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TEACHER' SELF-EFFICACY AND STUDENT LEARNING

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Abstract

The teacher's perception of their teaching self-efficacy includes a whole set of beliefs about their own ability to teach and to exert a positive effect on student learning. These beliefs are linked to behaviour patterns that teachers show in the classroom, and that establish marked differences in the type of teaching and in the strategies and methodologies used by teachers in their daily practice. This paper examines the results of a study in which 71 teachers and over 200 students from the University of Deusto (Spain) and the Catholic University of Temuco (Chile) took part. The aim of this study was to analyse teachers' beliefs and their relationship to students' perceived learning.

Keywords: Learning, self-efficacy, perceived learning, Spain, teaching strategies

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1. Introduction

One of the major challenges facing university teachers is to adapt and include student-centred strategies, methodologies and techniques that foster the competence to be learnt and encourage independent learning.

The success of these teaching activities and practices depends to a great extent on teachers' self-perception and confidence in their professional capacity to face up to the changes involved in learning-centred models (Rodríguez, Núñez, Valle, Blas, & Rosario, 2009).

This self perception, called self-efficacy, plays a major role in how teachers select assignments and activities, shaping their efforts and perseverance when addressing certain challenges, and even in their emotional response to difficult situations. Self-efficacy ultimately accounts for a cognitive construct that mediates between knowledge and action. Along with other variables, this determines the success of the actions themselves (Prieto, 2003).

1.1. Effects of self-efficacy on teaching and learning

Numerous studies point out that teachers with high self-efficacy levels are more open to new ideas, show greater willingness to try new teaching methods, design and organise their classes better, and are more enthusiastic and satisfied with their teaching (Allinder, 1994; Ashton, 1985; Bamburg, 2004; Guskey, 1998; Tschannen-Moran & Woolfolk Hoy, 2001). In short, self-efficacy beliefs affect teaching practice and the attitude towards the educational process and therefore, the quality of teaching and learning.

In recent decades, there has been a huge interest in analysing the relationship between teachers' self-efficacy and students' academic achievement (Chacón, 2006).

McLaughlin and Marsh (1978) were the first researchers to demonstrate the relationship between teachers' self-efficacy and student achievement (Prieto, 2007). Since then, other scholars on the subject have confirmed this relationship (Armor et al., 1976; Ashton & Webb, 1986; Caprara, Barabaranello, Steca, & Malone, 2006; Dee & Hoy, 2008; Gibson & Dembo, 1984; Hoy & Wollfolk, 1990; Muijs & Rejnolds, 2001; Ross, 1992; Skaalvik & Skaalvik, 2007; Wolters & Daugherty, 2007).

However, the perception of efficacy is not only related to students' outcomes in terms of performance, but they are also related to motivation (Ashton & Webb, 1986) and to students' self-perceived efficacy (Anderson, Greene & Loewen, 1988; Tschannen-Moran & Hoy, 2007).

2. Purpose of the Study

The aim of this study was to analyse teachers' (self-efficacy) beliefs in relation to university students' self-perceived learning.

3. Research Methods

3.1. Sample

3.1.1. Sample of teachers

The study sample consisted of 71 teachers from two universities, 45 (63.4%) of whom were from the University of Deusto (Spain) and 26 (36.6%) from the University of Temuco (Chile). The average age of participants was 42.21 years (sd= 8.56), with a minimum value of 28 and a maximum value of 65. Regarding gender, 53 were women (74.6%) and 18 men (25.4%).

3.1.2. Sample of students

A total of 2,195 students took part in the study. 64.3% (1411) were from the University of Deusto and 35.7% (784) from Temuco University. The average age of participants was 20.85 years (sd = 3.11), with a minimum value of 17 and a maximum value of 63. Regarding gender, 698 were women (31.8%) and 1339 men (61%). 7.2% of students gave no information on gender.

3.2. Procedure

3.2.1. Collection of information from teachers

For the selection of the sample, we contacted lecturers from the University of Deusto and the Catholic University of Temuco, who were informed about the research objectives and methodology, and were invited to participate in the study voluntarily.

