ASIS Impact Report: 2019-2022

CTL ASIS User

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1. Executive Summary.

In the majority of the modules, students who attended tutorials performed significantly better than students who did not. There is some evidence to suggest that students who attend at least 5 of the tutorials perform even better than those students who attend between 1-4 tutorials, however, this is not consistent over all modules. In the majority of modules, increased tutorial attendance is associated with improved academic performance.

2. Introduction.

This is a CTL report on the impact of the Academic Student and Excellence Tutorial Program (A_STEP) focusing on the faculty of _LAW_ , during the semester _sem1_. This report is based on the quantitative data analysis carried on the samples of modules in the faculty that formed part of the A_STEP. The CTL A_STEP program/initiative is based on the principles of Supplemental Instruction (SI), where it is the high risk modules that are identified, as opposed to high risk students. In essence, when students learn collaboratively in high quality tutorials which are facilitated by well trained tutors they are more likely to master course material and be successful. The CTL & A_STEP encourages regular attendance of tutorials, and believes that continued participation over time plays an important role for student success. Towards the goal of seeing continued improvement and critical self - reflection, the A_STEP examines its own impact on student academic performances and evaluates tutors on a semester-by-semester basis. Between the years 2019 - 2022, there were seven terms, four being term 1 and three being term 2.

3. Understanding tutorial attendance in relation to academic performance.

The following section presents the findings from the analysis of tutorial attendance in relation to academic performance for each module in the faculty. Data between 2019 - 2022 obtained from attendance lists and academic performance is analysed to determine whether students who attend tutorials perform better academically than the students who do not attend tutorials, and whether attending at least 5 tutorials makes a difference to academic performance. Furthermore, the relationship between academic performance and tutorial attendance is investigated. Finally, the relationship between tutorial attendance and academic performance is investigated within the top performing academic group and the lowest performing academic group.

For each faculty a summary of results is presented first to allow for an overall understanding of tutorial attendance in relation to academic performance. Thereafter, a section entitled Evidence is presented which details all of the results from the statistical analysis.

Table 1. A summary of primary findings from an analysis of a sample of LAW modules.

Modules	Do students who attend tutorials perfom significantly better than students who do not?	Do students who attend at least 5 tutorials perfom signifiicantly better than students who attend between 1-4 AND students that do not attend?	Is there a significant positive correlation between tutorial attendance and perfomance?
Faculty	Yes	Yes*	Yes
LHIS1514	Yes	Yes*	No
LILS1514	Yes	Yes*	Yes
LPSN1514	Yes	Yes*	Yes
EACC1614	No	No	No
LCRM1514	Yes	Yes*	Yes
EBUS1614	No	No	No
EECF1614	No	No	No
SSOL1514	No	No	No

Note:

* Is used to indicate results that have moderate to large effect sizes.:

^ Is used to indicate year modules.:

Faculty of LAW

Summary.

Between 2019 - 2022, there were seven semesters, from the 10 modules analysed, we find that students who attended tutorial sessions did perform significantly better in the faculty of LAW than students who did not attend any tutorial sessions. The practical significance of the difference in the means was medium.
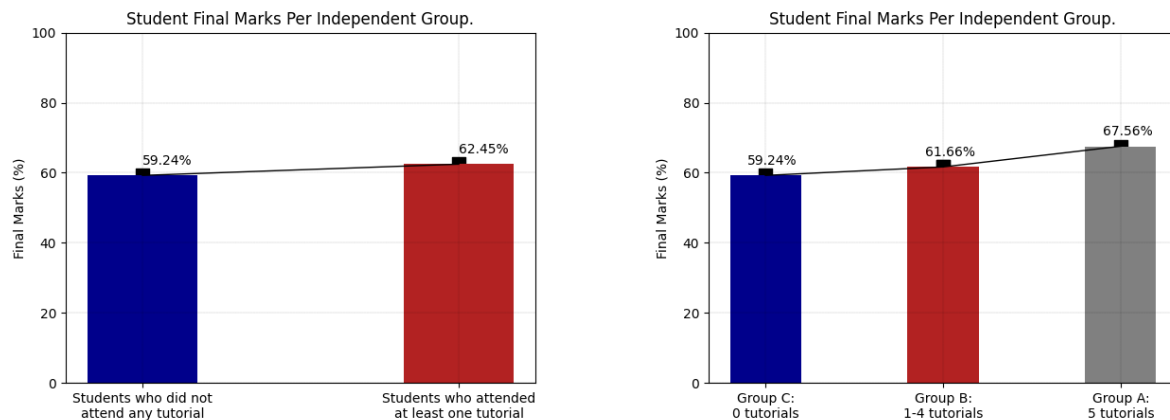
Evidence

