

Impacts of Large Classes on Student's Performance: A Case Study from the University of Guyana

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Abstract

As more persons seek higher education, class sizes continue to increase. The impact of an increase in class size has sparked much debate among policymakers and the education community. While there is no agreed definition of what size constitutes a large class, it is a common view that it exceeds an average of 100 students. Many believe that larger classes will negatively affect the student's performance and lead to a decrease in interaction. This may deter the teaching and learning process resulting in decreased performance. Our study was conducted to determine biology students' perception of the impact of large classes on their performance at the University of Guyana. Data was collected through an online survey and distributed to 1st -4th year students registered in the biology program. Nine-mark (grade) sheets from the department of biology with varying numbers of students were analyzed. We found that students believed that class size does have an impact on their performance. They indicated that their performance is poor in larger classes due to less interaction, limited feedback, and more disruptions. An analysis of courses in the biology department showed higher failure rates in larger classes, however, it cannot be concluded that this is a result of the class size. It is recommended that professional development training be provided to instructors on modes of teaching large classes.

Keywords: class size, large class, performance, interaction

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1. Introduction

As the student population continues to grow at universities, class size is likely to be one of the factors that will have a considerable impact on education delivery (Almulla, 2015). The increase in the number of persons seeking higher education is perceived to be a result of better job prospects (Persaud & Persaud, 2019). It is predicted that the number of students worldwide enrolling in higher education will double by 2025 (Goddard, 2011). The increasing number of students has sparked much debate among policymakers and researchers about the impact of class size on teaching and learner attainment (Pitch & Campbell, 2010). Class size refers to the number of students being taught in a course or classroom or the average number of students being taught by teachers in an education system (Grace & Oluwatoyin, 2016).

Large classes have increasingly become the norm in many countries around the world (Allais, 2014). Grace and Oluwatoyin (2016) defined a large class as including 50-100 students. But whether you have 50 or 1000 students, for most, a large class is one that feels big. While there is no agreed definition of a large class in literature, a large class can be considered one where the available resources can no longer cope with the number of students if they desire individual attention (Obanya, et al., 1999).

Research on the impact of large classes on the student has been ongoing for decades (Bethel University, 2019). The Tennessee Student-Teacher Achievement Ratio (STAR) project in the 1980s found that small classes were more advantageous to students in younger grades (high school and below) (Bethel University, 2019). In large classes, students are perceived to have a greater feeling of isolation from support measures and anonymity, which results in decreased motivation that could have a significant impact on performance (Letargo et. al, 2017). Students' interest and involvement are reduced (Cooper & Robinson, 2000) and their persistence to completion is affected (Delaney, 2008). Some studies have demonstrated better outcomes in large classes as it relates to academic performance (Hou, 1994), while others reported worse (Arias & Walker, 2004) and some with no change (Kennedy & Siegfried, 1997).

As Guyana envisions an economic boost from oil production, free education at the tertiary level is being touted by political players in the country. The University of Guyana currently has a student population of over 10,000, and this is expected to increase by 30,000 in the next 30 years (Newsroom, Guyana, 2019). In this paper, the impact of large classes on students' performance in the Department of Biology, Faculty of Natural Sciences at the University of Guyana was investigated. This information is important to administrators as they seek to revise strategies, to boost performance at the nation's premier tertiary institution. The paper sought to determine students' opinions on what constitutes a large class, assess students' interaction in large classes, and assess the impact of large classes on students' academic performance.

Method

This study was conducted at the University of Guyana, Turkeyen Campus. Biology students from their first to final years were the target of the research. Sampling was done using the simple random sampling technique where every student from years 1-4 had an equal chance of being selected for the survey. Questionnaires were selected as the primary data collection instrument. The questionnaires were distributed using Google forms. Additionally, data on students' academic performances for nine (9) courses in the Department of Biology were collected and analyzed. The courses were classed as small, average, and large based on the class size.

The data collected were analyzed using graphs, tables, and charts and reported in percentages. A chi-square test was also used to determine any statistical differences between class sizes and student performance. A P value of <0.05 indicates statistical significance, while a p-value of >0.05 was not statistically significant.

Results

Demographics

The majority of the respondents were females between the ages of 16 and 20. Most of the respondents were from the 1st and 2nd years (Table 1).

