# RANKING SERVICES FOR STUDENTS VIA PREFERENCE ELICITATION AT PADUA UNIVERSITY

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**Abstract**: *The University of Padua conducted a survey to elicit the preferences of its students for new services that the university, the city and local authorities could offer to improve student life before, during and after graduation. In this paper, we present the statistical methodology for ranking services according to students' preferences and discuss the resulting ranks of the services grouped in 10 thematic areas. We conclude that the preference elicitation method and the rank estimation method adopted in our research are appropriate for within-university prioritisation of student services.*

**Keywords**: *Service ranking, guidance services, preference analysis, dominance matrix, University of Padua.*

## 1.    Introduction

A university has a moral imperative to improve services for its students, adopting the perspective of students. Service planning should concentrate on student needs and preferences, and the services delivered should focus on the expected effects on students. Our statement is no demagogy; it is a necessity that stems from both institutional ethics and the single university's need to survive in the higher education global market [1] [2] [3].
We focus on educational and social services and economic support structures, for which there is an ever increasing need. The European University Association (EUA) [4] suggests restructuring the relationship between university education and student services so that educational outcomes and student welfare both improve in the EU. At present, the EUA is examining four classes of services: (i) Consulting and guidance, which include placement, mentoring and tutoring, and

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provisions made available by the ombudsman. (ii) Material support for everyday life, such as financial, health and disability assistance; accommodation and food provision; and other non-traditional subsidies for youth, families and the poor. (iii) Academic support of any kind — informative, formative and physical — for both domestic and foreign students. (iv) Non-academic services, which encompass sports and recreational activities, cultural support for organised groups, centres for social and cultural activities and transport and security within and around university campuses.

Students' needs differ according to student categories. Each category possesses its own features and expectations. If some universities are more responsive to those needs than others, students may favour that institution. Universities that fail to keep pace with best practices face potential decline.

The first step in understanding students' needs is to develop a clear picture of their characteristics and expectations. This can be achieved by each university, possibly each faculty, gathering information about its students and its situation, processing that information, defining a strategic vision on services, delivering those services and monitoring the results of its efforts. At any stage of this process, students should be involved, either individually or through student representative bodies.

In this paper, we focus on just the first step in the process, the knowledge achievement one. Statistics are used at this stage in the process to measure the relationships between alternative student services and students' preferences.

In Section 2, we introduce the methodology underlying our research, commencing with a survey of students at the University of Padua that was conducted during 2008. The research aimed at selecting and assigning individual values to services pertaining to learning and social life for which  students expressed an interest. Students were involved in the study from the start and contributed to the definition of the services. Research tools were then selected to rank students' preferences. We will finish with an elicitation of students' preferences.

We will transform the expressed preferences into priorities. In doing so, we aim to present the range of preference expressions in a clear and transparent manner and highlight the statistical relationships between particular groups of students and their expressed priorities.

The main outcomes of our analyses are presented in Section 3. The next step is expected to be a policy decision by the university administration on the proposals outlined in our research. Our results are presented in a way that allows political judgement to intervene.

## 2.    Materials and Methods

The research comprised two steps: collecting information on the kinds of services students considered important and ranking services according to students' preferences.

Interviews were conducted with 11 focus groups to yield a map of potential services. Each focus group was made up of about 15 students characterized by the same attributes. These included being disabled; resident in Padua; regularly attending classes, sports centres at the university,  e-learning courses at a decentralised university site; residing outside Padua but living in the city; daily commuting, part-time working, or full-time working; being a masters' programme student but graduated of another university; being a student who  graduated within the past two years.

Focus groups helped us to identify 104 possible services classified into 10 "thematic areas" (pre-university guidance, during course attendance services, after graduation guidance services, study support, socialisation, acknowledgment and efficiency, spaces, teaching materials, tutorship and learning initiatives).