Out of a total number of 5250 students enrolled in the faculty of LAW on the MAIN Campus, 928 attended at least one A_Step SI tutorial and scored an average of 62.45 % on their final mark, while 4322 did not attend any of the tutorials and obtained an average of 59.24 % on their final mark. Furthermore, 124 students attended at least 5 of the offered tutorials (Group A) and reached an average of 67.56 % on their final mark, while 804 students attended between 1-4 tutorials (Group B) and scored an average 61.66 %. Finally the 4322 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the faculty of LAW. The test shows that the t-statistic is equal to 5.75, associated with p-value equal to 9.55e-09. Since p-value is less than 0.05, we reject the null hypothesis i.e, students who attended at least one tutorial session performed significantly better than students who attended none. The effect size was determined using the Cohen's d method [2] and a medium effect was found (d = 0.21).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to 24.43, associated with p-value equal to 2.74e-11. Using the 5% significance level we reject the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a large effect between mean final marks of students in the three groups (eta2 = 1.0).

The Post hoc analysis using the Games-Howell test [5] does not indicate significant difference between students attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A).

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.04, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically significant, weakly positive linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.21, pval = 2.49e-10).

LHIS1514

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did perform significantly better in the module LHIS1514 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was medium.
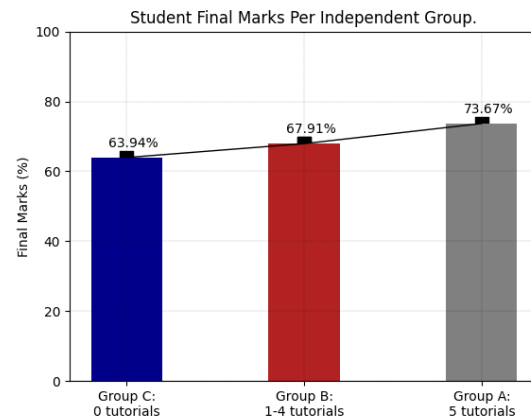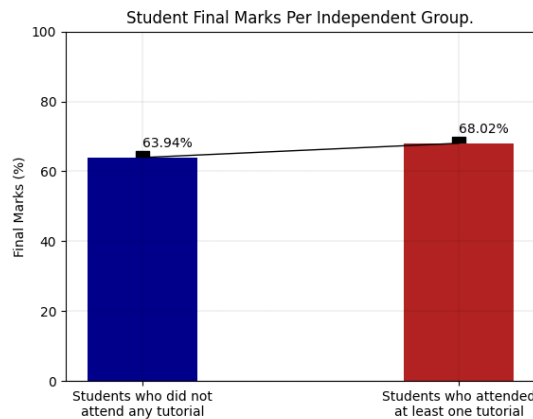
Evidence

Out of a total number of 838 students enrolled for the module LHIS1514 on the MAIN Campus, 162 attended at least one A_Step SI tutorial and scored an average of 68.02 % on their final mark, while 676 did not attend any of the tutorials and obtained an average of 63.94 % on their final mark. Furthermore, 3 students attended at least 5 of the offered tutorials (Group A) and reached an average of 73.67 % on their final mark, while 159 students attended between 1-4 tutorials (Group B) and scored an average 67.91 %. Finally the 676 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module LHIS1514. The test shows that the t-statistic is equal to 3.72, associated with p-value equal to 0.000215. Since p-value is less than 0.05, we reject the null hypothesis i.e, students who attended at least one tutorial session performed significantly better than students who attended none. The effect size was determined using the Cohen's d method [2] and a medium effect was found (d = 0.33).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to 7.22, associated with p-value equal to 0.000782. Using the 5% significance level we reject the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a large effect between mean final marks of students in the three groups (eta2 = 0.98).

