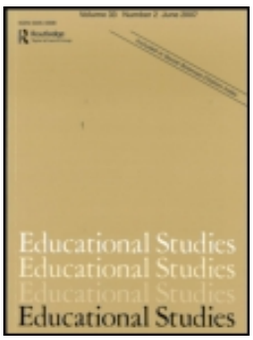

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ISSN: 0305-5698 (Print) 1465-3400 (Online) Journal homepage: https://www.tandfonline.com/loi/ceds20

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To cite this article: Lola C. Duque , Juan C. Duque & Jordi Suriñach (2013) Learning outcomes and dropout intentions: an analytical model for Spanish universities, Educational Studies, 39:3, 261-284, DOI: 10.1080/03055698.2012.724353

To link to this article: https://doi.org/10.1080/03055698.2012.724353

Educational Studies, 2013
Vol. 39, No. 3, 261–284, http://dx.doi.org/10.1080/03055698.2012.724353

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Learning outcomes and dropout intentions: an analytical model for Spanish universities

Lola C. Duque[a], Juan C. Duque[b]* and Jordi Suriñach[c]

[a]*Department of Business Administration, Carlos III University of Madrid, Getafe 28903, Spain;* [b]*Research in Spatial Economics (RiSE-group), EAFIT University, Medellín 050022, Colombia;* [c]*AQR-IREA, University of Barcelona, Barcelona 08034, Spain*

The dropout rate among Spanish university students is very high compared to the European mean, creating a pressing need for the introduction of policies and programmes aimed at increasing rates of persistence. In this article, we study this problem by combining students' perceived learning outcomes with their dropout intentions, and we propose a research model that considers subjective factors that might impact this decision. The model is estimated for two degree courses: Business Administration and Nursing. The estimation method uses structural equations based on the partial least squares algorithm. This allows the construction of indices for the variables of interest, enabling us to make comparisons between courses and over time. To reduce dropout intentions, efforts need to be focused on obtaining better cognitive outcomes, as well as on achieving a higher level of student satisfaction with their university experience.

Keywords: dropout intentions; student perceptions; higher education; learning outcomes

1. Introduction

Thirty per cent of university students in Spain fail to finish their degree, as opposed to an average of 16% in the 15 states of the European Union (Michavila 2006). Cabrera, Bethencourt, et al. "El Problema" (2006) present similarly high figures indicating a dropout rate in Spain of around 50% (organisation for Economic Cooperation and Development, OECD) or between 30 and 50% (*Ministerio de Educación y Ciencia*, MEC). Some reports claim that only 44% of Spanish students manage to finish their studies (*Industrial Research and Development Advisory Committee of the European Commission*, IRDAC). These figures show the pressing need for the introduction of policies and programmes aimed at increasing rates of persistence and attainment among university students in the Spain's education system.

This article seeks to undertake a comprehensive examination of this problem in an attempt to shed greater light on university dropout rates. In doing so, here, we study student dropout intentions and learning outcomes simultaneously. To identify the factors that impact on these variables, we consider the traditional elements studied in the literature, but we also incorporate less frequently studied theories in this context, including those of student involvement and satisfaction. Our study uses econometric tools, developed in the field of psychometrics, which enable us to go beyond a merely

*Corresponding author. Email: jduquec1@eafit.edu.co

descriptive analysis and to generate results that are directly applicable in the design of policies and programmes for minimising dropout intentions among university students. Although the study is conducted with the Spanish universities, the model and strategy can be applied to other geographical contexts. The inherent interest of this paper lies in the model proposed, the estimation procedure followed and the conclusions reached, which in the main can be extrapolated to any university system.

The measurement of learning outcomes (*cognitive* – academic knowledge and skills and *affective* – values, attitudes and behaviour) and rates of student dropout and attainment has been widely studied in the literature. However, few studies have examined both issues simultaneously. Edel's (2003) conceptual study suggests that poor academic achievement is the main explanatory variable of students' falling behind in their studies, school dropout and ultimate success rates. Bean (1985) proposes and tests a conceptual model of student socialisation in which he jointly analyses academic, social and personal outcomes, and their relationship with the intent to drop out of college. He concludes that this last variable is the best predictor of college student dropout syndrome. For this reason, here we focus our study on student dropout intention, which has the additional advantage of allowing us to collect data from students currently enrolled at university.

Among the recurring variables that help explain this phenomenon, we find a range of educational, psychological and environmental factors. Other factors, which have not attracted the same degree of research interest in this context, also emerge as determinants of school performance and the intent to drop out. Astin (1999), for example, proposes a theory of student involvement (effort and dedication), while the confirmation of expectations, widely studied in the service marketing literature, can be seen as another determinant of student satisfaction with the university experience. We, therefore, consider it worthwhile evaluating the contribution of these two variables (confirmation of expectations and student satisfaction) in our study of student performance and their intent to drop out. Duque (2005) reports that student involvement in their educational process (co-production) has a positive impact on learning outcomes, and these in turn affect student satisfaction.

Finally, it should be stressed that perceptive (subjective) variables explain in great measure behavioural intentions. Thus, for example, Lizzio, Wilson, and Simons (2002) find that a student's perception of the learning environment was a stronger predictor of academic outcomes than the student's prior academic record. Thus, our approach here is oriented more to the study of various perceptive factors, as opposed to one based strictly on objective information (school grades and socio-economic variables) as the sole determinants of university dropout.

Additionally, a number of findings from studies conducted in Spain point to the need to analyse other variables so as to complete our study. Salanova et al. (2005) examined how a range of facilitating factors and academic obstacles affect academic dropout. The application of this model indicates that the obstacles, principally of a material and organisational nature, negatively impact student performance, leading to eventual dropout. By contrast, facilitating factors of a social and motivational nature positively impact academic success. Royuela and Vayá (2005) and Bolancé and Guillén (2006) find that students who at high school studied subjects that made similar demands on them to those on the degree course were much less likely to drop out (higher rate of persistence). Similarly, having chosen the course as their first option reduced the possibility of dropout. Cabrera, Bethencourt, et al. "Un Estudio" (2006) studied the impact of various factors on dropout, the prolongation

of time spent studying and the completion of the degree course. They reported that variables related to the student and the learning environment were the most relevant. Among the former, they highlight psychological characteristics (motivation, academic record, course satisfaction and adequate capabilities) and the strategies and tools of intellectual study (use of adequate techniques, attendance at lectures and tutorials and the undertaking of complementary activities). Among the latter, variables associated with the learning environment, they stress the specific characteristics of the degree course, the organisation and the teaching faculty.

Thus, existing evidence of the causes and factors that influence university dropout in Spain has allowed us to identify a set of explanatory factors that we use to build our conceptual (and empirical) model and which we test in this study. The rest of the article is organised as follows: Section 2 describes the methodology employed in the study, Section 3 presents the questionnaire used for gathering data, Section 4 reports the results and Section 5 outlines the main conclusions to be drawn from the study.

