A Computerized Excel Spreadsheet Program for Monitoring Students' Grades and Attendance

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Abstract—This Program designed to automate and transform the administrative works and manual procedures carried out by faculty members during the semester, as well as to prepare the file requirements for the courses. By using the Excel program. The faculty member can obtain many reports or lists such as list of deprivation, course statistics and course report.

Keywords: Database; DBMS; MS Excel;

I. INTRODUCTION

The faculty member of the university is the most important part of the educational process. In addition to scientific research, the faculty member has different tasks involves, transferring information, experience and knowledge to the students, more over, many repetitive tasks such as recording the attendance during the lectures and writing the midterm and final exams. After the completion of the process of writing or documentation, then spend more effort and time to obtain the semester test scores and statistical reports. At the end of the semester, he prepares the denied lists, the total score of the semester work, the result as well as the final report of the course and all the reports of the requirements for academic accreditation. As long as these reports and lists are manually completed, they are not free of errors.

The purpose of this program is to develop, speed and increase the accuracy of faculty performance in the work to complete those lists and sheets or various reports needed during the semester. Thus, the provision of this computerized program to faculty members will facilitate the completion of these tasks to get error-free reports very quickly. In the following, we present the main reports and lists provided by this program.

1.1. Attendance sheets

Each sheet is a list of student names and other required data. The attendance lists are required in lectures, in final exams, also to follow-up absence form, the lists of the denied, and withdrawn, and the final attendance sheets for the requirements of the course file.

1.2. Lists of grades

Lists are containing the student grades data that includes; semester tests, final exam sheets, semester scores, final result with points written and grades, passed reports, returnees’ statements, assistant statements, grade report, final scores for the courses enrolled by the student.

1.3. Statistical summary for the course outcome

The program contains course statistics with diagrams. It also contains a summary of result with diagrams for the midterms and results of the course.

1.4. Statements for the teacher

It is a list used by faculty members, including the results of the tests for all the groups in charge of teachers, list of the weekly lectures of teachers and list of exams monitor.

1.5. Set charts

Diagrams are describing, charts to compare the pass rate of all groups in the same course, charts for all semester tests, charts of the final points and chart of goodness of fit.

1.6. Group reports

A number of reports can be produced by the program, including; a report for the national accreditation in Arabic, another in English, a report for the international accreditation in Arabic, another in English, a matrix for national accreditation in Arabic, another in English language, a report about tools measurement application, and obtaining final results. The "Rubric" and results analysis report.

1.7. Statistical tests

The program includes a number of important statistical tests, such as a homogeneity test to compare students' levels among different groups or courses, a comparison test between two pass rates for two groups or courses, a comparison test between semester grades, final test scores for any groups or course.
II. PROBLEM STATEMENT

With the increasing of tasks load. As well as the increasing of students and the groups assigned to teacher by the faculty during the semester, and for the need of report by college administration and the academic accreditation unit for various reports, which is the faculty member must accomplish and deliver in a timely manner. It was necessary to find and design an electronic program to accomplish those administrative tasks accurately, quickly, and to get the necessary reports on time.

The reports submitted by the faculty member during the semester were still manually paper-based, and the accuracy required in their data is not available, these reports converted to electronic copies by using the scanner and then re-copied to a file that may exceed 300 pages.

Hard documents are cannot be relied upon as a database when needed, particularly with regard to absences, semester or final grades and other important data. Handouts, lists or manual reports by a faculty member in a traditional manner are often inaccurate, due to many unintended errors such as the lists of the denied, the rates of denied or the outcome of the semester grades, as well as the result and academic assessments, and the reports required for academic accreditation. If you need to modify some grades in order to modify the points or modify the pass rates, this requires a full and accurate review of all grades of the students and requires great time and effort.

III. ADVANTAGES OF MICROSOFT EXCEL

Microsoft Excel is one of the most important programs in the Microsoft Office suite. As we know as users of excel it used in statistics, mathematics, and graphics. It is also a powerful database management program no less important than Microsoft Access, it contains many database functions, logical, and time functions. In this scientific paper, we used Excel as a database program.