The Post hoc analysis using the Games-Howell test [5] does not indicate significant difference between students attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A).

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically insignificant linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.08, pval = 0.296).

LILS1514

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did perform significantly better in the module LILS1514 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was medium.
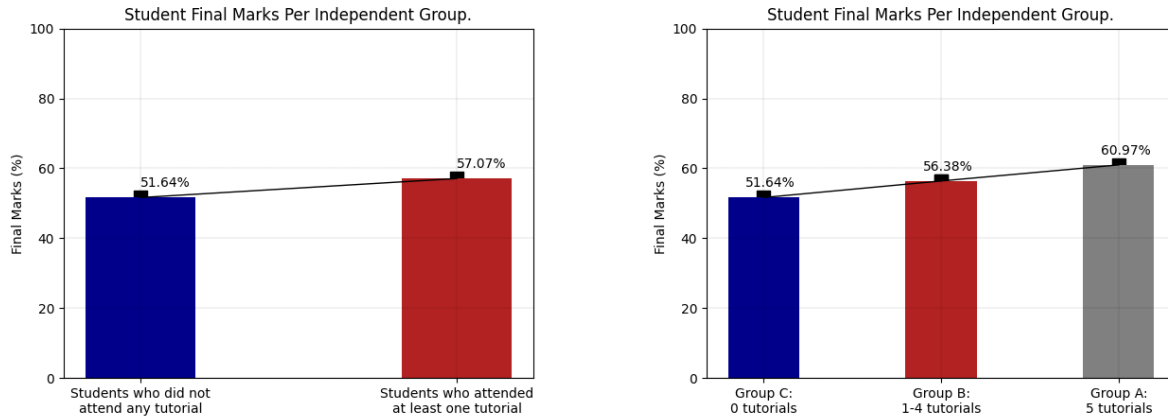
Evidence

Out of a total number of 797 students enrolled for the module LILS1514 on the MAIN Campus, 192 attended at least one A_Step SI tutorial and scored an average of 57.07 % on their final mark, while 605 did not attend any of the tutorials and obtained an average of 51.64 % on their final mark. Furthermore, 29 students attended at least 5 of the offered tutorials (Group A) and reached an average of 60.97 % on their final mark, while 163 students attended between 1-4 tutorials (Group B) and scored an average 56.38 %. Finally the 605 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module LILS1514. The test shows that the t-statistic is equal to 5.66, associated with p-value equal to 2.1e-08. Since p-value is less than 0.05, we reject the null hypothesis i.e, students who attended at least one tutorial session performed significantly better than students who attended none. The effect size was determined using the Cohen's d method [2] and a medium effect was found (d = 0.47).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to 18.02, associated with p-value equal to 2.23e-08. Using the 5% significance level we reject the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a large effect between mean final marks of students in the three groups (eta2 = 1.0).

Specifically, the Post hoc analysis using the Games-Howell test [5] indicates a significant difference between students who attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B).

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically significant, weakly positive linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.21, pval = 0.00309).

LPSN1514

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did perform significantly better in the module LPSN1514 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was medium.
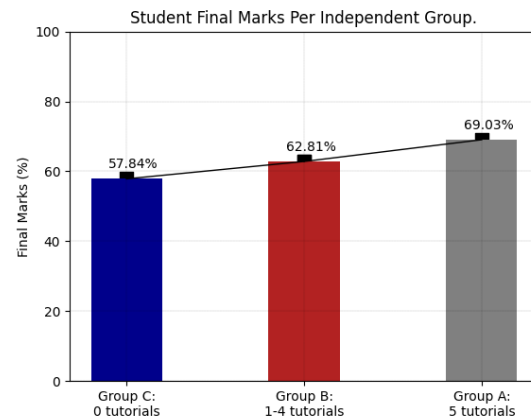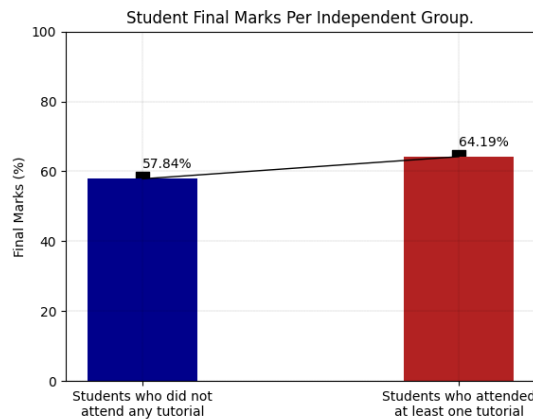
Evidence

