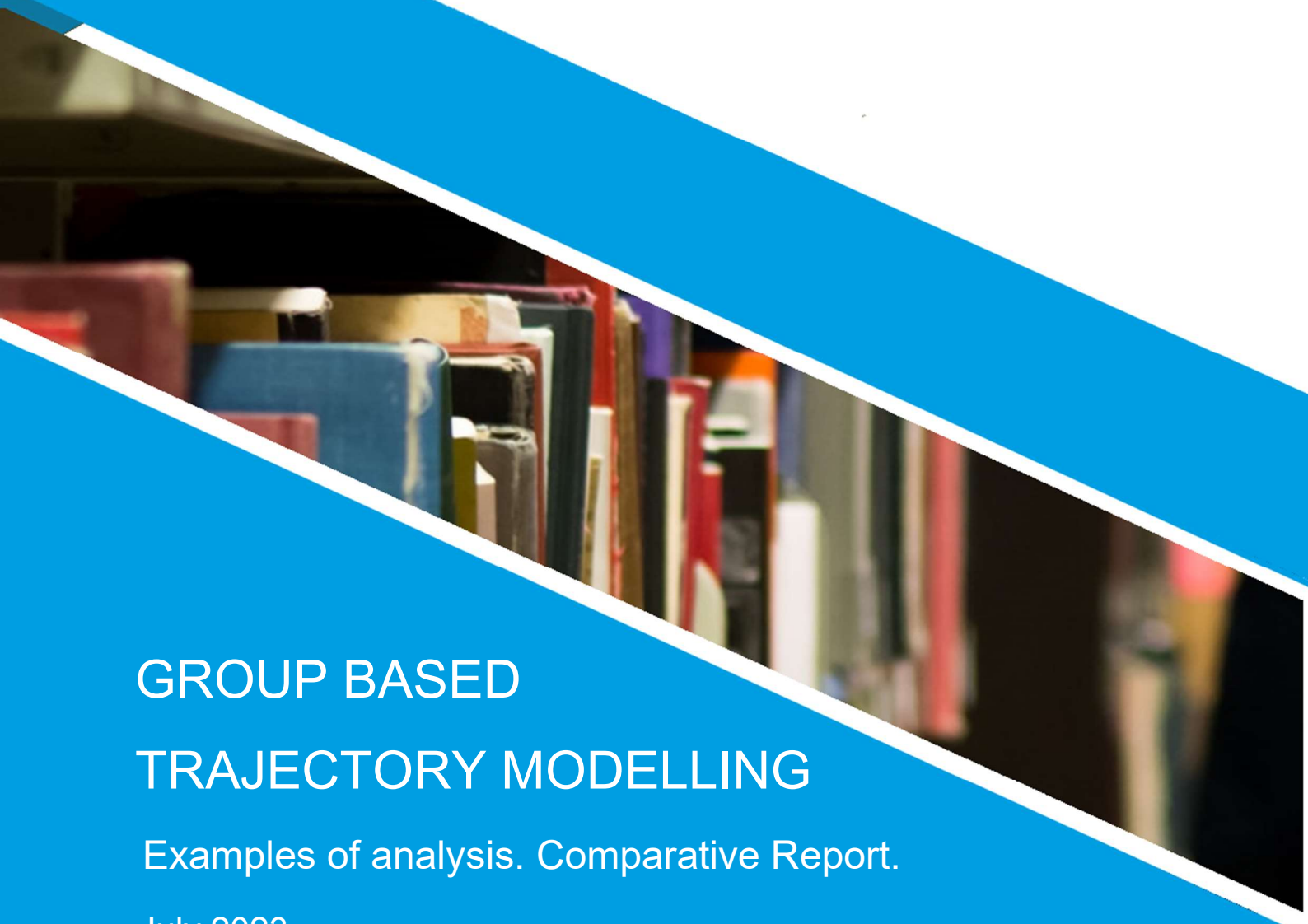
GROUP BASED TRAJECTORY MODELLING
Examples of analysis. Comparative Report

Helena Troiano, Ona Valls, Janine Jongbloed, Jean-François Giret, Chris Edwards



GROUP BASED TRAJECTORY MODELLING

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1. Introduction

In the elaboration of the Erasmus+ Complex Trajectories project, the administrations of the universities (or university systems) of the partners participating in the project have provided longitudinal registration data on the trajectory of each of their students. One of the main data available to the project is the performance and pace that students follow throughout their trajectory. This information is a fundamental indicator of the type of trajectory the student is following.

Clearly, some of these trajectories have a better prognosis for persistence and eventual completion than others. Thus, identifying the type of trajectory that the student follows can indicate which of these students require more attention and support from the institution.

Furthermore, it is useful to identify in which institutions and in which degree programmes these trajectories are more or less likely to be followed and, especially in order to address issues of equity at university, it is also useful to identify which socio-demographic profiles of students are more likely to follow one or the other trajectories.

We can approach this problem by classifying students into typologies using the Group Based Trajectory Modelling (GBTM). In each type or group, we classify those students who follow a similar pattern of performance and pace over the years we are observing, which is represented in each of the lines of the trajectory charts.

And indeed, we can see how students' subsequent decisions as to whether or not to continue studying are linked to these trajectories. This can be examined in detail in the tables that relate the belonging to one or another group to the status (graduate, persistent or dropout) at the end of the period of time observed. In addition, the complementary data relating the socio-demographic and academic profiles and the belonging to one or another trajectory group can be consulted in the appendix, although some comments can also be found in the text.

Firstly, we compare the distance learning universities, and secondly, the on-site universities, ending with the complete Catalan system[1], which allows us to keep those students who change their studies outside the university but still within the university system within the same territory.

It should be remembered that in the French, British and Portuguese university systems, the degrees are usually programmed in 180 credits, the equivalent of three years, while in the Spanish and, therefore, Catalan system, the degrees are normally programmed in 240 credits, the equivalent of four years.

[1] The analysis of Catalan universities in this study is based on data provided by the Departament de Recerca i Universitat from the DWH Uneix data on May 2021. The responsibility for all conclusions drawn from the data provided lies exclusively with the authors.

