



Article

A Path Model of University Dropout Predictors: The Role of Satisfaction, the Use of Self-Regulation Learning Strategies and Students' Engagement

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Abstract: University dropout is a phenomenon that is a concern in many countries all over the world. However, although there are studies in which the direct relationship of the personal and contextual variables is observed individually to predict dropout, there is little research to know whether any of these variables mediate each other in a more dynamic and complex model. Thus, the objective of this study was to analyze the extent to which the intention to drop out of university courses is predicted by (i) satisfaction and expectations with the course, (ii) engagement with the course, and (iii) by the use of Self-Regulated Learning (SRL) strategies. Eight hundred and seventy-seven students from two Spanish universities completed the CARE questionnaire. Path analyses were performed using Mplus 8.3. The data obtained indicate that the intention to drop out is directly and significantly explained by students' engagement (in 17.8%) and indirectly explained by the use of SRL strategies through engagement. Changes in engagement and in the use of SRL strategies were seen to be associated with satisfaction. Finally, the effect of satisfaction and the use of SRL strategies explained a proportion of students' engagement (53.6%). It is important for research or interventions focused on students' intention to drop out to understand that there are multiple variables that both directly and indirectly influence those intentions.

Keywords: higher education; dropout; satisfaction; learning strategy; regression analysis



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1. Introduction

With the creation of the European Higher Education Area (EHEA), university students became more responsible for their own learning processes and were considered autonomous, self-managed, self-regulated subjects. This autonomous character was most fully realized in the adoption of the European Credit Transfer System (ECTS) as the unit of measurement of academic credit. In Spain, Royal Decree 1125/2003 affirmed both the conceptual reformulation of how the higher education curriculum was organized, suggesting new models focused on the student's work, and a new measure incorporating theoretical and practical teaching, as well as other directed academic activities that the student must do in order to achieve the objectives in each of the subjects in the corresponding study plan [1]. In other words, the effective work of the student is considered an end to successfully pass the subjects of their study plan.

Since the implementation of the EHEA, dropout or completion of university courses has been considered a quality indicator for universities. Because of this, and because of the numerous negative consequences of dropping out, research to determine the causes of the phenomenon has proliferated in recent years. According to the Spanish government [2], university dropout affects 21.8% of the students in our country. In addition, 8.7% of students change their degree in their first year, which indicates that 30.5% of students who begin a

particular university degree in our country do not finish it. In universities with in-person teaching, this percentage falls to 25.4%, whereas in non-in-person universities it rises to 54.3%. These figures are worrying, since Spain has a much higher dropout rate than other European countries. According to data from the Organization for Economic Cooperation and Development [3], member countries can be split into three groups depending on their dropout rates, with Spain being in the group with the highest rate (over 15%) along with Canada, Ireland, and the United Kingdom.

Because of this, one of the main objectives of the Spain 2050 Strategy is that by 2050, half of the country's population will have access to higher education. However, no measures have been established with regard to prevention of university dropout, something that must be addressed as access to higher education increases. Greater access to higher education means a more diverse student population, some of whom will lack the personal resources and competencies needed to adapt to the new context. In addition, the Spain 2050 Strategy also emphasizes the problem of student demotivation. Spain is one of the countries with the highest ratings for students' sense of belonging at school. However, this feeling disappears rapidly, with the student satisfaction levels in secondary and higher education being much lower than the EU average. This progressive disaffection is both a cause and consequence of the problems mentioned above, from the high level of dropout to low academic performance [4].

1.1. Variables Associated with University Dropout

Determining the causes of university dropout is not a simple task, because, as various studies have reported, there is no single variable to predict why it happens. Instead, there are multiple variables interacting with each other [5]. Various models have emerged to explain the variables related to the phenomenon. Psychological, academic, sociological, economic, and organizational variables are some of the most commonly studied variable types [6]. Many are variables that are directly related to the student, such as SRL strategies, course satisfaction and expectations, and engagement.