The teachers who agreed to participate had to respond on a scale through a computer application. The application time was approximately 20 minutes. The scale was used at the beginning of the course.

3.2.2. Collection of information from students

All teachers participating in the study were asked to give one hour of their teaching time to apply the questionnaire to their students.

This questionnaire was applied in the classroom at the end of the course. Questionnaires were given to the group and students were allowed approximately 20 minutes to fill them in. Students were informed of the aims of the study, the confidentiality of the information collected, and that

participation was voluntary. The application time was approximately 15 minutes.

3.3. Instruments

3.3.1. Teacher self-efficacy

Teachers were administered the College Teaching Self-Efficacy Scale (Prieto, 2003). This scale is mainly used to assess self-efficacy beliefs in different areas of teaching practice. This is an instrument composed of 44 items that correspond to 4 fundamental dimensions of university teaching: students' involvement in learning, preparing and planning lectures, Interaction with students and the Assessment of learning and the teaching role itself. For each of the dimensions, teachers established the extent to which they felt able to carry out the proposed teaching activities on a 6-point Likert-type response scale (1= little capable, 6 = very capable).

The tool has confirmed the factor structure and has shown good internal consistency in the scales, with alpha coefficients ranging between .83 and .87 and an overall reliability of $\alpha = .95$, with a sample of 362 university lecturers (Prieto, 2003). Our study shows alpha coefficients ranging between .86 and .88 and the overall reliability is .95.

3.3.2. Perceived Learning

Students' Self-Perceived Learning Scale. Students' self-perceived learning was collected through a scale developed for this study, which consisted of 11 items where students had to determine the extent to which they had gained knowledge and skills. The scale had 4 possible answers (1=nothing

2=a little, 3=fair amount, 4= quite a lot). The reliability found in the instrument was .91.

The tools used for both samples were revised by a team of professionals to improve the expression and preparation of items, so that they could capture their meaning to a greater extent, both for the Spanish and the Chilean samples.

3.4. Statistical Analyses

In order to know the level of teachers' self-efficacy, a number of descriptive analyses were performed for each of the survey dimensions. The relationship between self-efficacy and students' perceptions of their learning was calculated by Pearson's *r*. To determine whether there were significant differences according to nationality and to the degree of self-efficacy, a variance analysis was performed.

4. Findings

4.1. Degree of teacher Self-efficacy

The descriptive analysis of the dimensions that make up the tool is presented in Table 1. The mean total scale score is set to a value of 5.06 in a possible range of 1 to 6. The mean achieved by the dimensions that make up the scale are between a value of 4.91 and 5.19, indicating that scores are high.

In none of the cases the asymmetry of the score distribution exceeds the value 1, although in all cases it is a negative-type asymmetry, indicating a tendency to accumulate cases with high values.

Table 1. Descriptive Statistics of Self-Efficacy in University Faculty

| <i>Dimensions</i> | <i>M</i> | <i>SD</i> | <i>Asymmetry</i> |
|------------------------------|----------|-----------|------------------|
| Learning Assessment | 4.91 | 0.54 | -0.27 |
| Student's Active Involvement | 5.01 | 0.64 | -0.84 |
| Classroom Interaction | 5.13 | 0.58 | -0.81 |
| Teaching Planning | 5.19 | 0.50 | -0.59 |
| Overall self-efficacy | 5.06 | 0.51 | -0.51 |

Although all dimensions have a high score, the highest score is Planning (5.19) and the lowest is Learning Assessment (4.91), which shows that teachers feel more self-confident in planning than in the evaluation function.

We analysed teachers' self-efficacy beliefs in relation to the University to which they belonged. The mean scores and standard deviations are shown in Table 2.