Table 1: Student demographics

Sex	Male		Female		
N=128	18.6%		81.4%		
Age	16-20	21-25	26-30	30-35	36-40
N=128	62%	25%	7%	4%	2%
Year of Study	1 st	2 nd	3 rd	4 th	
N=128	30.2%	44.2%	17.8%	7.8%	

Class Size

The majority of students (35%) agreed that a large class has more than 200 students (Figure 1). On the other hand, 83% of the students indicated that a small class has less than 50 students (Figure 2).

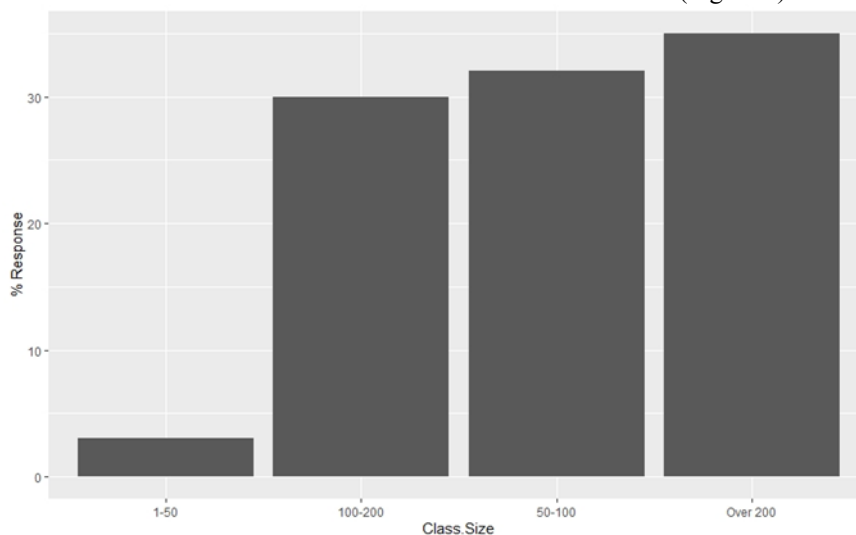


Figure 1: Average size of a large class

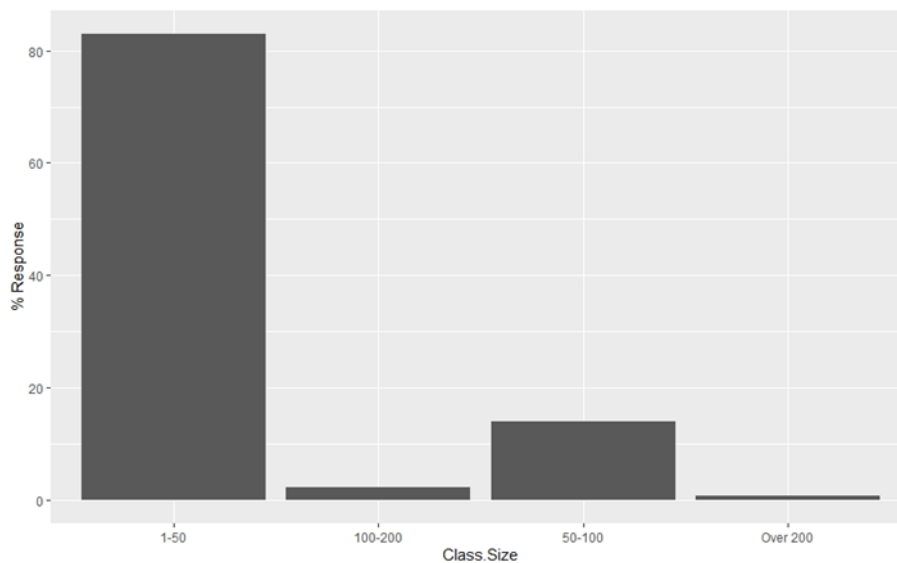


Figure 2: Average size of a small class

Classroom Interaction

The majority (57%) of the students indicated that there are average interactions in their classes (Figure 3). Most (47%) of these students only had some focus in class over 100 (Figure 4). Fifty-two percent (52%) of them always receive feedback in large classes while 3% never receive feedback (Figure 5). However, 50% of the students indicated that they only receive little details as feedback (Figure 6).