Within SRL strategies, some of the most influential constructs in student academic performance in higher education are time management, effort regulation, and metacognitive self-regulation [7]. The use of SRL strategies has been frequently studied in relation to university students' intention to drop out. Several studies have shown that students who have a strategic approach to the demands of self-regulated learning are less likely to drop out of university [8–11].

However, one of the most interesting findings in the current literature is the relationship between the use of self-regulation strategies and satisfaction with courses and previous expectations for the course. Studies such as Lim et al. [12] found that students' use of SRL strategies had a positive, statistically significant effect on satisfaction with learning. Furthermore, the findings also demonstrated that the influence of peer learning on learning satisfaction was fully mediated by SRL strategies. Similar results were reported by Li [13] from a sample of 4503 students, who found that increased use of SRL strategies improved satisfaction. Use of SRL strategies is also considered one of the most important predictor variables in explaining the intention to remain, as well as perceptions of self-efficacy [14], which in turn is one of the variables that usually explains engagement, a variable that will be explained below [15].

Course engagement is another variable that has recently been associated with the use of SRL strategies. Engagement is understood as the set of manifestations of motivation by students arising from the satisfaction of needs for competence, autonomy, and relationships in the learning context [16]. For Schaufeli and Bakker [17], engagement refers to a more persistent and influential affective–cognitive state that is not focused on a particular behavior. It is made up of three dimensions: vigor, which is characterized by a willingness to devote effort to a task and to persist in the face of difficulties; dedication, which refers to being strongly involved and to experiencing a sense of excitement, inspiration, pride,

challenge, and meaning; and absorption, which is characterized by fully concentrating on and being happily immersed in tasks in such a way that time passes quickly.

As explained above, several studies have analyzed the influence of SRL strategies on engagement, and they are considered to be closely related constructs due to their nature [18]. The importance of these relationships has grown in the literature, which has shown that students who receive instruction in SRL strategies (such as goal setting or time management, among others) have greater engagement and exhibit better academic performance [19–21]. In addition, several studies with university students have shown that the level of student engagement is a strong predictor of the intention to drop out [22,23], with students scoring more highly in engagement exhibiting less intention to drop out of their university courses.

Both constructs have been considered not only when differentiating between more and less effective students and in explaining academic success, but also in order to highlight the active role of the individual in their teaching–learning process. However, although these constructs have been analyzed separately to predict the intention to drop out of university, almost no studies have looked at these variables together to explain the phenomenon.

1.2. Objectives and Hypotheses

The main objective of the present study was to analyze the extent to which the intention to drop out of university, or to drop out and switch courses, is predicted by (i) satisfaction with the course being done and the expectations about it, (ii) course engagement, and (iii) the use of self-regulated learning strategies. In pursuit of this objective, we formulated a set of hypotheses that give rise to the path model (Figure 1). The model specifies that (1) the intention to drop out is directly associated with the use of SRL strategies and student engagement (the greater the use of SRL strategies and engagement, the lower the intention to drop out), (2) intention to drop out is indirectly associated with satisfaction and expectations through the use of SRL and engagement strategies (the higher the satisfaction and expectations, the greater the use of SRL and engagement strategies and the lower the intention to drop out), and (3) the use of SRL strategies is directly associated with engagement (the greater the use of SRL strategies, the greater the engagement).

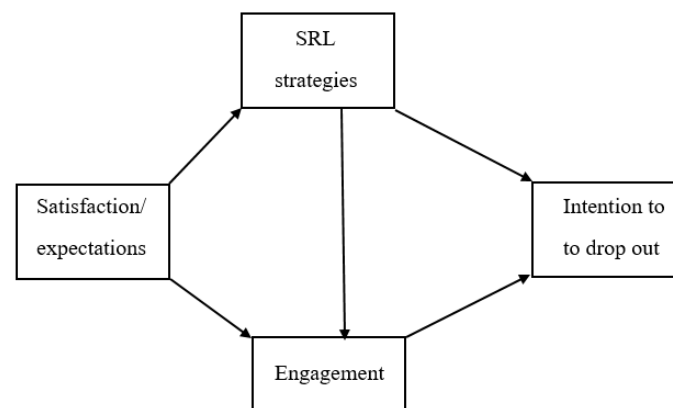


Figure 1. Hypothesis of the prediction model of university dropout considering course satisfaction and expectations, SRL strategies, and engagement.

