Learner autonomy and self-regulation in eLearning

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Abstract

The calibration concept refers to the accuracy of the perceptions that students have of their own academic performance. The studies point to its importance in self-control of metacognitive strategies. Metacognitive judgments play an important role in self-regulation of learning to provide information to students in order to enable them to make decisions in the learning tasks. In an online education system aspects related to self-regulation and self-efficacy gain particular relevance. Our results indicate that the difference between the actual grade and after performing the assessment task is higher when considered by default. A positive and statistically significant correlation between the two classifications (real and after) was found.

1. Introduction

The judgment students make about their cognitive process or its outcome has been investigated. Calibration means the distance between the level of perception and the actual level of understanding, capacity, competence or preparation in a particular area. The calibration concept refers, therefore, the accuracy of the perceptions that students have of their own academic performance (Stone, 2000). The studies point to its importance in self...

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control of metacognitive strategies (Pieschl, 2009). Metacognitive judgments play an important role in self-regulation of learning providing information to students to enable them to make decisions in the learning tasks.

In an online education system, with an emphasis on the idea of a learner as a constructor of his own knowledge, aspects related to self-regulation and self-efficacy gain particular relevance.

2. Self-regulation and calibration

There is an increasing emphasizing on student-centered learning and on them taking a proactive role in the construction of knowledge. The teacher's role is to guide and mentor the process. There has been over time a change in the way of looking to the learning process. In this sense, there is an emerging shift that displaces the process emphasis on the teacher to a perspective where the focus is on the learner. This means that it is increasingly recognized the active role of the learner in the learning process. The demands placed at this point for learners to achieve success, require him to learn new skills such as flexibility, responsibility, independence and being active. New predictors of academic success are placed in the ability to manage the learning process itself (Macejka, 2014). The autonomous learning requires self-management competencies and proactive, self-knowledge and self-control of the learning process.

According to Bjork, Dunlosky & Kornell (2013) for a learner to become effective in the learning process should not only be able to assess accurately the states of their own learning, but also be able to manage their own learning and activities in response to such monitoring (p.422). Self-regulated learning is recognized as an important factor in active control of the learning process and, consequently, in students’ academic performance. According to Zimmerman (1986) self-regulated learning in education is based on the premise that students use metacognitive, motivational, and behavioral processes in their learning. Self-regulated learning involves the selective use of specific elements that are tailored to each task learning (Zimmerman, 1998, 2002).

![Fig. 1. Components of self-regulation (Zimmerman, 2002)](image)

The self-regulated learners, in a metacognitive point of view, are able to make decisions that regulate the selection and use of different forms of knowledge. They do this by planning, organizing, implementing, managing, and evaluating the whole process. Metacognition has a prominent role here. Firstly it encompasses the knowledge of how people learn and process information, as well as their learning processes. Secondly, we have the task. In other words, understanding the type of task and the type of information processing that it entails. Finally, we have the knowledge of cognitive and metacognitive strategies such as planning, monitoring and verifying the results. Metacognition can thus be seen as a way of monitoring and control of thought (Goulão, 2013).
The dynamics established between monitoring and control is called calibration. This can be understood as a measure of the relationship between trust and performance. Calibration is the degree to which the person's perception of performance corresponds with his or her actual performance (Hacker, Bol & Keener, sd). The calibration plays an important role in the self-regulation cycle. This is due to the fact that the judgments students have about their training, may lead to review their situation to a learning task. Calibration, or absolute precision evaluates the accuracy of the judgments that the learner makes about their performance. In this context the deviation measures the degree to which a learner underestimates or overestimates the performance and it is obtained by calculating the difference between confidence of correct answers and actual performance on the task. We talk about overestimate of performance when there is a high degree of confidence but low performance. In underestimate the performance there is a low degree of confidence but a high performance (Pieschl, 2009).

In summary, self-regulation is important for the function of higher education is to develop competences for lifelong learning. Those who develop competencies for self-regulation will be more apt to go beyond the necessary to adapt to new challenges situations.

