

# The Impact of Student Unrest on Freshmen Engineering Students in South Africa

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**Abstract**— In 2016 alone, Google Scholar listed 301 results for “student unrest”. These results listed countries such as South Africa, Nigeria, India, Canada and the USA. The devastating effects of student unrest on student well-being, academic performance and career paths have been documented. Added to this is the disastrous financial consequences that institutions of higher education must endure. The purpose of this study is to draw together the consequences of student unrest, highlighting those that specifically impacted negatively on freshmen engineering students in South Africa during 2016. The academic year in South Africa is divided into two semesters, with approximately 260 students registering for Electronics 1 in the first semester and 130 registering in the second semester. The same course is offered in both semesters. During the first semester of 2016, no student unrest was experienced. However, in the second semester, just after 8 weeks of instruction had passed, student unrest flared up. This occurred at a critical time in the semester, as students were preparing to complete their main test which contributes significantly to their final grade at the end of the module. A descriptive case study is used with descriptive statistics of the quantitative and qualitative data. Quantitative data contrasts the final academic grades of Electronic 1 students in 2016, where the second semester students were affected by student unrest. Students from this second semester were also asked to complete an online questionnaire which sought to obtain their perspectives of the unrest. Results indicate that students from Semester 1 (NO student unrest) enjoyed a 10% higher median grade and 26% higher pass rate for their exam as compared to students from Semester 2 (YES student unrest). It must be emphasized that all these students were exposed to the same course content, academic and assessments. Furthermore, student perspectives primarily highlighted that their study routine was negatively affected by the student unrest.

**Keywords**— *Protests, intimidation, stress, achievement, effects*

## I. INTRODUCTION

Aristophanes, a 5<sup>th</sup> Century playwright of ancient Athens, once wrote in one of his plays “You [demagogues] are like the fishers for eels; in still waters they catch nothing, but if they thoroughly stir up the slime, their fishing is good; in the same way it's only in troublous times that you line your pockets”. These words well describe how some individuals and organizations have at times stirred up unrest in an attempt to obtain financial gain. This may be likened to organized crime, that is defined as “the planned violation of the law for profit or to acquire power; these offenses are each, or together, of a major significance; and are carried out by more than two participants within a division of labour for a long or undetermined time span

using a) commercial or commercial-like structures, or b) violence or other means of intimidation, or c) influence on politics, media, administration, justice and the economy” [1].

Student unrest is in no way a form of organized crime, but they do share certain elements or similarities. For example, planned violation of educational events is often organized in an attempt to gain or exert power over management in order to obtain specific demands. This planned violation is often carried out by a small percentage of the total study body over a lengthy period of time, that usually coincides with the registration or assessment periods, and may involve acts of violence and or intimidation. This description correlates well to a definition of student unrest in secondary schools given in 1969. “Student unrest is defined as the discontented attitude on the part of students toward school and its objectives, expressed in a manner that threatens the codes of conduct, written or implied, and disrupts the orderly process of education” [2].

Student unrest is in no way new to higher education. A simple Google Scholar search for this exact phrase will provide almost 14 000 hits, with 301 results listed for 2016 alone. These results listed countries from Africa, Asia, and the Americas. Two examples from Africa stand out in terms of the length of university closure due to student unrest. The Makerere University in Uganda was closed for 5 months in 1991 as a result of student unrest caused by an attempt on the part of Government to withdraw specific resources [3]. Then, the University of Dakar in Senegal was closed for an entire academic year in 1987 [4] due to student unrest that was initially flamed by an educational reform aimed at reducing repetition at the university by limiting the number of times that students could redo their final exam.

Student unrest should not be exaggerated but should reflect the crisis through which universities have been passing [5]. These crises need to be documented especially from the student's perspectives, as they are ultimately the ones who will be impacted by student unrest in the long run. The purpose of this study is to draw together the consequences of student unrest, highlighting those that specifically impacted negatively on freshmen engineering students at a University of Technology (UoT) in South Africa during 2016. A descriptive case study is used with descriptive statistics of the quantitative and qualitative data. Literature pertinent to the consequences of student unrest is firstly presented in order to determine which were prominently felt by freshmen engineering students in South Africa. The context of this study is then clarified along with the research methodology. Quantitative results of student grades are depicted

in figures while a brief section provides some qualitative data focusing on student perceptions of student unrest.

## II. THE CONSEQUENCES OF STUDENT UNREST

The consequences of student unrest include financial implications, effects on student engagement, psychological problems and administrative burdens [6-8]. It may further disrupt career path planning and endanger public safety.