2. Materials and Methods

2.1. Participants

Eight hundred and seventy-seven students from two Spanish universities participated in the study. Most were women (78.3%) in the first two years of various degree courses (i.e., psychology, speech therapy, early childhood education, primary education, social work, accounting and finance, and business administration). Most of the students were aged 18 to 19 years old ($M = 19.09$; $SD = 2.46$). A quarter (25.4%) of the participants had at some point thought about changing course and 24.9% had considered dropping out. Participants were identified and selected via non-probabilistic snowball-type sampling.

2.2. Instruments

An ad hoc questionnaire called the CARE questionnaire was created to collect personal and sociodemographic variables (sex, age, university, and current degree, among others), students' intention to drop out, course satisfaction and expectations, use of SRL strategies, and student academic engagement.

1. For Intention to drop out, participants were asked whether they had ever intended to (a) drop out (switch to another course) or (b) drop out of university altogether, to which they gave dichotomous responses (1 = No, 2 = Yes).

2. Satisfaction and Expectations was measured by four items from the satisfaction and expectations block in the Questionnaire for dropping out of university [24]. Responses were given on a five-point scale (1 = Completely disagree to 5 = Completely agree). Examples of items include "I am satisfied with the degree" and "The degree meets the expectations I had about it." The measure has good reliability ($\alpha = 0.81$; $\omega = 0.81$).

3. Self-Regulated Learning (SRL) was measured by six items from the self-regulation block in the Questionnaire for dropping out of university [24]. Examples of these items include "Before starting to study I set goals" and "I organize my study session according to difficulty." Responses were given on a five-point scale (1 = Completely disagree to 5 = Completely agree). The six items give an overall measure of SRL with acceptable reliability ($\alpha = 0.75$; $\omega = 0.75$).

4. Student Engagement (SE) was measured by the 17 items from the Utrecht Work Engagement Scale (UWES-S; ref. [17]), adapted to university students. Responses were given on a six-point scale (1 = Never to 6 = Always). Examples of items include "I forget everything that happens around me when I am absorbed with my studies," "I feel strong and vigorous when I am studying or going to classes," and "It is difficult for me to disengage from my studies." We used the general engagement index in the present study ($\alpha = 0.90$; $\omega = 0.90$).

2.3. Procedure

The Responsible Research and Innovation Subcommittee of the Research Ethics Committee of the University of Oviedo gave approval, allowing the necessary permits to be obtained for the study. Recruitment of participants was randomized in an ex-post fact study and teachers were asked to collaborate. Following that, the students (preferably first and second year) completed the questionnaire online using Google Forms. We included text informing the students of the study objective and assuring them of the confidentiality of their data, in compliance with data protection and the usual ethical requirements.

2.4. Data Analysis

Analyses were done using Mplus 8.3 [25] and the WLSMV estimator (since the variable "intention to drop out" is categorical). Firstly, the descriptive statistics and the correlations between the variables were calculated to decide the analytical approach best suited to the study objective. We followed Finney and DiStefano's [26] criteria of statistical normality, which sets ± 2 and ± 7 as the limits for skewness and kurtosis, respectively. No significant missing data were found; hence, the missing values were dealt with using the multiple imputation procedure. We then performed a path analysis to analyze the role of satisfaction, the use of SRL strategies, and engagement in predicting intention to drop out. The model was evaluated using the most commonly used statistical measures and indexes as criteria: chi-square (χ^2) and its associated probability (p), TLI (Tucker–Lewis Index), CFI (Comparative Fit Index), RMSEA (Root Mean Square Error of Approximation), and WRMR (Weighted Root Mean Square Residual) to assess the fit of the path model. The model shows a good fit when TLI and CFI ≥ 0.95 , and RMSEA and WRMR ≤ 0.06 . Cohen's d was used to calculate the effect size of the relationships included in the model: no effect ($d < 0.09$), small effect ($d = 0.10$ to 0.49), medium effect ($d = 0.50$ to 0.79), and large effect ($d \geq 0.80$).