We then conducted a sample survey and administered a short, two-page questionnaire composed of three parts:

-   Variables associated with students' backgrounds (gender, age, nationality, faculty, study programme, attendance year, domicile during the academic year);
-   Students' use of educational, social and learning support services and their weekly timetable;
-   A random list of 52 mapped services. For every thematic area, we defined six random lists of services by selecting four random sub-samples of items and combining the sub-samples in distinct pairs. Each random list was associated to a different questionnaire. Thus, every respondent had to choose among half of the items in each thematic area, for example among 6 services if the area was composed of 12 items. If any questionnaire had been submitted to an equal-size sample, all services would have matched the same number of times with all other services of a thematic area, although any sampled student was asked to express his or her preferences on just half the number of mapped services. In each of the six questionnaires, the length of the random lists of a specific area varied between four and eight services. This was aimed at significantly reducing the response error caused by the so-called "order effect" associated with having a long list of alternatives [5]. Moreover, alternatives within each area were administered in a permutated fashion so that the possible administration order effect be compensated on the whole set of responses.

Unfortunately, due to practical constraints, we administered just five of the six types of questionnaires. Hence, some services failed to match in these five questionnaires.

As a result of practical and economic issues, we selected students in a systematic fashion according to the order in which they entered in the Students' Secretariat and systematically allotted students to one of the five questionnaires, which they completed using the Computer Assisted Self-administered Interviewing (CASI) approach. This approach enabled us to define five random, equal-size, comparable sub-samples. The study group comprised 1,590 students, of which 1,526 completed the questionnaires, corresponding to a 96% response rate. The study was conducted from mid-April to mid-June 2007. Respondents to the five questionnaires were as follows: 305, first and second; 303, third; 310, fourth; and 303, fifth. The respondents represent a random sample of students using the university's services.

Students expressed preferences in each of the 10 thematic areas: from the list, they were required to select no more than one service out of four, two out of six, and three out of eight, according to the list length. When they had to select two or more services, no order of preference was asked for.

The scoring methodology is based on preference analysis. Let us denote with $y_{hij}$ the choice expressed by student $h$ ($h=1, …, n$) between services $i$ and $j$ ($i{\neq}j=1, …, k$) and $y_{hij}=1$ if $i$ was preferred to $j$ (from now on $i{>}j$), and 0 otherwise. When defining the dominance relationship, ties are ignored, so that $n_{ij}$ is the sum of occurrences of either $i{>}j$ or $j{>}i$. The maximum likelihood estimator of $\pi_{ij}$, the probability that $i{>}j$, is [6]:

$$\hat{\pi}_{ij} = p_{ij} = \sum_{h}^{n} y_{hij} / n_{ij} = v_{ij} / n_{ij} \qquad (i \neq j = 1, ..., k),  \qquad\qquad (1)$$

where $v_{ij}$ is the number of occurrences that $i > j$. Consequently, $p_{ji} = 1 - p_{ij}$ and $p_{ii}$ is conventionally put at 0.

The preference estimates can be ordered in a dominance matrix $\mathbf{P} = \{p_{ij} \ (i,j=1, ..., k)\}$, which is square and irreducible.

According to the Frobenius–Perron theorem of irreducible matrices, $\mathbf{P}$ satisfies the relationship:

$$\mathbf{Pw} = \lambda_{max} \, \mathbf{w}, \tag{2}$$

under $\mathbf{w'w}=1$ normalisation constraints. $\lambda_{max}$ is the largest positive eigenvalue and $\mathbf{w}$ is the corresponding right eigenvector whose entries are all positive. The main positive eigenvalue has a maximum boundary: $\lambda_{max} \leq (k+1)/2$ [7].

Entry $w_i$ ($i=1, \ldots, k$) estimates the relative position of service $i$ in a $0 \div 1$ interval. Since the maximally preferred services are assigned the highest values, the entry $w_i$ can be assumed as a measure of importance for the surveyed population. If we wish the weights to add up to one, a score $v_i$ is computed such that $\Sigma v_i = 1$, i.e. $v_i = w_i / \Sigma w_i$. Vector $\mathbf{v} = \{v_i \ (i=1, \ldots, k)\}$ estimates the preference probabilities of the listed services.

