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LEARNING ONLINE: REMOTE TEACHING AND UNIVERSITY STUDENTS' ENGAGEMENT

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Abstract. *The COVID-19 pandemic has had a dramatic impact on many dimensions of living and working conditions, and uncertainties about the developments that we shall still face in the near future. This paper analyses the implications of a forced overnight push to online teaching. Drawing upon an online survey conducted during the 2020 lockdown by the University of Modena and Reggio Emilia, this article describes students' living and studying conditions revealed by a large set of open and closed questions. The survey provides significant information on the students' real off-campus conditions, crucial data for the multidimensional analysis by combining non-parametric multivariate analysis of closed questions with textual analyses. It offers important indications about the most useful tools for inclusive teaching across thematic areas and highlights the main difficulties that emerged during the lockdown. Reflections on advantages and disadvantages, strengths and weaknesses in the innovative learning environment set up overnight are offered at a policy level.*

Keywords: *Covid-19, Online teaching, Student satisfaction, Student engagement.*

INTRODUCTION

After China, in Italy and suddenly all over the world, the health emergency brought about by COVID-19 triggered a radical and rapid change in university life. In March 2020, remote teaching became the rule almost overnight in all Italian universities, with drastic consequences for the length and depth of the organisation of both students and lecturers. Classes, examinations and laboratories were suddenly reorganised by a collective effort that benefited from previous experimentation and

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innovation in teaching methods. Not only did the technical and remote delivery of all classes lie at the core of the challenge, but also the array of tools and practices concerning emergency teaching (Hodges et al., 2020) that could build on existing practices. Here, the goal is to illustrate the lessons learnt by listening to students, building on a survey tool setup to evaluate students' feelings and socioeconomic living conditions. The online survey conducted by the University of Modena and Reggio Emilia (Unimore) investigated the material and socioeconomic conditions of its students during the lockdown, how they coped with the pandemic and how the remote teaching system affected organisation of their studies (methods and plans). In short, we sought to evaluate the consequences of social and physical distancing – as a practice imposed in order to cope with the pandemic.

The specific open and closed questions formulated in the questionnaire enabled us to investigate the following issues:

- What material and study conditions characterise those students who participated in the survey during the COVID-19 emergency period and what the main issues throughout this period were (Section 3.1).
- What the effects of the online teaching system on the students' plans were (Section 3.2).
- What drivers explain the degree of satisfaction with the online teaching system (Section 3.2).
- How many the typical profiles (and their characteristics) among students are (Section 3.3).
- Which new policy measures and actions can be implemented in order to help students and to increase their level of satisfaction after the emergency period (Section 5).

We have investigated these issues with descriptive analyses as well as by means of supervised and unsupervised multivariate methods. The paper is organised as follows: Section 2 describes the survey and the data. Section 3 reports the main results obtained performing: simple descriptive statistics (Section 3.1), random forest models implemented to explain the effects of the online teaching system (Section 3.2), multivariate analyses sought to identify homogeneous groups of students (Section 3.3), textual analysis on open questions (Section 3.4). Section 4 discusses the free text answers collected through the survey: beyond the emergency condition, it provides a fuller picture of the inequalities that students face during their academic lives while Section 5 concludes with some considerations for future university policies. Annexes present detailed results. The database is available online at http://dx.doi.org/10.25431/11380_1272288.

2. THE SURVEY

The survey covered 27,792 students, categorised by: department, type of study (bachelor's degree, master's degree, 5-year or 6-year degree), status in completing or not completing university examinations in the prescribed time (the status of regular/not regular is a peculiar characteristic of the Italian university system), ECTS credits, gender. The rate of complete answers was 19.2%, we therefore obtained a sample of 5,341 students.

The participation rate greatly varies by area and department, with a higher participation of students enrolled in the Society and Culture syllabus. Considering the type of degree course, the year of enrolment, the credits achieved and the gender, the response percentages in the sample are similar to the percentages of those enrolled students in the population only for some variables (see Table 1). We did not decide to weight the observations.

The online survey was carried out utilising Survey Monkey, with an individual link sent to the students. The questionnaire consisted of 36 questions grouped into four sections: (i) general information on trips home triggered by the emergency, living conditions and ongoing problems and changes; (ii) the organisation of study with respect to the teaching materials available, the timing and methods of the organisation of study; (iii) distance learning, with the focus on attendance and satisfaction, specific difficulties, conditions of concentration and interest, aspects that were missing and those that were appreciated, open questions on strengths and weaknesses of distance learning and suggestions and proposals; (iv) information on internships and working conditions. Annex 1 reports labels and short descriptions of variables used in the analyses.

Tab. 1: Frequency distributions of respondents and not-respondents considering the post-stratification variables

		Enrolled students (n)	*Completed survey (n)*	*Enrolled students (%)*	*Completed survey (%)*	*Response rate (%)*
Total		27792	5341	100	100	19.2
Area	Health	2434	478	8.76	8.95	19.6
	Life	1906	306	6.86	5.73	16.1
	Science	1859	262	6.69	4.91	14.1
	Society and Culture	14199	3310	51.09	61.97	23.3
	Technology	6956	981	25.03	18.37	14.1
	Erasmus	438	4	1.58	0.07	0.9
Current degree course	L - Bachelor's Degree	17757	3287	64.40	61.68	18.5
	LM - Master's Degree	5636	1132	20.44	21.24	20.1
	LM5 - Master's Degree 5 years	2747	597	9.96	11.20	21.7
	LM6 - Master's Degree 5 years	996	309	3.61	5.80	31
	Erasmus	438	4	1.59	0.08	0.9
Year of enrolment	1	7777	1214	27.98	22.73	15.6
	2	5239	1264	18.85	23.67	24.1
	3	7367	1321	26.51	24.73	17.9
	4	3030	677	10.90	12.68	22.3
	5	4170	818	15.00	15.32	19.6
	6	208	47	0.75	0.88	22.6
	N/A	1	0	0.00	0.00	0
Quartiles of archivied credits	Q1	8418	1134	30.29	21.23	13.5
	Q2	6889	1440	24.79	26.96	20.9
	Q3	6645	1525	23.91	28.55	22.9
	Q4	5336	1236	19.20	23.14	23.2
	N/A	504	6	1.81	0.11	1.2
Gender	Female	14379	3511	51.74	65.74	24.4
	Male	12973	1825	46.68	34.17	14.1
	Not Responding	440	5	1.58	0.09	1.1

3. RESULTS

3.1 DESCRIPTIVE ANALYSIS

We first summarise some important features that emerged from the univariate descriptive analyses of the dataset.

The surprise of the lockdown did not greatly affect the need of students to change their accommodation: 73.4% of students were living with their families, a tiny 15% needed or wanted to go back to their hometowns (mainly in distant regions such as Apulia, Basilicata or Sicily), and 11.6% remained in their community, student housing or apartment. Remote teaching had an impact on their studying conditions as did the digital resources they were able to use, such as electronic devices, internet connections and private spaces, to consult and browse class materials. Whilst a slight majority of students (53.4%) had their own private room where they could follow remote teaching and study, almost one fourth had to share the room or the computer with siblings, and more than one tenth could use a workstation for only a tiny fraction of the day (2-3 hours). Although the vast majority of respondents had a personal computer, there were 25% that did not: they asked a friend or relative to borrow their computer or were forced to use a smartphone. Whilst this could undermine the quality of remote teaching, it proved to be a major problem when it came to taking examinations. Overall, the Internet connection was not a problem except for 14% of respondents. The message is clear: the infrastructures that campus facilities offer are crucial for equalising the chances of studying effectively.

How remote teaching affected studying is revealed by the difficulties that emerged regarding self-organisation and the situation at home. A large 40% of respondents reported encountering major difficulties in self-organising their studying at home (listening, taking notes, assimilating content) and 9% (with a strong gender bias) declared that they had to take time away from their studying and instead prioritise domestic chores and responsibilities. Although one fourth declared that they were not in any way affected by the remote teaching, one fifth declared that they studied more hours and felt less prepared, while 15% needed more time to use the recorded classes. The impossibility of studying with colleagues in the library was felt as a barrier and a problem in the personal organisation. As discussed more thoroughly in Section 5, these findings demonstrate that not only material conditions, but also emotional and relational ones are crucial in defining a (more or less effective) study ecosystem.

Overall, the remote teaching system proved to be a positive experience for the majority of the students: 25% gave a score of 8 (on a scale from 1 to 10) whilst 50%

gave a median 6.4 score. Interestingly, students declared that their main difficulties were the following: 70% spent more time browsing and studying compared to the offline teaching experience; 60% felt that the absence of engagement with the lecturer was a problem; 60% had major difficulties in concentrating for personal (lack of motivation, no peer contact) or structural reasons (juggling the multiple teaching tools available, poor home material conditions).

3.2 A STUDY OF THE EFFECTS OF ONLINE EDUCATION ON STUDENTS' STUDY PLANS

The aim of the analysis is to evaluate if variations in students' study plans depend on university career features as well as on students' satisfaction with the online teaching.

We adopted the random forest algorithm (Breiman, 2001) with the target variable d20 "Compared to the plans you had for this semester, indicate where you are with your preparation in the various subjects" and input variables regarding living conditions, ongoing problems and changes, organisation of studies, distance learning (in Annex 1)[2]. The original target variable was a categorical variable with 5 modalities and, in order to prevent imbalanced data problems, two substantially negligible classes were excluded from the analysis (Table 2). The random forest model had, overall, a good predictive performance: the error rate was about 33%.