2. Methodology

2.1. Conceptual model and working hypotheses

Based on the preceding discussion, we have developed a research model (Figure 1) that relates nine variables of interest. Using this model, we shall test various hypotheses regarding learning outcomes and dropout intentions. The variables are:

Perceived quality: This is the consumer's overall impression of the relative inferiority/superiority of the organisation and its services (Bitner and Hubbert 1994). In higher education, the corresponding dimensions would be *quality of education* and *quality of educational resources* (Duque 2005).

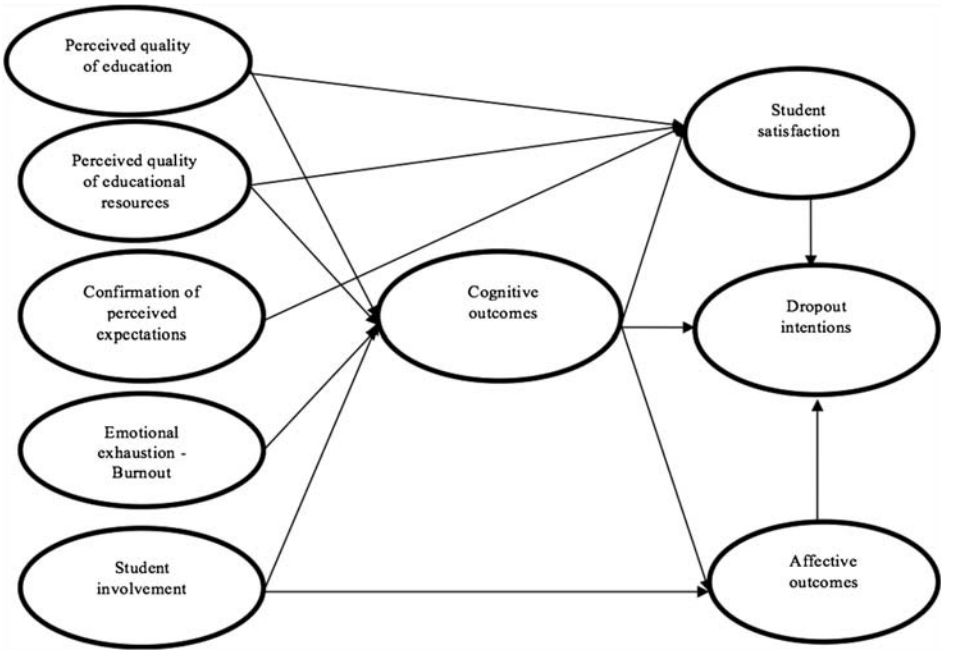

Figure 1. Research model.

Confirmation of perceived expectations: This compares a priori expectations of the service with its actual performance or results; hence, the consumer will perceive that performance either exceeds or falls short of these expectations (Oliver 1980).

Emotional exhaustion: This comprises one of the three components of the burnout syndrome, together with cynicism or a loss of interest in what one is doing, and a lack of professional efficacy or of personal fulfilment (Salanova et al. 2005). Students report feelings of fatigue, frustration, exhaustion and disillusionment with their studies (Neumann, Finaly-neumann, and Reichel 1990; Schaufeli et al. 2002).

Student involvement: Students need to be co-creators of their educational experience and achievements (Astin 1999; Hill 1995).

Cognitive outcomes: These represent the specific knowledge and skills of learning that students acquire during their educational experience (Frye 1999).

Affective outcomes: These reflect how the educational experience impacts on the students' values, goals, attitudes, self-concepts, world-views and behaviour (Frye 1999).

Students' overall satisfaction: The students' overall (dis)satisfaction with the organisation is based on all encounters and experiences with that particular organisation (Bitner and Hubbert 1994).

Dropout intention: This is the intent, conscious and openly discussed, to leave university/abandon one's studies produced by genuine exhaustion (Bean 1985).

The model itself postulates the existence of causal relations between the variables of interest, which formally constitute the following working hypotheses.

H1: A student's intent to drop out is influenced, negatively by her cognitive and affective outcomes, and also by her level of satisfaction with the overall university experience.

H2: A student's cognitive outcomes are determined by her perceived quality of education and educational resources, the confirmation of her a priori expectations of the degree, negatively by emotional exhaustion, and her involvement in the learning process.

H3: A student's satisfaction is influenced by her perceived quality of education and educational resources, the confirmation of her a priori expectations of the degree and her cognitive outcomes.

H4: A student's affective outcomes are influenced by her cognitive outcomes and by her involvement in the educational process.

2.2. Structural equation model using the partial least squares algorithm

Most of the variables used in the conceptual model comprise student perceptions, which mean they must be treated as latent variables (i.e. they cannot be measured directly or objectively). They can be measured indirectly using various indicators that are formulated either as survey questions or statements. These indicators constitute the measurement model, while the relations between the latent variables constitute the structural model.

Table 1 presents the equations used to represent the two models, where ξ and η are the latent variables of the structural model. The exogenous latent variables (ξ) are: *qualityE* (quality of education); *qualityR* (quality of educational resources); *confirmex* (confirmation of perceived expectations); *burnoutE* (emotional exhaustion); and *involve* (student involvement). The endogenous latent variables (η) are:

Table 1. Method of estimation.

Measurement models	Structural model
$x = \nabla_x \xi + \delta \qquad \xi = \pi x + \delta_\xi$ $y = \nabla_y \eta + \varepsilon$	$\eta = B\eta + \Gamma\xi + v$
where:	where:
x is the vector of manifest variables of ξ	η is the vector of endogenous latent variables
y is the vector of manifest variables of η	ξ is the vector of exogenous latent variables
∇_x is the matrix of weights for ξ	B is the impact or coefficient matrix for η
∇_y is the matrix of weights for η	Γ is the impact or coefficient matrix for ξ
δ is the vector of measurement errors of x	v is the vector of residues of specification
ε is the vector of measurement errors of y	
π is the matrix of weights for ξ – formative scheme	
ξ is the vector of exogenous latent variables	
η is the vector of endogenous latent variables	

resultCo (cognitive outcomes); *satisfac* (overall student satisfaction); *intention* (dropout intentions); and *resultAf* (affective outcomes).