Due to the sixth questionnaire not being administered, some pairs of items in the questionnaires never matched. Therefore, in order to apply the weight estimation method, the missing probabilities were indirectly estimated via the transition. The transition function for $p_{ij}$ is an algorithm that logically combines two preference probabilities $p_{ik}$ and $p_{kj}$: in general, if service $i$ is preferred to $k$, and service $k$ is preferred to $j$, then service $i$ will be preferred to $j$.[1]

In the following, we apply the "proportional" transitive estimation rule [12], which has proved to be superior to the "strong" and "moderate" rules proposed previously [13]:

$$if\,(p_{ik} \geq p_{kj} \geq 0.5) \Rightarrow p_{ij} = p_{ik} + 2(1 - p_{ik})(p_{kj} - 0.5) \tag{3}$$

$$if\,(p_{ik} \leq p_{kj} \leq 0.5) \Rightarrow p_{ij} = 2 p_{ik} p_{kj} \tag{4}$$

The proportional transition rule is stronger than the strong transition rule, suggesting that if both $p_{ik}$ and $p_{kj}$ are larger than 0.5, we can expect that $p_{ij}$ overcomes $max(p_{ik}, p_{kj})$; this new method allows us to estimate "how much" $p_{ij}$ is larger than $max(p_{ik}, p_{kj})$. Suppose that $p_{ik} > p_{kj} > 0.5$, we expect the unknown probability $p_{ij}$ to be larger than $p_{ik}$ of a quantity proportional to the normalised distance between $p_{kj}$ and 0.5. The case $p_{ij}=0.5$ is trivial, when students express no preference for either i or j.

This algorithm can only be applied if both preference probabilities $p_{ik}$ and $p_{kj}$ are either larger or smaller than 0.5. If either $p_{ik}<0.5$ and $p_{kj}>0.5$ or $p_{ik}>0.5$ and $p_{kj}<0.5$, the trivial value 0.5 is attributed.

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[1] A possible limit of the procedure is the so-called Condorcet Paradox, that is the existence of intransitivities between triplets, quadruplets, and so on, of the concerned alternatives [8]. Our data collection method respects the Condorcet's hypothesis of articulation of public reason since it implies each other independence of individual choices, homogeneity of students' judgmental competence, that is all students are supposed to choose according to an analogous choice structure (small changes in individual preferences should not lead to changes in the social preference larger than large changes in individual preferences, see [9]), anonymity of voters because only the number of votes counts for collective choice, but not the identity of students who cast the votes, and neutrality of the concerned alternatives so that their rank solution remains the same whatever the items' permutation administered [10] [11].

We can estimate an unknown probability $p_{ij}$ through more than one transition path. If more than one estimate of $p_{ij}$ is made available, we can estimate $p_{ij}$ with the arithmetic mean of the admissible estimates.

The scores of the services attained for each of the 10 areas obtained through the method expressed by equation (2) are described in Section 3. The methodology can be applied even to subgroups of students. In Section 3, we present also the results of the analysis stratified according to class attendance and student nationality.

# 3.    Results

The estimates of the preference probabilities of university services are presented in Table 1. For the sake of simplicity, we present and discuss only the three top-ranking activities within each of the 10 service areas.

The main eigenvalue of the dominance matrix for each thematic area of guidance services was close to its maximum $[(k+1)/2]$. This finding indicates that this approach is well suited to scoring these types of services. The mean and standard error of the preference probabilities for each service area are shown:  a high standard error, as in the *teaching material* area, indicates a strong difference among preferences.

Students expected that university services provided a clear picture of university life and information on jobs compatible with study pathways.

Job placement was the most important preoccupation of students before, during and after university:

- Before university, students wanted to know the likely professional outcome of their studies (percent weight estimate 13.1):  they showed confusion about the great number of study programmes on offer and wished to know, in concrete terms, how useful their university qualifications would be for employment. Students suggested that graduates (p.w.e. 11.8) and university teachers (p.w.e. 10.3) ought to be involved in toward-university guidance.
- Students also expected to be put in touch with companies, institutions and professional associations during their time at university (p.w.e. 14) to strengthen the link between education and work. They expected also that professionals and technicians should be involved in university teaching so as to shift the focus from the theoretical to the practical (p.w.e. 11.5). Students implicitly stated that they were unaware of the existence of some guidance services and asked that such services be advertised (p.w.e. 11.1).
- Moreover, students expected the university to provide support for them both in the areas of placement and pertinent postgraduate study programmes (p.w.e. 17.6). Students wished for individual counselling in choosing internships, training-on-the job (p.w.e. 14.4) and job searching (p.w.e. 14.3).

