

## Survey Learning Logistics at the FATEC Guarulhos, São Paulo, Brazil: Based on a Gamified System

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**Abstract:** Assuming gamification as a system that uses game-based elements and design techniques in a non-game context and that gamification has been being applied to promote behavioral change, it is understood that it may be applied to retain students focused on the disciplines studied. In this scenario, the study aims to know the perception of students of the logistics course from Guarulhos Technology School in São Paulo, Brazil, with the use of gamification for teaching and learning. From the perception to be raised by means of a questionnaire applied to the students and spontaneously answered, deploy a learning system content of gamification of course subjects aiming to decrease the dropout rate that today is around 30% in the first semester of the course. At the same time, to improve the quality of classes by replacing expository methodology with an interactive and shared methodology. It is expected that, based on the perception of students, it is possible to develop and implement a learning system covering the objectives to be achieved, the design of behavior, innovative activities that provide real-time feedback in a fun and exciting way for both students and professors.

**Key words:** education, student involvement, sharing, gamification

### 1. Introduction

It has been a long time since the teaching and learning process is seen as an enigma. Many are the challenges to be addressed in order to achieve the objectives of this process. If on the one hand one seeks the conviction of having effectively taught, on the other hand, one seeks the conviction of having effectively learnt.

There are many factors that make someone turns into a student, who then will become a scholar. The universe of those becoming students is different from the one of those becoming scholars. From the many reasons identified for students failing to become scholars, one can assume that the rupture of the teaching and learning process due to school dropout is caused, in part, by the lack of attractive classes.

School dropout rates are deemed to be connected with, among other factors, the methodology used in the classroom, which has been the customary expositive class. Over time and with the appearance of new technologies, there have been significant changes in the students' behavioral model, both of those becoming

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scholars and those limiting themselves to the role of students.

Under this scenario, some authors, in particular Kaap (2012), present a new technique to achieve the goals of the teaching and learning process, known as “gamification”. While there is no translation for this word in Portuguese, it is referred to as “gamificação” in the Portuguese version of this article.

Simões, Redondo, and Vilas (2013) state that today’s scholars have a close relationship with technology and are immersed in the world of video games, not only through the experience of playing, but with all the principles behind these digital environments.

According to these authors, replacing the methodology used in the classroom with a methodology that has gamification elements can be an action that will contribute towards retaining students at school, in addition to making the learning process engaging.

Assuming that the results coming from gamification are associated with the voluntary and intuitive participation of its users, this article has attempted to understand the perception of Logistics students from Faculdade de Tecnologia de Guarulhos — FATEC with the aim of, if favorable, initiating a gamification project for classes delivered to commencing groups in the program, i.e., in the first and second school terms.

To that end, we prepared a questionnaire which answers, after consolidated, based on the students’ perception, show if the students are disappointed with the current methodology and what they expect in case a methodology with gamification elements is implemented.

## 2. Gamification

Werbach (2012) defines gamification as the application of game design elements and techniques to contexts other than games. The author complements his definition by pointing out to the existence of three parts in this definition. The first one comprises game elements, the second, game design techniques, and the third, non-game contexts.

Accordingly, if we accept the definition given by Werbach (2012), the non-game context results of the need to transfer the content of subjects to students in an environment that can be a classroom or not.

The application of design techniques must be exactly this one, upon the creation of the teaching and learning environment to be proposed to the students.

By analogy, some game elements are already being used, such as assigning points to those completing the requested activities, disclosing the names of the students with the best performances, etc.

Simões, Redondo, and Vilas (2013) explain that, while today’s scholars are familiar with technology, they are not really motivated by the activities. Subsequently, they see the gamification of education (Figure 1) as an attempt to respond to such lack of motivation.