The structural model can be specified as follows (where v is the vector of other factors not included in the model or the error term):

resultCo = f (qualityE, qualityR, confirmex, burnoutE, involve and v_1)
satisfac = f (qualityE, qualityR, confirmex, resultCo and v_2)
intention = f (resultCo, satisfac, resultAf and v_3)
resultAf = f (involve, resultCo and v_4)

In order to estimate the structural model, we have used the partial least squares (PLS) algorithm. This algorithm comprises iterative procedures that generate estimations of the latent variables, so that these estimations or scores can be adjusted within the structural system and to the measurement system (Chatelin, Esposito, and Tenenhaus 2002; Westlund et al. 2001). The algorithm adjusts the weights of the principal components and maximises the predictive power of the model. This method is robust to conditions of non-normality and small sample sizes (Chin and Bauer 2000). Fornell and Bookstein (1982) describe, among other advantages of the PLS estimation, the fact that it is free of identification problems, and free of any distributional requirements as no population assumptions or scale measures are needed.

In the measurement model, as well as the possibility of modelling the latent variables in the reflective scheme (i.e. the observable variables reflect their latent variable), they can also be modelled in the formative scheme (equation on the right-hand side of the first quadrant), where the latent variable is generated by a linear combination of its observable variables. In our study, we treat all the exogenous latent variables (ξ) as formative, and the endogenous latent variables (η) as reflective.

3. Sample and questionnaire

3.1. Sample

Since, as Hernández (2006), among others, points out the rates of dropout, performance and graduation recorded by the universities differ markedly depending

Table 2. Sample by degree course.

University	Business Administration	Nursing
University of Barcelona	171	79
Rovira i Virgili University	54	57
University of Vic	39	56
Open University of Catalonia	20	–
Total	284	192

on the student's chosen academic discipline and also on the university itself, our field study has been conducted with universities that present distinct characteristics and with degree courses from distinct academic disciplines.

The field study was undertaken with a sample of universities from the same region, thereby ensuring that the students present similar socio-economic and demographic characteristics. This avoids any possible bias as a consequence of analysing individuals with quite distinct profiles. We also selected universities with considerably different profiles: the University of Barcelona (UB), the University of Vic (UVIC), the Rovira i Virgili University (URV) and the Open University of Catalonia (UOC). The UB represents the public university system with a large student body and a wide offer of degree courses; the la URV represents the smaller, public university. The UVIC is a private university and represents the universities in medium/small cities; and the UOC is an online university, operating a system of continuous assessment, at which most students combine academic life with work.

Our study focused on two different degree courses: (1) Business Administration, typified by intermediate dropout rates and (2) Nursing, which systematically reports the lowest rates of dropout and the highest rates of performance and graduation. The sample, thus, allows us to consider students of distinct vocational profiles. The questionnaire was administered with students in the first and last years of each degree course and, therefore, at their university. Table 2 summarises the full and effective sample (after removing all incomplete questionnaires) used in the analysis, distinguishing by degree and university.

The minimum sample size required to test the model was determined in line with Cohen (1988), who includes the effect of sample size (f^2) on the strength of results. Using a mean sample effect of $f^2 = 0.15$, an alpha significance level of 0.05, a strength of 0.80 (appropriate for social and behavioural studies) and taking as our reference the greatest number of regressors in the measurement equations, the minimum sample for the analysis needed to be greater than or equal to 117 valid questionnaires per degree course and/or university. Therefore, here, we can estimate the research model for both degree courses, with sample sizes greater than the minimum, but cannot examine the effects of the individual universities.

3.2. Questionnaire

The questionnaire includes questions and scales used in the literature, and also items specifically developed by the authors. Some of the items are reversed coded to better capture the variable "dropout intention". In relation to the students, we obtain information about their demographic characteristics and education; their perceptions as regards both the quality of education and the educational resources; their involvement in the education process; confirmation of their perceived

expectations; their level of burnout in relation to their studies; their level of satisfaction; their dropout or persistence intentions; the reasons why they might have thought of dropping out; their cognitive outcomes; and their affective outcomes. Table 3 presents the variables considered and how they relate with the structural model (below each latent variables, there are the items/questions/statements used to measure it), and Table 4 presents the descriptive statistics of these variables following data collection. The last column in Table 4 shows the ANOVA test conducted for each item: in most cases, it rejects the null hypothesis of identical means between business administration and nursing. These differences highlight the relevance of including both degree courses in our study. In general, nursing students express a more positive perception in aspects related to quality, confirmation of expectations, student's involvement, cognitive and affective outcomes and overall satisfaction. These positive perceptions expressed by nursing students are also reflected in their significantly lower means in aspects related to emotional exhaustion (burnout syndrome) and dropout intentions.

4. Results

Having completed the field study, we tabulated and recoded the information using SPSS software. We then estimated the proposed model using PLS-Graph software. Below, we present the main findings derived from the model for students of Business Administration and Nursing.

4.1. Reasons as to why students have considered dropping out

Of the Spanish students surveyed, 51.1% reported having thought of dropping out of university. Table 5 presents the main reasons for their having had such thoughts. The most usual reasons offered are a mistaken initial choice of degree course, its level of difficulty and the failure of the degree to live up to their expectations (their academic motives), followed by motives unrelated to the university itself (family, work, etc.) and, finally, financial reasons.

The general findings from the two degree courses do not coincide, as is to be expected given the importance of students' academic motives in the decision to dropout or not (financial and family reasons appear to be similar in the two groups of students). The percentage of students that have thought of dropping out is greater in Business Administration (56.7%) than it is in Nursing (42.7%). The main reason stated by Nursing students is financial, while the main motives among students of Business are the mistaken choice and the difficulty of the degree. A possible explanation might be found in the greater vocational motivation of a Nursing degree, and the higher levels of satisfaction and cognitive outcomes obtained in comparison to the degree in Business Administration.

4.2. Results of the model estimation for the two degrees

Figures 2 and 3 show the final model estimates for Business Administration and Nursing, respectively. The arrows indicate the value of the standardised coefficient and its level of significance: 1% (***), 5% (**) and 10% (*). These values are derived from a bootstrap simulation with 100 observations. In general terms, for Business administration, there are eight significant relationships at the 5% level: the

Table 3. Description of variables.