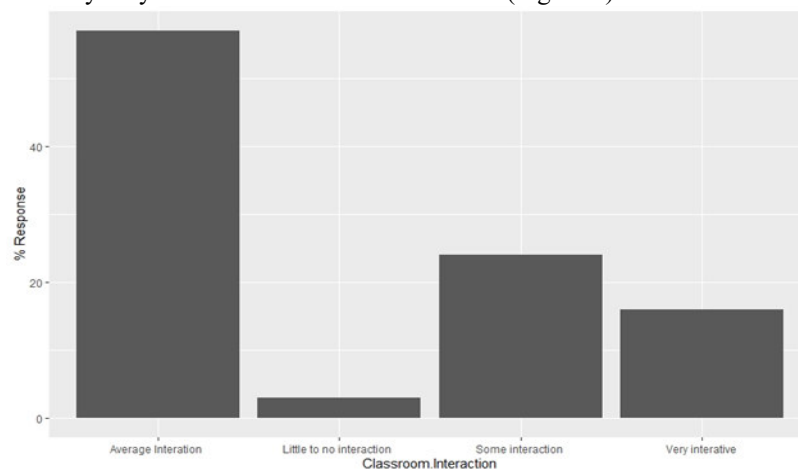


Figure 3: Interaction in classes with >100 students

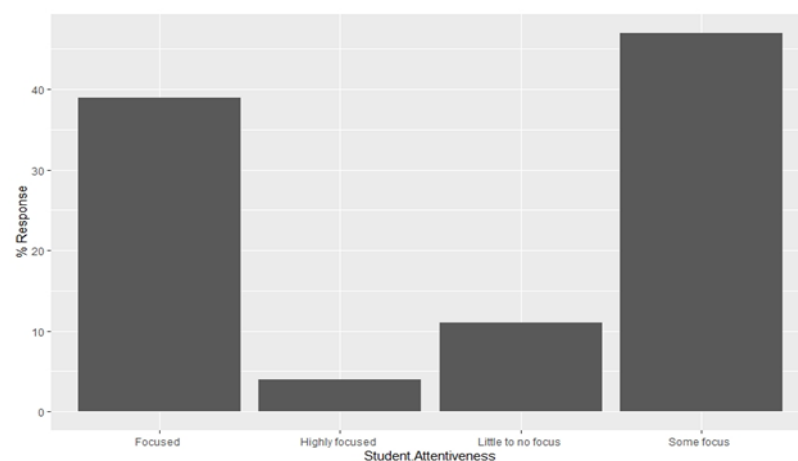


Figure 4: Students' attentiveness in a class of >100 students

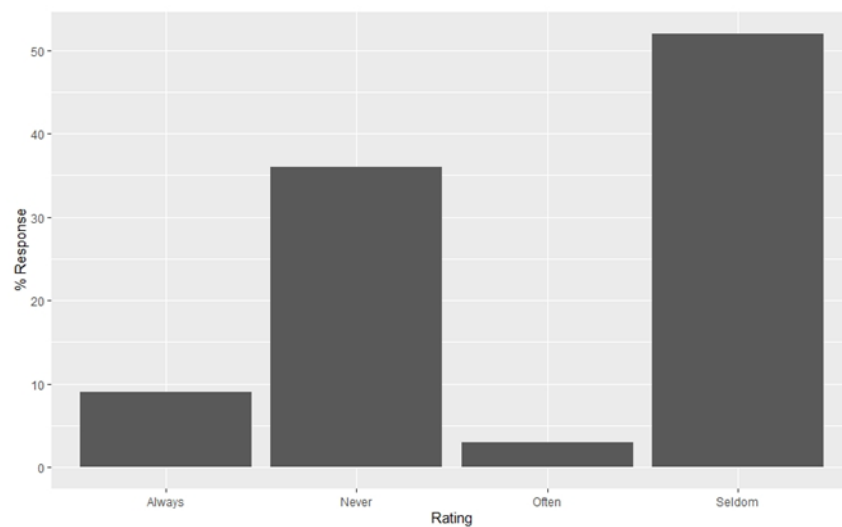


Figure 5: Feedback received from large classes

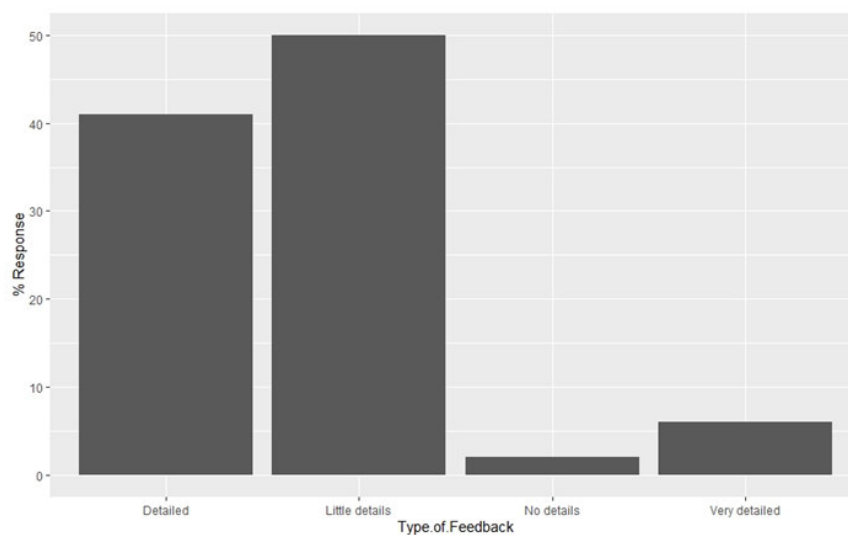


Figure 6: Type of feedback received from large classes

Academic Performance

63% of students indicated that class size does have an impact on their performance while 37% believed that it does not have an impact (Figure 7). Figure 8 highlights that students perform better in small classes as compared to large classes. 60% of the students perform excellently in small classes compared to 11% in large classes. The pass rate is higher in smaller classes as compared to larger classes as seen in Figure 9. There is a higher failure rate in large classes. However, there is no large variation among the As, Bs, Cs, and Ds. Figure 10 illustrates that most students lack individual attention and motivation in large classes. Statistical there is no difference between class size and the GPA of students and classroom interactions. However, there is no statistical difference between the number of students and the pass rate in courses (Table 2).