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2. Online universities

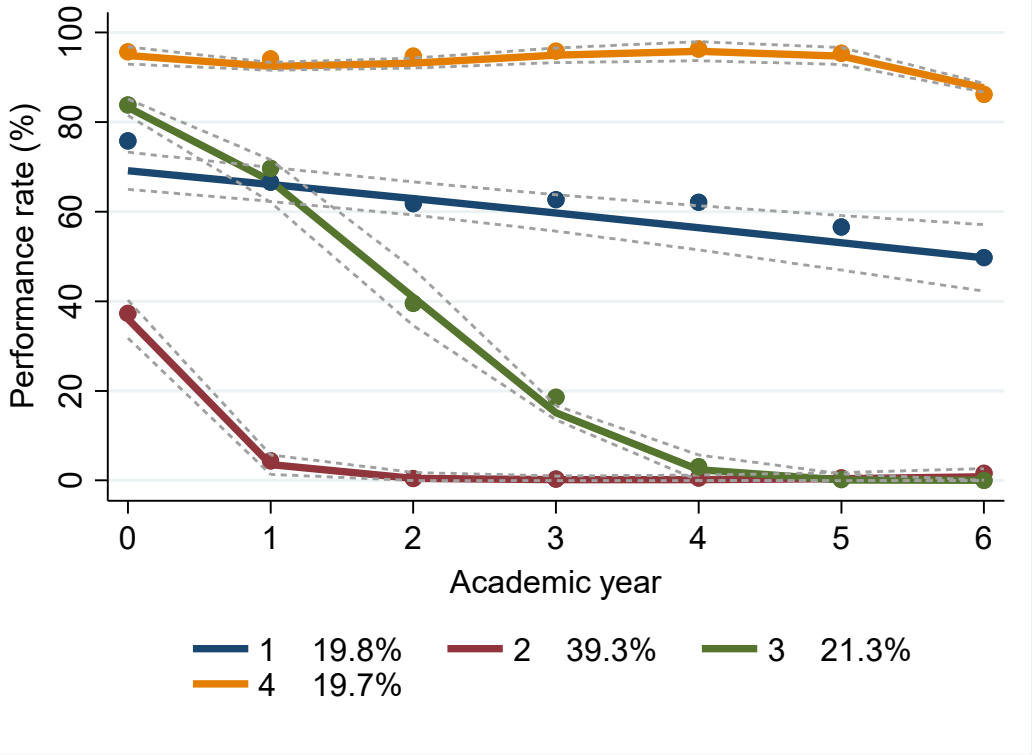
Distance learning universities all over the world are characterised by a public that shares its dedication to studies with other activities that are very central to their lives and, therefore, very time-consuming. One clear consequence of this situation is, firstly, that the trajectories of their students are mostly slow, far from the pace stipulated as a pathway by on-site universities, and, secondly, that they have a lot of dropouts.

Here we can compare, for the 7-8 years observed, the types of trajectories that emerge and the "final results" obtained by the students who follow each of these trajectory-types.

2.1. Universitat Oberta de Catalunya (UOC)

The groups obtained in the case of the UOC are the four trajectories represented in the following chart.

Figure 1. Perfomance Rate trajectory of students. UOC 2012 cohort.



Note: Dropped-out = "0" on years of non-enrollment; Graduated = "missing" on years already graduated.

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In the case of the UOC, we see, firstly, the constitution of two extreme groups. On an upper end, there is a group of one-fifth of students who have a performance close to 100% (group 4). Thus, although they may go more or less quickly, what they choose to study each year is well adjusted to their possibilities and they respond without problems to the requirements of the subjects. In contrast, there is a very large group, 40% (group 2) who, after having taken the first year without much success, drop out immediately. In the first group, we observe high graduation and persistence rates as the final status, while in the last group there is an almost total predominance of dropouts.

Table 1. Final states for every performance rate trajectory. UOC 2012 cohort.

Final state for each trajectory - UOC						
	Drop-out	**Persist**	**Graduation w/ Delay**	**Graduation**	***Total*** **%**	***n***
Trajectories* [0.519]**						
G1: Medium performance	21.1	**53.1**	**21.2**	4.6	*100%*	*1389*
G2: Early leavers	**94.9**	4.4	0.1	0.7	*100%*	*2924*
G3: High perf. to late dropout	**94**	3.5	0.1	2.4	*100%*	*1534*
G4: High performance	3.1	**32.2**	**44.3**	**20.3**	*100%*	*1527*
Total	*61.8%*	*19.2%*	*13.2%*	*5.8%*	*100%*	*7374*

Note: * * p ≤ 0.01 for the chi2 test | * p ≤ 0.05 for the chi2 test
In brackets: V Cramer as a measure of intensity association between variables.
Bold: Values greater than 1.96 for residuals standardised and corrected as a measure of intensity of positive association between categories.

The third group (group 3) is formed by another fifth of students who, with a good or very good performance in the first two or three years, very quickly drop their performance rate and find themselves, for the vast majority, in a final stage of dropping out of their studies. We don't know the reason for this, it could be internal dynamics in the way they live and approach their studies, or external circumstances outside their university life that prevent them from being able to cope with it.

The last group that emerges is that of the last 20% with an intermediate performance over the whole period (group 1). In this group there is more complexity, as we can see because it is the one with the widest confidence intervals, indicating that it is more heterogeneous. This complexity is also reflected in the final situation, which can lead to graduation and persistence, but also 21% end up dropping out.

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While in the first two groups the intervention of the institution does not seem likely to be very relevant, in the case of these last two groups, it is to be expected that it can make a difference, so that an interesting framework for university policies can be expected.

With regard to the profile (see appendix), it is interesting to note that among the early leavers (group 2) there is an over-representation of students in the fields of health and engineering, while among the high performers (group 4) there is an over-representation of students in the field of social studies. This probably reflects the inherent difficulty of studying in each of these different areas in distance learning modality.

2.2. Universidade Aberta (UAb)

In the case of the UAb, it is important to mention that we only have data for the bachelor's degree in Education. This means that the data visualised and commented below are for only 160 students. This is a very small sample compared to those available at the other universities. For this reason, we can observe larger confidence intervals than in the trajectories observed in the other universities.

The groups obtained in the case of the UAb are the three trajectories represented in the following chart.