Variable	Description
qualityE	*Quality of education*
QLECT10	Lectures and teachers appear to dominate the subject matter
QCLASS11	Teachers make the classes interesting
QSYLLA12	The course syllabus and class contents appear to be coherently structured
qualityR	*Quality of educational resources*
QINSTA13	The university has installations that facilitate learning
QPRACT14	There are practical activities that prepare us for the labour market
QTIMET15	The class timetable is convenient
QADTIV16	The administrative services and faculty office work efficiently
confirmex	*Confirmation of perceived expectations*
EXINTE22	Intellectual growth (new knowledge and ideas)
EXSYST23	Education system in general (syllabus, classes, methods of assessment, etc.)
EXADAP24	Adaptation to university life
EXTEACH25	Interaction with teachers
EXMILIEU26	Integration in the social milieu and extracurricular activities
EXFRIEN27	Opportunity to make friends or good class mates
burnoutE	*Emotional burnout*
TIRED28	I feel very tired when I finish the day at university
STRESS29	I feel under a lot of stress in the mornings because I have to face another day at university
EXHAUS30	I am emotionally exhausted studying this degree course
STRESSF31	Studying or attending class is stressful for me
BURNT32	I feel burnt out as a result of my studies
involve	*Student involvement*
IMATER17	I have taken steps to expand on the materials presented in class
ICLASSES18	I have attended most classes this year
ILIFEU19	I have integrated well into the cultural and social life of the university
IATTIT20	My attitude towards the course, classes and teachers has been positive
IOPPORT21	I have taken good advantage of the opportunity to study at this university
resultCo	*Cognitive outcomes*
THEOR44	Good level of theoretical knowledge
PRACT45	Good level of practical knowledge
TOOLS46	Concepts, methodologies and useful tools for joining the labour market
KNOWL47	On finishing, I will have sufficient knowledge to do a good job
PPASS48	My percentage of subjects passed is high
satisfac	*Student's overall satisfaction*
SATISE33	Degree of satisfaction with the education received at the university
DEGFAM34	Degree of satisfaction expressed by your family as regards your education
SATOPT35	How does your university compare with one that works very well
SATFIN54	Taking the above into consideration, degree of satisfaction with your education
intention	*Dropout intentions*
KEEPON39	Sometimes, I feel unsure whether to keep on studying year after year
IDEADE40	I have thought about changing to another degree course
IDEADR41	I have thought about the idea of dropping out
SPOKEN42	I have spoken to friends and family about the possibility of dropping out of university

(*Continued*)

Table 3. (*Continued*).

Variable	Description
GOBACK36	If everything goes to plan, I am going back to university next semester (*reversed*)
GRADU37	I hope to graduate from this university (*reversed*)
RECOM38	I would recommend this university to a close friend (*reversed*)
resultAf	*Affective outcomes*
ANAINF49	Skills for using and analysing information
COMMU50	Skills for effective communication (understanding, writing and speaking)
PLANN51	Planning and organisational skills
INTPER52	Points of view and the way in which I interact with others
OUTCPOS53	I think the outcomes of my education are positive

Note: latent variables are in Italics, and items for each latent are listed below.

student's intention to drop out is influenced negatively by satisfaction (H1), the student's cognitive outcomes are determined by the perceived quality of educational resources and the confirmation of a priori expectations (H2), the student's satisfaction is influenced by the perceived quality of education, the confirmation of a priori expectations and by cognitive outcomes (H3) and the student's affective outcomes are influenced by cognitive outcomes and involvement in the educational process (H4). For Nursing, there are six significant relationships at the 5% level: the student's cognitive outcomes are determined by the perceived quality of educational resources and negatively by emotional exhaustion (H2), the student's satisfaction is influenced by the perceived quality of education, the confirmation of a priori expectations and by cognitive outcomes (H3) and the student's affective outcomes are influenced by cognitive outcomes (H4).

The estimation method consists of an iterative process that maximises the predictive and explanatory power of the model, which is assessed in terms of R-square values of the dependent variables in the model. As can be seen in Table 6, the model explains a high percentage of the dependent variables (R^2 values): cognitive outcomes is explained in more that 43% in both estimations, affective outcomes is explained in more than 37% and satisfaction is explained in more than 51%, though the value of the dropout intention is a little low in the case of Nursing (just 12% vs. 41% for Business Administration). The Table also shows the values of the mean communality of the variables (similar to factor loadings, indicating the extent to which each question/item/statement in the questionnaire reflects its corresponding latent variable). These values are around 0.70, showing a good level of internal consistency.

The exogenous variables (quality of education, quality of resources, confirmation of expectations, exhaustion and student involvement) are modelled as formative variables, that is, they are linear combinations of its corresponding indicators, and for these we apply neither the communality measure nor that of internal consistency. For these exogenous variables, we check that their measures cover various aspects of the variable and that there are no problems of collinearity between them.

The discriminant validity, which indicates if the latent variables are unrelated, is verified by checking the value of the average variance extracted (AVE) from each

Table 4. Descriptive statistics of the variables.

Variable	Business Administration		Nursing		ANOVA p-values
	Mean	SD	Mean	SD	
QLECT10	5.10	1.25	5.26	1.28	0.2101
QCLASS11	3.88	1.26	4.36	1.27	0.0001
QSYLLA12	4.81	1.29	4.68	1.43	0.2797
QINSTA13	5.08	1.57	4.88	1.71	0.1877
QPRACT14	3.12	1.62	5.27	1.51	0.0000
QTIMET15	5.08	1.54	5.06	1.45	0.9154
QADTIV16	4.05	1.69	4.38	1.64	0.0351
EXINTE22	4.65	1.37	5.40	1.14	0.0000
EXSYST23	4.31	1.48	4.93	1.19	0.0000
EXADAP24	5.13	1.43	5.65	1.28	0.0001
EXTEACH25	4.34	1.47	4.99	1.38	0.0000
EXMILIEU26	4.23	1.66	4.96	1.46	0.0000
EXFRIEN27	5.39	1.55	5.83	1.32	0.0012
TIRED28	4.63	1.75	4.64	1.66	0.9226
STRESS29	3.42	1.58	3.05	1.76	0.0164
EXHAUS30	3.13	1.72	2.69	1.69	0.0070
STRESSF31	3.13	1.66	3.06	1.77	0.6630
BURNT32	2.87	1.67	2.49	1.64	0.0157
IMATER17	3.17	1.51	3.94	1.62	0.0000
ICLASSES18	5.85	1.34	5.92	1.52	0.6631
ILIFEU19	4.63	1.73	5.15	1.63	0.0011
IATTIT20	5.37	1.15	5.72	1.12	0.0009
IOPPORT21	5.15	1.34	5.69	1.27	0.0000

THEOR44	5.01	1.31	5.19	1.21	0.1265
PRACT45	3.51	1.58	4.88	1.55	0.0000
TOOLS46	3.77	1.57	4.99	1.38	0.0000
KNOWL47	4.22	1.62	5.05	1.47	0.0000
PPASS48	5.20	1.61	6.05	1.23	0.0000
SATISE33	4.67	1.21	5.21	1.16	0.0000
DEGFAM34	4.99	1.51	5.72	1.16	0.0000
SATOPT35	3.98	1.46	4.55	1.33	0.0000
SATFIN54	4.84	1.27	5.53	1.16	0.0000
KEEPON39	2.99	1.90	2.23	1.72	0.0000
IDEADE40	2.60	2.05	1.93	1.62	0.0002
IDEADR41	1.93	1.52	1.50	1.27	0.0016
SPOKEN42	1.97	1.62	1.51	1.37	0.0018
GOBACK36	5.88	1.91	6.09	1.80	0.2327
GRAD37	6.44	1.26	6.54	1.35	0.4278
RECO38	5.36	1.56	5.92	1.29	0.0000
ANAINF49	4.85	1.35	5.21	1.25	0.0034
COMMU50	4.77	1.33	5.26	1.27	0.0001
PLANN51	4.75	1.36	5.15	1.19	0.0012
INTPER52	4.93	1.29	5.38	1.16	0.0001
OUTCPOS53	5.07	1.32	5.63	1.12	0.0000

Note: The questionnaire scale runs from 1 (poor or very little) to 7 (good or a lot).