**Table 1. First three priorities expressed by Padua University students with reference to service area.**

| Service | Percent weight estimate |
|---|---|
| **Before university guidance** *(12 items)*: $\lambda_{max}$=5.997,  $\mu = 8.3$,   $\sigma = 2.5$ | |
| Linking university programmes and employment pathways at high school | 13.1 |
| Faculties and study programmes should be presented in high school by university students and graduates | 11.8 |
| Faculties and study programmes should be presented by university teachers | 10.3 |
| **During course attendance services** *(12 items)*: $\lambda_{max}$=5.952,  $\mu = 8.3$,   $\sigma = 2.6$ | |
| Students should be put directly in touch with companies and graduates | 14.0 |
| Occupational experts should lecture and students be credited for attendance | 11.5 |
| Service accessibility should be advertised | 11.1 |
| **After graduation guidance services** *(8 items)*: $\lambda_{max}$=4.198,  $\mu = 12.5$,   $\sigma =3.6$ | |
| Promoting guidance for postgraduate study programmes and jobs | 17.6 |
| Creating an individual consultation service for choosing internship | 14.4 |
| Organizing university services for graduate placement | 14.3 |
| **Study support** *(12 items)*: $\lambda_{max}$=5.743,  $\mu = 8.3$,   $\sigma = 3.0$ | |
| Lowering transportation costs | 14.4 |
| Subsidies for bars and non-university canteens | 11.3 |
| Synchronizing train and bus schedules with lesson timetables | 10.4 |
| **Socialisation** *(8 items)*: $\lambda_{max}$=4.357,  $\mu = 12.5$,   $\sigma = 2.4$ | |
| Creating university sites for amusement and socialisation, run by students | 16.4 |
| Promoting cultural exchange with students from different countries | 15.1 |
| Promoting sport activities within the university | 13.8 |
| **Acknowledgements and efficiency** *(16 items)*: $\lambda_{max}$=7.884,  $\mu = 6.3$,   $\sigma = 2.0$ | |
| Running administrative practices through the Internet, avoiding queues | 9.9 |
| Fostering through any channel student grant and tax-reduction information | 9.0 |
| Creating a call centre to deal with student enquiries to the student secretariat | 8.5 |
| **Spaces** *(8 items)*: $\lambda_{max}$=4.333,  $\mu = 12.5$,   $\sigma = 2.6$ | |
| Increasing spaces in laboratories, libraries and classrooms | 16.3 |
| Making study rooms accessible in evening hours | 14.3 |
| Increasing study room capacity | 14.0 |
| **Teaching material** *(8 items)*: $\lambda_{max}$=3.942,  $\mu = 12.5$,   $\sigma = 5.0$ | |
| Inviting teachers to put their teaching materials on the web | 20.8 |
| Increasing completeness of teaching materials on the web (to avoid textbook purchase) | 17.1 |
| Taping all lectures and making them available on the Internet | 14.8 |
| **Tutorship** *(8 items)*: $\lambda_{max}$=4.284,  $\mu = 12.5$,   $\sigma = 3.0$ | |
| Creating individual tutorship with teachers, assistants and PhD students | 15.9 |
| Creating a commission in faculties with tutors to providing help and dealing with complaints | 14.9 |
| Encouraging teachers to act as senior tutors for students | 14.7 |
| **Learning initiatives** *(12 items)*: $\lambda_{max}$=6.045,  $\mu = 8.3$,   $\sigma = 2.4$ | |
| Ensuring teachers can be contacted at consulting hours | 11.7 |
| Making email contact with teachers possible | 11.1 |
| Ensuring that course evaluation yields tangible results | 10.8 |

Students also noted that they would like the university to enter into agreements with Padua local authorities, institutions that support studies, such as the ESU, and transportation companies so that train and bus schedules could be synchronised with lesson timetables (p.w.e. 10.4). Students also wished transportation costs to be reduced (p.w.e. 14.4) and subsidies for introduced bars and canteens (p.w.e. 11.3).