3. The online learning context

Technological development, as well as the demands of society and the labor market urge to the change of learning environments. The virtual learning environments promote a more active role on the part of students in the construction of their own knowledge (Goulão, 2010). These same environments comprise different formats to support learning that allow a more appropriate choice according to the contents to be transmitted and the learning styles of each.

The eLearning gives the student time and space flexibility, allowing a better management that suits their needs in education. In these learning systems, one of the most important roles of the teacher is being the mediator/facilitator. This means that the teacher should aim to provide appropriate educational aid to students’ constructive learning (Goulão, 2012, p.29). Associated with virtual learning environments, we find three essential concepts: adaptability, mobility, and cooperation. This means that the incorporation of ICT in the educational context, using the virtual spaces, allows a more effective response to the educational challenges by allowing using strategies and tools that best fit to the real needs of their learners. The research work of Azevedo & Cromley (2004) points to the implications that the design of virtual learning environments has for the acquisition of knowledge. It follows, on one hand, the need of teachers being aware of this situation and look to train their students so they regulate their learning. On the other hand, at the environments’ designers level so they conceive structures that allow students to proceed to their learning self-regulation.

In an online education system, with an emphasis on the idea of a learner as a constructor of his own knowledge, aspects related to self-regulation and self-efficacy gain particular relevance. We live in a society that appeals to these skills, which allow individuals to adapt quickly and effectively to new challenges. For this reason, current research has shown the importance of encouraging our students to control their learning process. The impact of a more personal, social and participative pedagogy is distinguished. (McLoughlin & Lee, 2010).

Students in eLearning require greater self-direction and self-regulation to achieve their academic goals (Bol & Garner, 2011). To lead the students to reflect on their learning strategy and tailor their metacognitive strategies to achieve success in the task is of great relevance.

Working in virtual environments, from the point of view of the learner, has implications and behavioral changes in their posture. It is necessary that they are aware that there is a close relationship between autonomy, that virtual environments provide, and maturity, motivation, and self-discipline of the learner. In other words, greater autonomy implies a greater maturity, greater motivation, and greater self-discipline. This is because more freedom implies greater responsibility on the learner.

In summary, the combination of various resources such as multimedia technologies, and internet use make learning can happen in any setting and at any time (at school, at university, at home, in leisure spaces, among others). This feature of absence of spatiotemporal constraints combined, also, with the need for lifelong learning is the basis of new educational scenarios and changes in the relationships that are established between the different actors in the teaching learning process. This approach applied to the educational field is extremely
important because it allows the learner to be at the center of their learning with active participation constructing their own knowledge.

4. Method

4.1. Objectives

The objectives of our research are to identify:

a) in general terms, the pattern of responses on the classification students hope to obtain in the evaluative task, and

b) the association between the degree of the expected and the real grade in an evaluative task (calibration)

4.2. Design and participants

Data collection was made through questionnaires and occurred in three specific times: immediately before the assessment, immediately after the assessment, and after know the classification. A total of 55 undergraduate eLearning students participated in the survey, as volunteers; 16% males and 84% females; the average age of the participants was 41, ranging from 26 and 57 years old (see Table 1) seven students were in their 20s, 19 students were in their 30s, 18 students were in their 40s, 10 students were in their 50s. The median age was 41.

4.3. Material and procedure

- Self-assessment
  We used three different questionnaires. The first one immediately before the assessment. Another one immediately after the assessment test, and, finally, when they know their classification (table 2).

