Using of undergraduate student's feedback, learning process and growth mindset to improve the teaching and learning at university

Jalberth Fernandes de Araujo, Izadora Soares Cardoso, Ariadne Caroline Silva Guedes, Ianca Rocha Ferreira, Helvio Rubens Reis de Albuquerque
Federal University of Campina Grande
Brazil

Abstract

Several researches indicate that undergraduate students are unsatisfied with their learning experience at university. One of the reasons is the non-effective communication between teachers and students. The non-effective communication may cause problems in teaching and learning, which are fundamental and professional skills that teachers and students must continually develop. Problems in teaching and learning impact directly the learning experience at university of the students, and improve the communication between teachers and students can solve the problems. The communication and, consequently, the teaching and learning, can be improved using the undergraduate student's feedback. In this paper, a methodology to improve the teaching and learning is presented. The methodology is based on the use of undergraduate student's feedback, and it was utilized in an electrical engineering classroom during one year. Based on the results, teaching, learning, communication, motivation, engagement and satisfaction of the teacher and students have improved correlating the methodology with the learning process and growth mindset.

Keywords: feedback; teaching; learning; communication; mindset.

1. Introduction

The world is changing faster than at any time in human history. Teachers and students are meeting the big global need in education. They have access to a lot of information and learning, making them more affordable and effective.

The access to a lot of information and learning makes the student do not solely depend on teachers for trivial information and makes the teacher's role more challenging with the advancement in technology. Today, teachers and students can use the advancement in technology correlated with the interactive and much-needed teaching-learning aids like videos, web links and online courses to enhance the education process. Thus, if teachers and students utilize the advancement in technology, not only the education process is improved, but also the learning experience.

The learning experience is impacted directly by the communication between teachers and students. A non-effective communication may cause problems in teaching and learning, which are fundamental and professional skills that teachers and students must continually develop. The problems may cause

dissatisfaction of teachers and students in their experience at university.

As the communication between teachers and students is a matter directly correlated with their learning experience and performance at university, several researchers have been exploring different solutions to improve the teaching and learning and, consequently, solve the reasons that make the communication non-effective between teachers and students.

One of the solutions explored was the frequency of interactions between teacher and student (Lamport, 1993). Investigations of the frequency of teacher-student interactions show that more often students have out-of-classroom interactions with their university teachers, the better the quality of the relationship and more connected the students to the university, improving their learning experience (Couture, 2016). However, the frequency of interactions does not enable conclusions about the quality of these interactions, as shown in the survey of Komarraju, Musulki and Bhattacharya (2010). Furthermore, not all interactions with university teachers are necessarily positive in nature, and thus do not automatically lead to positive outcomes, as said in Baumeister and Leary (1995).

Although the interactions may improve the learning experience, failures in communication between teachers and students can cause unknown expectations, problems with comprehending and uninteresting classroom lessons. The communications barriers certainly make it difficult for teachers and students, and many times, teachers fail to create engaging lessons and struggles to connect with their students on a one to one basis. Moreover, students also have unaddressed learning or speech difficulties and struggle to communicate in classroom settings. Sometimes, they have trouble comprehending lessons and organizing their thoughts. Because of hesitation, students often shut down, isolating themselves out of fear or embarrassment.

Currently, the teacher-student relationship and the education process are moving to a more rational and questioning atmosphere, where the teacher student bond is beyond the stereotypes and not defined by obedience and acceptance, like in earlier times. However, teaching settings tend to be more fragmented at university, with less frequent interactions between teachers and students. In addition, teaching is just one scholarly activity expected of university educators, with quality research typically receiving greater recognition than quality teaching in the academic community (Hagenauer and Volet, 2014).

Beyond interaction, another solution that have been studied was the care for students. The importance of the care concept for students is correlated with other factors, like respect and connectedness. These factors impact positively the communication between teachers and students (Komarraju, Musulkin, and Bhattacharya, 2010). They can improve the efforts, engagement, intrinsic motivation and results (Dweck, 2016) of the teachers and students and, consequently, their teaching and learning. Dweck (2016) shows that people who believes that the intelligence can be developed by hard work, strategy and orientation create a mindset, called growth mindset, that decide their potential and success. The work of Dweck (2016) is correlated directly with the success of the learning experience of teachers and students at university, and she proves that use the growth mindset can improve results of people, and, in this case, teachers and students.

Another solution was studied by Denzine and Pulos (2000). They presented that teacher approachability is an important quality that must be guaranteed in order to facilitate positive teacher–student interactions. Stephen, O'Connell and Hall (2008) showed that the approachability of lecturers is relevant not only for

teacher-student relationship, but also for an overall feeling of connectedness to the university and preventing students from becoming alienated from the university. Furthermore, Devlin and O'Shea (2012) presented the significance of approachable and available university lecturers for the adaptation process of first-year students from a low socio-economic background. Approachable lecturers and tutors who answered students' questions promptly, and clearly communicated expectations with regard to assignments, were described as very helpful for students' success in learning and adjusting to university.