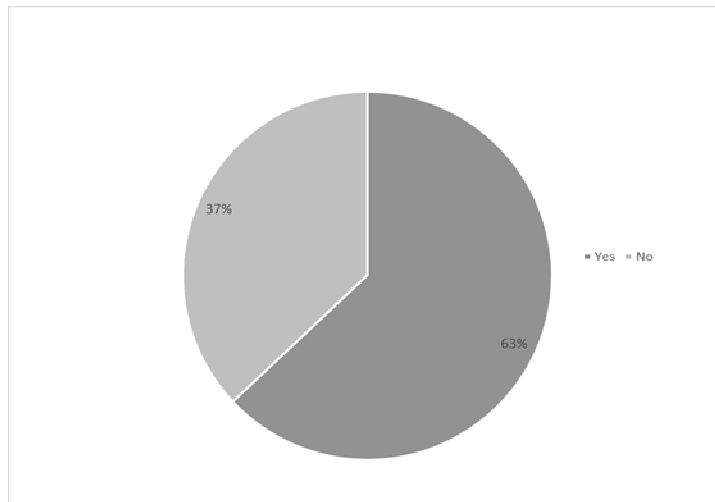


Figure 7: Students' view on whether class size affects academic performance

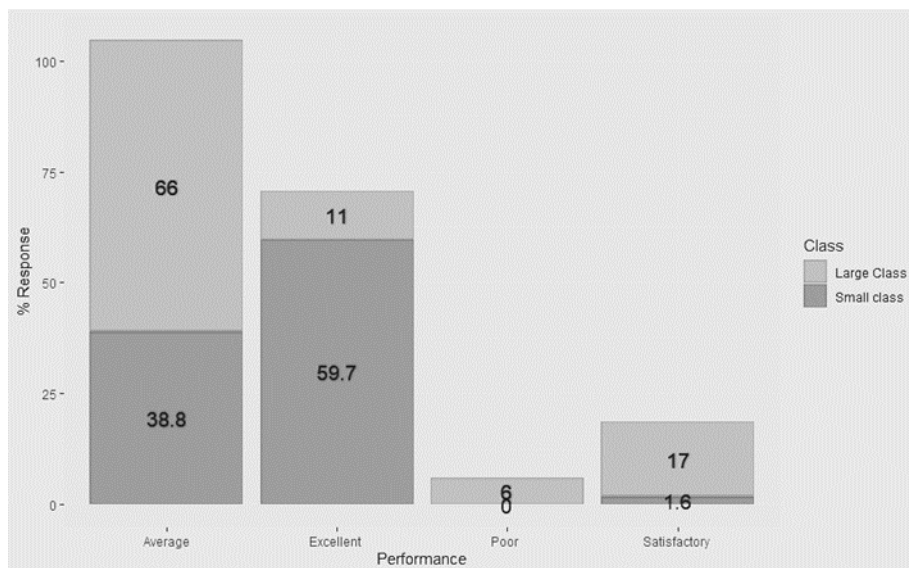


Figure 8: Students' performance in large vs. small classes

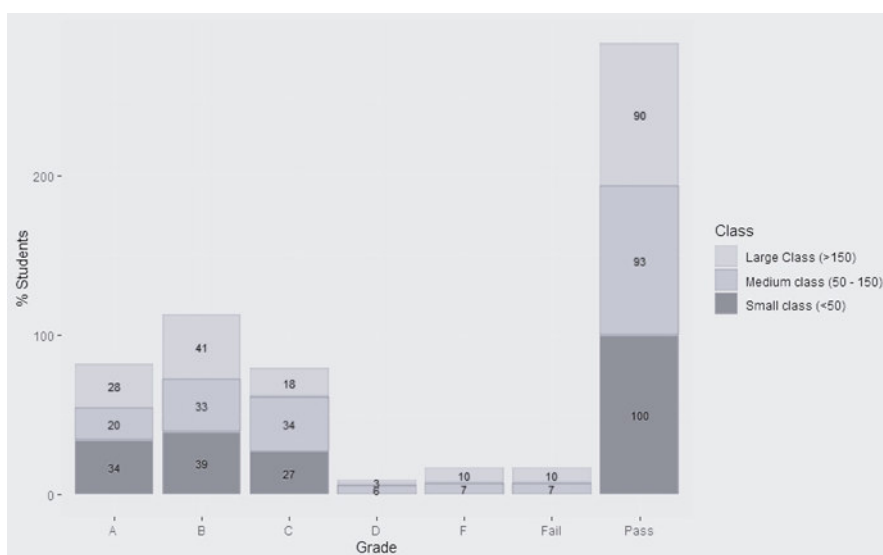


Figure 9: Grade distribution for nine courses in the Department of Biology, University of Guyana