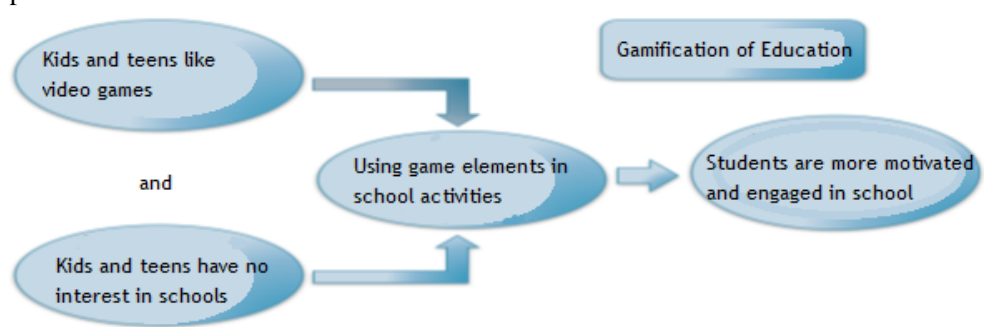


Figure 1 Application of Gamification to School Context (Simões, Redondo, and Vilas, 2013)

Fardo (2013) states that “gamification is an emerging phenomenon, so there are few reports of empirical experiments in educational processes, since educators need to appropriately master this language before being able to use it in their projects.”

In this sense, even after overcoming the challenge proposed to professors, the mastering of the dynamics of gamification, not necessarily the gamification per se, needs to show fair results, since the goals to be achieved have to be mutual, i.e., both the professors’ and students’ needs have to be addressed.

### **3. Research**

In order to understand the perception of the students from FATEC Guarulhos regarding the methodology currently in use and the possibility of replacing it with a methodology with gamification elements, the main goal of which is a greater engagement, we prepared a questionnaire with the questions below, where students are deemed key elements for a decision on the gamification of education to be made. Before the students answered the questions, the dynamics of gamification was explained so that they could give answers comparing the current methodology with the proposed one.

(1) In general, are you satisfied, neither satisfied nor dissatisfied, or dissatisfied with the classes?

(2) Do you get excited to go to college?

(3) usually feel so engaged in the topics presented at class that time passes quickly.

(4) The methodology of expositive classes used by the professors should be changed, since classes could be better and less demanding.

(5) I would feel a lot more motivated if classes were given by means of educational games or similar methodology WITH or WITHOUT the use of computers and/or cell phone applications.

(6) Regardless of the methodology used, I would feel more motivated if I had feedback right after performing the activities requested by the professors, or in real time if possible.

(7) Classes would be a lot better if there was some kind of competition between the students of the group based on the content learned.

(8) Classes would be a lot better if there was a tool where students could share their learning with other students of the program.

(9) If classes were funnier and more engaging, my learning would definitely improve.

(10) To which point do you think you will complete the program?

Considering certain age range dispersion and also in order to identify possible differences of perception between each gender in the same questionnaire, we collected age- and gender-related information.

One hundred ten students participated as respondents, accounting for approximately 80% of the students enrolled in the school terms object of the research.

### **4. Results and Discussion**

Gamification has been being promoted as a new tool embraced by the new generation, while requiring specificity for its elements to be applied to the target audience. Therefore, we mapped the sample for gender and age range, as one can see from Figures 2 and 3, respectively.

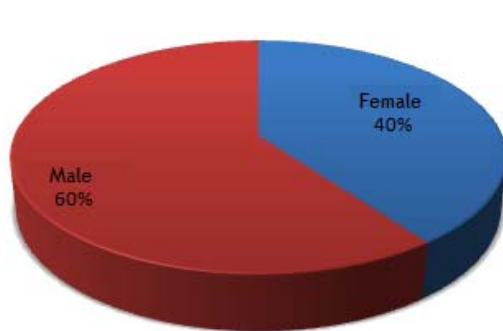


Figure 2 Gender

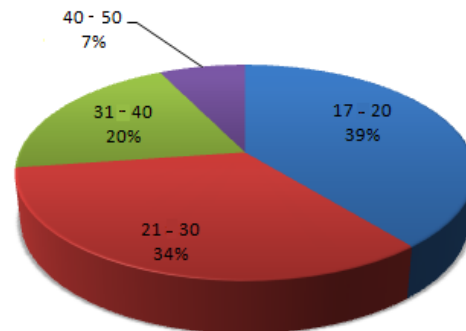


Figure 3 Age Range

As shown in Figure 3, the age ranges “17–20” and “21–30” total in 83% of respondents, ranges which are deemed to have adhered to new technologies, thus favoring the application of gamification.