Research by Palmer, O'Cane, and Owens (2009) shows that the likelihood of remaining at university was higher for students who developed a sense of belonging to the university, as their study satisfaction was increased through connectedness. Development of a feeling of belonging is of particular importance in the first year of study, as most decisions to drop out are made during this year. Furthermore, many first-year students enter university with unclear expectations and relatively high levels of uncertainty and anxiety, as presented in studies of Gibney, Moore, Murphy, and O'Sullivan (2011). Brinkworth, McCann, Matthews, and Nordstro¨m (2009) found that first year students had unclear expectations not only regarding their role as students, but also regarding communications between teacher and student at university. Over 80% of the sample expected to have 'ready access' to tutors and lecturers to facilitate successful study. If students fail to connect to the university and their study subject for whatever reason, as unclear expectations, as shown by Brinkworth, McCann, Matthews, and Nordstro¨m (2009), drop-out is often the result.

Although there is empirical support for the idea that peer relationships are the most important for students' sense of belonging, relationships with teachers and tutors also play an important role in students' decisions to complete their studies or to leave after the first year (Ramsay, Jones, and Barker, 2007). Furthermore, positive relationships with university teachers not only contribute to the retention of students but also facilitate other factors, such as commitment (Strauss and Volkwein, 2004), effort (Lundberg and Schreiner, 2004), motivation (Rugutt and Chemosit, 2009), satisfaction (Calvo, Markauskaite and Trigwell, 2010) engagement (Zepke and Leach, 2010), deep-learning approaches (Trigwell, 2005), achievement, and intellectual development (Halawah, 2006).

Observing the researches, it can be seen that the solutions of teaching, learning, communications and learning experience of teachers and students are directly correlated with mindset, mainly growth mindset, as studied by Dweck (2016). The teacher-student relationship clearly affects students' successful study progress, including factors such as course satisfaction, retention, learning approaches and achievement. On the other hand, teacher-student relationship also affects university teachers, for example through their adoption of particular teaching practices, which in turn affects teaching quality (Hagenauer and Volet, 2014). Thus, improving the communication between teachers and students, their learning experience, teaching, learning and satisfaction at university can be enhanced. The enhancing can be optimized combining methodologies based on undergraduate student's feedback, learning process and growth mindset, which is the goal of this paper.

2. Methodology

The methodology proposed in this paper was used in an electrical engineering classroom at Federal University of Campina Grande, Brazil, with 52 students coursing a discipline called electronics devices.

To collect the results, the methodology was applied during one year.
To improve the communication, teaching and learning between teacher and students, the authors of this paper used a methodology based on a combination of undergraduate student's feedback, learning process and growth mindset, as it is shown in Figure 1.

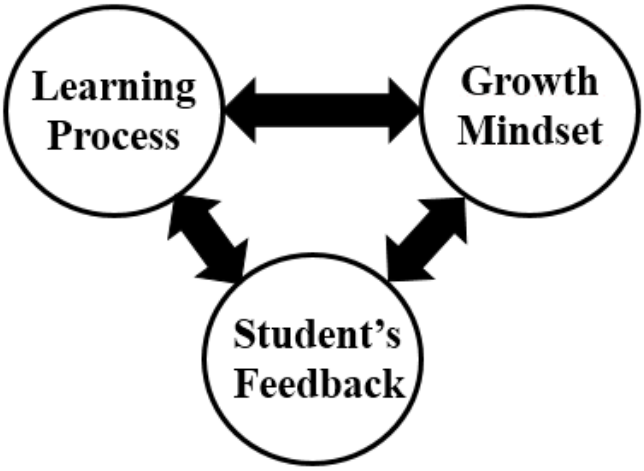

Figure 1. Combination of undergraduate student's feedback, learning process and growth mindset.

To understand the combination showed in Figure 1, it is necessary to explain how the learning process, the growth mindset and the student's feedback were used in the classroom.
Initially, teacher and students must use consciously the learning process, which is illustrated in diagram presented in Figure 2.

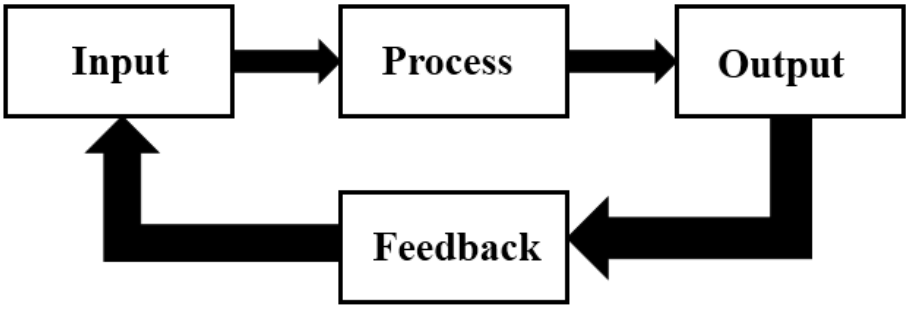

Figure 2. Learning process diagram.