Table 5. Reasons for dropping out by degree course (percentage scores based on those students reporting dropout intentions).

Main reason as to why students have considered dropping out	Business Administration	Nursing	Total
Financial reasons	9.32	21.95	13.58
Mistaken choice of degree (it is not for me)	20.50	12.20	17.70
I find it very difficult	21.74	6.10	16.46
I expected far more from the degree course (expectations)	14.29	10.98	13.17
Socially I do not feel comfortable	4.35	10.98	6.58
Other reasons unrelated to the university itself (family, work, etc.)	29.81	37.80	32.51
Percentage of students that have thought of dropping out	56.69	42.71	51.10

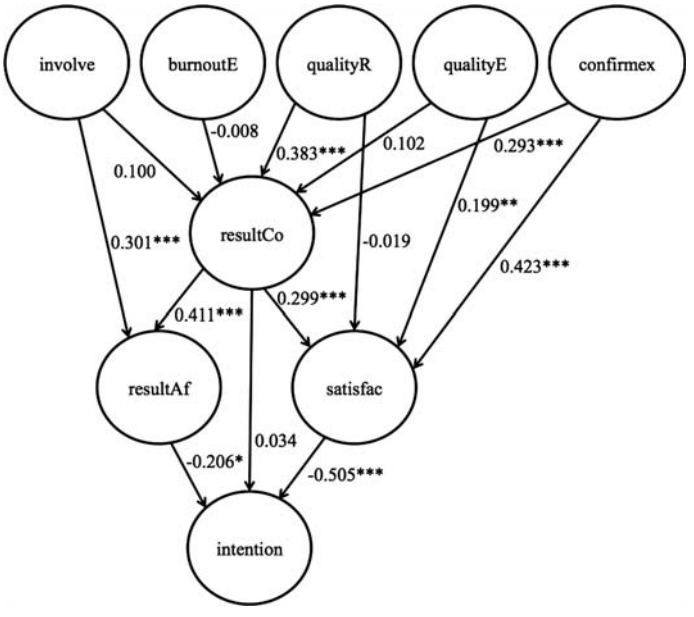

Figure 2. Model estimations for the degree courses: Business Administration.

latent variable with the variance value shared among the other model variables (Fornell and Larcker 1981). Table 7 shows the correlations between the latent variables (below the diagonal); and (in bold) on the diagonal, we include the square root of the AVE. The AVE values exceed the shared variance that each of these variables has with the rest of the model variables, indicating the discriminant validity of the variables. This means that each latent variable shares more variance with its indicators than with other measures in the model (Hulland, 1999).

In general, we observe that the relationships are in the expected direction; thus, a student's cognitive outcomes and level of satisfaction increase with the increasing perceived quality of the educational resources and when her a priori expectations are confirmed. The student's level of satisfaction also increases as her cognitive

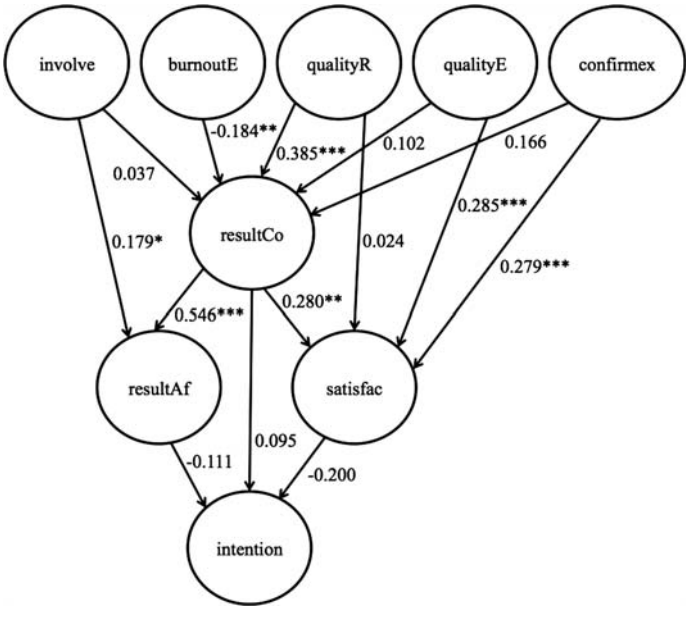

Figure 3. Model estimations for the degree courses: Nursing.

Table 6. Model estimation.

Latent variable	R^2	Redundancy	Communality
Business Administration			
ResultCo	52%	.397	.76
Satisfac	59%	.431	.73
Intention	41%	.259	.63
ResultAf	37%	.263	.70
Nursing			
ResultCo	43%	.324	.76
Satisfac	51%	.388	.77
Intention	12%	.090	.73
ResultAf	39%	.288	.74

outcomes increase. The dropout intention rises when the student is not satisfied with the university experience. And, finally, an improvement in perceived cognitive outcomes and greater student involvement enable her to increase her affective outcomes.

Based on the estimations, the specific results in relation to the four hypotheses proposed are:

> *H1*: The only variable to have a statistically significant and negative casual relationship with the dropout intention rate is that of student satisfaction (see Figure 2). Neither the cognitive nor the affective outcomes affect the intention to drop out. The absence of significant relations as regards dropout intentions in Nursing students may be due to the low redundancy of the intention variable, since it only has a value of

Table 7. Discriminant validity of the model variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Business Administration									
(1) QualityE	**.78**								
(2) QualityR	.60	**.67**							
(3) Confirmex	.54	.21	**.65**						
(4) BurnoutE	–.24	–.14	–.30	**.74**					
(5) Involve	.44	.38	.55	–.30	**.63**				
(6) ResultCo	.54	.63	.60	–.20	.46	**.87**			
(7) Satisfac	.57	.51	.69	–.28	.47	.65	**.85**		
(8) Intention	–.42	–.34	–.54	.38	–.38	–.41	–.62	**.80**	
(9) ResultAf	.44	.44	.65	–.26	.49	.55	.67	–.53	**.84**
Nursing									
(1) QualityE	**.78**								
(2) QualityR	.55	**.63**							
(3) Confirmex	.60	.48	**.69**						
(4) BurnoutE	–.30	–.22	–.34	**.61**					
(5) Involve	.37	.32	.51	–.20	**.70**				
(6) ResultCo	.48	.57	.49	–.36	.32	**.87**			
(7) Satisfac	.60	.47	.60	–.32	.31	.57	**.88**		
(8) Intention	–.25	–.17	–.29	.36	–.11	–.28	–.32	**.56**	
(9) ResultAf	.50	.33	.53	–.27	.35	.60	.61	–.29	**.86**

0.09, while this variable present a value over 0.26 for Business Administration. Thus, other measures need to be sought for the dropout intention of this group.