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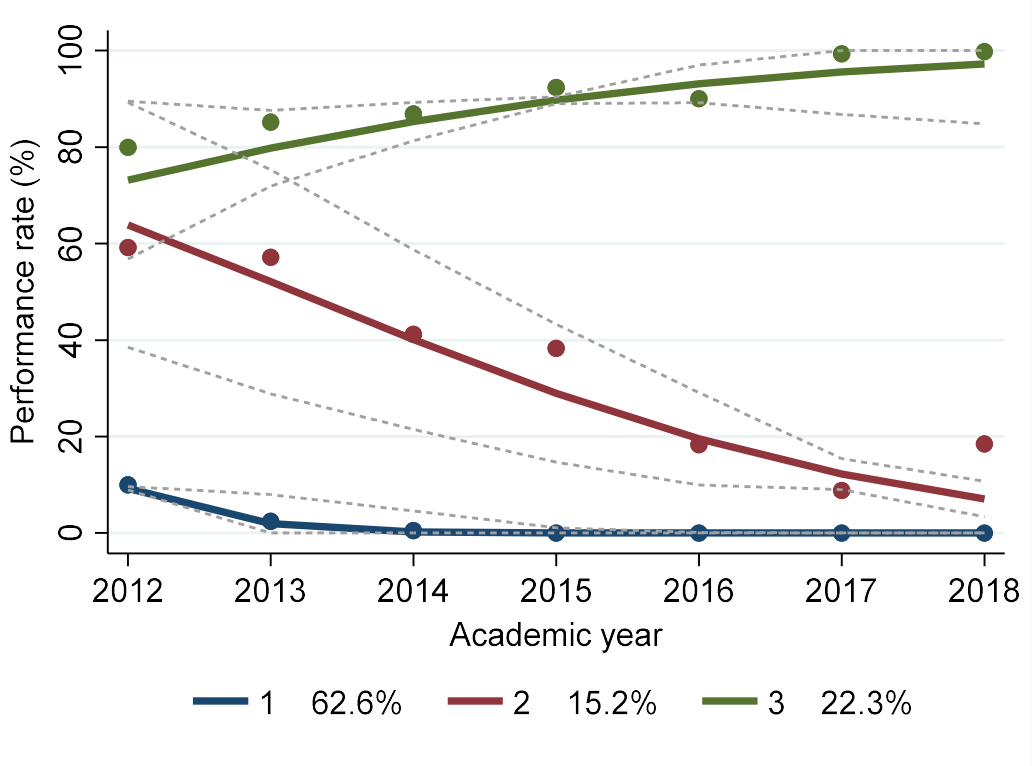
Figure 2. Performance Rate trajectory of students. UAb 2012 cohort.



Note: Dropped-out = "0" on years of non-enrollment; Graduated = "missing" on years already graduated.

As we have seen in the case of the UOC, at the UAb it is possible to observe also two extreme groups. On the one hand, there is a group of almost 22.3% of the students who have had a high performance (group 3). Thus, they have proven to be very successful at adjusting to their studies and in fulfilling their course requirements. On the other hand, there is a very large group, 62.6% (group 1) who tend to struggle with their studies and drop out quickly after their first year of study.

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Table 2. Final states for every performance rate trajectory. UAb 2012 cohort.

Final state for each trajectory - UAb						
	Drop-out	Persist	Graduation w/ Delay	Graduation	*Total*	
					%	*n*
Trajectories* [0.684]**						
G1: Early leavers	**97**	2	0	1	*100%*	*101*
G2: High-Medium perf. to late dropout	69.6	**17.4**	8.7	4.3	*100%*	*23*
G3: High performance	2.8	**0**	**80.6**	**16.7**	*100%*	*36*
Total	*71.5%*	*3.8%*	*19.6%*	*5.1%*	*100%*	*160*

Note: * * * p ≤ 0.001 for the chi2 test | * * p ≤ 0.01 for the chi2 test | * p ≤ 0.05 for the chi2 test
In brackets: V Cramer as a measure of intensity association between variables.
Bold: Values greater than 1.96 for residuals standardised and corrected as a measure of intensity of positive association between categories.

Finally, group 2 is the smallest group (15.2%) and consists of students who initially had medium to good academic performance in the first two or three years of their studies. However, they quickly start to deteriorate their performance and their performance rate dropped significantly. In addition, this group has a high drop-out rate, but also the highest persistence rate of all groups.

2.3. The Open University (OU)

Three of the four groups identified within the OU data are represented in the following chart. The fourth group, comprising those students who drop out after their first year, would form a much more steeply falling curve than that of the class 2 students plotted. This group of students were removed from the dataset as they are a distinct group that dominates the GBTM analysis. By removing these students, the smaller latent groups can be identified. The plot has a different style to the others because it was produced by the Latent Class Mixed Modelling (LCMM) package in R.

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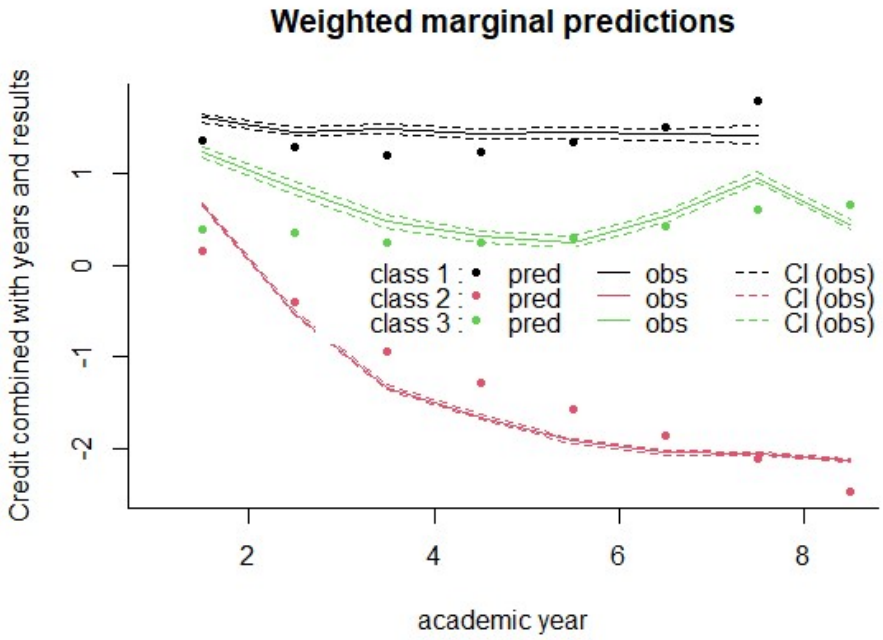
Figure 3. Performance Rate trajectory of students. OU 2012



Note: The values plotted on the y-axis are of a factor calculated from the credit achieved in an academic year. There is one additional group that is not included in this plot. It contains the students who drop out after the first year of study. This group is included in the tables below.

These four classes, which we will now refer to as groups to fit with the remainder of this report, are reported in the table below. In this table we see students in Group 1 graduate, mostly within seven years. The project has defined those taking 8 years or longer to graduate as having delayed their studies, and a handful of G1 students fall into this category.