<table>
<thead>
<tr>
<th>Moment</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st – Before the assessment</td>
<td>We are doing a study about the perception of the students regarding their classifications. So we would like to count on your cooperation in the different moments of evaluations of united course. That is, this test will arise whenever there is an evaluation moment, before and after the same, and it is important you answer twice. It is simple and does not take long. Ready to collaborate? Come on, then! Knowing that in this e-folio … is asked to answer 2 questions on Topic 1, according to the rules which will be made available, what do you think will be your classification in this work? Once you have answered must click &quot;Submit all and finish&quot;. Do not forget, the scale is 0-4 and must indicate only one number that may have, or not, one decimal place. Example 1; 3 Example 2; 3.4 Thank you, again, for your cooperation!😊</td>
</tr>
<tr>
<td>2nd – After the assessment</td>
<td>As we said earlier, we are to undertake a study on the perception of students regarding their classifications. For this we would like to continue to rely on your cooperation. As already noted is simple and does not take long. Ready to collaborate? Come on, then! Now that ended your e-folio … and uploaded them, which do you thought to be the classification you will get? Do not forget, the scale is 0-4. Indicate only one number and after answering must click &quot;Submit</td>
</tr>
</tbody>
</table>
all and finish”.
Thank you, again, for your cooperation!

3rd – After knowing the classification

Following the work we are doing we have another question for you. The answer does not require you much time.
We appreciate your opinion.

It was asked, before starting, and after completing your e-folio A, to indicate a rating in each of these moments.
Now that you know the classification obtained in this work, compare it with the ratings assigned to the two previous times.
For this comparison the note you got in your e-folio
a) is it higher / lower / equal to it flagged?
b) why? Indicate at least one reason for this.
c) how that fact will influence your study process in the future?
Thank you!

- Academic performance

Participants in our study were students who were in continuous assessment. In this situation there are three assessments: 2 moments online (e-folios) and 1 moment face to face. Each e-folio has a maximum rating of 4 values. The works were designed, provided and graded by the teacher responsible for the course. Students were informed that our "presence" was just for research.

Participants were asked to complete the questionnaire online at their own place. This course belonged to the 2nd semester.

Figure 3 presents the overall research procedure used in this study.

![Fig. 3. The overall research procedure](image)

In this paper we will present only the results obtained from the analysis of the first moment of evaluation conducted online (e-folio A).

4.4. Data analyses

We proceeded to the analysis of participants' responses according to our objectives. It was the purpose of this research to identify, in general terms, the pattern of responses on the classification they hope to obtain in the evaluative task, and to identify the association between the expected and the real grade in a evaluative task (calibration).

To answer to our first goal we grouped the result of the difference between self-reported ratings on the 2nd moment and the actual score obtained. For this we considered as reference point 0 which meant: Real Rating
(performance) = Self-reported Rating (confidence of correct answers).
To analyze the last goal we used the Pearson correlation statistic and Student t test.

5. Results

We will present the results taking into account the two objectives of our research.

5.1. Pattern of responses on the classification they hope to obtain in the evaluative task

We found that the number of students who responded to the two moments - Before and After - was quite different. Since the students who responded to the moment After was superior. Table 3 presents the results shown in moments Before and After.

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.92</td>
<td>2.95</td>
</tr>
<tr>
<td>Mode</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Std Dev.</td>
<td>.464</td>
<td>.481</td>
</tr>
<tr>
<td>Minimum</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.5</td>
<td>4.0</td>
</tr>
</tbody>
</table>

In this result only the subjects who responded at both times were taken into account.

5.2. Association between the degree of expected and a real grade in a evaluative task (calibration)

Before we begin the presentation of this item results it is necessary to identify some assumptions. So,

- Difference = (Real grade (performance) – Self-reported grade “After” (confidence of correct answers)): judgment about the performance
- Positive values = Students had better actual score than self-reported grade: underestimation
- Negatives values = Students had a worse actual score than self-reported grade: overestimation
- Equal to zero = The actual score was equal to the self-reported grade

As previously mentioned the number of students who responded “After” was superior. Thus, the results that we present from now relate only to the time “After”.