H2: The only significant variable in both degree courses that accounts for cognitive outcomes is the perceived quality of educational resources (installations –classrooms and laboratories, practical activities, and administrative services, etc.). For students of Business Administration, confirmation of their prior expectations (related to their intellectual development, the education system, their adaptation to university and its sociocultural environment) also has a significant impact on cognitive outcomes. By contrast, for Nursing students, the exhaustion caused by their studies (stress, tiredness, burnout) negatively affects their cognitive outcomes.

H3: Of the four variables (perceived quality of education and educational resources, the confirmation of a priori expectations and cognitive outcomes), all are significant in terms of the level of satisfaction reported, with the exception of the perceived quality of educational resources.

H4: Affective outcomes (self-concepts, world views, behaviour and values) are influenced by a student's cognitive outcomes and, especially in the case of students of Business Administration, by the degree of student involvement in their education.

4.3. Indices of the variables of interest

The methodology employed allows us to construct indices for each of the variables of interest. These indices enable us to make comparisons between universities and/or degrees, as well as to monitor the evolution of these variables over time. The indices represent student perceptions of each of the variables or aspects included in the model. They are generated by taking the mean value of the indicators (i.e. the questions in the questionnaire) and the weights assigned to them by the PLS algorithm. Table 8 shows

Table 8. Indices of the model variables.

Index	Business Administration	Nursing
Quality of education	59	64
Quality of resources	49	65
Confirmation of expectations	58	69
Burnout – exhaustion	35	20
Student involvement	62	71
Cognitive outcomes	47	66
Student satisfaction	58	68
Dropout intentions	27	12
Affective outcomes	65	73
Mean value of indices that should ideally be high	56.8	68
Mean value of indices that should ideally be low	31.5	16

the indices for each degree course on a scale from 1 to 100, where 1 is the lowest value and 100 the highest. For the variables of student burnout and dropout intentions, the ideal value then is around 1, while for the other variables the ideal value is around 100.

All the index values obtained for Nursing are higher than those obtained for the Business Administration degree, with the exception of the values that we expected to be low (burnout and dropout intentions), which indeed are also lower among the Nursing students. Based on these values, we can infer that the Nursing students are more satisfied, have higher perceptions of the quality of their degree, that their expectations have been largely confirmed and that they get more involved in their learning process. Likewise, they obtain better academic outcomes, and feel better prepared for the labour market (affective outcomes). Finally, they feel less burnt out than students on the Business administration course, and their dropout intentions are very low (12 points on a scale of 100). These results are consistent with the initial impression obtained from the descriptive statistics presented in Table 4.

The index values for Business Administration students, although lower than those of the Nursing students, are all above 50. The main differences are to be found in the dropout intention (15 points higher than that of the Nursing students), while they are more burnt out than their Nursing counterparts, and perceive that their cognitive outcomes are not as good as they would like them to be.

Appendix Tables A1 and A2 show the indicators for each variable and cross them with a range of criteria: university, academic year, age range, sex, place of birth, grades, whether or not students work, mode of admission to the university and learning style. The information thus obtained allows us to consult the cells of interest and compare them with the mean index value that is found in the first row under the heading, bearing in mind, that is, the number of observations per group.

Finally, Table 9 shows the overall effects that exist between any pair of model variables, taking into account both direct (derived from the model's direct links) and indirect relationships (those that are maintained via a third variable). The values enable us to quantify the impact that variables have on each other so, in terms of educational policy initiatives, the best course of action would be to focus on those variables that present higher coefficients and which are associated with a lower indicator (i.e. one with a greater margin of improvement).

Thus, for example, in the case of Business Administration:

Table 9. Total effects on the dependent variables.

Total effects	Business Administration	Nursing
Quality of education → cognitive outcomes	0.102	0.102
Quality of resources→ cognitive outcomes	*0.383*	*0.385*
Confirmation of expectations → cognitive outcomes	*0.293*	0.166
Burnout – exhaustion → cognitive outcomes	–0.008	–0.184
Student involvement → cognitive outcomes	0.100	0.037
Quality of education → satisfaction	0.229	*0.314*
Quality of resources→ satisfaction	0.096	0.132
Confirmation of expectations → satisfaction	0.511	*0.325*
Cognitive outcomes → satisfaction	*0.299*	*0.280*
Burnout –exhaustion → satisfaction	–0.002	–0.052
Student involvement → satisfaction	0.030	0.010
Cognitive outcomes → dropout intentions	–0.202	–0.212
Satisfaction → dropout intentions	–0.505	–0.200
Affective outcomes → dropout intentions	–0.206	–0.111
Quality of education → dropout intentions	–0.121	–0.079
Quality of resources→ dropout intentions	–0.068	–0.086
Confirmation of expectations → dropout intentions	–0.273	–0.091
Burnout – exhaustion → dropout intentions	0.002	0.039
Student involvement → dropout intentions	–0.082	–0.028
Student involvement → affective outcomes	*0.342*	0.199
Cognitive outcomes → affective outcomes	*0.411*	*0.546*
Quality of education → affective outcomes	0.042	0.056
Quality of resources→ affective outcomes	0.157	0.210
Confirmation of expectations → affective outcomes	0.120	0.091
Burnout – exhaustion → affective outcomes	–0.003	–0.100

Note: Significant variables are in italics.

- To reduce dropout intentions, efforts should be focused primarily on ensuring a higher level of student satisfaction with their university experience. Second, initiatives are required in relation to the students' prior expectations, that is, establishing the nature of students' expectations as regards the degree course and improving communication so that these expectations are more rational. Third, efforts should be made to improve student perceptions of their cognitive outcomes.
- To increase cognitive outcomes, efforts should be focused first and foremost on improving the quality of the resources supporting student education and, secondly, initiatives are required to ensure students' prior expectations are more rational.
- To increase student satisfaction, efforts should be focused on ensuring students have more rational expectations prior to commencing their degree, on increasing the level of cognitive outcomes obtained, and finally, on improving student perceptions of educational quality.
- Finally, to improve affective outcomes, initiatives should be taken, first, at obtaining better cognitive outcomes, and second, at ensuring greater student involvement in their educational process.

In the case of the Nursing degree,

- To reduce dropout intentions, initiatives should be taken to improve student cognitive outcomes and student levels of satisfaction with their university experience.