Tab. 2: Frequency distribution of modalities of variable D20

	Number	*% of respondents*	*% of used answers*
I am keeping abreast of all subjects	1197	22.4	23.5
I'm behind in some subjects	2827	52.9	55.4
I'm behind in all of my subjects	1080	20.2	21.2
I decided not to prepare any exams	23	0.4	
Other (specify)	214	4.0	
Sum	5341	100.0	100.0

When using a random forest algorithm, it is possible to rank the predictor variables according to their importance. Different indices can be used to determine the importance of the explicative variables in explaining the target variable. More specifically, we used a multi-way importance plot that combines some of these indices.

[2] Open questions of those sections are not included in this analysis.

In the case of qualitative variables, such as question d20, the plot uses: i) Mean Decrease Accuracy, which expresses how much accuracy the model loses by excluding each variable; ii) Mean Decrease Gini, which is a measure of how each variable contributes to the homogeneity of the nodes and leaves in the resulting random forest; iii) Mean Minimal Depth, based on the minimum depth of a variable in a tree, i.e. the depth of the node that splits on that variable and is closest to the root of the tree.

The higher the value of Mean Decrease Accuracy or Mean Decrease Gini score is, the higher the importance of the variable in the model is, and, in a random forest, if the Mean Minimal Depth is low then many observations are divided into groups based on this variable. Figure 1 (multi-way importance plot) shows the most important variables, whose impact can be analysed with the partial dependence plots (Figure 2).

The partial dependence plot (PDP) shows the marginal effect that one or two features have on the predicted outcome of a machine learning model (Friedman, 2001). The PDP makes it possible to highlight whether there is a dependency between the target variable and a set of input features of interest and to show whether the relationship between the target and a feature is linear, monotonic or more complex. The output is a plot, in which we have in abscissa the values of the input feature and in ordinate, in the case of classification problems (as in the case of question d20), the probability of belonging to a class of the target variable, while, in the case of a continuous target variable (d23), the value estimated by the model at the different values of the explanatory variable.

We observe the following impacts on the target variable d20 (student's performance in preparing the various subjects):

– being able to organise (d25_5: I can't organise my daily study activities effectively) impacts on the performance;
– as expected, proceeding equally with all the subjects (*d21_1: I am progressing equally on all the subjects taught in this semester*) positively impacts on keeping abreast of all subjects;
– with respect to distance learning (*d22: Are you following the distance learning activities provided by your study programme?*), there is a direct relationship between the amount of distance learning and keeping abreast of all subjects; there is an inverse relationship with those who are behind all, while the relationship is not monotonous with those who are behind by some subjects;
– lessons accumulation (*d24_1: The accumulation of lessons is creating difficulties for me*) has a direct relationship to those who are behind on everything, and obviously not for those who are keeping abreast of all subjects;

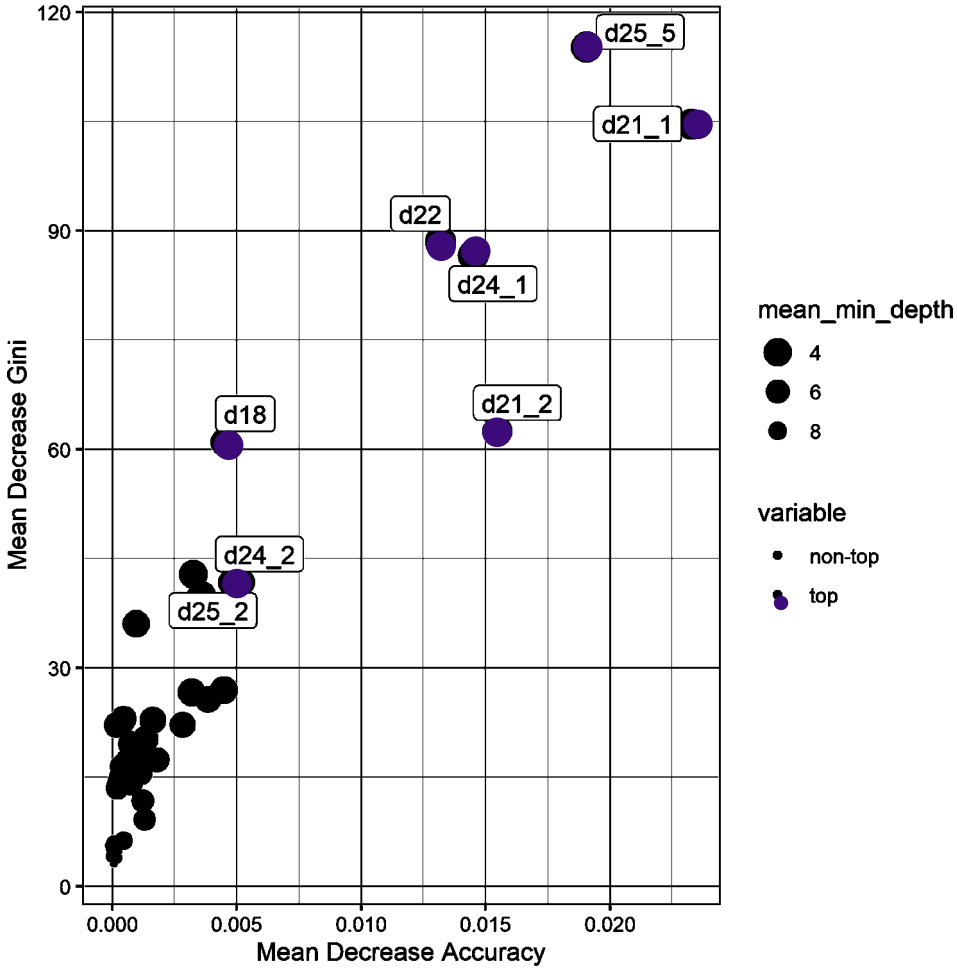

Fig. 1: Multi-way importance plot [d20]

Legend: top variables (blue) are those in the highest eight positions of the new variable importance that is obtained by combining the three criteria, i.e. the mean decrease accuracy, the mean decrease Gini and the mean minimal depth (mean_min_depth); non-top variables (black) are all remaining variables. In the mean minimal depth, the size of dots indicates the mean of the minimal depths (1, 2, …) in all trees. The lowest values are the closest to the root of the tree and, therefore, if the size of a variable is low, then many observations are divided into groups based on this variable.

– as expected, those who have prioritised some subjects (*d21_2: I have given priority to certain subjects taught in this semester*) are behind on some subjects;
– how students rearranged the study (*d18: How did you rearrange your studying times?*) seems to have an effect on falling behind in some subjects, while not seeming to affect keeping abreast or falling behind on all subjects.

In general, from the partial dependence plots (Figure 2) we observe that the most important input variables listed above mostly influence students that are behind in some subjects compared with the plans they had for the semester[3].

The analysis of the aspects influencing the level of satisfaction with the online teaching system can be considered a first step in understanding how to improve the online experience. For this further analysis, we consider variable d23 as the target

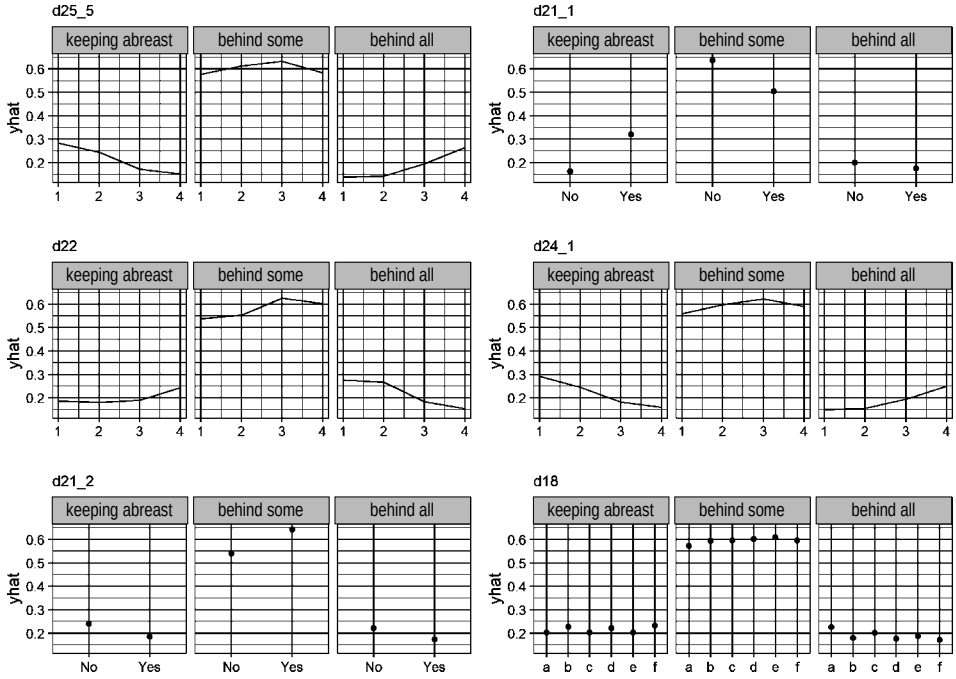

Fig. 2: Partial dependence plot [d20 vsd25_5, d21_1, d22, d24_1, d21_2, d18]

Legend: variables d25_5, d22, d24_1 are in a Likert scale (1-4) with the following modalities: 1 Not at all | 2 Barely | 3 Enough | 4 Very much
d21_1 and d21_2 are dichotomy variable (yes/no)
Variable d18 has the following modalities:

a Other (specify)
b I am studying as I used to, in terms of hours
c I study less because online lessons require less effort
d I study more because online classes require more effort
e I study more, but my level of preparation seems to be lower
f I study more, because I don't have to leave

[3] The central category ("behind some") is the most frequent in the dataset, so there is a higher probability of belonging to this class, however the objective of the PDPs is to visualise the effect induced by the changes in explanatory variables (d25_5, d21_1, d22, d24_1, d21_2, d18) on the target variable d20.

variable ("How satisfied are you with your global distance learning experience?", score range 1-10). The regression random forest provides a quite good result in terms of adaptability, with the explained variance equal to 50.24% (the mean of squared residuals is 2.18).