Out of a total number of 694 students enrolled for the module LPSN1514 on the MAIN Campus, 298 attended at least one A_Step SI tutorial and scored an average of 64.19 % on their final mark, while 396 did not attend any of the tutorials and obtained an average of 57.84 % on their final mark. Furthermore, 66 students attended at least 5 of the offered tutorials (Group A) and reached an average of 69.03 % on their final mark, while 232 students attended between 1-4 tutorials (Group B) and scored an average 62.81 %. Finally the 396 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module LPSN1514. The test shows that the t-statistic is equal to 6.26, associated with p-value equal to 6.88e-10. Since p-value is less than 0.05, we reject the null hypothesis i.e, students who attended at least one tutorial session performed significantly better than students who attended none. The effect size was determined using the Cohen's d method [2] and a medium effect was found (d = 0.48).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to 25.63, associated with p-value equal to 1.83e-11. Using the 5% significance level we reject the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a large effect between mean final marks of students in the three groups (eta2 = 1.0).

Specifically, the Post hoc analysis using the Games-Howell test [5] indicates a significant difference between students who attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A).

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically significant, weakly positive linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.29, pval = 4.64e-07).

EACC1614

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did perform significantly better in the module EACC1614 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was very small.
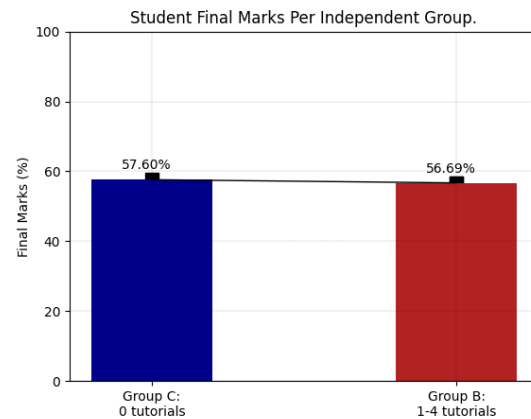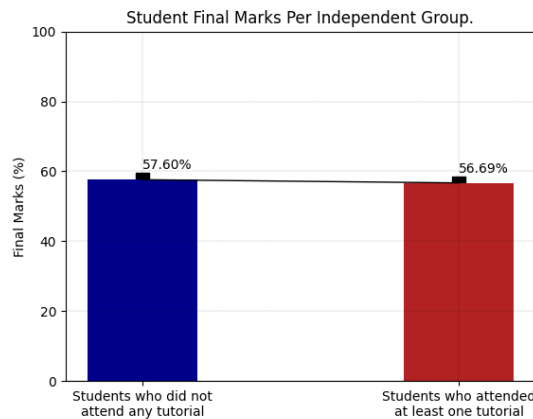
Evidence

Out of a total number of 909 students enrolled for the module EACC1614 on the MAIN Campus, 61 attended at least one A_Step SI tutorial and scored an average of 56.69 % on their final mark, while 848 did not attend any of the tutorials and obtained an average of 57.6 % on their final mark. Furthermore, 0 students attended at least 5 of the offered tutorials (Group A) and reached an average of nan % on their final mark, while 61 students attended between 1-4 tutorials (Group B) and scored an average 56.69 %. Finally the 848 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module EACC1614. The test shows that the t-statistic is equal to -0.36, associated with p-value equal to 0.719. Since p-value is greater than 0.05, we accept the null hypothesis i.e, students who attended at least one tutorial session performed similar to students who attended none. The effect size was determined using the Cohen's d method [2] and a large effect was found (d = -0.05).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to nan, associated with p-value equal to nan. Using the 5% significance level we accept the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a very small effect between mean final marks of students in the three groups (eta2 = nan).

The Null Hypothesis has been accepted i.e, there's no significant difference between students attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A). Therefore, the Games Howell Post-hoc analysis [5] was omitted.