Table 2. Mean and standard deviations of the Self-efficacy dimensions according to the University

| <i>Dimension</i> | <i>Statistics</i> | University | |
|--|-------------------|----------------|----------------|
| | | Deusto n=36 | Temuco n=35 |
| Teaching planning | M | 5.15 | 5.26 |
| | SD | 0.54 | 0.43 |
| <i>Student's active involvement</i> | M | 4.82 | 5.35 |
| | <i>SD</i> | 0.68 | 0.39 |
| <i>Classroom interaction</i> | M | 4.98 | 5.38 |
| | <i>SD</i> | 0.55 | 0.55 |
| <i>Learning assessment</i> | M | 4.77 | 5.16 |

| | | | |
|----------------------------|-----------|-------------|-------------|
| | <i>SD</i> | 0.56 | 0.41 |
| <i>Total Self-efficacy</i> | M | 4.93 | 5.27 |
| | <i>SD</i> | 0.53 | 0.37 |

* Note: The dimensions where significant differences ($p < .01$) have been found are indicated in italics and bold.

With regard to teachers' nationality, Chilean teachers score significantly higher on overall Self-efficacy ($= 5.27$) than their Spanish counterparts ($= 4.93$). By specifying dimensions, significant differences were found in the Student's involvement ($F=13.32$ $p < .01$), Classroom Interaction ($F= 8.39$ $p < .01$), Assessment ($F= 9.69$ $p < .01$) and total Self-efficacy ($F= 8.41$ $p < .01$) dimensions, but not in the Planning dimension.

4.2. Relationship between the level of teacher self-efficacy and perceived learning outcomes

Teachers' self-efficacy beliefs in general and in the Involvement and Interaction dimensions had a significant, positive, and moderate correlation with students' perceived learning outcomes, but not in the Planning and Assessment dimensions, where the relationship is not significant (see Table 3).

Table 3. Correlations between Self-efficacy and perceived learning outcomes

| Dimensions Self-efficacy | | Perceived Learning Outcomes. Interactions between Self- efficacy and perceived learning outcomes |
|-----------------------------|-----------------------|--|
| | Pearsons' correlation | .30 |
| Overall self- efficacy | Sig. (bilateral) | .01 |
| | N | 71 |

| | | |
|-------------|-----------------------|------------|
| | Pearsons' correlation | .21 |
| Planning | Sig. (bilateral) | .07 |
| | N | 71 |
| | Pearsons' Correlation | .35 |
| Involvement | Sig. (bilateral) | .00 |
| | N | 71 |
| | Pearsons' Correlation | .40 |
| Interaction | Sig. (bilateral) | .00 |
| | N | 71 |
| | Pearsons' Correlation | .21 |
| Assessment | Sig. (bilateral) | .07 |
| | N | 71 |

To examine whether there are significant differences in perceived learning outcomes based on self-efficacy beliefs, we conducted a variance analysis (ANOVA).

As can be seen in Table 4 with a significance level of $p < 0.01$ and $F = 6.17$, we can conclude that teachers with a higher perceived level of overall efficiency, had students with greater perceptions of learning ($= 2.89$) than teachers with lower levels of efficacy ($= 2.74$).

This relationship also appears in the Involvement and Interaction dimension. That is, when teachers have more confidence in their ability to make students feel actively involved in their learning process, perceived learning outcomes are higher ($= 2.91$) than when the confidence level is lower in this area ($= 2.73$).

Similarly, those teachers who feel more able to interact with students and create a learning environment of trust and mutual respect, achieve a greater

perception of the learning acquired (= 2.93) by their students than those with lower perceived efficacy in this dimension (= 2.71).