According to students, universities should not only be a place of learning; they should also encourage social interaction and cultural growth. Thus, they proposed that university should provide sites where they could have fun and socialise, with such sites being run by the students themselves (p.w.e. 16.4); they also desired areas suitable for self-development and sports activities (p.w.e. 13.8). Moreover, students seemed interested in cultural exchanges with students from other countries and regions (p.w.e. 15.1).

The key aspects of service planning and management were: efficiency, users' comfort and communication through the Internet. These characteristics were viewed as keys to any administrative practice. Students' preferences were the following: Administer services in an efficient manner to avoid queues (p.w.e. 9.9), disseminate information on grants and tax reductions (p.w.e. 9.0), and set up a call centre to answer service-related questions (p.w.e. 8.5).

Students also stated that they would like teachers to post their teaching materials on-line (p.w.e. 20.8) and that this material should be enough wide to avoid the purchase of textbooks (p.w.e. 17.1). They also suggested taping all lectures and making them freely available (p.w.e. 14.8). It is unclear whether such requests are motivated by a desire to improve their education or simply to avoid financial outlays and time spent in class.

Overall, the students placed most emphasis on learning, not only on laboratories and classrooms but also on lecture rooms and libraries (p.w.e. 16.3), requesting that they remain open until late in the night (p.w.e. 14.3).

Students did not see their peers as tutors if they were unable to keep up in class. They felt that tutorship should be the role of teachers, teaching assistants and PhD students (p.w.e. 15.9).

Concerning teacher–student relationships, students required contact at out-of-class question times (p.w.e. 11.7) and favoured contact via email (p.w.e. 11.1). They also expressed a desire to continue to vote for class evaluations and that these evaluations deliver tangible outcomes (p.w.e. 10.8).

Students cannot be viewed as a single entity: clusters of students differed according to service expectations. Therefore, intervention in the area of service provision requires addressing the different needs of student categories. In the following paragraphs, we focus on the rankings assigned to certain categories.

Class attendance is a variable that discriminates among students' preferences[2]. The attendance frequency is often conditioned by students' extracurricular activities, for example, 43.1% of non-attending students work[3], as opposed to 11.8% of attending students. Students who do not regularly attend classes have fewer relationships with peers and teachers and cannot access university services during their spare time.

Not-attending students have specific needs, such as accessing on-line teaching materials and information on classes, contacting teachers via e-mail (p.w.e. 22.3 vs. 6.1 of attending ones) and accessing taped lectures via the Internet (p.w.e. 18.4 vs. 13.2). They would also like study rooms to be made available in the evening (p.w.e. 16.6) and teachers to be available on appointment

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[2] We consider 'attendant' a student who has taken more than 40% of the university courses during the last year.
[3] We consider 'worker' a person working at least 21 hours a week.

outside regular office hours (p.w.e. 11.8) (Table 2). Such students also appear to deem individual tutorship important to fill gaps caused by missing classes (p.w.e. 17.8) [14].

**Table 2. Service priority for non-attending students compared with attending students.**

| Service | Percent weight estimate | |
|---|---|---|
| | Not att. (n=473) | Attending (n=1053) |
| Making email contact with teachers possible | 22.3 | 6.1 |
| Taping all lectures and making them available on the Internet | 18.4 | 13.2 |
| Creating individual tutorship with teachers, assistants and PhD students | 17.8 | 15.1 |
| Making study rooms accessible in evening hours | 16.6 | 13.3 |
| Emailing a newsletter about conferences, social and recreational initiatives for students | 15.8 | 9.3 |
| Ensuring teachers can be contacted at consulting hours | 13.6 | 10.9 |
| Making teachers available by appointment (outside of consulting hours) | 11.8 | 8.9 |

*Note: services belong to different thematic areas, consequently percent weight estimates do not add to 100.*

Foreign students constitute another distinct category at the University of Padua. Although many foreign students reside in university houses (25.8% vs. 3.5% of Italians), others share apartments with other students. They are, therefore, bound to use university study rooms. That is why they wished for the university to expand access hours (p.w.e. 19.6 vs. 14.0) and impose silence in study rooms (p.w.e. 15.8 vs. 10.6).