3. Results

3.1. Preliminary Analysis

Table 1 shows the descriptive statistics and Spearman's correlation coefficients. Data analyses show univariate and multivariate normality (kurtosis = 1.161, $t = 1.239$, $p > 0.05$). All correlations were statistically significant at $p < 0.001$. The variables "satisfaction", "engagement", and "use of SRL strategies" were positively related to each other and negatively related to the intention to drop out. Finally, the intention to drop out of the degree (switch to another) and the intention to drop out of university altogether were positively, closely correlated.

Table 1. Descriptive statistics and Spearman's correlation coefficients.

| | 1 | 2 | 3 | 4 | 5 |
|-------------------|-----------|-----------|-----------|----------|--------|
| 1. Sat._Exp. | — | | | | |
| 2. Stud._Eng. | 0.612 ** | — | | | |
| 3. SRL Strategies | 0.352 ** | 0.520 ** | — | | |
| 4. IDO_Degree | −0.468 ** | −0.380 ** | −0.172 ** | — | |
| 5. IDO_University | −0.387 ** | −0.365 ** | −0.201 ** | 0.767 ** | — |
| M | 3.956 | 3.890 | 3.787 | 1.254 | 1.218 |
| SD | 0.637 | 0.760 | 0.568 | 0.436 | 0.432 |
| Skewness | −0.744 | −0.559 | −0.221 | 1.131 | 1.165 |
| Kurtosis | 0.968 | −0.523 | −0.071 | −0.724 | −0.643 |

Note: Sat._Exp. (satisfaction and expectations); Stud._Eng. (student engagement); SRL Strategies (self-regulated learning strategies); IDO_Degree (intention to drop out of the degree/switch to another course); IDO_University (intention to drop out of university altogether); IDO_Degree and IDO_University (1 = no; 2 = yes); Sat._Exp. and Stud._Eng. (min. = 1; max. = 5); SRL Strategies (min. = 1; max. = 6). ** $p < 0.001$.

3.2. Predictors of Dropout

The initial path model did not have a good fit, neither in predicting dropping out of the degree course (switching to another course) ($\chi^2(1) = 41.91$; $p < 0.001$; TLI = 0.747; CFI = 0.958; RMSEA = 0.216 (0.163–0.274); WRMR = 0.040) nor in predicting dropping out of university altogether ($\chi^2(1) = 107.22$; $p < 0.001$; TLI = 0.395; CFI = 0.899; RMSEA = 0.348 (0.294–0.405); WRMR = 0.063). The model was re-specified as follows. Firstly, close examination of residuals and modification indexes indicated the need to include a direct effect of satisfaction and expectations on intention to drop out. Secondly, considering the significance of the estimated effects, due to the absence of statistical significance, the effect of SRL strategies on intention to drop out was eliminated from the model. The final model with these modifications fitted the data well, both in predicting dropping out of the degree course ($\chi^2(1) = 1.223$; $p > 0.05$; TLI = 0.999; CFI = 1.000; RMSEA = 0.016 (0.000–0.093); WRMR = 0.067) and predicting dropping out of university ($\chi^2(1) = 0.001$; $p < 0.001$; TLI = 1.000; CFI = 1.000; RMSEA = 0.001 (0.000–0.990); WRMR = 0.009).

Tables 2 and 3 give information on the relationships between the variables in the final path models (degree dropout and university dropout) and their size, direction, and statistical significance.