Financial losses can be subdivided into different categories affecting both students and the university. If an academic year is suspended, it will mean that students will enter the workforce one year later. This means that students will lose an entire year of income, which is usually treated as a cost that must be borne indefinitely by the student and the family [9]. Students that are already working may be excluded from a promotion that is linked to the successful completion of their course. Job promotion is a major factor in wage increases [10] where a potential source of additional income is now lost to the student. The loss of infrastructure due to violent student unrest that must now be replaced can significantly reduce the financial resources of a university. Recent student unrest at the Central University of Technology resulted in a number of petrol bombs being hurled at storerooms which subsequently burned down. In fact, student protesters caused almost \$10 million in damages in just three months of 2016 [11]. Adequate security to ensure the safety of students and staff, and to prevent further damage to infrastructure, adds an additional financial burden to the university. The University of the Witwatersrand had to deploy additional private security and police on their campus in 2016, which is not ideal, making both students and academics uncomfortable [12]. Part-time staff are usually contracted by a university to work for a fixed duration coinciding with the length of a semester. They are usually paid an hourly wage [13] that means, if a semester is extended due to student unrests, the university would need to extend their contract and pay them additional wages which were not originally budgeted for.

A study at the University of Uyo in Nigeria revealed that student unrest negatively impacts on the academic performance of students [14]. Due to the suspension of classes during student unrest, the contact between lecturer and students are reduced and deprives the students from face to face communication and engagement with the lecturers. In some cases, the syllabus cannot be completed, and many of the institutions resort to online engagement and assessments with students via a learning management system. This, in itself, poses challenges as some students do not have suitable access to the Internet while the reliability and validity of online assessments in an uncontrolled environment remains questionable [15]. The sudden change in the academic timetable and lack of face to face communication may leave many students ill-prepared for their assessments, as their study routine is interrupted. The rescheduling of the academic timetable, including assessments, further adds to the administrative burden of academics.

Student health and psychological problems result during periods of student unrest, which include raised levels of stress and anxiety [7, 16]. This may be aggravated by pressure and intimidation by fellow students to participate in the unrest, additional financial pressure resulting from the unrest and

increased academic pressure to adapt to the ever changing academic timetable.

Student unrest is often not confined to university campuses, resulting in safety risks to staff, students and the general public. In recent student unrests in South Africa, a bus was burned and a store looted, after police and students violently clash in the streets of Braamfontein near Wits University [17]. Table I presents a summary of some of the consequences of student unrest, where the second column indicates the associated actions that lead to the consequences. For instance, career disruptions may be caused by loss of promotion due to student unrest.

TABLE I. CONSEQUENCES OF STUDENT UNREST

Consequence	Manifested by or incurred by
Financial losses	Loss of income for students University property damage and repairs Additional security measures Additional part-time staff wages
Reduced student engagement	Suspension of classes Interrupted study routine
Psychological problems	Stress and anxiety
Career path planning	Loss of promotion
Administrative burdens	Rescheduling of the academic timetable Additional assessment papers
Endangers public safety	Off campus protests

## III. THE CONTEXT OF THIS STUDY

Electronics 1 is a compulsory offering in the National Diploma: Engineering: Electrical qualification in South Africa. The National Diploma is a NQF (National Qualifications Framework) Level 6 qualification that requires students to obtain a minimum of 360 credits to complete it. The majority of modules in this programme have a credit value of 12 that indicates that students should dedicate at least 120 notional hours to each module. Approximately 260 students register for this module in the first semester of the year, with about 130 registering in the second semester (14 weeks in duration). The syllabus of Electronics 1 covers six sections, which is exactly the same in both semesters. These include the operation and application of the oscilloscope, electrical basics, Thevenin's Theorem, resistors, capacitors, diodes, transistors and the design of power supplies and amplifiers. The structure of the module is shown in Table II, where the difference between the first semester and second semester is highlighted in yellow for 2016.