Most of the foreign students think that Italian is a problem for them, so they would like to see an Italian tutorial service within the university (p.w.e. 24.0 vs. 2.8), as well as simulations and tests to improve their Italian (p.w.e. 22.2 vs. 13.0) and basic computer science learning (p.w.e. 16.1 vs. 10.6). As their linguistic ability is low, compared with the Italian students, to take notes during classes, they would like teaching materials to be posted on-line (p.w.e. 30.5 vs. 20.2 of Italians), enabling them to go through the material at their own pace.

Foreign students would also like more learning-related books in peripheral libraries (p.w.e. 18.5 vs. 12.8). In contrast to Italian students, they would favour the creation of an office for complaints against teachers (29.3 vs. 4.8).

Finally, foreign students are more likely to travel outside Italy and would like to have more information about learning opportunities in other European countries (p.w.e. 18.4 vs. 12.0), opportunities to change study programme (p.w.e. 14.2 vs. 6.1) and support for whose who wish to enrol at the University of Padua (p.w.e. 13.9 vs. 9.3). They would also like to be helped in completing admin-related paperwork owing to major difficulties they encounter in deciphering rules pertaining to university procedures [15].

**Table 3. Service priority for foreign students compared with Italian students**

| Service | Percent weight estimate | |
|---|---|---|
| | Foreign (n=92) | Italians (n=1434) |
| Inviting teachers to put their teaching material on the web | 30.5 | 20.2 |
| Creating an office for complaints against teachers | 29.3 | 4.8 |
| Instituting a service for linguistic revision for non-Italian students | 24.0 | 2.8 |
| Promoting cultural exchange with students from different countries | 23.4 | 14.6 |
| Making simulations and tests for foreign language learning available to students | 22.2 | 13.0 |
| Making study rooms accessible in evening hours | 19.6 | 14.0 |
| Increasing the number of books in faculty libraries | 18.5 | 12.8 |
| Advertising notices for student opportunities in Europe | 18.4 | 12.0 |
| Making simulations and tests available for basic computer science learning | 16.1 | 10.6 |
| Increasing the number of buses during rush hours | 15.9 | 7.0 |
| Promoting sports activities within the university | 15.9 | 13.7 |
| Making study rooms available to groups of students | 15.8 | 13.1 |
| Imposing silence in study rooms, providing ward service in study rooms | 15.8 | 10.6 |
| Supporting students who plan to change faculty | 14.2 | 6.1 |
| Supporting students of other universities wishing to enrol at Padua University | 13.9 | 9.3 |

*Note: services belong to different thematic areas, consequently percent weight estimates do not add to 100*

## 4.    Discussion

Certain terms recur in our research on services for university students:  relationships, guidance, economic support and communication.

Students look to peers to socialise, teaching staff and tutors to improve their knowledge and increase their own motivation for studies and university officers to supply services.

Students are heavy users of the Internet, and the Internet should be used more to communicate the many services and opportunities that are available to students. The web can, for many, provide a substitute for vocabulary, and students expect to find on-line details of topics they find relevant. Nevertheless, the Internet cannot be a substitute for direct contact with tutors.

Students also need to share information about available services, so the type and quality of the available services are to be promoted. As consumers, students have to be kept informed. The University of Padua has already put in place services to support students in this regard; however, students did not get all the information they required.  Like many customers, some students only became aware of the existence of a particular service when a specific need arose. It is, therefore, crucial to find better ways to directly promote the delivery of all services that are available, possibly involving students when they approach a service counter.

Knowledge of the employment chances is crucial for students' decision-making skills. Such knowledge can be gained in a number of ways including information exchange with graduates, listening to career guidance experts and undertaking internships.