- To increase the cognitive outcome index, efforts should be focused principally on improving the quality of educational resources (laboratories, practical sessions, specially equipped classrooms, etc.), as well as on reducing levels of student exhaustion and burnout.
- To increase the level of student satisfaction, attention must first be directed at the expectations held by students prior to commencing their degree. Second, a more favourable perception of educational quality needs to be attained and, third, the level of cognitive outcomes needs to be raised.
- Finally, to raise the affective outcome index, efforts should be focused first on achieving better cognitive outcomes, second, on improving the quality of educational resources, and finally, on achieving greater student involvement in their learning process.

5. Conclusions

In this article, we have proposed a conceptual model that directly relates students' dropout intentions with their learning outcomes, and then we have related these two variables with a further seven associated factors. We have estimated and tested a set of hypotheses and causal relations drawn from a prior review of the literature. The model has been tested with two different degree courses: Nursing and Business Administration, drawing on data for university students with distinct profiles.

Based on the results obtained, the main university policy proposals that should ensure the improvement of these two degree courses can be stated as follows:

To reduce *dropout intentions* on both courses, efforts should be focused on obtaining better perception of *cognitive outcomes*, as well as on achieving a higher level of student *satisfaction* with their overall university experience. In order to obtain better cognitive outcomes, policies should be aimed at offering good levels of practical and methodological knowledge and skills training that can serve students when seeking to enter the labour market. In the case of Business Administration, efforts should be focused on ensuring students have more realistic *expectations* prior to commencing their degree. Thus, what is required is a careful exercise in communication, seeking to create rational expectations about what knowledge the students are going to acquire on the course, about how the education system functions (syllabuses, classes, assessment, etc.) and about university life in general.

To increase the level of *student satisfaction*, efforts should be similarly focused on the *expectations* held by students before matriculation. Initiatives should also be taken to create a more favourable perception of the *quality of education*, as well as to raise the level of *cognitive outcomes* obtained by the students. The quality of education is based on student perceptions of the ability of the lecturers and teachers, on the way in which the latter make their classes interesting, and on the structure of the course curriculum.

To improve *cognitive outcomes*, student perception of the *quality of educational resources* needs to be improved, including the quality of the laboratories, libraries and classrooms, the practical activities designed to prepare students for the labour market and, in general, the services provided by the faculty offices and other administrative bodies. In addition, in the case of Business Administration, work is required on the prior *expectations* held by the students; while in Nursing attempts need to be made to reduce the degree of *exhaustion* (tiredness, stress, burnout, etc.) felt by the students, resulting from their studies.

Finally, to increase students' *affective outcomes* (learning of skills – analyses of information and effective communication, expressing points of view, interacting with others, etc.), efforts need to be focused, first and foremost, on obtaining better *cognitive outcomes*, and then on ensuring greater student *involvement* in their education. Thus, initiatives should be taken to engage students more by designing activities that allow them to gain a broader vision of the subjects presented in class, that improve their attitude to the course curriculum, classes and teachers, and that encourage greater student integration in the cultural and social life of the university. In addition, in the case of Nursing, efforts should be focused on improving student perception of the *quality of the resources* supporting their education.

In short, the study indicates that the results are influenced by the characteristics of each degree course so that any policy recommendations for improving performance and reducing dropout intentions need to be analysed on a degree-by-degree basis.

Acknowledgement

The authors acknowledge the support received from the *Ministerio de Educación y Ciencia* (Project EA2007-0184). J. Suriñach and Lola C. Duque also acknowledge support received under Projects ECO2009-12678 and SEJ2007-65897, respectively.

Notes on contributors

Lola C. Duque is an assistant professor at University Carlos III of Madrid, Spain. She is interested in services marketing for non-profit and public sector organisations, with a special emphasis in higher education. Since her dissertation she has been studying different aspects of service assessment in higher education by extending theories from different literature streams, comparing students' perceptions in different countries and posting methods to collect and analyse data.

Juan C. Duque is a full-time professor of the School of Economics and Finance at EAFIT University (Colombia). He is founder and director of the group Research in Spatial Economics (RiSE-group) at the same university. He developed the software PLS-Py SAIA for the Ministry of Education and Culture of Spain. This software is a decision support system to help policy-makers to design strategies to reduce dropout intentions in Spanish universities. He has also participated in several studies on the determinants of university dropout in Spain and rural–urban differences in student achievement in Colombia.

Jordi Suriñach is a professor of Applied Economics at the University of Barcelona and director of the Institute of Applied Economic Research (IREA-UB). He has been vice chancellor of the University of Barcelona (2001–2005) and director of the GIDEP innovation in education group. He is the author of several projects related with education at national and regional level (Ministry of Education, Women Catalan Institute, University of Barcelona). He is the evaluator of European, national and regional projects related to the Bologna Process and leader of two 7th FP projects (IAREG and SEARCH).

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Appendix

Appendix A. Indices for the model variables. Business Administration.

BUSINESS ADMINISTRATION	Observations	Percentage	Perceived quality of education *qualityE*	Perceived quality of resources *qualityR*	Perceived confirmation of expectations *confirmex*	Burnout *burnoutE*	Student involvement *involve*	Cognitive outcomes *resultCo*	Student satisfaction *satisfac*	Dropout intentions *intention*	Affective outcomes *resultAf*
Total	284	100	59	49	58	35	62	47	58	27	65
Universit											
UB	171	60.2	60.9	45.7	54.6	30.3	63	38.3	54.2	27.8	58.9
URV	54	19.0	59	47.6	56.8	33.5	65.5	34.9	55.1	25.6	64.7
UVic	39	13.7	60.1	48.2	55.9	32.2	58.7	38.7	55	27.7	59.8
UOC	20	7.0	76.8	62.5	70	28.5	75	53.6	74.7	13.4	73.4
Academic year											
First year	147	51.8	63.4	49.2	55.9	30.4	63.5	40.8	55.8	27.2	59.3
Second year	26	9.2	59.2	46.4	54.4	35.5	64.4	40.3	51.9	30.8	60.7
Third year	42	14.8	61.5	41.5	58.1	30.3	62.5	36.1	56.9	23.1	63.3
Fourth year	69	24.3	58.4	48.2	56.7	31.2	64.7	35.5	57.2	24.8	64
Age											
Under 20 years of age	143	50.4	63.7	49.3	55.8	31.1	64	40.9	55.6	27	60
Between 21 and 23	81	28.5	56.5	44.1	55.9	31.4	62.6	34.5	54.1	26.9	61.1
Between 24 and 26	26	9.1	58	41.2	51	32	60.3	33.2	51.7	30.7	57.4
Between 27 and 29	15	5.3	64.2	52.4	63.6	27.8	63.7	41.9	63.6	21.2	67.9
Over 30	19	6.7	69.4	54.2	62.7	30.5	71	46.2	66	17.4	69.9
Sex											
Male	107	37.6	59.3	47	53.9	32.3	60.7	38.8	54.1	26.6	57.3
Female	177	62.3	62.9	47.9	57.7	30.2	65.5	38.8	57.1	26.2	63.5
Place of birth											
Catalonia	251	88.4	30.8	23.7	28	15.6	31.7	19.1	27.9	13.3	30.5
Rest of Spain	14	4.9	29.8	23.3	27.6	15.3	31.3	20	26.8	12.7	30.2

(*Continued*)

Appendix A. (*Continued*).