Table 2. Results of the final path model fit of the intention to drop out of university altogether (direct and indirect effects).

| | Estimate | SE | T | p | Cohen's d |
|--------------------------------------|----------|------|--------|--------|-----------|
| Direct Effects | | | | | |
| Engagement → Intention to drop out | −0.265 | 0.09 | −4.539 | <0.001 | 0.31 |
| Satisfaction → Intention to drop out | −0.314 | 0.08 | −5.747 | <0.001 | 0.40 |
| Satisfaction → Engagement | 0.534 | 0.03 | 22.521 | <0.001 | 2.34 |
| SRL strategies → Engagement | 0.339 | 0.04 | 13.049 | <0.001 | 0.98 |
| Satisfaction → Engagement | 0.374 | 0.03 | 12.957 | <0.001 | 0.97 |

Table 2. Cont.

| | Estimate | SE | T | p | Cohen's d |
|---|----------|------|--------|--------|-----------|
| Indirect Effects | | | | | |
| Satisf. → Engag. → Intention to drop out | −0.141 | 0.06 | −4.462 | <0.001 | 0.31 |
| Satisf. → Engag. → SRL → Int. to drop out | −0.034 | 0.02 | −4.098 | <0.001 | 0.28 |

Note: Estimate (standardized coefficients).

Table 3. Results of the final path model fit of the intention to drop out of the degree course (switch to another course) (direct and indirect effects).

| | Estimate | SE | T | p | Cohen's d |
|---|----------|------|--------|--------|-----------|
| Direct Effects | | | | | |
| Engagement → Intention to drop out | −0.137 | 0.09 | −2.438 | <0.015 | 0.17 |
| Satisfaction → Intention to drop out | −0.512 | 0.10 | −9.802 | <0.001 | 0.70 |
| Satisfaction → Engagement | 0.535 | 0.03 | 22.660 | <0.001 | 2.38 |
| SRL strategies → Engagement | 0.336 | 0.04 | 12.992 | <0.001 | 0.98 |
| Satisfaction → Engagement | 0.374 | 0.03 | 12.957 | <0.001 | 0.97 |
| Indirect Effects | | | | | |
| Satisf. → Engag. → Intention to drop out | −0.073 | 0.06 | −2.423 | <0.015 | 0.16 |
| Satisf. → Engag. → SRL → Int. to drop out | −0.017 | 0.01 | −2.371 | <0.018 | 0.16 |

Note: Estimate (standardized coefficients).

The data from this study indicate that most but not all of the initial hypotheses were confirmed. We confirmed that (a) the greater the satisfaction with the course, the greater the use of SRL strategies, the greater the student engagement, and the lower the intention to drop out; and (b) the greater the use of SRL strategies, the greater the student engagement and the lower the intention to drop out. We could not confirm that the intention to drop out is directly related to the use of SRL strategies. Figure 2a,b shows the direct effects.