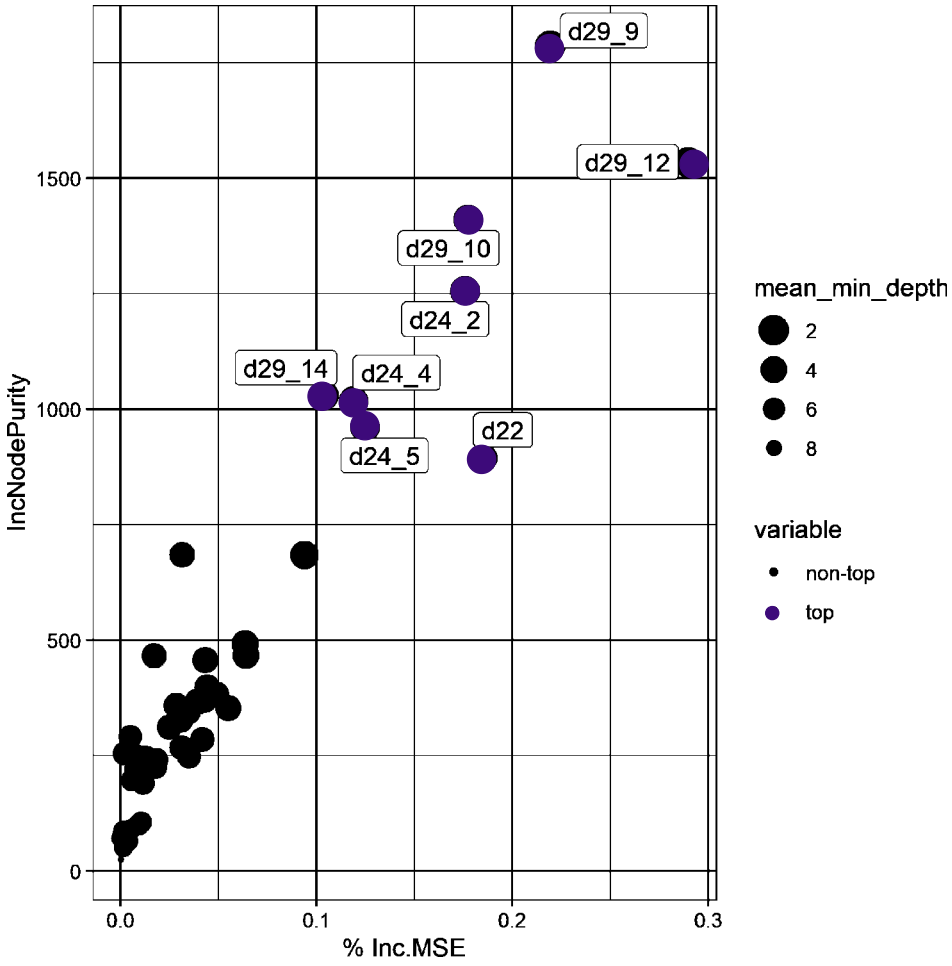

Fig. 3: Variable importance and multi-way importance plot of the dimensions affecting how satisfied students were with their distance learning experience [d23]

Legend: top variables (blue) are those in the highest eight positions of the new variable importance that is obtained by combining the three criteria, i.e. the mean increase of mean squared error (% Inc.MSE), mean node purity increase (incNodePurity) and the mean minimal depth (mean_min_depth); non-top variables (black) are all remaining variables. In the mean minimal depth, the size of dots indicates the mean of the minimal depths (1, 2, …) in all trees. The lowest values are the closest to the root of the tree and, therefore, if the size of a variable is low, then many observations are divided into groups based on this variable.

The different methods utilised for assessing variable importance provide different rankings that can be summarised through a multi-way importance plot (Figure 3). In this case, as the target variable is continuous, the multi-way importance plot was built using: i) Percentage increase in mean square error (%IncMSE), analogous to accuracy-based importance, and is calculated by shuffling the values of the out-of-bag samples, ii) Increase in node purity (incNodePurity), analogous to Gini-based importance, and is calculated based on the reduction in sum of squared errors whenever a variable is chosen to split.

Figure 4 analyses in detail the relationships that link the most important variables (highlighted in Figure 3) to the target variable. From the partial dependence plots we observe substantially linear relationships. The results show that satisfaction

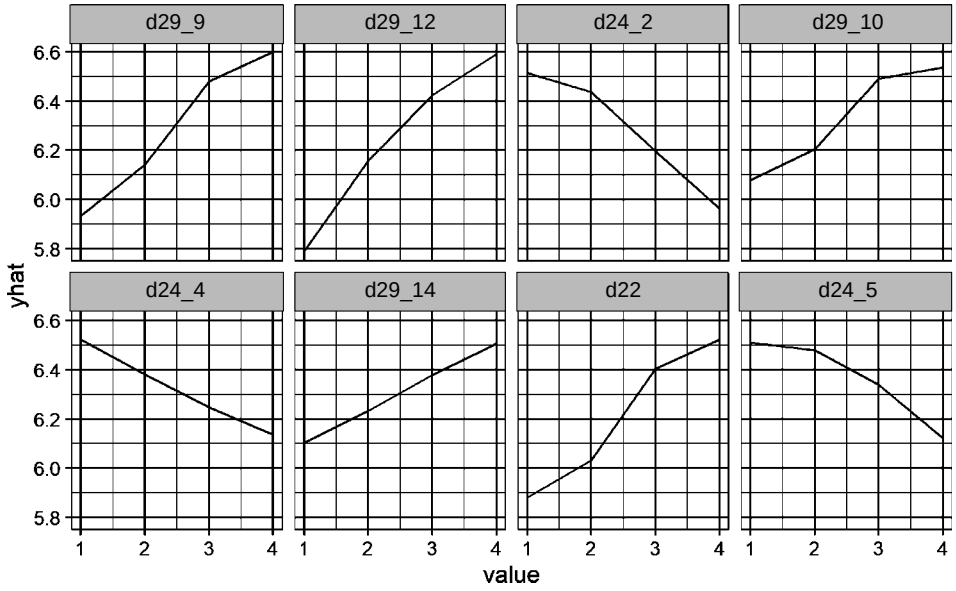

Fig. 4: Partial dependence plot of the top important dimensions affecting how satisfied students were with their distance learning experience [d23]

Legend: all variables are in a Likert scale (1-4) with the following modalities: 1 Not at all | 2 Barely | 3 Enough | 4 Very much

d29_9 The commitment of teachers in teaching and in keeping us updated

d29_12 The readiness and the efforts poured by the University into setting up distance learning, as well as ad hoc initiatives like this one

d24_2 I don't know how to extricate myself among the different recordings

d29_10 The prompt uploading of the recorded lessons

d24_4 I find it difficult to follow the lessons and therefore to take good notes

d29_14 The awareness of having all the resources of the course available at all times and everywhere

d22 Are you following the distance learning activities provided by your study programme?

d24_5 the absence of involvement during the lesson makes it difficult for me to stay focused

increases concomitantly with appreciation for the commitment of lecturers (d29_9 and 29_10), the readiness and efforts made by the university to organise distance learning (d29_12) and to provide all the resources necessary for studying (d29_14), and the share of attendance on distance learning activities (d22). Conversely, satisfaction decreases with respect to three variables: the difficulty in knowing how to extricate oneself between the different recordings increases (d24_2), the difficulty in following the lessons and therefore taking good notes (d24_4) and the absence of involvement during the lesson that makes it difficult for students to stay focused (d24_5).

3.3 DEFINING HOMOGENEOUS GROUPS OF STUDENTS AND TYPICAL PROFILES

The multivariate analysis of the closed questions intends to classify students by considering the combinations of all material conditions and choices related to studies and life organisation. The 48 variables under analysis belong to three main groups: Ongoing problems and changes; Organisation of study with respect to the teaching materials available, the timing and methods of the organisation of study; Distance learning[4]. We applied the Partitioning Around Medoids algorithm (PAM) (Schubert and Rousseeuw, 2019) with the Gower's similarity index. A feature of this algorithm is the independence from the data order unless some of the distances among objects are tied (Kaufman and Rousseeuw, 2005, p. 104), as was the case in our dataset[5]. In order to evaluate the optimal number of groups to be used in PAM, we analysed the silhouette coefficients for an increasing number of partitions (from 2 to 15) (Hennig and Liao, 2013; Rousseeuw, 1987). We choose the 8-cluster partition because all groups have a similar relative importance in terms of frequencies[6].

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[4] The variables under analysis are: Ongoing problems and changes (d15_7, d15_11), Organisation of study with respect to the teaching materials available, the timing and methods of the organisation of study (d17, d18, d19, d20, d21_1, d21_2, d21_4), Distance learning (d22, d23, d24_1, d24_2, d24_3, d24_4, d24_5, d24_6, d24_7, d24_8, d25_1, d25_2, d25_3, d25_4, d25_5, d25_6, d26, d27, d28_1, d28_2, d28_3, d28_4, d28_5, d28_6, d28_7, d29_1, d29_2, d29_3, d29_4, d29_5, d29_6, d29_7, d29_8, d29_9, d29_10, d29_11, d29_12, d29_13, d29_14). Detailed description of each variable is available in Annex 1. The selection of the 48 variables under analysis excludes all the variables (belonging to the three main groups) that show not significant variability in the dataset. Detailed data on variability can be obtained upon request to the authors.