Excel program has many advantages, including:

3.1. A large number of worksheets can managed as needed in a single file.

3.2. It can import and export various data types from and to all windows programs.

3.3. It has a high level of security for specific papers or a specific range of cells or for the whole file.

3.4. Ease of linking worksheets or cells together by using codes.

3.5. Hyperlink technology is available, to link the worksheets together or with files from windows programs.

3.6. The possibility of protecting cells that contain codes and hide it.

3.7. The possibility of hiding some important fields or columns that we do not want to appear.

3.8. Possibility to install the fields and columns that we want to show the top and right or left of the tables as addresses.

3.9. Validation rules can be included to increase security and to prevent input errors.

3.10. Conditional formats are available to distinguish important data, whether inputs or outputs.

3.11. Contains many functions of databases, in addition to logical functions, mathematical and statistical. Can also be create new function when needed.

The monitoring program consists of dozens of papers linked together with code to form an integrated data processing and reporting file. The main screen of the program contains many keys, which allow us to move between all components of the program. These keys are cells that cross-linked to all tables, reports, and statistics. All worksheets linked to the main screen of the program, so that the user controls the program components through that screen. The general layout of the main screen of the program shown in Figure (1) below:

The green keys on the screen are to open the input tables. The yellow keys are to open tables, and reports, while the light blue keys are using for data entry. Finally, empty yellow keys contain important code related to the input data.

IV. INPUTS AND OUTPUTS OF PROGRAM

The working sheets in the program divided into two main groups. First inputs set and second output set.

4.1. Input range

4.1.1. College data inputs include courses, scientific departments, lecture rooms, faculty data. These data are semi-static and sometimes need to be update, but they change from one faculty to another.

4.1.2. Data input of the study population assigned by the faculty member at the beginning of each semester, the data of the students in each division. The data is entire by using the copy and paste feature only to preserve the formats applied to the input tables and the collection of input cells.
4.1.3. Data input, reporting, attendance and grades. These data entered after the lectures performed or after the tests performed and corrected.

4.2. Output Set

After completing the data entry and making sure that there are no mistakes during the input process, we get the necessary reports and statistics correctly. From these outputs:

4.2.1. Outputs in the form of reports, statistics or statistical tests and only require the entering of the group number, or the code of the course, and then print the report.

4.2.2. Outputs in the form of lists or sheets, it requires entering of the group number, or the code of the course then run the application to select the students of the group or students of the course, then print or save it.

The following diagram represents the scheme for the program:

![Program outline diagram]

Figure (2): The program outline

The program used during the previous semesters by the faculty members of the quantitative methods unit at the faculty of economics and administration at the University of Al-Qassim, to identify the weaknesses or imbalances points. According to user feedback and suggestions, an integrated vision of the proposed software adopted.

V. MECHANISM OF ACTION OF THE PROGRAM

After entering the data of students lists, attendance, marks of midterms and final exams, as well as the data of required reports. We enter the number of any group or code of any course or university code for every student or the name of every faculty member, then all statements and reports relating to the input statement will be fully prepared. The following points explained the mechanism of the program:

5.1. The program calculates absenteeism rates consistently and refers to students who have exceeded the allowed percentage of absenteeism before the end of the semester and identifies the list of denied that will be handed to student affairs.

5.2. The program calculates the degree of the semester work by combining the degree of laboratory test or participation with the degrees of the quizzes and the approved semester tests degree, and then approximate the fractions.

5.3. The program combines the grade of the semester work with the final test score, and then gives the final grade figure and written.

5.4. The program can add one mark, two or more, automatically according to the instructions of the college administration, to those who need to pass or to modify the grade.

VI. RULES AND CONDITIONS FOR USING THE PROGRAM

Each set of code in the program has specific capabilities, which are using or operating within a specified number of rules or conditions governing it. Accordingly, the program designed to fit the curriculum of the teaching process in the university in terms of the number of midterm and quizzes as well as the number of students in the group. Note that program capacity can be change as needed. The rules are:

6.1. The maximum number of quizzes is eight.

6.2. The program select the best high demanded number out of the eight. (quizzes scores are equal).

6.3. The program select all quizzes when are not equal.

6.4. The maximum number of midterms is three.

6.5. The program select the best high tow midterm out of the three. (midterm scores are equal).

6.6. The program select all midterm when are not equal.

6.7. If the grades of the semester works (semester tests, laboratory, home works and quizzes) grouped, then there is a specific field for it, the.