Regardless of the motivation behind the answers given to the question about the intention of completing the program, with duration of six terms and a current dropout rate of approximately 30%, one can see that 17% of those still in the first or second term are likely to drop out from the course, as shown in Figure 4.

10. To which point do you think you will complete the program?

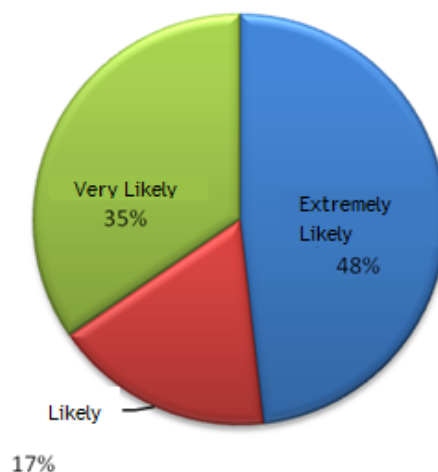


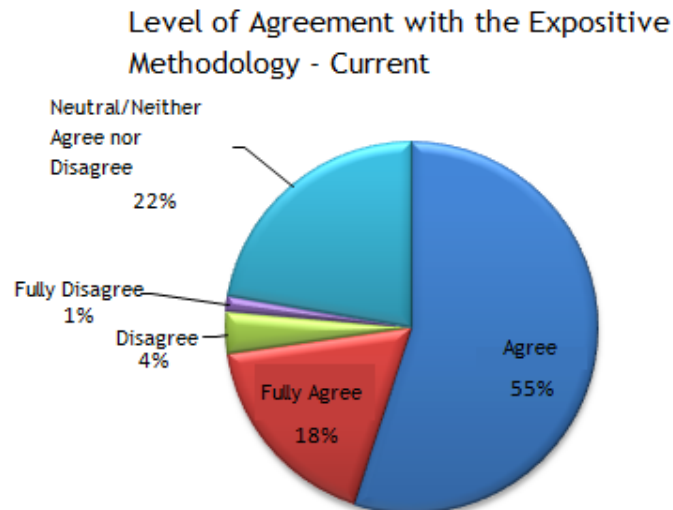
Figure 4 Dropout Likelihood

On the other hand, one can also see that even with the application of the current methodology, 83% will do their best to complete the program.

In order to understand the level of agreement with the current methodology, we consolidated the answers given in questions two and three, i.e., “2. Do you get excited to go to college?” and “3. I usually feel so engaged in the topics presented at class that time passes quickly,” and the result obtained is shown in Figure 5.

Considering the percentage obtained for the neutral ones, 77% accept the traditional methodology.

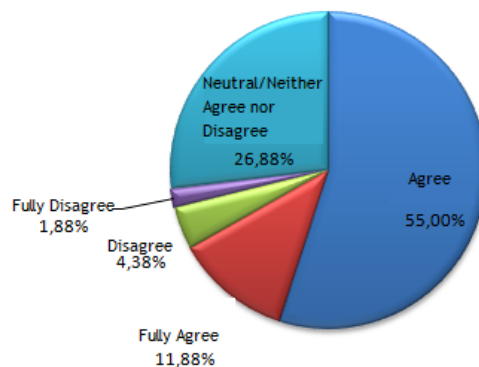
If approximately 80% accept the current methodology, then it cannot participate with a significant percentage for the dropout rate observed, i.e., the methodology is not the cause of such rate.



**Figure 5** Agreement with the Current Methodology

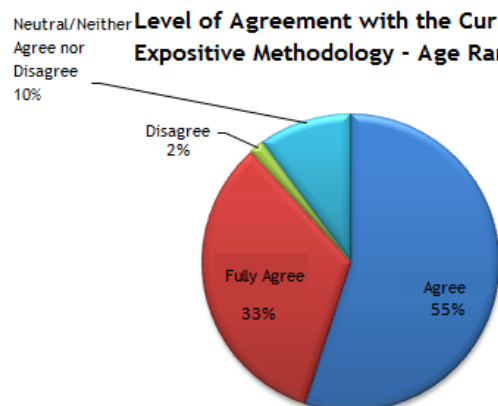
Assuming that the use of gamification is intended to young people, since they were born in the digital era, this population, i.e., aged from 17 to 30, was disaggregated from the total population, totaling in 83% of the participants, in order to verify if the greatest percentage of those who agree with the current methodology is in this age range or older. The result is showed in Figures 6 and 7.