[5] We see this feature in the similarity matrix. As expected, with a very large number of units and categorical and discrete variables (with few values), many some pairwise similarities in the matrix are equals.

[6] Detailed results can be obtained upon request to the authors.

In what follows, the groups of students will be described with respect to the partitioning variables and to the information on each student's status of her/his university career (Area of studies, Degree course, Year of enrolment, Quartiles of achieved credits) and Gender.[7]

cl-cq1: The Satisfied: *students fully satisfied with the online teaching*. This cluster contains about 8% of the students, mainly female, attending the 3rd year of a 5 or 6-year course, who belong to departments in the area of Life, Health and Science. These students have generally acquired a number of credits far below the median level of the credits acquired by students attending the same course and the same year. They were enthusiastic about online teaching and did not have any problem with e-learning or interpersonal communications. They owned all the necessary information technology tools and stated that they studied more than ever, now that they had more free time and they did not have to spend time in commuting. They did not see any negative aspects as regards relationships with lecturers or classmates and in the organisation of study. Moreover, online teaching did not influence their concentration and their ability to focus.

cl-cq2: The Diligent-but-Detached *students who were compliant but disapproving.* This cluster contains about 14% of the students, mostly female, mainly belonging to departments in the Society and Culture area, who were attending the 4th year and with a number of credits acquired below or equal to the median. They attended online classrooms (only on some topics) and had a good opinion of the online lessons. They were able to deal with the new teaching system, but they were disappointed with some aspects of it.

cl-cq3 The Hostile: s*tudents against the online teaching*. This cluster contains about 11% of the students, mostly males enrolled on a master's degree course in technology with a number of credits acquired far above the median. The main drawback was the absence of interaction between students and lecturers and among students, probably because the area of study requires laboratory experience that cannot be replaced by online teaching. They attended lectures, studied all subjects with more dedication than in the pre-COVID period. Yet, their knowledge and skills were deemed not satisfying.

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[7] Annex 2 presents data on the composition of each cluster according to the university status and gender. Annex 3 displays the bi-plots of the simple correspondence analysis; Annex 4 displays the boxplots of the students' satisfaction with the distance learning experience (*d_23 How satisfied are you with your global distance learning experience?* graded from 1 to 10), by cluster.

cl-cq4: The Confused: *the overall baffled students*. This cluster contains about 15% of the students, mainly female, belonging to the Science, Health and Life scientific areas and attending the 3rd year of a 5- or 6-years course. In general, these students had a number of acquired credits far below the median level. Even though they appreciated the online teaching system, they did not attend online lessons. They had difficulties with studying at home because they were not able to concentrate. However, they did not miss the organisation of teaching before the COVID period and appreciated some aspects of the online system, such as more free time and the absence of commuting to attend lessons.

cl-cq5: The Enthusiastic: *the passionate and eager students*. This cluster contains about 11% of the students, mainly male, belonging to the Technology and Science areas and attending a master's degree course. They had acquired a number of credits above the median level. They did not have any particular problems, attended lessons online and appreciated online teaching. They studied more than in the pre-COVID period because they had more free time. They were able to concentrate and were able to schedule tasks. The online teaching system gave them incentives to study and attend lessons.

cl-cq6: The Hard-working: *the committed but dissatisfied student*s This cluster contains about 12% of the students, mainly male, belonging to the Technology area and with a number of credits acquired above the median level. They were dissatisfied with the online teaching system because even though they attended lessons and study, they perceived a lower level of knowledge and competence. They thought that online teaching was negative in every respect, but particularly with regard to the interaction with lecturers and between students.

cl-cq7: The Lost: *students who were puzzled*. This cluster contains about 18% of the students, mainly male, belonging to the Society and Culture scientific area, attending the 2nd year and with a number of credits acquired both above and below the median level. They gave a 'pass grade' to online teaching and attended some of the lessons. However, they perceived an inferior level of knowledge and competence and they were not able to keep up with their studies. They did not regret the absence of interaction with lecturers but they missed interactions with other students.

cl-cq8: The Undecided: *students who were uncertain and might drop out*. This cluster contains about 11% of the students, mainly female attending the 1st year in the Society and Culture area and with a number of credits acquired below the median level. They expressed a negative opinion of online

teaching and did not attend lessons. They were not able to keep up with exams, but they stated that the organisation of everyday tasks had not changed; nor had the interactions with students and lecturers been modified in the COVID period. They gave negative scores to all aspects of online teaching, especially about the impossibility of concentrating.

3.4 MULTIVARIATE ANALYSIS ON OPEN-ANSWER QUESTIONS

The non-compulsory open-answer questions are dealt with text mining strategies, according to the specific characteristics of the different sets of answers. Firstly, four corpora were created to organise the free texts answering on *Ongoing changes* (d16)[8], on the *Strengths* (d30)[9] andn*Weaknesses* (d31)[10] of distance learning, and on *Suggestions and proposals* (d32)[11]. Annex 5 reports descriptive statistics of corpora (Fergadiotis *et al*., 2015) produced after their tokenisation (acquisition of text by numerical word indexing)[12]. The corpora are very different in terms of respondent rate and lexical variety. In particular, corpora on *Strengths* and *Weaknesses* of distance learning, and on *Suggestions and proposals* refer to fewer respondents than those engaged in describing the *Ongoing changes*, and a smaller average response length. In the case of the corpus *Ongoing changes*, the significant response rate allows a classification of students based on the types of changes they highlight. In the case of the other three smaller corpora, the analysis is limited to highlighting the themes addressed in each corpus, providing a focused view on the students' perspective over their distance learning experience and its potential for the academic organisation.

In each corpus, the text was lemmatised and all content terms, nouns and adjectives, with at least five occurrences, were selected as keywords. In the case of

[8] Question d16: "Describe how and in what way (positive and negative) the Covid-19 emergency has changed your life in general, apart from your studying activities".

[9] Question d30: "Report up to a maximum of 3 strong points of your distance learning experience".

[10] Question d31: "Report up to a maximum of 3 weak points of your distance learning experience".

[11] Question d32: "Please provide your suggestions and proposals".

[12] In particular, for each corpus, Annex 5 describes: the number of Types, i.e. the number of different words present in the corpus; the number of tokens, i.e. the number of occurrences of the types; the average text length of the answers; the type/token ratio, which provides an assessment of the lexical diversity of the corpus; the number of hapax forms, i.e. the forms that appear only once in the corpus, and their weight in terms of occurrences. Types/token ratio measures the lexical diversity in a corpus based on the relationship between the number of tokens and the number of types. A high index value indicates greater linguistic diversity and thus less repetition of the same words in the corpus. This ratio is highly dependent on the text's length, making it difficult to accurately compare corpora of different sizes.

the corpus *Ongoing changes*, this selection was used to define a Vector Space Model to be analysed with factorial and cluster analysis techniques using SPAD[13] software. In the case of the remaining three corpora, the lemmatised texts were analysed using the Iramuteq[14] software.
In what follows, Section 3.4.1 and 3.4.2 report the analysis carried out on the corpus *Ongoing changes*, Section 3.4.3 illustrates the results obtained on the three other smaller corpora.

3.4.1 CORPUS ONGOING CHANGES – STUDENTS' CLASSIFICATION

The size of the *Ongoing changes* corpus, with 5,607 responses[15] and 234,677 total occurrences, supports an analysis aimed at identifying different groups of students characterised by different needs and different request of changes in online teaching. A textual analysis was applied to the corpus to select the terms of content (nouns and adjectives) and to define a Vector Space Model in which each student response is formalized as a vector in a p-dimensional vector space, spanned by the content terms selected in the vocabulary (Misuraca and Spano, 2020). Then the resultant matrix *Students* $\times$ *Lexicon* [4562 $\times$ 1687] was subjected to correspondence analysis and cluster analysis in order to group the students according to similarities in terms of lexicon expressed in responses (Lebart, Morineau and Piron, 2004; Lebart, Salem and Berry, 1998; Lebart, Morineau and Warwick, 1984; Reynolds *et al.*, 2006). Observations under analysis are 4,562, out of 5,607, since we consider only students having at least five different keywords in their response.

Analysing the dendrogram (see Figure 5, upper panel), we select the partition in five clusters. Figure 5 (lower panel) reports the factorial map (*f1f2*) in which clusters of respondents are highlighted in the different convex hulls, and cluster' centroid has a size proportional to the cluster's instances.

In the factorial map, we observe a polarisation, along the first factor, between clusters cl-txt1 and cl-txt2 on the left, and clusters cl-txt4 and cl-txt5 on the right; while the second factor polarises clusters cl-txt2 and cl-txt5 (bottom) versus cluster cl-txt4 (top). In order to give meaning to such polarisation we need to interpret the themes encompassed in each cluster. Such an interpretation can be done by reading the characteristic dictionaries of each cluster, with terms ranked by their test

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[13] SPAD is a software dedicated to Data Mining and Predictive analysis that provides a totally graphical and intuitive interface. https://ia-data-analytics.com/data-mining-software

[14] Iramuteq is freely available at http://www.iramuteq.org/

[15] In the analysis of open-answer questions we have used all the available answers, even though the questionnaire was not fully completed.