BUSINESS ADMINISTRATION	Observations	Percentage	Perceived quality of education *qualityE*	Perceived quality of resources *qualityR*	Perceived confirmation of expectations *confirmex*	Burnout *burnoutE*	Student involvement *involve*	Cognitive outcomes *resultCo*	Student satisfaction *satisfac*	Dropout intentions *intention*	Affective outcomes *resultAf*
Other EU countries. North America. Japan	6	2.1	30.2	24.4	29.2	13.6	37.6	21.1	31.4	15.1	28.6
Latin America	8	2.8	29.1	23.9	28.1	17.1	30.8	21.7	27.4	11.5	32
Africa	1	0.3	30.5	25.9	29.1	17.5	29.5	18.3	29.3	20.1	37.4
Other	4	1.4	37.8	27.9	34.8	7.5	36.5	25.1	35.2	8.4	34.6
Grades											
Average/low	147	51.8	60.5	46.2	52.3	31.9	61	37.2	52.7	29.3	57.8
Average/high	137	48.2	62.6	49	60.6	30.1	66.6	40.5	59.4	23.2	64.7
Work											
I do not work	141	49.6	62.3	47.4	57.1	31.7	64.5	38.5	55.5	26.1	61.1
I work part time	97	34.1	59.1	47.7	53.5	30.8	60.6	37.6	53.8	29.7	58.6
I work full time	46	16.2	64.4	48	59.8	29.5	67.8	42	62.1	20.1	66.6
Learning style											
Memorising	79	27.8	61.1	48.8	53.8	34.9	61.3	38	53.5	29	56.6
Understanding concepts and meanings	205	72.2	61.7	47.1	57.2	29.5	64.6	39.1	56.9	25.3	62.9
Access											
First choice	228	80.2	61.4	47.6	55.8	31.5	63.5	38.4	55.8	26.6	61.5
Not first choice	56	19.7	62.1	47.4	58.1	29.3	64.5	40.5	56.5	25.2	59.7

Appendix B. Indices for the model variables Nursing.

NURSING	Observations	Percentage	Perceived quality of education *qualityE*	Perceived quality of resources *qualityR*	Perceived confirmation of expectations *confirmex*	Burnout *burnoutE*	Student involvement *involve*	Cognitive outcomes *resultCo*	Student satisfaction *satisfac*	Dropout intentions *intention*	Affective outcomes *resultAf*
Total	192	100	62	66	79	20	66	55	66	19(12)	73
Universit											
UB	79	41.1	59.1	63	76.1	21.2	62.4	50.7	64.3	18.1	71.4
URV	57	29.7	62.1	64.8	78.1	18.6	68.3	58.5	64	20.7	73.5
UVic	56	29.2	64.2	69.9	83.2	18.9	68.8	56.7	69.4	17.8	75.1
Academic Year											
First year	127	66.1	62.8	67.1	79.8	17.6	66.8	57.3	66.4	19.1	73.2
Second year	38	19.8	58.7	61.8	74.8	25.2	63.4	48.8	63.3	18.8	72
Third year	26	13.5	59.2	63.7	79.6	22.6	65.5	51.7	66.1	17.5	74.9
Fourth year	1	0.5	53.1	48.8	69.7	12.2	79.7	40.4	58.6	10.9	58.3
Age											
Under 20 years of age	83	43.2	61.3	65.7	78.2	19.1	66.5	56.2	64.7	21.3	72
Between 21 and 23	63	32.8	60.6	66.1	79.5	20.2	65.2	52.6	66.6	18.5	73.5
Between 24 and 26	14	7.3	67.5	63.1	82.7	22.9	63.8	61.1	69.4	12.7	82.2
Between 27 and 29	10	5.2	56.8	65.9	78.1	16.2	66.9	50.6	67.3	13.6	69.7
Over 30	22	11.5	62.7	64.8	76.4	20.6	67.5	53.5	64	16.4	71.6
Sex											
Male	19	9.9	58	61.9	69.2	17.1	58.5	50.4	58.6	17.2	64.9
Female	173	90.1	61.8	65.9	79.8	20	66.8	55.3	66.5	19	74
Place of birth											
Catalonia	153	79.7	61.4	65.7	79.8	18.9	66.8	54.7	66.7	18.1	73.1
Rest of Spain	28	14.6	60.5	63.2	71.6	21.9	61.3	53.5	59.8	21.4	71.6
Other EU countries. North America, Japan	2	1.0	50	60.8	71.5	34.5	51.3	58.9	55.7	10.9	79.5
Latin America	6	3.1	72	74	84.3	25.3	70.2	60.6	73.7	27.4	76.4

(*Continued*)

Appendix B. (*Continued*).

NURSING	Observations	Percentage	Perceived quality of education *qualityE*	Perceived quality of resources *qualityR*	Perceived confirmation of expectations *confirmex*	Burnout *burnoutE*	Student involvement *involve*	Cognitive outcomes *resultCo*	Student satisfaction *satisfac*	Dropout intentions *intention*	Affective outcomes *resultAf*
Africa	2	1.0	58.5	70.1	85.9	23.7	71.1	58.8	61.6	16.4	78.6
Other	1	0.5	63.8	58.4	80.9	16.9	70.2	55	64.6	10.9	67.9
Grades											
Average/Low	46	23.9	61.2	66.6	74	24.6	59.7	52.8	61.1	20.6	69.2
Average/High	146	76.0	61.5	65.2	80.2	18.2	68	55.4	67.1	18.2	74.3
Work											
I do not work	106	55.2	61.7	66.2	79.4	19.8	66	55.8	66.2	16.8	71.9
I work part time	63	32.8	60.8	65.5	77.9	20.1	65.9	54.2	66	23.5	74
I work full time	23	11.9	61.9	62.6	77.8	18.3	66.4	51.5	62.7	15.2	76.2
Learning style											
Memorising	58	30.2	62.9	68.8	78.9	21	63.7	56.7	68.2	18.9	74.8
Understanding concepts and meanings	134	69.8	60.8	64.1	78.7	19.2	67	54	64.6	18.7	72.4
Access											
First choice	169	88.0	61.8	66.4	79.2	19.6	66.2	55.1	65.9	18.2	73.3
Not first choice	23	11.9	59.2	59	75.5	20.8	64.8	52.7	63.9	23	71.4