6.8. The maximum marks of the midterm tests score may be one of the following: 10, 15, 20, 25, 30, 35, and 40.

6.9. The maximum marks of the final test score may be one of the following: 30, 40, 50, 60, and 70.

VII. PROGRAM DESIGN

The database consists of the following basic tables (courses, academic departments, faculty members, students, classrooms, lecture and test timetables, academic year timetables and weekdays). The following figure (3) is a chart describing the nature of relationships between these tables.
The following shows some of the lists and reports that be obtained from the program and are consisted with the data of semester II 372 for the academic year 1437.

To get a report for the results of the group's tests taught by any teacher, see Figure (4), you can enter the name of the teacher on the main screen, and then press the “Teacher Test Reports” button.

For a weekly lecture timetable shown in figure (5), for any teacher, enter the name of the teacher on the main screen, then press the "teacher test reports" and "teacher weekly timetable". If the teacher's weekly lecture timetable appears on the main screen blank, this indicates that the teacher's data not entered.

To get any of the following lists shown in figure (6), figure (7), until figure (19), for a specific group, enter the group number in the main screen, and press the appropriate key.

Figure (4): Report the results of groups studied by a member

Figure (5): Weekly lecture timetable for a faculty member

Figure (6): The daily lecture attendance list of one group

Figure (7): Weekly lecture attendance list of one group

Figure (8): List of the first semester test scores of one group

We need the above list shown in figure (8) to announce the results. The students' names appear to be unlisted, there is an option to hide or show names.
We need the above list shown in figure (10) at the end of last week of the semester to submit it to the student affairs unit.

We need the above list shown in figure (11) at the end of last week of the semester to submit it to the student affairs unit. This is a list showing the total grade of students’ semester work, addition to the student denied or withdrawn.

After entering the final test scores, the program combines them with the grades of the semester work and gives the final grade figures and written, as in figure (12).

If the college administration need to add one or two degrees to those who have received 59 or 58, the process done without any effort to control the main screen. The same is true for adding number to modify grades.
Figure (15): Show students who obtained the marks of assistance for one group

The figure (15) shows the list of students who received the marks of assistance, whether to pass or to modify the grades.

The figure (16) shows the results of the goodness of fit test of and frequency distribution and some statistical measures of the results of the students of one group.

Figure (16): Histogram and goodness of fit test for the normal distribution of one group

The figure (17) shows one of the requirements of the course file that we need for academic accreditation.

Figure (17): Analysis of the results of one group

To get results report for the course tests for any student, as in figure (20), enter its number on the main screen, then press the "results of the student".

Figure (20): A report of the final results of one student in the quantitative methods unit

Figure (21): Comparison of pass rates among students of the course QU200
For getting the graph, as in figure (21), for any course, enter the course code in the main screen, then press the key "statistical tests and graphs" and then "graphical representation of pass rates".

For any of the tests, as in figure (22), figure (23), and figure (24) then enter the numbers of the groups or the codes of the courses in the cells assigned to them.

The user of the program does not need to spend any effort to set up any of these reports, because the program will do it. Only select the group number, open the report, print it or save it in PDF format, but we should not forget that the course methodology is the source of many data in the report of the course. We should depend on the syllabuses in filling the "report data entry schedule". It is advice to fill report data entry schedule at the beginning.

To get any of the reports, as in figure (25) above, figure (26), figure (27), and figure (28), below for any group enter the group code number in the main screen, then print the report or save it in PDF format.

The full report of the course cannot be submitted either for international or national accreditation, because either of them contains between six and nine pages, so we have only suggested that the first or last page of those reports be presented in Arabic or English.

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VIII. CONCLUSION

The problem of completing the sheets, lists and the necessary reports for a faculty member is spending more time and effort to obtain the semester test scores and statistical reports, by adopting the primitive manual method. This resulted in many unintended errors. Therefore, we presented this program as an alternative to this problem. We summaries the outputs of the program as following:

8.1. Reports and lists required for international and national academic accreditation in Arabic and English language.

8.2. Attendants and denied lists required at the end of the semester, to submitted for student affairs.

8.3. Lists of tests attendance and results of the midterms and quizzes during the semester.

8.4. List of marks of the semester homework and the final results of the course.

8.5. Course statistic and result summary of the course.

8.6. Perform many statistical tests used in the planning and decisions making to improve the educational process.

REFERENCES