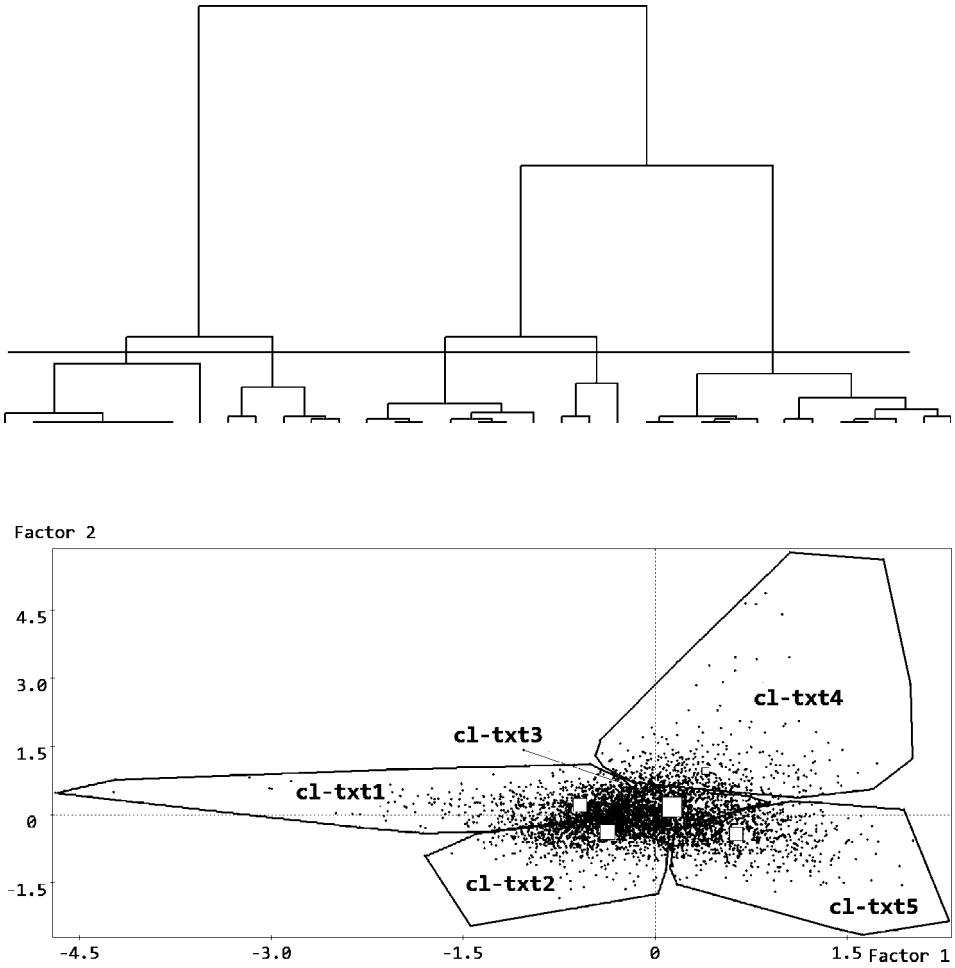

Fig. 5: *Ongoing changes* corpus: cluster analysis dendrogram and factorial map

Legend: dots in the factorial map (lower panel) indicate each student's answer, convex hulls delimitate each cluster and squares indicate cluster centroids, with size proportional to the number of instances in the cluster.

values[16]. The following themes characterise the five clusters of students:

cl-txt1 Students with changes in their personal sphere and in relationships with family members and friends. This cluster contains about 22% of the respondents.

[16] For each cluster, the characteristic terms are available in Annex 6.

cl-txt2 Students who evaluate negative and positive aspects of the new context. This cluster contains about 25% of the respondents.

cl-txt4 Students with problems in their economic and in social and material conditions. This cluster contains about 10% of the respondents.

cl-txt5 Students focusing on the positive and negative novelties of online teaching. This cluster contains about 18% of the respondents.

Although question d16 was asking students to consider changes "aside from their studying activities", two clusters of students hardly separated the issues: in cl-txt3 they exhibit themes intertwining a mix of family life and study conditions, and students in cl-txt5 focus on the big change in their study conditions, i.e., online teaching.

Thanks to the thematic definition of each group of students it is now easy to interpret the latent meaning explained by each factor. The first factor is a composite indicator of students' considerations about the relational sphere and the living and studying conditions. On the left side of the first factor, there are themes focusing on relationships with friends and family members (characterising cl-txt1), and with the external context (characterising cl-txt2); on the right, the focus is on material conditions (cl-txt4) and studying conditions (cl-txt5). The second factor highlights a polarisation of students addressing themes related with the private sphere (top) versus the public sphere (at the bottom). At the centre, students in cluster cl-txt3 address mixed themes concerning the emergency in their personal and public dimensions.

The aim of the question d16 posed to the students was to identify which areas of the students' lives (other than studying) were experiencing the greatest changes. The result obtained through the cluster analysis shows that for some areas (i.e., new context created and online teaching) the effects of the changes are assessed as positive for some students while they are assessed as negative for others. This result provides a more focused hint at the interpretation of changes driven by COVID-19 emergence than can be obtained through a sentiment analysis (Misuraca et al., 2021).

3.4.2 CORPUS ONGOING CHANGES: CORRESPONDENCE ANALYSIS ON STUDENTS' PROFILES ACCORDING TO CLOSED VS. OPEN QUESTIONS

By means of a correspondence analysis, we intersected the classification of students obtained by closed-answer questions (Section 3.3) with the classification obtained from the open questions comprised in the *Ongoing changes* corpus (Section 3.4.1). Observing the biplot of the analysis in Figure 6, we note that students who focused on positive and negative novelties of online teaching (cl-txt5) are strictly associated

with both students who are satisfied with the online teaching system (cl-cq1) and students who are diligent but dissatisfied with it (cl-cq6). Moreover, we see that students with changes in the personal sphere (cl-txt1 and cl-txt2) are, in general, diligent but hostile or indifferent to online teaching (cl-cq2 and cl-cq3). Students with economic and material problems (cl-txt3) are, in general, undecided female students (cl-cq8). Finally, we may note that groups of students who are diligent and enthusiastic about online teaching (cl-cq5) and of confused and unhappy female students (cl-cq4) who are in a halfway position between the personal sphere and the organisation of study and of family life. Groups of "lost" students (cl-cq7) and students with material problems (cl-txt4) are in the centre of the axes.

3.4.3 STRENGTHS, WEAKNESSES, SUGGESTIONS AND PROPOSALS CORPORA

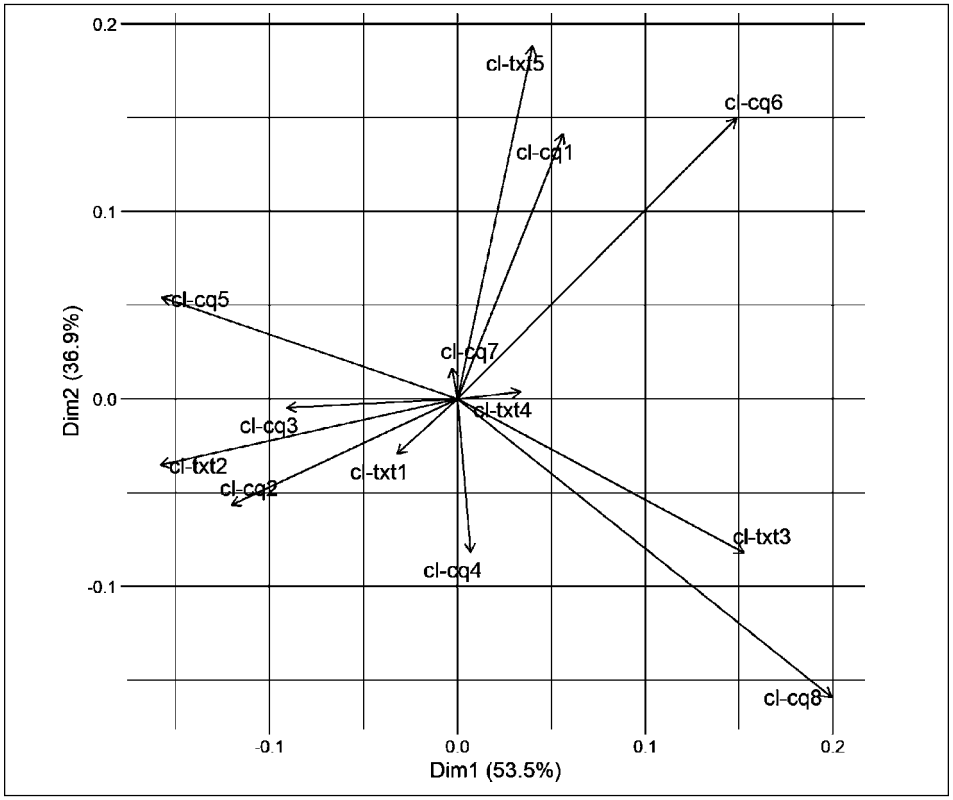

Fig. 6: Biplot of simple correspondence analysis: 8 groups classification with closed-answer questions (cl-cq) and 5 groups classification on the open question ongoing changes (cl-txt)

The other three smaller corpora - S*trengths*, *Weaknesses*, S*uggestions and Proposals* - were analysed in order to characterise the different themes. For these corpora, the ALCESTE[17] method (Reinert, 1983 and 1990; Marpsat, 2010) was used. In general, the characteristics of the sample of respondents to open questions were similar to the characteristics of the sample of respondents to closed ones, with respect to the traits of the population. Females attending a course in the Society and Culture area were over-represented, while students with a number of acquired credits below the first quartile of the credits acquired by students attending the same course and the same year were under-represented. Freshmen as well, were under-represented. For some students, the over-representation was more evident in open answers than in closed ones and this indicates the greater inclination of these students to supply more detailed answers rather than a limited set of closed answers. These students were those with a number of credits below the third quartile of the credits acquired by students in the same year and in the same course and attending the second year of a bachelor degree and the first year of a master's degree.