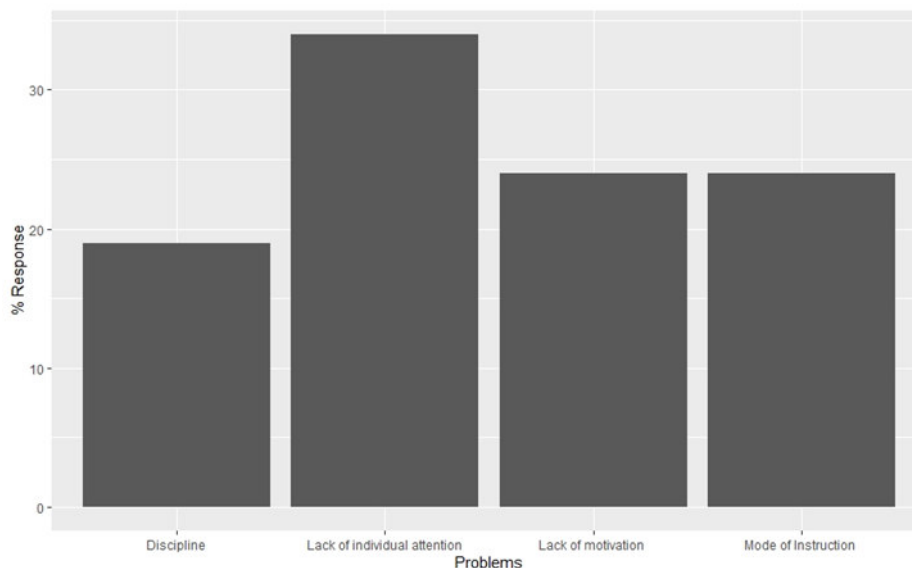


Figure 10: Large class problems that affect performance

Table 2: Statistical relationship between class size and GPA and classroom interaction and a pass rate of students in courses vs. the number of students in the courses.