Group 2 students tend to start off well but do not tend to graduate, as they mostly dropout gradually over time. Nearly a fifth of this group, however, do persist in their study, and have studied within the last two years of this dataset.

Group 3 represents the group that might be expected to graduate but take study breaks. Therefore, a significant proportion (35%) have a delayed graduation, with a further fifth persisting in their studies but yet to complete by the end of the dataset.

The students in Group 4 are those who do not return to study after their first year. The open nature of the Open University means there are no entry requirements. This places no barriers before students as they take up study. Students are also able to study as many (or few) modules as they

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want. There is no requirement to commit to a degree and some students may study for a certificate that only requires one year of study. This project has focussed on the attainment of degree qualifications.

Table 3. Final states for each performance rate trajectory. OU 2012 cohort.

Final state for each trajectory - OU						
	Dropout	Persist	Graduation w/ Delay	Graduation	Total %	n
Trajectories* [0.671]						
G1: high performance			0.2	99.8	100.0	2413
G2: high performance, delayed dropout	81.1	18.4	0.2	0.3	100.0	8120
G3: medium performance	0.9	21.5	34.6	43.1	100.0	894
G4: early dropout	100.0				100.0	11115
Total	78.5	7.5	1.5	12.5	100.0	22542

Note. * 95% confidence (p≤0.05)

In brackets: Cramer's V as a measure of intensity of association between variables

Zero values are omitted for clarity

The profile table in the appendix suggests that age, socio-economic status, and educational background strongly influence the group a student is likely to fall into. Interestingly, there is some association between subject studied and group: for example, those studying Health and Welfare and Services subjects are more likely to be among the Early Leavers than other the groups. Perhaps these students are more likely to be studying towards diplomas than degrees. Those not declaring a link to any subject are a significant group, and very much more likely to be in the Early Leavers group.

Those changing their field of study are a significant number of students who are very likely to continue their study beyond one year. However, as over 70% are in the category of delayed dropout, this maybe postponing their decision to drop out. Having made this observation, the proportions of these students in the medium and high performing groups, who we expect to complete their qualification are higher than for the group that does not change.

A more detailed exploration of these findings is likely to lead to useful recommendations for practical changes to the advice and support given to students.

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3. Onsite universities

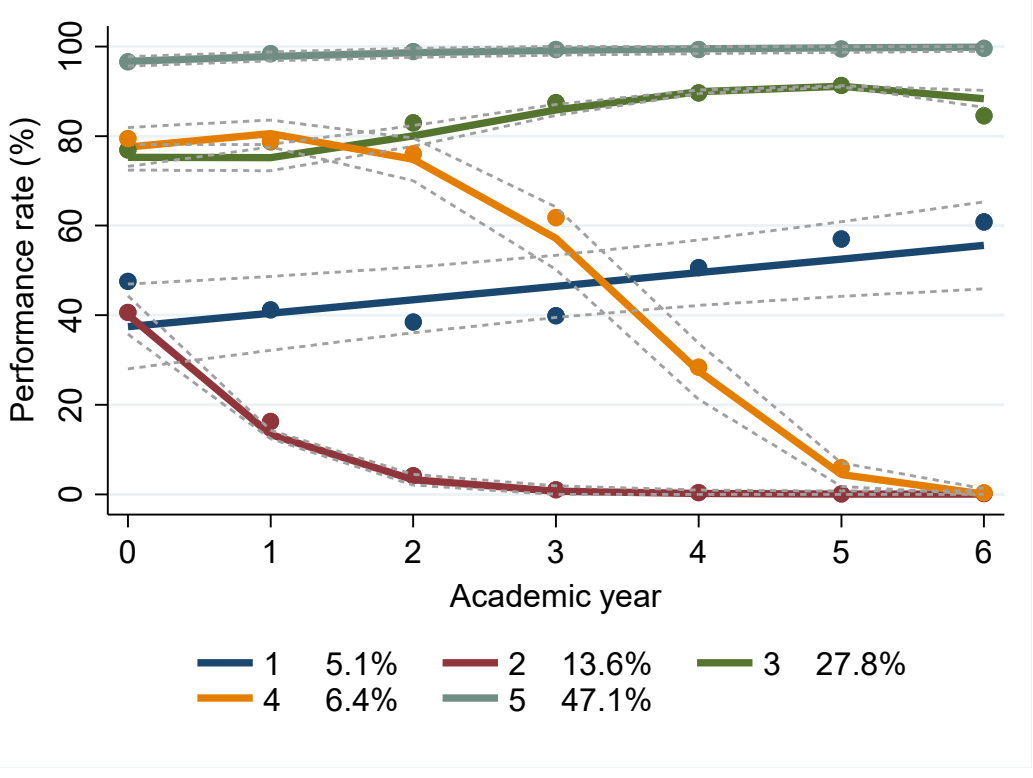
Although in recent decades there has been an important diversification of the type of student in on-site universities, if we compare with distance learning universities, it is clear that a much larger majority are predominantly students, in the sense that this is their main activity.

As we shall see in this section, this predominance is also reflected in the number of people who fit into each of the trajectory-types obtained with the GBTM.

3.1. Universitat Autònoma de Barcelona (UAB)

The groups obtained in the case of the UAB are the five trajectories represented in the following chart.

Figure 4. Perfomance Rate trajectory of students. UAB 2012 cohort.



Note: Dropped-out = “0” on years of non-enrollment; Graduated = “missing” on years already graduated.

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In the case of the UAB we can see that the group that represents a very good performance throughout all the studies (group 5) reaches almost half of the students, as we said, this reflects the majority of students with central activity in their studies. The vast majority of these students have completed their degree at the end of the period observed (see table 4).

Table 4. Final states for every performance rate trajectory. UAB 2012 cohort.

Final state for each trajectory - UAB						
	Drop-out	**Persist**	**Graduation w/ Delay**	**Graduation**	***Total %***	***n***
Trajectories* [0.732]**						
G1: Low performance + improving	9	**79.9**	11.2	0	*100%*	*356*
G2: Early leavers	**97.4**	2.2	0	0.4	*100%*	*1012*
G3: Good perf. + improving	0.5	5.9	**70.4**	23.2	*100%*	*2065*
G4: Good perf. + late drop-out	**65.7**	**10.7**	22.9	0.7	*100%*	*432*
G5: Very good performance	0	0.2	19.9	**79.9**	*100%*	*3569*
Total	*17.7%*	*6.5%*	*31%*	*44.9%*	*100%*	*7434*

Note: * * p ≤ 0.01 for the chi2 test | * p ≤ 0.05 for the chi2 test
In brackets: V Cramer as a measure of intensity association between variables.
Bold: Values greater than 1.96 for residuals standardised and corrected as a measure of intensity of positive association between categories.