Unlike the previous cluster analysis, with the ALCESTE method, implemented by Iramuteq, we obtained classifications of the textual segments[18] rather than classifications of the students. Analysing the matrix *Segments* $\times$ *Active forms* of each corpus, the ALCESTE method enabled us to identify 2, 5 and 4 thematic clusters, respectively, in the corpora S*trengths*, *Weaknesses* and *Suggestions and Proposals*[19]. For each of the corpora analysed, the themes around which the answers were focused have been identified. Iramuteq groups into classes the text segments that are similar in terms of content and provides a set of graphic tools with which to visualise the results: dendrogram of the text segment classes, the factorial map, the graph representing the links between the terms in each class. The network graphs (available Annex 8) provide a better focus on the contents of each class[20].

Themes characterising the classes of the three corpora have been synthesised in Tables 3-5.

With regard to the corpus *Strengths* (Table 3), the two classes of themes underscore the fact that the strengths of online teaching mainly refer to flexibility

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[17] ALCESTE is the acronym of Analyse des Lexèmes Cooccurrents dans les Enoncés Simples d'un Texte. A summary presentation of this method is available in Marpsat (2010).

[18] Segmentation is obtained through fragmentation into phrases. Iramuteq defines phrases by using mainly punctuation and defines as a segment a sequence with a maximum of 40 words.

[19] Annex 7 reports the descriptive statistics of these corpora.

[20] Statistics on the main characteristic terms and graphic visualisation of dendrograms and factorial maps can be obtained from the authors upon request. In addition to visual tools, the disambiguation of terms in the characteristic dictionaries has been verified through the analysis of concordances, available in Iramuteq. A selection of texts for the main characteristic terms in each class is available in Annex 9

in attending lessons (Class 1, especially as concerns Engineering students) and to interactions with peers and lecturers (Class 2, as well as those female students who work and study, attending a bachelor's degree course in the departments of Human Science and Cultural studies and Education). On the contrary, from the *Weaknesses* corpus (five classes listed in Table 4), the lack of interactions and difficulties in attending online lessons were considered one of the weak points in the online teaching, particularly as regards the Engineering students. The other classes of weak points refer to: difficulties in attending online lessons, lack of concentration; the incapability of lecturers to organise courses online (lessons, loaded handouts and organisation of the course internet page); the limits of the technology and the uncertainty related to exams, stages and other teaching activities.

Tab. 3: S*trengths*

Class 1	Flexibility in listening to the recorded lessons and in the organisation of study and less stress (73.33% of the analysed segments). Students in this class were mainly male, attending the first or the second year of a bachelor 's degree course in the Science and Technology areas (particularly, Engineering)
Class 2	More interactions with students and lecturers, positive outcomes of the University for working students, fewer difficulties and speed in the organisation of the emergency period (23.67% of the analysed segments). Students in this class were mainly female (who work and study) attending a bachelor's degree course in the departments of Human Science and Cultural Studies and Education.

Tab. 4: Weaknesses

Class 1	Lack of interactions/discussions with peers and lecturers, absence of library services, less stimuli and engagement (24.07% of the analysed segments). Students in this class were on the whole, not working and attending a course in the Technology area (particularly, Engineering).
Class 2	Difficulties in attending online lessons, lack of concentration (22.81% of the analysed segments). Students in this class were mainly female, in the first or second year of a bachelor's degree course in the Science area (especially, Economics).
Class 3	Ineffective online lessons and lecturers incapable of supplying services online; too many recorded and loaded materials and difficulties in printing slides and handouts (16.84% of the analysed segments). Students in this class were for the most part in their second year of a bachelor's degree course in the Society and Culture area.
Class 4	Limitation of the technology: problems with internet connections and low quality of the sound and the videos loaded (12.03% of the analysed segments). Students in this class were for the most part, attending a course in the Education and Human Sciences department.
Class 5	Uncertainty about examinations, activities in the labs or about internship programs (24.25% of the analysed segments). Students in this class were mainly attending a course in the Education and Human Sciences and Health area.

Observing the characteristics of the different classes of strengths and weaknesses, we may note that it is impossible to identify a single type of beneficiary of the online teaching system. Students may differ in perceiving the strong and weak points of the emergency period in relation to their scientific area, to their family circumstances, and to their employed or not employed status. The analysis confirms that the emergency period reduces the opportunities and exacerbates problems for students with family or economic difficulties.

Furthermore, we can see that working students in the corpus *Suggestions and* P*roposals*, recommended maintaining the online teaching platform in a post-lockdown period (Class 1). Other suggestions refer to possible improvements in the overall organisation such as: clear rules (Class 2); better quality of online lessons (Class 3); time schedules and the Departmental rules about teaching organisations to be strictly observed by lecturers to better organise the home self-study (Class 4).

Tab. 5: Suggestions and Proposals

Class 1	Maintain online teaching also after the end of the COVID-19 emergency period (22.39% of the analysed segments). Students in this class were mainly in the labour market, attending the fifth year of a course in the Health area.
Class 2	Clear rules (26.05% of the analysed segments). Students in this class were mainly female attending a course in the Health area and in the department of Education and Human Sciences.
Class 3	Improve the quality of the online lessons (sounds and availability of the loaded materials) and improve the quality of the internet pages of the courses, especially organisation and layout (19.07% of the analysed segments). Students in this class were mainly part-time workers, attending a course in the Society and Culture area.
Class 4	Observe the lesson time schedule and the Departmental rules about teaching organisations (32.49% of the analysed segments). Students in this class were mainly attending the first or the second year of a bachelor's degree course in Economics and are non-working or occasionally working students.

4. DISCUSSION

Some years ago, Charles Sabel and colleagues (Sabel et al, 2011) commented on the successful PISA results obtained in Finland: the secret of their success was not investment in excellence, but systematic multiple actions intended to help less advantaged students through differential support. In accordance with this perspective of differentiated policy measures, this paper has analysed the impact of COVID-19 emergency distance teaching on university students. The main results of an empirical survey conducted during the emergency highlight the importance of acquiring a shared knowledge about students' material and socioeconomic living

conditions in order to be fully prepared to implement effective university policy measures to address further needs of online teaching. The University of Modena and Reggio Emilia promptly devised a first tool for investigating the strengths and weaknesses during the emergency.

The non-parametric multivariate analyses of the empirical survey supported evidence-based learning from the emergency remote teaching. Within an encompassing framework of enhanced quality of education and personal and collective well-being, we now discuss the overall results, focusing on the factors that could be minimised or supported to create a more equal background able to provide differential support to those more in need.

The local dimension. Unimore benefited from a close connection with the local area that protected its students from sudden and unexpected changes. Overall, the local and territorial vocation of Unimore protected the students from the negative consequences of the emergency.

Infrastructural divide between the home and campus. Clearly, there are stark differences between the home and campus as regards to the material conditions for studying. On-campus facilities furnish an ecosystem full of advantages: electronic devices, high speed Internet, online resources. Quiet and semi-private spaces, support concentration, but above all else, the peer-to-peer relations that the emergency revealed as even more important than usually believed. These facilities are places for aggregation, sociability and critical debate as much as they offer both comfortable spaces for studying and accessing digital infrastructures (such as high-speed internet and laboratories). Many of these conditions are far from being available to students off campus within their homes. Here lies the vicious circle between poor material conditions and weaker university achievements, which calls a differential approach to students (especially when it comes to emergencies such as the one that turned on-campus teaching into remote teaching overnight) to be considered. Even in normal times, a marked infrastructural divide is mitigated by university policies aiming at providing basic conditions for equal opportunities in access to tertiary education. Considering the essential and non-negotiable on-campus character of the institution we call 'university', we are going to face one or two more semesters of distance teaching and students need to fully benefit from better organised classes and electronic materials. Moreover, the institution should be able to recreate the social context and vital relational ties that make the university experience a truly rich and long-running experience.

Remote teaching. Overall, the remote teaching system was positively evaluated across departments and different courses. Burdensome and fatigue are the highlighted key results. Following classes online is more challenging than in a physical room

because it requires greater concentration in addition to continuous monitor watching and headset listening. Students complained that it was harder to listen and take notes in remote settings, especially - needless to say - when private spaces or personal computers were shared and the Internet connection was slow. Over two thirds of the students expressed bewilderment, impatience and dissatisfaction, exacerbated by the sometimes-cumbersome technical procedures necessary to access the remote teaching platform and electronic resources. Three quarters complained of a major change in their organisation, with 40% having problems in organising their more solitary home activity. The lack of social contact and peer-to-peer discussion had a heavily negative influence.

Gender gap. Overall, the empirical analysis points to a significant and unexpected gender gap. Female students did not reveal any significant differences on many indicators (study organisation, concentration, material conditions of devices and spaces), save one: sharing domestic caretaking duties. Problems at home are not personal but depend on family arrangements. Females, even of such a young age, are required to contribute to domestic work to a greater extent than males. They share the caretaking of the elderly, sick or minors with their parents, which negatively affects their study 'self-organisation'. Even among younger women, the topic of an unequal distribution of duties among domestic and non-domestic spaces angrily emerges.