In the learning process, the input is everything that teachers or students study, see, listen and live. The inputs are all the experience that teacher and students living during a course. The more inputs, the more processing can be done. Processing is the step that teacher or student make connections and combinations based on the inputs.
In the processing step, teacher uses the meaning learning to connect and combine the different inputs of students and facilitate the learning. The connection and combinations are made during the classes, studies, sleep and rest (Carey, 2015).
After the processing, teacher and students verify theirs learning, using the output step. The output step is based on the verification, proof and recognize of the learning. During the verification of learning, the

teacher and student can identify the gaps in teaching and learning (Khan, 2012).

The correction and close of the gaps are made during the feedback step, where teacher and student using the current learning as an input in the learning process. Using the verification of learning as an input provides new connections and combinations during the process step, and the new output is an optimized output, resulting in an improve of learning and teaching.

To reach the optimized learning and teaching, a growth mindset in teacher and students must be developed. Thus, the teacher must encourage their students to believe that with effort and hard work they can develop the optimized learning. The growth mindset was remembered during the course to the 52 students, in classes, tests and after tests.

To improve the teaching, the teacher encourages their students to answer a form, where they put their opinions about the explanation of the teacher, and suggestions to enhance the teaching. The student's feedback is used to enhance the explain of the teacher and improve their communication and, consequently, the teaching and learning.

5. Results

The most of teachers and students just teach and study without to concern with some method. The use of meaning learning, learning methods (Carey, 2015), growth mindset (Khan, 2012, Dweck, 2016) and learning process develop a mindset of learning in the students and improve their performance at challenges and tests during the course. As teacher and students were being trained, together, to learn and develop growth mindset, the teacher improves your explanation, consequently your communication with the students, and the students combined the growth mindset with the learning process to improve their learning. The results were more motivation, engagement, learning, hard work. These results impacted directly the performance in the tests. Despite the challenges in tests and nervousness, they use of methodology contributed for a better performance in the course, resulting in an approval of 88.46% of the students. The students that did not approved in the discipline, reported that it is not fault of the methodology, but personal factors in their lives.

The student's feedback was used to improve the teaching and communication of the teacher in relation with their students. A form in which the students answers questions for enhance the explanation of the teacher was used. The questions were:

1. How the teacher can improve their teaching methodology?
2. The tests were fair?
3. How was the learning experience with the teacher?

These three questions resulting in an improvement of communication, clarify, teaching and learning, because the students answered their opinion about the methodology used by the professor. The student is the element that use the methodology, thus them are the better element to give clarify to the teacher of how he can improve their explanation and communication.

Concerning to the first question, the students prefer explanations of theory interspersed with practical exercises. In explanations of theory and practical exercises, the teacher always mentioned that the students were able to learn anything, if they used their efforts and hard work. The teacher also highlighted that they

should give importance to the way they learned and studied, in order to give meaning to their learning and the result in test would be only a consequence to their approval in the discipline.

As the teacher explain not only the technical subject, but also the learning process and growth mindset, the students were trained to perform what they learned. As a result, 100% of the students answered that the tests were fair. Theses results imply that, despite the challenges in the tests, the students developed a growth mindset during the course. Moreover, a student said that the tests were a possible level to accomplish, without distractors. They said that because the teacher trained the students to the test, because he believes that test is not the focus, but the learn, which means that the teacher-student relationship was based on teaching and learning, not in test scores.

Regarding to the third question, some answers are below:

1. "The methodology was good, tests were fair, and the teacher always encouraged the students to learn and he mentioned applications during the classes."
2. "It was a great experience to have a teacher who cares about student (looking for a closer student-teacher relationship) and learning; who has no intention of failing, but of doing his fair work. I just want you to continue like this for the next classes. Teacher, you are great!"
3. "It was good, the animation and motivation of the teacher motivated us too, continue like this. This gives us hope for the course, among so many teachers disgusted with their work, you are an example to be followed."
4. "It was a very good experience, where we have a great learning about the subject of the discipline. The teaching methodology used by the teacher was of great help in fixing the content."
5. "Very positive experience. What impact me, especially, was the attention and patience with us when clarifying doubts. The teacher also demonstrated a lot domain of content and a serious commitment to our learning, believing in our potential and respecting our rhythm."

The answers of the third question indicate that the combination of undergraduate student's feedback, learning process and growth mindset improve the communication between teacher and students, their teaching, learning and learning experience. The methodology made the students more motivated, interested and engaged with the discipline and course, give to them more satisfaction.

6. Conclusions

As the goal of this paper, the using of undergraduate student's feedback combined with learning process and growth mindset improve the communication between teacher and student providing and enhancing motivation, engagement, satisfaction, teaching, learning and learning experience.

The methodology implies in a teacher-student relationship based on teaching and learning, not on the test scores.

Despite the methodology was applied in one discipline of the course of Electrical Engineering of Federal University of Campina Grande, in Brazil, it can be used in others disciplines and courses. The idea here is improving the teaching and learning of the teachers and students, become them better professionals of the future.

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