**Level of Agreement with the Current Expositive Methodology - Age Range 17-30**



**Figure 6** Agreement with the Current Methodology (Age Range 17–30)

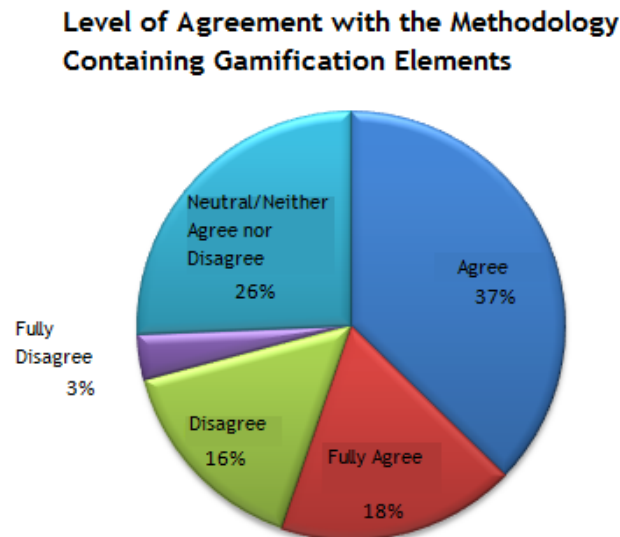
**Level of Agreement with the Current Expositive Methodology - Age Range 31-50**



**Figure 7** Agreement with the Current Methodology (Age Range 31–50)

Under this scenario, one can see that there is a balance regarding the application of the methodology currently implemented, regardless of the age range involved.

As this analysis includes the “neutral” component and those who disagree with the current methodology, i.e., approximately 40% suggest that a change in the methodology would be acceptable (i.e., considering that for neutrals the gamification would be acceptable as well), we consolidated the questions containing gamification elements to find the level of acceptance of this new methodology, as shown in Figure 8.



**Figure 8 Agreement with the Gamified Methodology**

The questions containing gamification elements used in the preparation of Graph 7 were: “4. The methodology of expositive classes used by the professors should be changed, since classes could be better and less demanding”; “5. I would feel a lot more motivated if classes were given by means of educational games or similar methodology WITH or WITHOUT the use of computers and/or cell phone applications”; “7. Classes would be a lot better if there was some kind of competition between the students of the group based on the content learned”; “8. Classes would be a lot better if there was a tool where students could share their learning with other students of the program”; and “9. If classes were funnier and more engaging, my learning would definitely improve”.

Based on the answers given to these questions, one can see that for 81% of the participants gamification could bring good results, assuming that the indicated acceptance would support the requirement “voluntary participation in a gamified environment.”

## 5. Conclusion

Since the research goal was to understand the perception of Logistics students from Faculdade de Tecnologia de Guarulhos – FATEC, in São Paulo, Brazil, regarding the use of gamification in the teaching and learning process (and to that end we used a questionnaire prepared based on the gamification requirements and applied it to the population concerned), we assume that the goal was achieved.

According to the results obtained and presented in the section “Results and Discussion” of this article, one can conclude that, while the methodology currently used is not rejected, a methodology with gamification elements would be accepted by 80% of the participants.

Considering that the percentage of participants who are “Neutral, Neither Agree nor Disagree” is about 30% for the questions about acceptance of the current methodology and the proposed methodology, one can assume that the dropout rate obtained is within this population. Under such a scenario, planning a gamified teaching and learning system can help decreasing the dropout rate observed.

In furthering this study, it is worth determining, also by means of research, which gamification elements would better meet the needs of the students of Technology in Logistics from Faculdade de Tecnologia de Guarulhos — FATEC.

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