<table>
<thead>
<tr>
<th></th>
<th>Real</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.18</td>
<td>2.85</td>
</tr>
<tr>
<td>Mode</td>
<td>3.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Std Dev.</td>
<td>.419</td>
<td>.543</td>
</tr>
<tr>
<td>Minimum</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.8</td>
<td>4.0</td>
</tr>
</tbody>
</table>

After known the general results we will proceed to the analysis of the differences between self-reported ratings. For this, we have grouped the differences between real grade and self-reported grade in three major category - Equal to zero / Below zero (overestimation) / Above Zero (underestimation) (Graphic 1).
As can be seen there are marked differences in the categories Below Zero and Above zero. In the e-folio A, 72.7% of students had a better Real score than indicated, and 20% had a worse score than what was expected.

In the category Below zero, 50% of people had a difference between [0.22; 0.80] more than what was indicated. In the category Above zero, 63% of people had between [-0.2; -0.21] points of difference under the indicated. That is, the difference by default is greater than the gap by excess. Students who thought they would have better score missed for less.

We will then see what happens with the average differences between the Real and After grades on e-folio A.

<table>
<thead>
<tr>
<th></th>
<th>Real Mean (SD)</th>
<th>After Mean (SD)</th>
<th>T(54)</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-folio A</td>
<td>3.18 (.419)</td>
<td>2.85 (.543)</td>
<td>4.157 (s)*</td>
</tr>
</tbody>
</table>

As can be seen the students in e-folio A indicate a rating significantly lower to the ranking that they actually obtained (Real).

To test the hypothesis whether there was an association between the actual score (Real) and self-reported score After, we used the Pearson correlation test. It was found that the actual score (Real) is positively correlated with the score indicated after completion of work, \( r = .301, p = .026 \). Higher self-reported rating After is associated with higher actual classification (Real).

So, our results indicate that the difference between the actual grade and the one indicated after performing the assessment task is higher when considered by default. I.e., students who thought they would have better grades missed for less. In addition, a positive and statistically significant correlation between the two classifications (real and after) was found.

### 6. Conclusions

Our aim was, first, to analyze the pattern of responses on the classification students hope to obtain in the evaluative task. Our results indicate that the average self-reported ratings at After category is below the average of the actual ratings. In addition, students who underestimated their classification are much more than the students that overestimated it. However, students that overestimated their grades missed the actual grade for less.

Secondly, to analyze the relationship between the degree of expected and actual grade in the task (calibration), we used Pearson correlation and Student the t-test. The findings with these tests allow us to say that the differences found between performance and confidence of correct answers are statistically significant. This
suggests that there is a positive correlation between them, which means that the higher self-reported rating After, higher the actual classification (Real).

To develop self-regulatory competence of students is not only very important to help them achieve success now, but also to ensure future successes. Actions relating to the control of performance have a critical role in the self-regulatory process leading to a monitoring process of learning by the students. This action control allows them to not only detect the weaknesses of the learning process, but also alert to the effectiveness of learning strategies that are being used. Teachers can help students in this self-regulatory process so that the responsibility of the learning process can be transferred to students.

In our study we tried that students reflect on their own learning process when designing the experimental study in those three moments, with particular relevance to the last moment. We tried therein that students did a self-reflection and a review of the whole learning process to find their weaknesses or reinforce strategies that led to success. Ultimately, our goal was that the students applied self-monitoring in their learning and develop their own monitoring mechanism becoming an integral part of their personal learning.

According to Cheng (2011), Self-regulated learners optimize Their learning strategies through continuous self-assessment of Their learning efficacy. It is in the interests of teachers to develop students 'self-regulation ability If They really want to Enhance students' learning (p.14)

To conclude, self-direction for general or specific objectives, by the students, is extremely important. The ability to self-regulate learning is extremely important to overcome procrastination and achieve success factor. This importance is enhanced when we are in online contexts where the emphasis is on the student as responsible for their learning process. Knowing this reality is relevant to provide information to teachers that seek to develop tasks and strategies that help reduce procrastination and thus make them more self-regulated learners.

References

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