Clusters of students. Students have been grouped into clusters according to their answers to the closed questions and to the open-end questions. Specific combinations of material conditions, organisational choices and characteristics of the studying ecosystem clearly identify eight subpopulations of students when it comes to remote teaching: the Satisfied; the Diligent but detached; the Hostile; the Confused and unhappy; the Enthusiastic; the Hard-working but dissatisfied; the Lost; the Undecided. The extensive descriptions presented in Section 3.4.1 and 3.4.2 clarify the salient traits of these specific groups of students, prompting interesting considerations. Gender better qualifies specific groups: the Satisfied, the Diligent-but-detached, the Confused, the Undecided are groups dominated by women, while men seem to cluster less and are more spread across other groups. It emerges from free texts that female students have more home tasks (including taking care of the elderly, or of remote learning of their younger siblings) than male students. Coupled with the unexpected gap that women encounter at home, gender preferences should be taken into account by future policies in order to create both more flexibility and targeted actions. These clusters have shown themselves l to be important, especially for academic year freshmen, whose first experience of academic life is doomed to be completely virtual.

Relevant topics and suggestions. The automated text analysis furnishes a complementary material that helps in grasping the material and socioeconomic conditions of the students. Interestingly, their spontaneous answers offer insights not foreseeable at the time of the questionnaire's drafting. The main suggestion is about the style of teaching. In the new ecosystem, it is important to innovate and adapt the style of teaching to the remote setting. Online interactions among peers and with the lecturer, a more precise organisation of classes, a balanced homework load, a better audio quality are some practical suggestions.

Projecting into the near future, these suggestions hold true more in general as they intertwine with pre-emergency autonomous actions in terms of innovative teaching methods and transformations in class and curriculum supply. The survey has acknowledged the importance of a closer look at the material off-campus living conditions of the students. Comprehensive knowledge could concretely lead to that 'differential approach' and its subsequent successful results in benefiting the majority of students, not only the excellent ones. Moreover, the efficacy of and satisfaction with the teaching style could also gain from this differential approach and all the changes that the COVID-19 emergency immediately required.

5. POLICY IMPLICATIONS

There are some features of the remote teaching forced by the emergency that are typical of a phase that will be overcome as we write; but there are other elements that are rooted in what was already in previous ecosystem made of living and studying conditions, attitudes and results that were achieved before the COVID-19 outbreak. The remote teaching and services offered to students in the next semesters will have to take these features into account, in order to emerge from this phase without (or with less) dispersion. Moreover, there is a tendency to not concentrate primarily on excellence, but on a more general collective effort to increase the effectiveness of university teaching.

The results of the survey confirm the need to define what specific actions are necessary for different groups of students, departments, years of the course, conditions of study and access to resources essential for academic studying. Four lines of action seem to be essential.

The first, preliminary, action is to ensure that students are equipped with adequate digital devices and internet connections, economically helping those unable to afford such purchases in a timely manner.

The second action concerns flexibility in teaching modes that could facilitate the realignment between study programmes. If teaching in presence remains a

distinctive feature of public universities, online lessons in synchronous or remote mode, facilitate the organisation of teaching and study activities by students. Some universities are developing a blended teaching method. While it is not clear how the best practices for remote teaching will emerge and be concretely configured, there is a potential risk that the more classic onsite academic experience is biased by economic discrimination: only those who can afford travel and accommodation costs will live the traditional full academic ecosystem. It is important in any event, to reflect upon the potentialities of a mixed mode for those who cannot attend in presence.

The third action concerns the potential for improving the general quality of teaching, which can look at both students' experiences and new ways of designing lessons (e.g., peer instructions, flipped classrooms or mixed teaching tools). Designing a distance teaching system requires perhaps even more time than in-presence courses. During the emergency, teachers have had to rapidly revise not only the timing and mode of delivery of lectures, but also themes, as well as modes of interaction with students. A spinoff effect is that many students and teachers have appreciated the potential of digital technologies, that were previously ignored, such as those that allow teaching with small groups of students (in discussion/exercise sessions), the involvement and self-organisation of students for study activities or in-depth study, the exploration of a variety of topics not always able to find defined at the beginning of the course.

The fourth line of action concerns university libraries: they are vital spaces for community bonding and finding study material. This twofold function cannot be entirely shifted online, but at least investing on the online access to library' e-resources is a mandatory step for containing the potential for socio-economic bias among students.

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ANNEXES

Annex 1 - Table A1: *Metadata*

Section	Question id	subquestion id	variable selected for partition	Question	*scale of the variable*	MODALITIES of the variables	
Language of compilation							
	d1			Language of compilation	*categoric*	Italiano English	
Gender							
	d2			Genre	*categoric*	Male | Female | I do not answer	
General information on home trips caused by the emergency: place_origin/destination							
	d3			Following the Covid-19 emergency			
		d3a			*string*	I moved to another place (please specify)	
	d4			What is the name of the province where you were staying before the Covid-19 emergency? (If you choose ABROAD, specify the country and place in the box)	*categoric*	ABROAD	111 provinces
		d4a			*string*	ABROAD (specify)	
	d5			What is the name of the municipality where you lived before the Covid-19 emergency?	*string*	Open-Ended Response	
	d6			On what date did you return home or move to another place?	*date*	MM/DD/YYYY	
	d7			What is the name of the region where you are currently living? (If you choose ABROAD, specify the country and place in the box)	*categoric*	ABROAD	111 provinces
		d7a			*string*	ABROAD (specify)	
	d8			What is the name of the municipality where you are currently living?	*string*	Open-Ended Response	
Living conditions							
	d9			How many people are living with you in your current dwelling? (Please enter a number between 0 and 100 and no text in the box)	*numeric*	Open-Ended Response	
	d10			Are you currently living in a studentsâ€™ hall of residence/boarding house?	*yes/no*	yes/no	
	d11			Do you have a space where you can study?	*categoric*	yes, I have a room for my exclusive and only use | yes, it's the room that I share with other family members / roommates | yes, it's the place that is available when I study | no, but I manage to use a dedicated space a few hours a day | no, but there is a space where I can study every now and then even if I cannot reserve it in advance Other (specify)	
		d11a			*string*	Other (specify)	
	d12			Do you have an electronic device (computer, laptop, tablet) that you can use when you study?	*categoric*	Yes, for my exclusive use | Yes, shared with others | No | No, but I can use my personal smartphone | Other (specify)	
		d12a			*string*	Other (specify)	
	d13			How do you judge the quality of your internet connection?	*categoric*	very good | good | average | not satisfactory | very bad	
	d14			Does your internet connection have a limit for maximum usable GB?	*categoric*	No, I use my home fiber or ADSL connection that has no limits | Yes, I use my smartphone connection (less than 30 GB monthly) | Yes, I use my smartphone connection (more than 30 GB monthly) | Other (specify)	
		d14a			*string*	Other (please specify)	

Section	Question id	subquestion id	variable selected for partition	Question	*scale of the variable*	MODALITIES of the variables
Ongoing problems and changes						
	d15			What are the main difficulties you are currently facing? (More than one answer is possible)		
		d15_1			*dichotomic*	I have economic problems that are not connected with Covid-19 emergency
		d15_2			*dichotomic*	I have economic problems due to the Covid-19 emergency
		d15_3			*dichotomic*	I have health problems related to the Covid-19 (my family or roommates)
		d15_4			*dichotomic*	I have health problems that are not related to Covid-19 (my family members or roommates)
		d15_5			*dichotomic*	I have problems due to the condition of my family members, roommates or friends
		d15_6			*dichotomic*	I do not have time to study because I have to take care of my family, live-in-friends
		d15_7	yes		*dichotomic*	I don't understand how to organize my studying activities
		d15_8			*dichotomic*	I don't have a proper internet connection
		d15_9			*dichotomic*	I don't have an electronic device that I can use for my studying activities.
		d15_10			*dichotomic*	I would prefer not to say anything
		d15_11	yes		*dichotomic*	None of these issues
		d15_12			*string*	Other (please specify)
	d16text			Describe how and in what way (positive and negative) the Covid-19 emergency has changed your life in general, apart from your studying activities	*string*	
Organization of study with respect to the teaching materials available, the timing and methods of the organization of study						
	d17		yes	What teaching materials do you have available?	*categoric*	All those indicated at the beginning of the lessons | Some texts | Other (specify which part you are missing, if any)
		d17a			*string*	Other (specify which parts are missing, if any)
	d18		yes	How did you rearrange your studying TIMES? (More than one answer is possible)	*categoric*	I study more because I don't have to leave the house and spend time commuting | I study more because online classes require more effort | I study more, but my level of preparation seems lower | I study the same as before in terms of hours| I study less because online classes require less effort | Other (specify)
		d18a			*string*	Other (please specify)
	d19		yes	Did you change the WAY you study? (More than one answer is possible)	*categoric*	I have not changed my way of studying: I have organized with my colleagues through chat and video | I have not changed my way of studying: I study mostly by myself | I have changed my way of studying: now I study mostly by myself | I have changed my way of studying: I have organized with my colleagues through chat and video (from WhatsApp to zoom, etc) to study together more efficiently than before | I have difficulty finding books and materials to study, because libraries are closed | Other (specify)
		d19a			*string*	Other (specify)
	d20		yes	Compared to the plans you had for this semester, indicate where you are with your preparation in the various subjects	*categoric*	I am basically caught up | I am behind on some| I am behind on all | I had decided not to prepare any exams | Other (specify)
		d20a			*string*	Other (please specify)
	d21			Describe how you are organizing your studying activities among the different subjects.		
		d21_1	yes		*dichotomic*	I am progressing equally on all the subjects taught in this semester
		d21_2	yes		*dichotomic*	I have given priority to certain subjects taught in this semester
		d21_3			*dichotomic*	I've prioritized only one subject in this semester
		d21_4	yes		*dichotomic*	I'm catching up on the preparation of last semesters' exams

