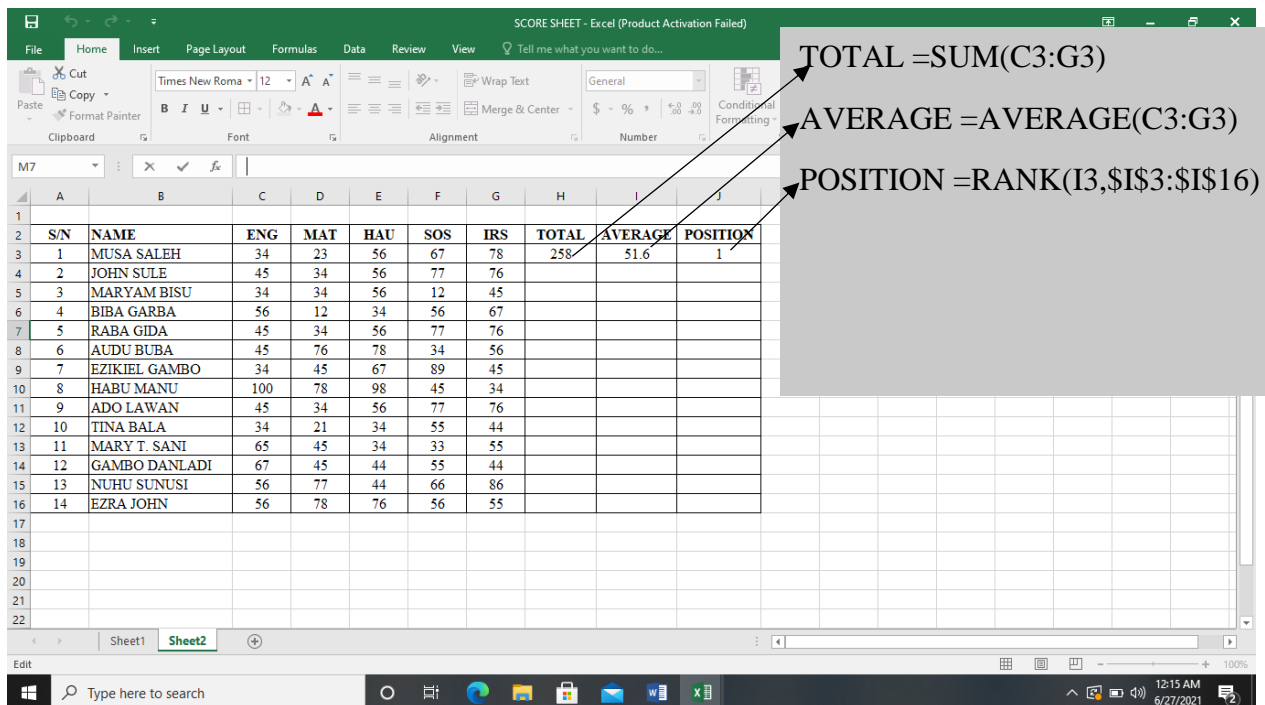


Figure 9: Excel Ranking formula

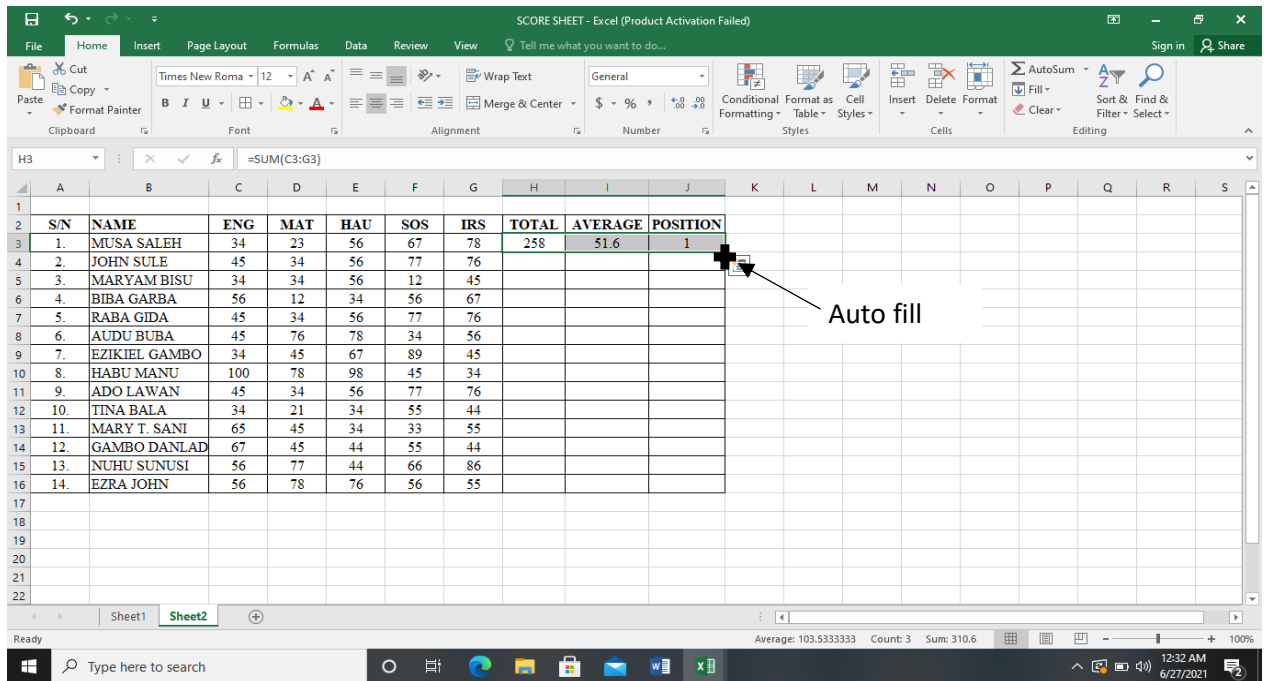


Figure 10: coping ranking formula

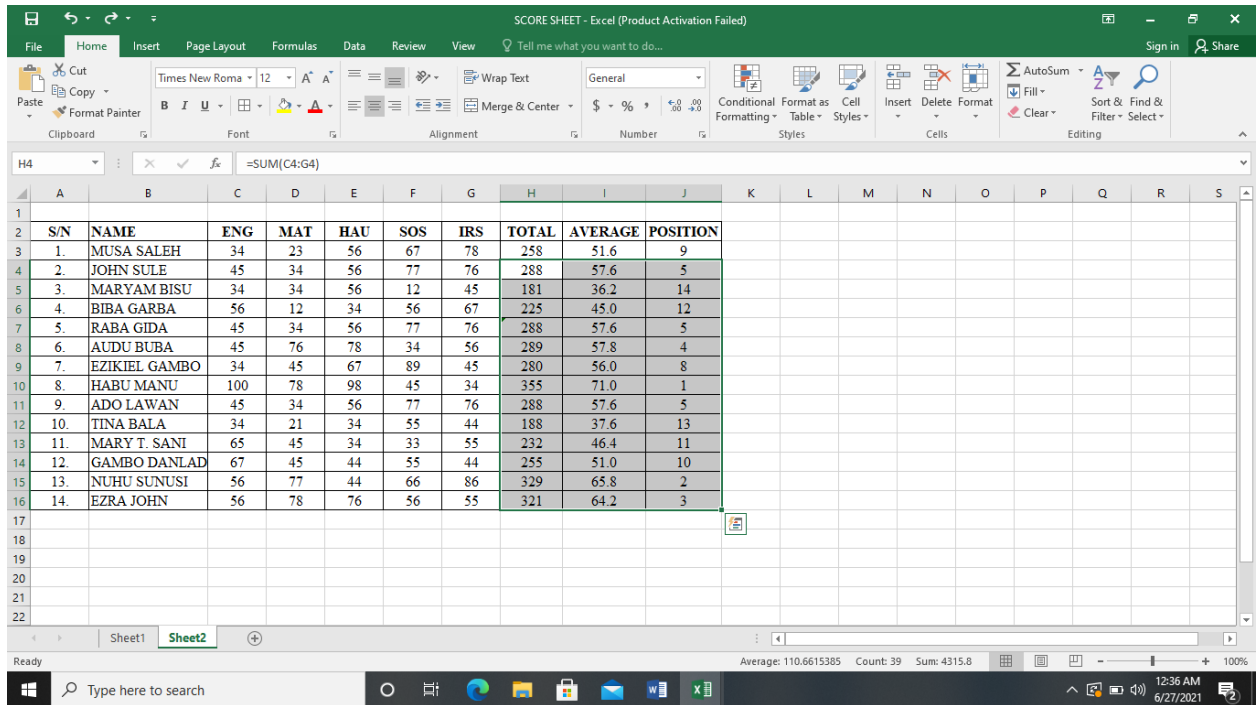


Figure 11: Auto filling ranking formula

5. Conclusion

This paper selected available technology that teachers may have access to, for making their work easy, error free and timely. Excel spreadsheet was used to demonstrate some of the benefit of ICT tools in enhancing teachers productivity. One major change is the opportunity provided by technology to help teachers engage in various activities to handle ever increasing number of students.

6. Recommendations

This paper recommends the need for proficiency training for teachers especially on excel programme and the need to encourage teachers to incorporate ICT tools such as excel in their computations.

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