Table 4. Means and deviation of learning based on self-efficacy standard perceived outcomes teachers' levels

| Dimensions | Under graduate degree | Learning outcomes Mean | N | SD | F | Sig. | Effect size |
|-----------------------|-----------------------|------------------------|----|------|-------|------|-------------|
| Overall self-efficacy | Low | 2.74 | 31 | 0.19 | 6.17 | .01 | -.63 |
| | High | 2.89 | 40 | 0.27 | | | |
| Planning | Low | 2.77 | 36 | 0.23 | 3.47 | .06 | -.45 |
| | High | 2.88 | 35 | 0.26 | | | |
| Involvement | Low | 2.73 | 35 | 0.21 | 10.27 | .00 | -.78 |
| | High | 2.91 | 36 | 0.25 | | | |
| Interaction | Low | 2.71 | 36 | 0.20 | 16.66 | .00 | -.97 |
| | High | 2.93 | 35 | 0.25 | | | |
| Assessment | Low | 2.78 | 36 | 0.22 | 2.01 | .16 | -.37 |
| | High | 2.87 | 35 | 0.27 | | | |

Regarding the effect size, as estimated by Cohen (1988), the differences between learning outcomes and overall self-efficacy dimensions, Involvement and Interaction are great.

This is quite different in the Planning and Assessment dimensions, where the mean difference between those students of teachers with low and high self-efficacy does not reveal significant differences in perceived learning.

5. Conclusions

From the analyses in this study we can conclude that the perceived self-efficacy of teachers from both universities, Deusto and Temuco, is very high. And it is particularly high in those strategies related to Planning and to the Interaction with students and somewhat lower in those strategies related to Student's active involvement and to the Assessment of their learning and their own teaching practice. Similar results were found in a study conducted by Prieto (2005).

These data indicate that beliefs are not necessarily uniform in the various tasks required of teachers in their professional practice. This conclusion is backed by the theory proposed by Bandura (1997) and Zimmerman (1996), focused on how self-efficacy varies depending on the activity or task faced by teachers.

It is further noted that nationality marks significant differences in teachers' self-efficacy levels. Teachers from Chile had a higher level both in Overall Self- efficacy and in the dimensions related to Student Involvement in Learning, Interaction and Assessment than Spanish teachers.

Similar results were derived from the Teaching and Learning International Survey (TALIS) run by the OECD, which concluded that Spanish teachers' self- efficacy beliefs are usually low in comparison with those of other countries. This may be partly due to the self-critical character of Spanish teachers (Ministerio, 2009).

Teachers' self-efficacy beliefs are significantly, but moderately related to students' perceived learning, except in the Planning and Assessment dimensions.

Teachers' self-efficacy beliefs in general and in the Involvement and Interaction dimensions have a significant, positive, and moderate correlation

with students' perceived learning outcomes, but not with the Planning and Assessment dimensions.

Teachers with higher levels of overall efficacy have students with higher perceived learning levels than teachers with lower self-efficacy levels.

It can be observed that, as teachers feel more confident when successfully performing the tasks analysed, students also have a higher perception of their learning achievement, except in the tasks related to Planning and Assessment, where the level of perceived efficacy does not affect students' perceived outcomes.

This study could be completed in future research that took into account not only the level of perceived self-efficacy but also the use teachers make of the teaching strategies in the classroom. Thus, in addition to perceptions, we would have data derived from direct observation of teaching.

Similarly, this study could be further enriched with evidence of learning undertaken by students and not only with their perception of learning.

Teachers' tendency to teach according to their self-efficacy beliefs raises a reflection on practical proposals for the development of training programmes for university lecturers.

Due to the enormous influence that this construct has on student teaching and learning, it is essential to create a high sense of efficacy from the teachers' initial training since, according to the authors, once the perception of efficacy is established in teachers' belief system, this tends to be stable and resistant to change (Achurra & Villardón, 2012; Chacón, 2004; Pajares 1992; Woolfolk, Hoy, & Murphy, 2001).

A possible training intervention in all dimensions, but especially in relation to the Assessment dimension, an area where teachers have a weaker sense of self- efficacy, might improve and strengthen beliefs, thus affecting the quality of university education.

However, despite the relevance that teachers' self-efficacy beliefs may have in teaching, they alone do not guarantee the effectiveness of teaching. They must have the knowledge and skills needed to help students to achieve the desired learning outcomes. The fact of considering oneself capable of teaching does not guarantee by itself the quality of teaching; knowledge, training and teaching skills are essential in any case to promote student learning.

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