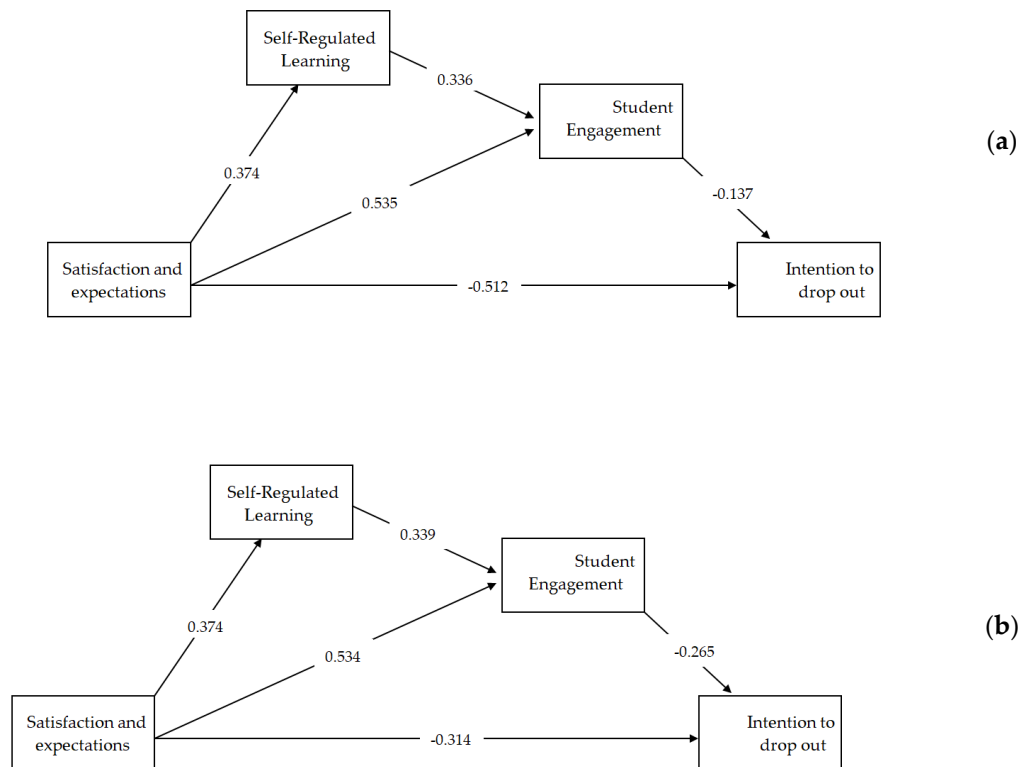


Figure 2. Final path model of dropout predictors: (a) degree studies, (b) university studies (1 = no, 2 = yes). All estimated effects are statistically significant at $p < 0.001$.

Other aspects to highlight are that in both types of dropout, the effect of satisfaction with the course on student engagement was very large. Likewise, the effect of satisfaction on the use of SRL strategies was also large. However, whereas in dropping out of a degree (to switch to another) the effect of satisfaction on the intention to drop out was close to large, in dropping out of university altogether it was only close to medium. Another difference is that the effect of engagement on the intention to drop out was greater in the intention to drop out of university altogether than to drop out and switch to another degree. Finally, the indirect effect of satisfaction with the course on the intention to drop out was statistically significant in both cases, but greater in dropping out from university altogether.

As for the total prediction, in both models, the amount of the explained variance of student engagement (university: $R^2 = 0.536$; degree: $R^2 = 0.536$), use of SRL strategies (university: $R^2 = 0.140$; degree: $R^2 = 0.140$), and intention to drop out (university: $R^2 = 0.178$; degree: $R^2 = 0.249$) were statistically significant at $p < 0.001$.

4. Discussion

Dropout theories in higher education have highlighted the importance of considering the interaction between multiple variables [5,6,11]. However, although some of the most important variables have been analyzed separately to predict the intention to drop out of university courses, practically no studies have addressed these variables together to explain the phenomenon. The main objective of the present study was to analyze the extent to which the intention to drop out of university altogether or to switch to another course is predicted by course satisfaction and expectations, engagement, and the use of SRL strategies.

Considering our initial hypotheses, we can conclude that the intention to drop out is not directly related to the use of SRL strategies as we proposed. This contrasts with the results from Bernardo et al. [27], who used a sample of 1037 university students and found that those who had been trained in SRL strategies had the least intentions of dropping out. Along similar lines, the study by Castro-López et al. [10], with 1912 university students, showed that there was a direct relationship between university dropout and the use of SRL strategies (the greater the use of SRL strategies, the lower the university dropout). However, when the analyses were carried out through a classification tree in which other variables were taken into account, they noted that the use of SRL strategies worked as a modulating variable, such that it compensated for the students who felt dissatisfied with their choice of degree. Those who scored negatively on this variable but positively on the use of SRL strategies still had a lower probability of dropping out of the course (46%). However, there are few studies that have analyzed the direct effect of SRL strategies on university dropout, and it is more common for them to have analyzed the effect via academic performance, such that the greater the use of SRL strategies, the better the academic performance and, therefore, the less likely the student is to drop out [28–30].