TABLE II. STRUCTURE OF ELECTRONICS 1

Semester 1 - 2016	Semester 2 - 2016
Unit 1 – Unit 7 presented consecutively over 7 weeks	Unit 1 – Unit 7 presented consecutively over 7 weeks
Seven online self-assessments completed by the end of week 8	Seven online self-assessments completed by the end of week 8
First five online self-assessments contribute to T1	First five online self-assessments contribute to T1
Main test written in a computer laboratory in week 9	Main test postponed due to student unrest in week 9
University recess during week 10	University recess during week 10
Review of content for week 11 - 13	No class for week 11 – 14, with an online test written in week 13
Practical work completed and grades assigned in week 13	Practical work NOT completed and grades assigned in week 13

The syllabus is divided into 7 units, with each unit being discussed over a period of one week. Once a unit is complete, then an online self-assessment is made available for 6 days to further engage students with the content. The first five online self-assessments contribute to Test 1, and counts 25% towards the course mark. Students need to obtain a coarse mark of at least 40% to gain entry into the final summative exam (classroom based). The weightings of the various assessments are shown in Table III, where the exam (written in a controlled laboratory with online access) carries a weighting of 60%.

TABLE III. ASSESSMENT WEIGHTINGS

Assessment	Weightings
Test 1 (T1): 5 online self-assessments + 1 peer assessment	25%
Practical mark: 5 experiments + 1 practical assessment	35%
Main test (T2): First 5 units and is written in a classroom	45%
Coarse grade total	100%
Weighting of course grade to final grade	40%
Exam grade	100%
Weighting of exam grade to final grade	60%

#### IV. METHODOLOGY USED IN THIS RESEARCH

Yin [18] describes three types of case studies, being exploratory (examines a situation where an intervention produces no single clear result), descriptive (describes a situation within a real life context) and multiple case studies (discover the differences between and within cases). A descriptive case study is used in this research as the phenomenon (student unrest) is described within a real life context (freshmen engineering students enrolled at a UoT in South Africa). The independent variable of interest is student unrest as it is not dependent on any freshmen engineering students who then become the dependent variable, as these students are influenced by student unrest.

Descriptive statistics, rather than inferential statistics, are used as the results are interpreted with regard to specific engineering students enrolled at a UoT. These descriptive statistics include the student profile and grade results of students enrolled in two different semesters of 2016 (quantitative data). However, both groups of students were exposed to the same academic who was able to cover the entire syllabus with both groups. Semester 1 of 2016 (NO student unrest) is contrasted to Semester 2 of 2016 (YES student unrest) to determine if any significant impact occurred on the academic achievement of the latter group of students. All assessments listed in Table III are presented to highlight where possible differences occurred. Qualitative data focuses on how freshmen engineering students were affected by recent student unrest at a UoT in South Africa during 2016. One open-ended question was included in an overall online survey of the module presented to freshmen engineering students at the end of the semester.

The target population was restricted to all engineering students enrolled for the module Electronics I (ELE11 presented during Semester 1 and ELE12 presented during Semester 2) during 2016. No sampling technique was used as the results of all the students were included. The sample size for Semester 1 of 2016 was 235 while the sample size of Semester 2 was 130.

Student demography is also shown in order to determine if there were any significant differences between the two semesters.

#### V. RESULTS AND DISCUSSIONS

The profile of students registered for ELE11 and ELE12 are shown in Fig. 1 (home languages), Fig. 2 (gender) and Fig. 3 (age brackets). These results show very little difference between the two groups of students, where both groups major home language was Sesotho (indicative of the Free State province in South Africa). The minority of students are female, which is one of the reasons why a global drive exists to encourage more women in engineering. The majority of students were younger than 25 years, which validates them as freshmen engineering students who have completed their secondary or high school career. The left hand axis in Fig. 3 shows that number of students who registered in Semester 1 (represented by the dots) while the right hand axis represents the number of students registered for Semester 2 (indicated by the shaded area). Clearly more students register in Semester 1, as they have just completed their school career, as compared to Semester 2.