The relationship between job knowledge and the student's predilection for a particular study programme is not linear. Employment opportunities and job type are the principal dimensions of the multi-criteria decision-making processes that students undergo while they search for a study programme. The choice of a programme also crosses the dimensions of factors such as cultural

propensity, empathy for a particular discipline, reputation of the faculty and university and closeness of course location—all subjects alien from labour considerations. The problem for many students is that they are unable to imagine the business world simply because, in general, they have not had significant internship or work experience.

The socio-economic context is vaguely represented in students' minds. Nevertheless, they wish to make independent decisions. They, thus, request information services that are impartial, directly accessible and easy to understand. They indicate as top-rank informants other students and graduates who are able to provide information on university life, quality of teachers, teaching facilities and employment opportunities. The second best informants are university teachers who have contacts with companies and institutions and are able to map out the pathways from education to employment.

Communication between administration services and students needs to be improved at the University of Padua. To dispel student uncertainties and enable decision making, all services should be organised into relational maps and informative tables. The maps should be exhaustive, structured in a hierarchical manner and informed by the end users' viewpoint.

The relevant information for students—course organisation, characteristics, content and logistics—should be made available via the Internet. For current students, study material is an important issue, and lessons should be made available via the Internet to facilitate studies.

Economic support for learning should be available not only to students with insufficient family income, but to any student. A growing number of students prefer managing a personal loan; this enables them to make their own decisions about their lives, free from familial or other social constraints.

The type and number of services required depend on student characteristics. Some students are interested in socialising as much as learning. Others, such as those who work or have children or face a long daily commute to get to the university, may not be interested in social activities but do require lessons to be made available on-line and have contact with teachers and administration officers. There is a high risk that such students will abandon their studies. Appropriate methods, therefore, need to be put in place to enable them to keep in touch with the university.

In conclusion, our research has identified specific attributes of students whose learning ability and social development may be at risk as a result of weaknesses in university administration services. The findings may prove useful to planners of university services.

## Acknowledgements

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# Appendix. List of students' and graduates' supporting activities

**1. Before university guidance** (maximum 2 choices)
A. Guidance towards university to be started at fourth year of high school (previous to last year)
B. Faculties and study programmes should be presented in high school by university students and graduates
C. Veneto universities to be described and made accessible through the Internet
D. Realizing meetings in high schools with professional orders
E. Statistics on employment after graduation to be introduced to high school students
F. Linking university programmes and employment pathways at high school
G. Improving competences of high school professors for strategic guidance
H. Veneto universities to be introduced at high school level by a third-party institution
I. Lectures typical of each university faculty to be delivered to high school students
J. Increasing and advertise the meetings where faculties are presented
K. Diffusing at the high school level a map of people who can be called for guidance purposes
L. Faculties and study programmes should be presented  by university teachers

**2. During courses attendance services** (maximum 2 choices)
A. Pairing any refresher with a close-to-graduation student in order to guide the former within the faculty
B. Creating a blog where early-graduates can describe their experiences
C. Publishing a unique booklet with description of all University courses, instead of single faculty booklets
D. Supporting students who plan to change faculty
E. Guidance service to be organized for bachelor and master students
F. Service accessibility should be advertised
G. Creating student groups for helping students in the definition of individual study programme
H. Improving the competences of Students' secretariat people in guidance for abroad studies
I. Students should be put directly in touch with companies and graduates
J. Occupational experts should lecture and students be credited for attendance
K. Organizing a soft-competence evaluation service
L. Standardizing the rationale of faculty's websites

**3. After university paths** (maximum 1 choice)
A. Organizing guidance courses for graduates
B. Organizing university services for graduate placement
C. Promoting guidance for postgraduate study programmes and jobs
D. Educating graduates in CV writing and employment colloquium
E. Creating an individual consultation service for choosing internship
F. Adding to the graduation material an informative map about the job market
G. Advertising notices for student opportunities in Europe
H. Allowing students to keep their academic email address one year after graduation

**4. Study support** (maximum 2 choices)
A. Subsidies for bars and non-university canteens
B. Canteens' closure time to be delayed after 3 pm
C. Improving the number of vending machines of liquids and snacks
D. Creating a website for students' information exchanges on housing and else
E. Increasing parking places for bicycles and motorcycles
F. Increasing the number of buses during rush hours
G. Allowing students to spend their after-meal bonus as they like