Parameters	Degree of freedom	P-value	Comments
GPA	287	0.0004108	Statistically significant
Classroom interaction	164	2.3e-05	Statistically significant
Students performance	28	0.2745	Not statistically significant

Discussion

Grace and Oluwatoyin (2016) defined a large class as having 50-100 students, while Jungic and Kent (2006) referred to a large class as having more than 200 students. However, in this study, we found that a large class for the students has over 100 students, and a small class has less than 50 students. While there may be no consensus on the number of students that constitutes a large class, the phenomenon does exist and it is pertinent that educators determine the impact of these classes on students' performance (Obanya et al., 1999).

One of the existing gaps among large classes is classroom interactions (Jungic & Kent, 2006). Classroom interaction is integral to the teaching and learning process and can, therefore, have significant effects on students' performance if not present (Hanum, 2016). We found that although more than 90% of the students were present for most of their classes, they were not always engaged. Most of the students indicated that they had average interaction in class, however, there were also cases where there was little to no interaction. Many of them indicated that they have some focus during classes of more than 100 students. Classroom interactions maybe are restricted due to the student-to-teacher ratio. For example, in a class of 100, the student-to-teacher ratio is 1:100. Also, available resources may restrict the teaching-and-learning process. This makes it difficult to design classroom activities so that everyone is engaged and also for students to focus and get individual attention (Grace & Oluwatoyin, 2016). Leahy (2006) observed that there is decreased interaction in larger classes and she cited discipline problems as one of the possible reasons. Often in these classes, some students indicated that while they try to focus, others distract them. Additionally, when class activities are done only a few students do the work as it is difficult for the teacher to check on the progress of each student. These can affect how students perform, especially in individual assessments.

The majority of students indicated that class size affects their performance and they perform better in small classes as compared to larger classes. They also indicated that there is a lack of individual attention and motivation in large classes. An analysis done on nine biology courses also found a higher failure rate in large classes as compared to smaller classes. While this may be due to several other factors, such as the level and technicality of each course, Leahy (2006) also found in her study that there is decreased student achievement in larger classes. All of the respondents in her study indicated that student achievement is reduced in large classes.

We also found that there is a statistical relationship ($p= 2.3e^{-05}$) between classroom interaction and students' performance. As classroom interactions decrease so does performance (Hanum, 2016). Discussion time is reduced in larger classes (Ngoboka & Schultz, 2002) and instructors in larger classes tend to use mainly a teacher-centered approach (Almulla, 2015). Learners' focus and attention can decrease drastically after about 20 minutes of continuous teacher discourse (Penner, 1984). Many students also indicated that feedback is often

delayed and is not detailed in large classes; this may be difficult because of the volume of assessments that the instructor is expected to grade.

Large classes are dynamic and have students with various backgrounds, cultures, and learning abilities (Friedlander & Kerns, 1998). Individual attention to specific student needs is restricted in large classes due to the high teacher-to-student ratio (Friedlander & Kerns, 1998). Siegfried and Walstad (1998) found that study effort, age of the student, and a good match between the student's learning style and the instructor's teaching style can positively impact performance, however, other students that learn differently may be disadvantaged. This may lead to the student feeling alienated and disengaged, which may decrease the student's responsibility, discipline, engagement, and overall performance (Wilsman, 2020). These pieces of literature were consistent with the findings of this study, as students indicated that they were lost in classes, couldn't keep up with the instructor, or did not have the background knowledge as other peers to keep up with the level at which the instructor is teaching. Even though they attend the class they remain unfocused

Conclusion

We found that a large class is generally one with more than 100 students and these larger classes present more challenges that negatively impact students' performance. The majority of students indicated that class size affects their performance. Our findings suggest that these challenges range from limited classroom interactions, delayed and limited feedback, and lack of focus and individual attention. Most students perform excellently in smaller classes as compared to larger classes. There is also a higher failure rate in larger classes, however, this can also be influenced by other factors such as the level of difficulty of the course and student competence.

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