There is also the group of early drop-outs (group 2), with 14% of students, who, however, as a group, persist a little beyond the first year. Almost all these students dropped out at the end of the period observed.

About 28% belong to a type (group 3) that starts off with good performance, but is not fully successful, and over time improves their performance. It is possible that these are students who experience the shock of the change in requirements and levels of demand once they have entered university. Nonetheless, their trajectory is one of clear improvement and, although often with delays, they end up graduating.

A small group, with only 6% (group 4), maintains a good performance during the first years and then, suddenly, this performance rate begins to fall dramatically. In this group, two thirds end up dropping out, but there is also a significant percentage (23%) that end up graduating and a part that is still active.

Finally, an even smaller group, with 5% (group 1), seems to show a great deal of heterogeneity and more complex trajectories. Overall, they describe a trajectory in which they begin with low

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performance, below half of the approved credits, but progressively improve. In fact, most of them persist and even 10% end up graduating.

Once again, the central groups (group 1 and group 4), which on this occasion are much smaller than in distance learning universities, seem to be the group of students with the greatest need for institutional support to help them achieve a good final result for the student, even though it is complex.

As can be seen in the tables in the appendix, there are some groups in which some socio-demographic or academic characteristics are over-represented. Specifically:

Early leavers (group 2): older, men, non-university parents, non-academic previous track. Very good performers (group 5) reflects the exact opposite characteristics: younger, women, university parents, academic previous track.

In Good performance and improving (group 3) and Low performance and improving (group 1) it stands out that they are from engineering, probably reflecting the fact that this is a challenge in the requirement and difficulty of the first courses.

In Good performance and late drop out (group 4) students are a little older, they have changed studies, and they are over-represented in social sciences and engineering. It seems as if they are finding their place and struggling with what they want to do and the demands they face.

3.2. Université de Bourgogne (UB)

In the case of the Université de Bourgogne, students either successfully complete the academic year and obtain 60 ECTS or do not and have zero ECTS for the year. For this reason, we conduct the GBTM on a dichotomous dependent variable (i.e., 60 ECTS or zero) using a logit type equation to estimate the probability of observing the outcome *y* (successfully completing 60 ECTS), for observation *i* at time *t*, given membership in group *j* (Nagin, 2005). Therefore, the estimated parameters (*β*'s) estimate the trajectory shape of the probability of successful completion of 60 ECTS.

As in the previous models, we estimate this only for those still participating or who dropped out for each time *t*, as those who successfully graduated are declared as missing for time points following graduation. We thus estimate only for those still enrolled (in a bachelor's degree) or who dropped out (and thus could hypothetically re-enrol) at each point in time. The groups obtained in the case of the UB are the three trajectories shown in the following figure.

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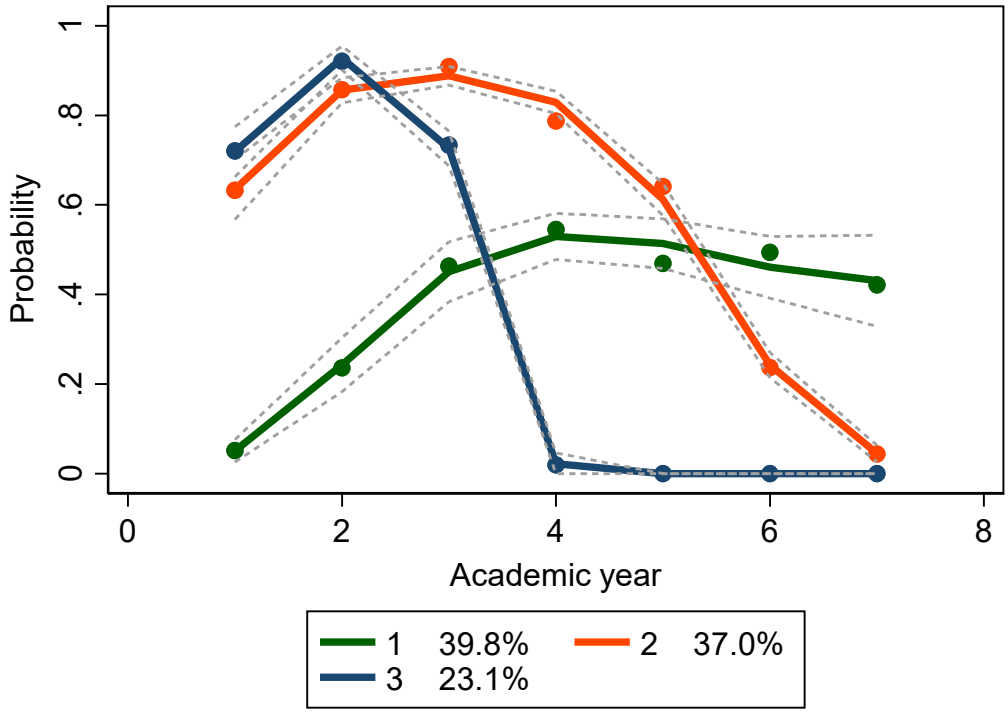
Figure 5. Probability of successful completion trajectory of students. UB 2012 cohort.



Note: Dropped-out = "0" on years of non-enrollment; Graduated = "missing" on years already graduated.

For UB, we find that the group showing very good performance at the beginning of their studies (group 3) consists of about 23% of the students, and these students successfully complete after three years (the time it takes to complete a bachelor's degree in France). Almost all these students have completed their degree at the end of the observation period (see table 4).

There is a group with long participation, who take more time than usual to complete their bachelor's degree (group 2). These students most often graduate from their degree, although about one in ten (13%) do drop out.

Finally, there is also a large group of students who show poor early performance with a slight improvement over time (group 1), consisting of about 40% of students, who, however, as a group, mainly drop out over time. Indeed, almost all these students (84%) have dropped out by the end of the observation period.

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Table 5. Final states for every probability of successful completion trajectory. UB 2012 cohort.

Final state for each trajectory - UB						
	Drop-out	Persist	Graduation w/ Delay	Graduation	*Total*	
					%	*n*
Trajectories **[0.55]						
G1: Poor + slight improvement	83.6	0.2	4.4	11.7	*100%*	*1511*
G2: Long participation	13.1	0	4.6	82.3	*100%*	*934*
G3: Good + graduate	1.6	0	1.6	96.9	*100%*	*580*
Total	*46.1%*	*0.1%*	*3.9%*	*49.9%*	*100%*	*3025*

Note: ** p ≤ 0.01 for the chi2 test | * p ≤ 0.05 for the chi2 test
In brackets: V Cramer as a measure of intensity association between variables.