    H.  Speeding the queue at university canteens
    I.  Creating an office, run by students, for housing
    J.  Lowering transportation costs
    K.  Increasing parking places for students' cars
    L.  Synchronizing train and bus schedules with lessons' timetables

**5. Socialization** (maximum 1 choice)
    A.  Creating university sites for amusement and socialisation, run by students
    B.  Emailing a newsletter about conferences, social and recreational initiatives for students
    C.  Organizing parties chiefly at the initial years
    D.  Promoting sport activities within the university
    E.  Supporting students of other universities wishing to enrol at Padua University
    F.  Diffusing through the Internet news on students' parties, tournaments and other aggregative opportunities
    G.  Organizing theatre occasions for all university people
    H.  Promoting cultural exchange with students from different countries

**6. Acknowledgements and efficiency** (maximum 3 choices)
    A.  Defining non-bureaucratic and plane guidelines for enrolling at the university
    B.  Creating a unique counter for a unique queue in Students' secretariat
    C.  Creating student secretariats in towns other than Padua where the University of Padua operates
    D.  Counting credits for granting purposes after the fall session
    E.  Instituting prizes for profitable students
    F.  Defining a "student's health rights chart" referred to services and costs
    G.  Increasing the maximum number of printing pages and photocopies a student can use
    H.  Instituting a tutorial service for linguistic revision for non-Italian students
    I.  Creating a call centre to deal with students enquiries to the student secretariat
    J.  Running administrative practices through the Internet, avoiding queues
    K.  Fostering through any channel student grant and tax reduction information
    L.  Recognizing sport merits as a part of study curriculum
    M.  Installing wireless and telephone in students' residences
    N.  Creating a patronage for foreign students' sojourn permits
    O.  Creating an office for complaints against teachers

**7. Spaces** (maximum 1 choice)
    A.  Aggregating faculty buildings in defined segments of the urban territory
    B.  Finding larger classrooms
    C.  Imposing silence in study rooms, providing ward service in study rooms
    D.  Making the students available rooms for cultural and recreational projects
    E.  Increasing spaces in laboratories, libraries and classrooms
    F.  Increasing study room capacity
    G.  Making study rooms available to groups of students
    H.  Making study rooms accessible in evening hours

**8. Teaching material** (maximum 1 choice)
    A.  Increasing completeness of teaching material on the web (to avoid textbook purchase)
    B.  Supporting courses whose teachers write textbooks
    C.  Increasing the number of books in faculty libraries
    D.  Allowing students to tape teachers' lessons
    E.  Inviting teachers to put their teaching material on the web
    F.  Allowing commerce of lecture notes, as revised by teachers
    G.  Creating a multimedia production centre for e-learning

H.  Taping all lectures and making them available on the Internet

**9. Tutorship** (maximum 1 choice)
    A.  Creating individual tutorship with teachers, assistants and PhD students
    B.  Creating a commission in faculties with tutors to providing help and dealing with complaints
    C.  Making simulations and tests available for basic computer science learning
    D.  Encouraging teachers to act as senior tutors for students
    E.  Students' unions to be empowered for junior tutorship and information
    F.  Making simulations and tests for foreign language learning available to students
    G.  Improving the teaching competences of faculty junior tutors
    H.  Eliminatining faculty junior tutors

**10. Learning initiatives** (maximum 2 choices)
    A.  Favouring outer-faculty student consultation for helping students in preparing particular exams
    B.  Organizing in each faculty study groups with graduates for preparing access-to-profession exams
    C.  Allowing a regulated access to libraries through the Internet (with password)
    D.  Improving the questionnaire and data collection method for yearly course quality evaluation
    E.  Making teachers available by appointment (outside of consulting hours)
    F.  Organizing summer schools
    G.  Organizing study groups where students of last years are present, for each study programme
    H.  Helping students in using the OPAC catalogue
    I.  Ensuring that course evaluation yields tangible results
    J.  Ensuring teachers can be contacted at consulting hours
    K.  Making email contact with teachers possible
    L.  Organizing competitions with prizes for students, for a more pleasant study