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically insignificant linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.11, pval = 0.414).

LCRM1514

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did perform significantly better in the module LCRM1514 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was medium.
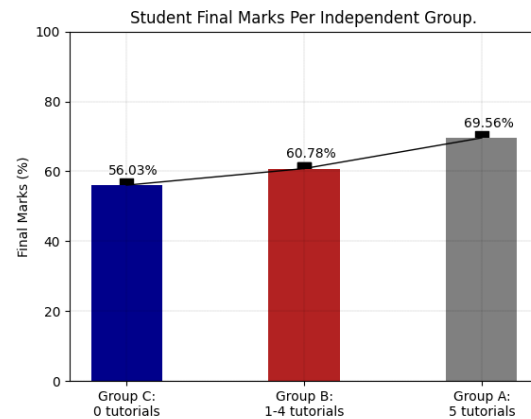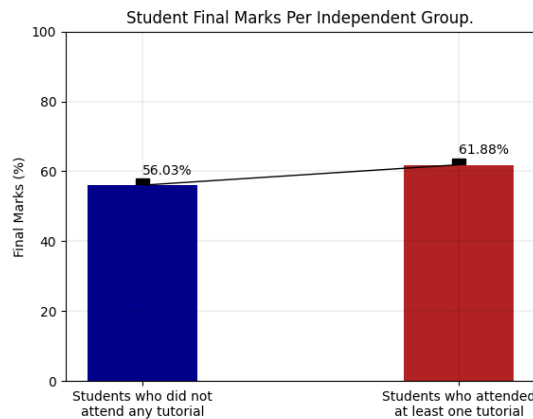
Evidence

Out of a total number of 857 students enrolled for the module LCRM1514 on the MAIN Campus, 201 attended at least one A_Step SI tutorial and scored an average of 61.88 % on their final mark, while 656 did not attend any of the tutorials and obtained an average of 56.03 % on their final mark. Furthermore, 25 students attended at least 5 of the offered tutorials (Group A) and reached an average of 69.56 % on their final mark, while 176 students attended between 1-4 tutorials (Group B) and scored an average 60.78 %. Finally the 656 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module LCRM1514. The test shows that the t-statistic is equal to 4.85, associated with p-value equal to 1.44e-06. Since p-value is less than 0.05, we reject the null hypothesis i.e, students who attended at least one tutorial session performed significantly better than students who attended none. The effect size was determined using the Cohen's d method [2] and a medium effect was found (d = 0.39).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to 15.68, associated with p-value equal to 2.06e-07. Using the 5% significance level we reject the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a large effect between mean final marks of students in the three groups (eta2 = 1.0).

The Post hoc analysis using the Games-Howell test [5] does not indicate significant difference between students attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A).

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically significant, weakly positive linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.26, pval = 0.000237).

EBUS1614

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did not perform significantly better in the module EBUS1614 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was medium.
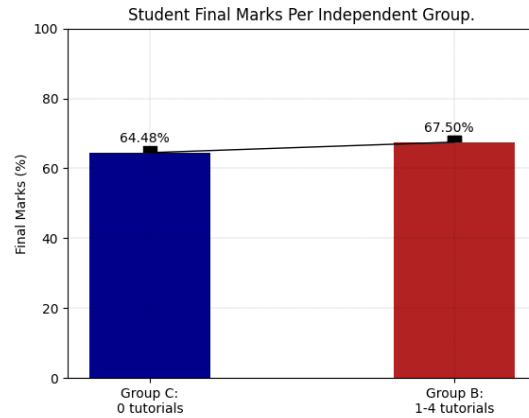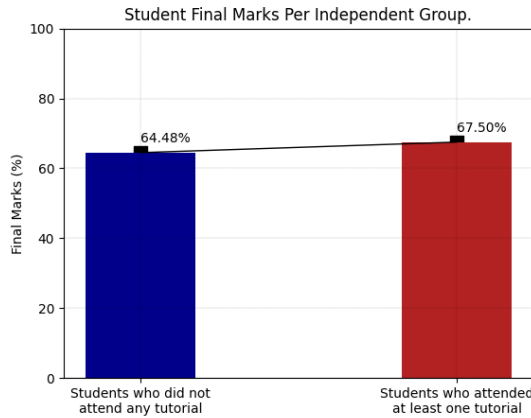
Evidence