However, our other two hypotheses were accepted. The first is that the greater the satisfaction with the course, the greater the use of SRL strategies, the greater the student engagement, and the lower the intention to drop out. The second is that the greater the use of SRL strategies, the greater the student engagement and the lower the intention to drop out. Although, as noted in our introduction, there are no studies in which the mediating effect of these variables has been observed when predicting college dropout, what we do know, and what our study indicates, is that the influence of SRL strategies on engagement has been studied and has revealed that those students who receive instruction in SRL strategies have greater engagement [19,20,31,32]. Furthermore, we also know that satisfaction with the degree course is one of the variables that best predicts the intention to drop out, with those students who are least satisfied with their degree being the most likely to drop out [33,34]. Satisfaction is also associated with academic performance, so the greater the satisfaction with the course, the higher the academic performance [35].

Although it is true that there are multiple variables that interact to predict dropping out, many studies have observed direct effects between the different variables, but not the mediating effects between them and dropping out.

Finally, although the amount of variance explained by the intention to drop out by the variables included in the model (satisfaction with the course, use of SRL strategies, and student engagement) is statistically significant, it is very small. Clearly, this indicates that the intention to drop out is due to the effects of conditions (personal, family, economic, academic) other than the levels of these three predictor variables (satisfaction with the course, use of SRL strategies, and student engagement). Future research should look more deeply into what these variables are, since action that must be taken in response at different levels (institutional, academic, personal guidance, etc.) depends largely on that.

5. Conclusions

We can conclude that university dropout is a phenomenon of growing interest in current research. However, it is still necessary to continue to study it in more depth since there are multiple variables that interact with each other to predict it. Thus, although we found that satisfaction with the course, the use of SRL strategies, and student engagement are variables that serve to predict whether students intend to drop out or not, there is still very little research into them that considers each of these variables in a single model. Such a model could help us to understand which of these variables has greater weight, as well as the direct and indirect relationships with the intention to drop out. The present study provides some results to help continue studying the phenomenon in a much more integrated manner, but it is still necessary for future research to look into it more deeply.

6. Limitations

This research has some limitations. Firstly, although the sample represents a significant population, it is limited to two educational institutions, which limits how much the results may be extrapolated to different contexts. For this reason, the results contribute to suggesting the indicated relationships and the proposed explanations that may be examined more thoroughly in later research.

Secondly, some variables were not considered in this study that should have been. Academic performance and perceived self-efficacy are variables that have been considered when studying variables such as SRL strategies. Not including them might have caused us to miss an opportunity to observe how the other variables interact with them. Future research should take these aspects into account in order to improve the study of the variables that influence the intention to drop out of university courses.

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Institutional Review Board Statement: This research was carried out considering the international protocols for scientific research, and in particular, in accordance with the requirements of the Declaration of Helsinki for research with human beings and Organic Law 3/2018, of 5 December, on Protection of Personal Data and ensuring digital rights. In addition, we had the explicit permission of each participant to use their data for scientific research, with their anonymity and confidentiality assured. This research was approved by the Subcommittee for Responsible Research and Innovation of the Research Ethics Committee of the University of Oviedo on 18 May 2021 (Approval Code: 3_RRI_2021).

Informed Consent Statement: The data collected in this study are anonymous and all content is confidential in accordance with Organic Law 3/2018 on the protection of personal data and guarantee of digital rights. By submitting the completed questionnaire, the students stated being informed about the purpose of the study and agreed to participate in it. Likewise, they acknowledge having been informed that the data will be protected and will be subject to anonymity and confidentiality throughout the investigation process.

Conflicts of Interest: The authors declare no conflict of interest.

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