As noted for the other universities, and shown in the tables in the appendix, specific socio-demographic or academic characteristics are over-represented in some groups. For example, the poor performance with only a slight improvement group (group 1) tends to be older, mainly male, with a low family SES, a professional baccalaureate, and poor grades in high school.

The good and graduate group (group 3) shows directly contrasting characteristics: younger, female, high family SES, academic baccalaureate, and fairly good high school grades. In the long participation group (group 2), students are mainly younger, female, and they are over-represented in high family SES. They are the group most represented in good high school grades. As underscored in the UAB example, they may be finding their place and struggling with what they want to do and the demands they face, causing them to take longer to finish their degree.

Overall, we see striking similarities between the two face-to-face universities examined thus far, providing some evidence for the idea that a determining factor in student trajectories may be the juxtaposition between online and face-to-face learning. However, we also see important differences in the complexity of student trajectories, with the Catalan example showing more variety than the French case. This may be partly due to differences in institutional pathways between the two countries, with France typifying a fairly rigid system.

On the other hand, it is also important to note that the analyses do not measure exactly the same outcome (performance rate versus probability of successfully completing 60 ECTS), and so these also play a role in the number and nature of the groups that we found.

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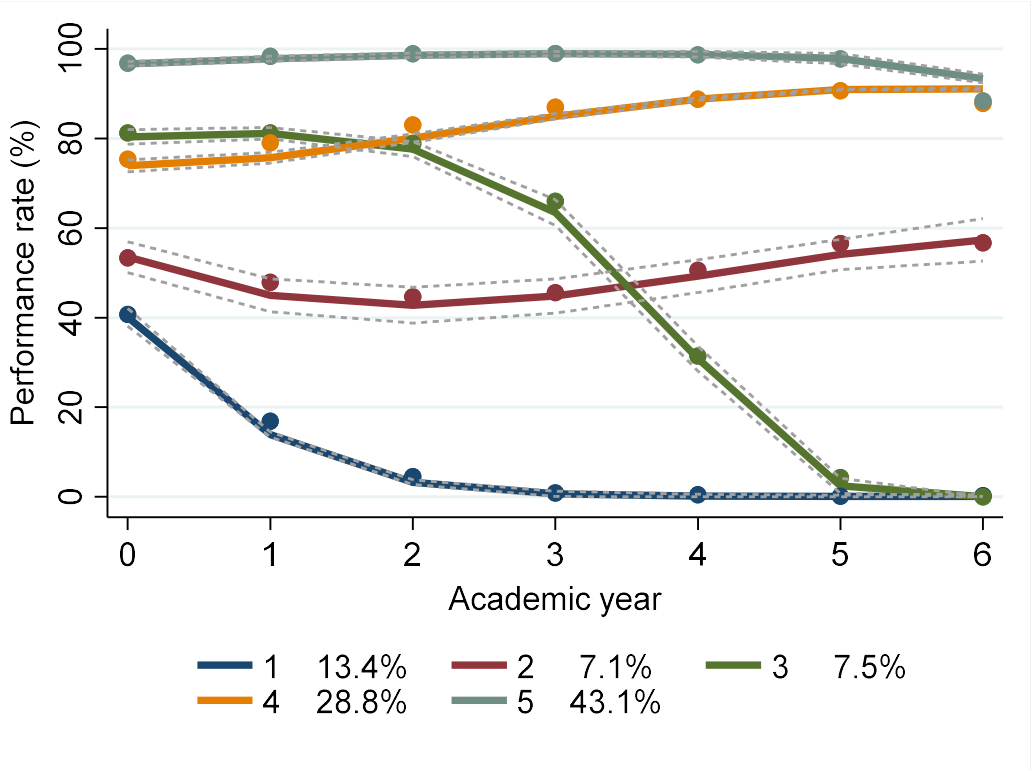
4. Catalan University System (SUC)

In this last section we will deal with the data of the Catalan on-site university system as a whole. Thus, the data include many more cases, but also greater complexity due to the inclusion of different types of universities, such as peripheral, private and, especially, a university devoted to the field of engineering.

Figure 6. Perfomance Rate trajectory of students. SUC-onsite 2012 cohort.



Note: Dropped-out = "0" on years of non-enrollment; Graduated = "missing" on years already graduated.

The results are practically identical to those of the UAB, the single university that we have chosen to analyse separately. It should be noted that there are more people in the group of those who start at a low or good level, and then improve, because here there is a whole university of engineering.

The five groups that we identified in the case of the UAB now emerge again. Thus, we have at the two extremes those who drop out in the first years (group 1) and those who maintain a very high performance throughout the period (group 5), with very high graduation rates.

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Those who start with around 80% of credits passed and improve (group 4), or who start with lower performance and improve (group 2) have a higher proportion of students than when we only analysed the average university in the system, the UAB. This can be attributed to the fact that we have included the engineering university in the data, which is not excessively selective in terms of access, but is selective in terms of course progression.

Along the same lines, we also find a slightly higher proportion of students in the group that maintained a good performance until they dropped out quickly and left after a few years after the cohort entered university (group 3).

Table 6. Final states for every performance rate trajectory. SUC-onsite 2012 cohort.

Final state for each trajectory – SUC onsite						
	Drop-out	**Persist**	**Graduation w/ Delay**	**Graduation**	***Total***	
					%	***n***
Trajectories* [0.732]**						
G1: Early leavers	**97.5**	2	0	0.5	*100%*	*4965*
G2: Low performance + improving	9.2	**77.1**	13.7	0	*100%*	*2420*
G3: Good perf. + late drop-out	**73.8**	**12.1**	13	1.1	*100%*	*2415*
G4: Good perf. + improving	0.6	6.3	**72.8**	20.4	*100%*	*10873*
G5: Very good performance	0.2	0.5	21.4	**77.9**	*100%*	*16234*
Total	*18.8%*	*8.2%*	*32.6%*	*40.4%*	*100%*	*36907*

Note: * * p ≤ 0.01 for the chi2 test | * p ≤ 0.05 for the chi2 test
In brackets: V Cramer as a measure of intensity association between variables.
Bold: Values greater than 1.96 for residuals standardised and corrected as a measure of intensity of positive association between categories.