Out of a total number of 840 students enrolled for the module EBUS1614 on the MAIN Campus, 4 attended at least one A_Step SI tutorial and scored an average of 67.5 % on their final mark, while 836 did not attend any of the tutorials and obtained an average of 64.48 % on their final mark. Furthermore, 0 students attended at least 5 of the offered tutorials (Group A) and reached an average of nan % on their final mark, while 4 students attended between 1-4 tutorials (Group B) and scored an average 67.5 %. Finally the 836 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module EBUS1614. The test shows that the t-statistic is equal to 0.42, associated with p-value equal to 0.678. Since p-value is greater than 0.05, we accept the null hypothesis i.e, students who attended at least one tutorial session performed similar to students who attended none. The effect size was determined using the Cohen's d method [2] and a small effect was found (d = 0.21).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to nan, associated with p-value equal to nan. Using the 5% significance level we accept the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a very small effect between mean final marks of students in the three groups (eta2 = nan).

The Null Hypothesis has been accepted i.e, there's no significant difference between students attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A). Therefore, the Games Howell Post-hoc analysis [5] was omitted.

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically insignificant linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.67, pval = 0.334).

EECF1614

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did perform significantly better in the module EECF1614 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was very small.
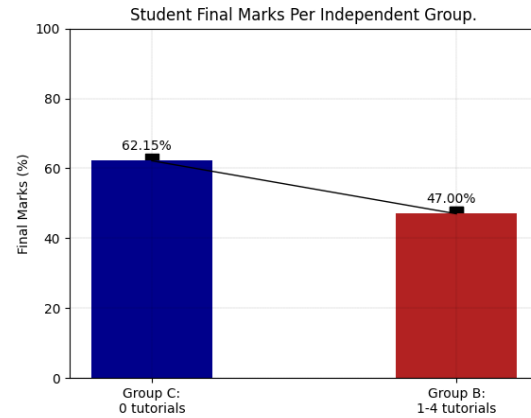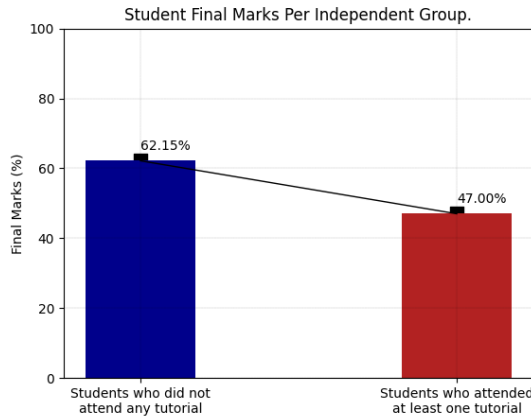
Evidence

Out of a total number of 17 students enrolled for the module EECF1614 on the MAIN Campus, 4 attended at least one A_Step SI tutorial and scored an average of 47.0 % on their final mark, while 13 did not attend any of the tutorials and obtained an average of 62.15 % on their final mark. Furthermore, 0 students attended at least 5 of the offered tutorials (Group A) and reached an average of nan % on their final mark, while 4 students attended between 1-4 tutorials (Group B) and scored an average 47.0 %. Finally the 13 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module EECF1614. The test shows that the t-statistic is equal to -1.99, associated with p-value equal to 0.065. Since p-value is greater than 0.05, we accept the null hypothesis i.e, students who attended at least one tutorial session performed similar to students who attended none. The effect size was determined using the Cohen's d method [2] and a large effect was found (d = -1.14).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to nan, associated with p-value equal to nan. Using the 5% significance level we accept the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a very small effect between mean final marks of students in the three groups (eta2 = nan).

The Null Hypothesis has been accepted i.e, there's no significant difference between students attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A). Therefore, the Games Howell Post-hoc analysis [5] was omitted.

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically insignificant linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.78, pval = 0.218).

SSOL1514

Summary.