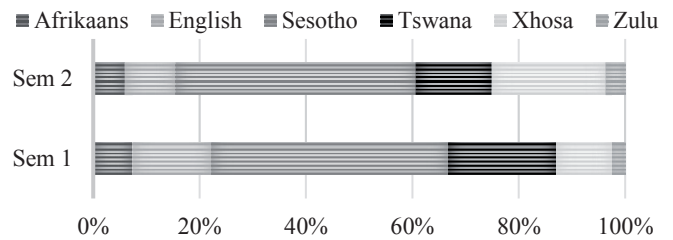


Fig. 1. Home languages of students in Semester 1 and 2 of 2016

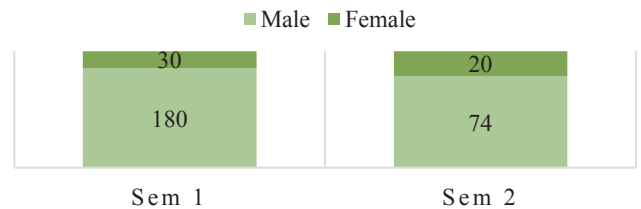


Fig. 2. Gender of students in Electronics 1 for 2016

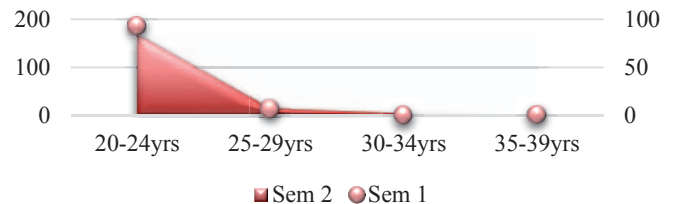


Fig. 3. Age brackets of students in Electronics 1 for 2016

Fig. 4 and Fig. 5 shows the median and pass rates for all assessments conducted in 2016. When the data distribution is skewed, the median is often more appropriate than the mean or average in describing the center of the data [19]. In this case, many outliers exist as the final grade of some students lies below 30%. Notice that Semester 1 has a much higher median than Semester 2 for Test 1, the practical grade and the exam grade (differences of 9%, 12% and 10% respectively). The latter two have most likely been influenced by student unrest, as students



were not able to submit all their practical assignments in Semester 2, nor were they afforded review sessions with their lecturer. Fig. 5 illustrates that more students enrolled for Semester 1, as compared to Semester 2, but that Semester 2 has a significant drop for the exam grade (26% difference). The reverse occurs for Test 2, as students in Semester 2 completed their main test online, as compared to Semester 1, where students wrote their main test in a controlled laboratory environment. However, this helped to prepare Semester 1 students for their final exam, that was also scheduled in a controlled laboratory environment. Semester 2 students had no such preparation.

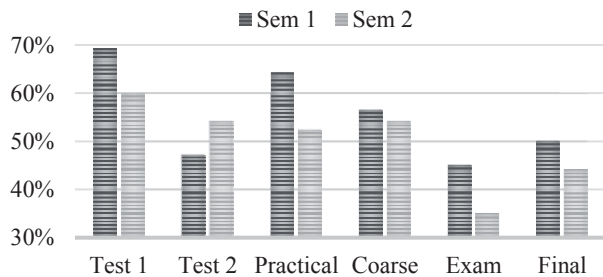


Fig. 4. Median grades for all assessments of Electronics 1 in 2016

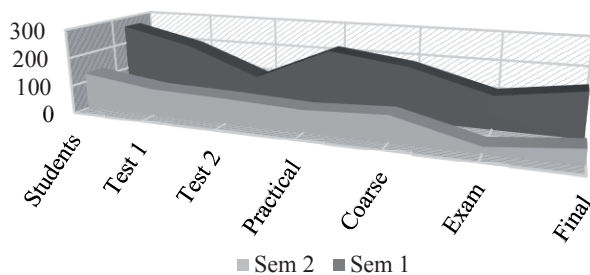


Fig. 5. Pass rates (as a number) for all assessments of Electronics 1 in 2016

The one open-ended question regarding HOW students were influenced by the student unrest revealed one dominating theme, namely a negative impact on their study routine. One student commented "Study routine is all messed up as well as sleep routine gone to hell just wondering if we gonna finish this year and if I am gonna make it". Student confusion about what would eventually happen and anxiety about how they would fare is also discerned in this student's comment. Another student stated "Student who has unrest have more stress and always will be depressed". These two comments points to reduced student engagement with their study material and psychological problems as outlined in Table I.

## VI. CONCLUSIONS

The purpose of this study was to draw together the consequences of student unrest, highlighting those that specifically impacted negatively on freshmen engineering students in South Africa during 2016. Students enrolled for both semesters of 2016 have a similar demographic profile, with the majority speaking Sesotho, being male and under the age of 25 years. However, a key difference occurs when considering their exposure to student unrest. Results indicate that students from Semester 1 (NO student unrest) enjoyed a 10% higher median grade and 26% higher pass rate for their exam as compared to

students from Semester 2 (YES student unrest). In the past, there was usually less than 8% difference between the two semesters.

Furthermore, student perspectives primarily highlighted that their study routine was negatively affected by the student unrest, with some of them experiencing psychological problems. In these troublesome times, the pockets of both students and universities have not been lined, but instead emptied by the effects of student unrest!

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