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5. APPENDIX

Descriptives for the 4 groups. Percentages. UOC

Trajectories of Performance Rate - UOC						
	Medium performance	Early leavers	High perf. to late dropout	High performance	*Total* %	*Total* n
Age* [0.077]**						
Under 26	**25.7**	37.2	17.6	19.5	*100%*	*1868*
26 - 35	17.1	39.6	**22.9**	20.4	*100%*	*3040*
Over 35	15.8	**41.5**	20.7	22	*100%*	*2468*
Total	*18.8*	*39.6*	*20.8*	*20.7*	*100%*	*7376*
Gender ns. [0.011]						
Women	18.8	39.2	20.9	21.1	*100%*	*3766*
Men	18.9	40.1	20.7	20.3	*100%*	*3610*
Total	*18.8*	*39.6*	*20.8*	*20.7*	*100%*	*7376*
Field of study* [0.059]**						
Humanities and Arts	16.2	40	23.7	20.1	*100%*	*452*
Health	19.8	**43.7**	19.3	17.2	*100%*	*1285*
Social Sciences	19.1	37.1	20.7	**23.1**	*100%*	*4755*
Engineering and Architecture	17.4	**47.2**	22.1	13.4	*100%*	*884*
Total	*18.8*	*39.6*	*20.8*	*20.7*	*100%*	*7376*

Note: *** p < 0.000 ** p ≤ 0.01 * p ≤ 0.05 for the chi2 test

In brackets: V Cramer as a measure of intensity association between variables.

Bold: Values greater than 1.96 for residuals standardised and corrected as a measure of intensity of positive association between categories.

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Descriptives for the 3 groups. Percentages. UAb.

	Early leavers	High-Medium perf. to late dropout	High performance	*Total*	
				%	*n*
Age* [0.244]					
Under 26	80	20	0	*100%*	*10*
26 - 35	67.2	19	13.8	*100%*	*58*
Over 35	58.7	10.9	**30.4**	*100%*	*92*
Total	*63.1*	*14.4*	*22.5*	*100%*	*160*
Gender ns. [0.086]					
Women	61	14.4	24.6	*100%*	*118*
Men	69	14.3	16.7	*100%*	*42*
Total	*63.1*	*14.4*	*22.5*	*100%*	*160*

Note: *** p < 0.001 ** p ≤ 0.01 * p ≤ 0.05 for the chi2 test

In brackets: V Cramer as a measure of intensity association between variables.

Bold: Values greater than 1.96 for residuals standardised and corrected as a measure of intensity of positive association between categories.

Descriptives for the 4 groups. Percentages. OU.

Trajectories of performance rate - OU						
	Medium performance	Early leavers	High performance to late dropout	High performance	Total %	n
Age [0.033] p=8.6 e-10						
Under 26	3.8	49.8	35.1	11.4	100	7761
26-35	4.1	46.6	38.8	10.5	100	7681
Over 35	4.0	51.8	34.1	10.2	100	7100
Total	*4.0*	*49.3*	*36.0*	*10.7*	*100*	*22542*
Gender [0.028] p=0.00067						
Female	4.7	42.7	38.9	13.7	100	11192
Male	4.7	43.8	39.9	11.6	100	7195
Undeclared	0.8	76.5	21.6	1.2	100	4155
Total	*4.0*	*49.3*	*36.0*	*10.7*	*100*	*22542*
SES [0.966] p=7.8 e-46						
Not low ses	4.2	47.9	36.7	11.2	100	20245
Low ses	2.1	63.7	27.9	6.3	100	2216
Undeclared	3.7	17.3	76.5	2.5	100	81
Total	*4.0*	*49.3*	*36.0*	*10.7*	*100*	*22542*

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Educational background [0.093] p=2.0 e-42						
Educated to at least 18 (upper secondary)	4.3	47.3	35.5	12.9	100	13756
Left school before 18 (lower secondary)	3.5	52.7	36.5	7.3	100	8691
Undeclared	3.2	23.2	71.6	2.1	100	95
Total	*4.0*	*49.3*	*36.0*	*10.7*	*100*	*22542*
Final field of study [0.094] p=3.6 e-77						
I00: General	5.2	28.1	56.0	10.7	100	2208
I01: Education	4.0	40.4	42.6	12.9	100	1128
I02: Arts and Humanities	7.1	29.7	40.5	22.7	100	2557
I03: Social sciences, Journalism, and Information	4.8	34.1	46.0	15.1	100	3295
I04: Business, Administration, and Law	4.1	37.4	46.2	12.2	100	1873
I05: Natural Sciences, Mathematics and Statistics	7.2	31.5	49.3	11.9	100	1661
I06: Information and Communication Technologies	5.3	35.0	50.1	9.7	100	1324
I07: Engineering, Manufacturing and Construction	6.3	28.3	49.6	15.7	100	254
I08: Agriculture, Forestry, Fisheries and Veterinary	4.3	38.0	40.5	17.2	100	163
I09: Health and Welfare	3.4	43.8	38.5	14.3	100	1633
I10: Services	3.7	39.8	35.7	20.7	100	241
Multiple	4.2	62.5	29.2	4.2	100	24
Undeclared	0.7	89.1	9.5	0.7	100	6181
Total	*4.0*	*49.3*	*36.0*	*10.7*	*100*	*22542*
Changing field of study [0.251] p=4.0 e-223						
No change	4.6	38.4	42.6	14.4	100	14466
Changed	9.5	2.6	72.6	15.3	100	1895
Undeclared	0.7	89.1	9.5	0.7	100	6181
Total	*4.0*	*49.3*	*36.0*	*10.7*	*100*	*22542*

Descriptives for the 5 groups. Percentages. UAB.