Between 2019 - 2022, there were seven semesters, we find that students who attended tutorial sessions did not perform significantly better in the module SSOL1514 than students who did not attend any tutorial sessions. The practical significance of the difference in the means was medium.
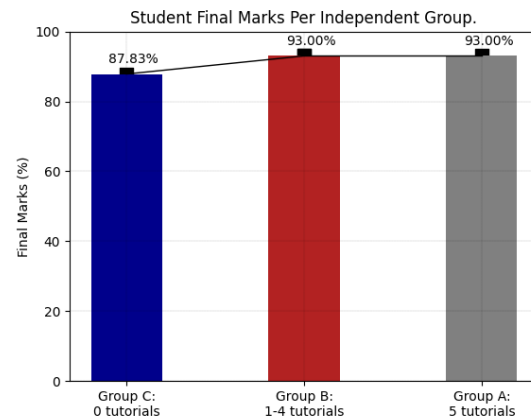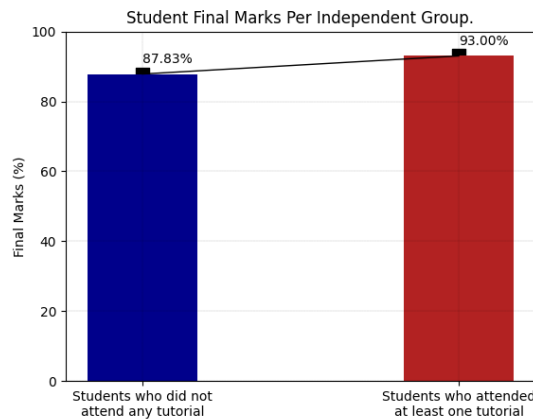
Evidence

Out of a total number of 10 students enrolled for the module SSOL1514 on the MAIN Campus, 4 attended at least one A_Step SI tutorial and scored an average of 93.0 % on their final mark, while 6 did not attend any of the tutorials and obtained an average of 87.83 % on their final mark. Furthermore, 1 students attended at least 5 of the offered tutorials (Group A) and reached an average of 93.0 % on their final mark, while 3 students attended between 1-4 tutorials (Group B) and scored an average 93.0 %. Finally the 6 students that did not attend any of the tutorials are labelled (Group C). Refer to plots above for visualization of the data distributions.

An independent two-samples T-test analysis [1] was conducted for comparing the final marks of students who attended at least one tutorial session, and students who attended none for the module SSOL1514. The test shows that the t-statistic is equal to 0.54, associated with p-value equal to 0.603. Since p-value is greater than 0.05, we accept the null hypothesis i.e, students who attended at least one tutorial session performed similar to students who attended none. The effect size was determined using the Cohen's d method [2] and a small effect was found (d = 0.35).

A one-way analysis of variance [3] was conducted to compare the average academic performances of Group A, B and C, these are students who did not attend any tutorial sessions (Group C), students who attended between 1-4 of the tutorial sessions (Group B) and, students who attended at least 5 of the tutorial sessions (Group A). The analysis returns an F-statistic equal to 0.13, associated with p-value equal to 0.881. Using the 5% significance level we accept the null hypothesis of no difference in averages of final marks for students in the three groups. The effect size [4] determined points to a small effect between mean final marks of students in the three groups (eta2 = 0.02).

The Null Hypothesis has been accepted i.e, there's no significant difference between students attended no tutorial sessions (Group C) and students who attended between 1-4 tutorial sessions (Group B), as well as between students who attended no tutorial sessions (Group C) and students who attended at least 5 tutorial sessions (Group A). Therefore, the Games Howell Post-hoc analysis [5] was omitted.

Linear regression analysis [6] of student attendance and final marks returns a determination coefficient that is equal to 0.14, i.e. 4.23% of the variation in final marks of students can be explained by the variation in tutorial attendance. There was a statistically insignificant linear relationship (at a 5% significance level) between attendance of the tutorial sessions and the final mark obtained by the students (r = 0.37, pval = 0.631).

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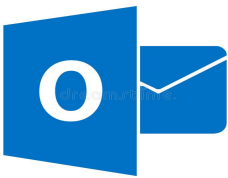
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Acknowledgements

Contact Details

- email: mbonanits@ufs.ac.za
- email: motsokobie@ufs.ac.za
- email: maribeg@ufs.ac.za

- www.ufs.ac.za/ctl

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