Trajectories of Performance Rate - UAB							
	Low perf. + improving	**Early leavers**	**Good perf. + improving**	**Good performance + late drop-out**	**Very good performance**	***Total***	
						%	***n***
Age* [0.107]**							
Under 26	4.8	12.2	**28.4**	5.7	**49**	*100%*	*6877*
26 - 35	4.7	**30.8**	20.1	**7.9**	36.6	*100%*	*429*
Over 35	3.1	**32.8**	21.1	**7**	35.9	*100%*	*128*
Total	*4.8*	*13.6*	*27.8*	*5.8*	*48*	*100%*	*7434*
Gender* [0.188]**							
Women	3.6	10.6	25.7	4.8	**55.3**	*100%*	*4415*
Men	**6.5**	**18.1**	**30.8**	**7.3**	37.3	*100%*	*3019*
Total	*4.8*	*13.6*	*27.8*	*5.8*	*48*	*100%*	*7434*

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Family Educational Level* [0.054]**							
Non-university	4.9	**14.4**	27.5	6.2	47	*100%*	*4272*
University	4.6	11.3	27.5	5.4	**51.3**	*100%*	*2723*
Total	*4.8*	*13.2*	*27.5*	*5.9*	*48.7*	*100%*	*6995*
Field of study* [0.125]**							
Humanities and Arts	4.7	**19.8**	27.4	6.9	41.3	*100%*	*1264*
Sciences	5.3	11.1	26.4	5.9	**51.3**	*100%*	*939*
Health	3.3	9.1	26.9	2.9	**57.7**	*100%*	*1905*
Social Sciences	4	11.6	28.1	**6.9**	49.5	*100%*	*2735*
Engineering and Architecture	**12.9**	**28.3**	**32.2**	**7.8**	19	*100%*	*591*
Total	*4.8*	*13.6*	*27.8*	*5.8*	*48*	*100%*	*7434*
Access route* [0.085]**							
PAU (Baccalaureate + exam)	4.9	10.9	**28.7**	5.3	**50.2**	*100%*	*5230*
CFGS (Vocational training)	4.7	**16.9**	27.6	6.3	44.5	*100%*	*1283*
Previous bachelor's degree obtained	3.8	**29.8**	18.3	6.9	41.2	*100%*	*131*
Previous bachelor's degree non obtained	4.7	**23.4**	25.3	**9.3**	37.4	*100%*	*364*
> 25 years old	6.8	**31.9**	19.8	**10.6**	30.9	*100%*	*207*
Other	1.8	16	24.2	3.2	**54.8**	*100%*	*219*
Total	*4.8*	*13.6*	*27.8*	*5.8*	*48*	*100%*	*7434*

Note: *** p < 0.000 ** p ≤ 0,01 * p ≤ 0.05 for the chi2 test
In brackets: V Cramer as a measure of intensity association between variables.
Bold: Values greater than 1.96 for residuals standardised and corrected as a measure of intensity of positive association between categories.

Descriptives for the 3 groups. Percentages. UB.

Trajectories of Probability of Successful Completion (60 ECTS) - UB					
	Poor + improvement	**Long participation**	**Good + graduate**	***Total***	
				%	***n***
Age [0.06]**					
Under 24	49.6	31.3	19.1	*100%*	*2957*
Over 25	64.7	13.2	22.1	*100%*	*68*
Total	*50.0*	*31.0*	*19.2*	*100%*	*3025*
Gender [0.15]**					
Women	43.8	34.2	22.1	*100%*	*1760*
Men	58.6	26.3	15.2	*100%*	*1265*
Total	*50.0*	*31.0*	*19.2*	*100%*	*3025*
Family SES [0.15]**					

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Low SES	57.1	29.0	13.9	*100%*	*1336*
High SES	43.1	33.3	23.6	*100%*	*1609*
Total	*50.0*	*31.0*	*19.2*	*100%*	*3025*
Type of baccalaureate [0.25]**					
Professional	88.1	4.9	7.0	*100%*	*243*
International	62.5	18.2	19.3	*100%*	*88*
Technological	77.4	13.1	9.5	*100%*	*451*
Academic	39.8	37.8	22.4	*100%*	*2242*
Total	*50.0*	*31.0*	*19.2*	*100%*	*3025*
High school grades [0.23]**					
Good grades	23.6	41.4	35.0	*100%*	*423*
Moderate or poor	50.0	31.2	18.1	*100%*	*1525*
Total	*50.0*	*31.0*	*19.2*	*100%*	*3025*

Note: *** p < 0.000 ** p ≤ 0,01 * p ≤ 0.05 for the chi2 test
In brackets: V Cramer as a measure of intensity association between variables.

Descriptives for the 5 groups. Percentages. SUC-onsite.

	Trajectories of Performance Rate - SUC						
	Early leavers	**Low perf. + improving**	**Good performance + late drop-out**	**Good perf. + improving**	**Very good performance**	***Total***	
						%	***n***
Age* [0.119]**							
Under 26	11.9	6.6	6.3	**30.5**	**44.7**	*100%*	*34195*
26 - 35	**32.1**	6.4	**9.2**	17.7	34.7	*100%*	*1919*
Over 35	**33.6**	4.4	**10.2**	15.2	36.6	*100%*	*795*
Total	*13.5*	*6.6*	*6.6*	*29.5*	*44*	*100%*	*36909*
Gender* [0.205]**							
Women	10.9	4.6	5.5	26.1	**53**	*100%*	*20275*
Men	**16.6**	**8.9**	**7.8**	**33.6**	33.1	*100%*	*16634*
Total	*13.5*	*6.6*	*6.6*	*29.5*	*44*	*100%*	*36909*
Family Educational Level* [0.070]**							
Non-university	**14.8**	6.6	**6.8**	28	43.8	*100%*	*18672*
University	10.7	6.6	5.6	**31.7**	**45.5**	*100%*	*14258*
Total	*13*	*6.6*	*6.3*	*29.6*	*44.5*	*100%*	*32930*
Field of study* [0.134]**							
Humanities and Arts	**21.1**	6.2	**8.6**	23.3	40.9	*100%*	*4298*
Sciences	12.7	**7.5**	4.9	29.4	45.6	*100%*	*2730*
Health	8.4	3.6	3.7	24.4	**59.9**	*100%*	*6990*

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Social Sciences	11.4	5.6	**7.6**	28	**47.4**	*100%*	*15347*
Engineering and Architecture	**18.2**	**11.3**	6.5	**40.6**	23.4	*100%*	*7544*
Total	*13.5*	*6.6*	*6.6*	*29.5*	*44*	*100%*	*36909*
Access route* [0.092]**							
PAU (Baccalaureate + exam)	10.3	**7**	5.7	**31.6**	**45.4**	*100%*	*23359*
CFGS (Vocational training)	**18.3**	6.1	**7.6**	27	41	*100%*	*5742*
Previous bachelor's degree obtained	**33.2**	3.5	8.2	14.7	40.4	*100%*	*624*
Previous bachelor's degree non obtained	**25.3**	6.6	**9.3**	24.2	34.6	*100%*	*1783*
> 25 years old	**32.8**	**8.9**	**10.2**	19	29.2	*100%*	*765*
Other	13.2	4.8	**7.9**	27.6	**46.6**	*100%*	*4636*
Total	*13.5*	*6.6*	*6.6*	*29.5*	*44*	*100%*	*36909*

Note: *** p < 0.000 ** p ≤ 0,01 * p ≤ 0.05 for the chi2 test
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