Section	Question id	subquestion id	variable selected for partition	Question	*scale of the variable*	MODALITIES of the variables	
		d21_5			*dichotomic*	Differently from what I was doing before, I've decided to take the next exams as a non-attending student	
		d21_6			*dichotomic*	I'm not studying	
		d21_7			*string*	Other (specify)	
Distance learning							
	d22		yes	Are you following the distance learning activities provided by your study programme?	*categoric*		Not at all | Barely |Enough | Very much
	d23		yes	How satisfied are you with your global distance learning experience?	*numeric*	score: 1-10	
	d24			DISTANCE LESSONS: Indicate the extent to which the following issues are difficult for you today.			
		d24_1	yes		*ordinal*	the accumulation of lessons is creating difficulties for me	Not at all | Barely |Enough | Very much
		d24_2	yes		*ordinal*	I don't know how to extricate myself among the different recordings	Not at all | Barely |Enough | Very much
		d24_3	yes		*ordinal*	it takes longer to follow a recorded lesson than it does to follow a lesson inside the classroom	Not at all | Barely |Enough | Very much
		d24_4	yes		*ordinal*	I find it difficult to follow the lessons and therefore to take good notes	Not at all | Barely |Enough | Very much
		d24_5	yes		*ordinal*	the absence of involvement during the lesson makes it difficult for me to stay focused	Not at all | Barely |Enough | Very much
		d24_6	yes		*ordinal*	the absence of direct interaction does not allow for enough explanations	Not at all | Barely |Enough | Very much
		d24_7	yes		*ordinal*	the quality of the connection makes it difficult for me to follow the lesson	Not at all | Barely |Enough | Very much
		d24_8	yes		*ordinal*	I spend a lot of time in front of the screen and I feel fatigued	Not at all | Barely |Enough | Very much
	d25			CONCENTRATION, INTEREST, INTERACTION: Indicate to what extent the following issues prove difficult for you.			
		d25_1	yes		*ordinal*	I'm having a hard time concentrating	Not at all | Barely |Enough | Very much
		d25_2	yes		*ordinal*	I lack the will to study	Not at all | Barely |Enough | Very much
		d25_3	yes		*ordinal*	I'm constantly distracted or interrupted by other family or care needs at home	Not at all | Barely |Enough | Very much
		d25_4	yes		*ordinal*	The many channels of communication used for didactic purposes(chat, email, dolly, etc.) disorient me	Not at all | Barely |Enough | Very much
		d25_5	yes		*ordinal*	I can't organize my daily studying activities effectively	Not at all | Barely |Enough | Very much
		d25_6	yes		*ordinal*	I have found no difference between the way I am studying now and the way I used to study before the emergency	Not at all | Barely |Enough | Very much
	d26		yes	Has your mode of interaction with the teachers changed? Compare your present mode of interaction with your experience before the emergency.	*categoric*		Yes, for the better | Yes, for the worse | It has not changed| With distance learning, any type of interaction has ceased
	d27		yes	Has your mode of interaction with the other students changed? Compare your present mode of interaction with your experience before the emergency.	*categoric*		Yes, for the better | Yes, for the worse | It has not changed| With distance

Section	Question id	subquestion id	variable selected for partition	Question	*scale of the variable*	MODALITIES of the variables	
							learning, any type of interaction has ceased
	d28			What do you lack now that all face-to-face teaching activities have been cancelled?			
		d28_1	yes		*ordinal*	The possibility to ask for explanations while listening to the lesson	Not at all | Barely |Enough | Very much
		d28_2	yes		*ordinal*	The chance to interact face-to-face with my university mates and discuss educational issues	Not at all | Barely |Enough | Very much
		d28_3	yes		*ordinal*	The stimuli given in class that motivate you to study	Not at all | Barely |Enough | Very much
		d28_4	yes		*ordinal*	The weekly schedule of lessons	Not at all | Barely |Enough | Very much
		d28_5	yes		*ordinal*	The possibility of attending face-to-face classes	Not at all | Barely |Enough | Very much
		d28_6	yes		*ordinal*	Face-to-face office hours	Not at all | Barely |Enough | Very much
		d28_7	yes		*ordinal*	The possibility to study in the library	Not at all | Barely |Enough | Very much
		d28_8			*string*	Other (specify the missing element and the ranking in the scale - Not at all, a little, enough, a lot)	
	d29			What do you appreciate about this period, as you cannot attend face-to-face lessons?			
		d29_1	yes		*ordinal*	Increased flexibility of timetables	Not at all | Barely |Enough | Very much
		d29_2	yes		*ordinal*	I have time to devote myself to planning my future and to my hobbies	Not at all | Barely |Enough | Very much
		d29_3	yes		*ordinal*	Zero Journey time	Not at all | Barely |Enough | Very much
		d29_4	yes		*ordinal*	The chance of keeping abreast of all subjects more easily	Not at all | Barely |Enough | Very much
		d29_5	yes		*ordinal*	The possibility to pause the recording and assimilate the concepts before listening again	Not at all | Barely |Enough | Very much
		d29_6	yes		*ordinal*	Increased interaction among students, through many channels	Not at all | Barely |Enough | Very much
		d29_7	yes		*ordinal*	Less stress	Not at all | Barely |Enough | Very much
		d29_8	yes		*ordinal*	The comfort / pleasure of being at home	Not at all | Barely |Enough | Very much
		d29_9	yes		*ordinal*	The commitment of teachers in teaching and in keeping us updated	Not at all | Barely |Enough | Very much
		d29_10	yes		*ordinal*	The prompt uploading of the recorded lessons	Not at all | Barely |Enough | Very much
		d29_11	yes		*ordinal*	The University Staff commitment in providing us with all the help you can get	Not at all | Barely |Enough | Very much
		d29_12	yes		*ordinal*	The readiness and the efforts poured by the University into setting up distance learning, as well as ad hoc initiatives like this one	Not at all | Barely |Enough | Very much
		d29_13	yes		*ordinal*	The possibility to reconcile the studying activities with the burden of domestic and care commitments	Not at all | Barely |Enough | Very much
	d29_14		yes	What do you appreciate about this period, as you cannot attend face-to-face lessons? 121	*ordinal*	The awareness of having all the resources of the course available at all times and everywhere	Not at all | Barely |Enough | Very much
	d29_15				*string*		
d30text				Report up to a maximum of 3 strong points of your distance learning experience.	*string*	Open-Ended Response	
d31text				Report up to a maximum of 3 weak points of your distance learning experience.	*string*	Open-Ended Response	
d32text				Please provide your suggestions and proposals.	*string*	Open-Ended Response	

Annex 2 - Table A2: ***Share of students, by cluster partitioning elaborated on closed questions[1], according to the university status and gender***

	1 Female students satisfied	2 Diligent and detached f	3 Students hostile	4 Confused and unhappy f	5 Students enthusiastic	6 Hard-working but dissatisfied	7 The lost …first-year students	8 Undecided female students	*Sum by row*	1 Female students satisfied	2 Diligent and detached f	3 Students hostile	4 Confused and unhappy f	5 Students enthusiastic	6 Hard-working but dissatisfied	7 The lost …first-year students	8 Undecided female students	*Sum bu column*
share of students by cluster																		
	7.5	**14.5**	**11.3**	**14.9**	**10.6**	**12.3**	**18.4**	**10.6**	***100.0***	**7.5**	**14.5**	**11.3**	**14.9**	**10.6**	**12.3**	**18.4**	**10.6**	***100.0***
Area of study																		
Health	9.3	14.0	9.9	18.4	12.3	10.2	18.2	7.8	*100.0*	11.0	8.6	7.8	11.0	10.2	7.4	8.8	6.6	*8.9*
Science	8.8	11.1	12.2	21.4	11.8	10.7	13.7	10.3	*100.0*	5.8	3.8	5.3	7.1	5.5	4.3	3.7	4.8	*4.9*
Society and Culture	7.4	16.2	11.2	13.3	8.7	12.0	19.5	11.8	*100.0*	60.8	69.4	61.4	55.4	50.8	60.8	65.9	69.5	*62.1*
Technology	6.1	10.4	12.1	15.0	14.7	16.3	17.0	8.4	*100.0*	15.0	13.3	19.7	18.5	25.4	24.5	17.1	14.6	*18.4*
Life	9.9	12.8	11.5	21.1	15.1	6.6	14.8	8.2	*100.0*	7.5	5.1	5.8	8.1	8.1	3.1	4.6	4.5	*5.7*
Sum	*7.5*	*14.5*	*11.3*	*14.9*	*10.7*	*12.3*	*18.4*	*10.5*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Degree Course[2]																		
L	7.1	14.5	10.6	14.7	9.8	13.1	19.2	11.1	*100.0*	58.3	61.7	57.7	60.9	56.6	66.2	64.5	64.9	*61.7*
LM	7.8	13.8	14.8	14.0	12.8	12.9	15.6	8.4	*100.0*	22.0	20.3	27.7	19.9	25.6	22.4	18.1	16.9	*21.3*
LM5	7.4	16.4	10.9	16.3	10.9	8.0	17.4	12.7	*100.0*	11.0	12.7	10.8	12.2	11.5	7.4	10.6	13.6	*11.2*
LM6	11.3	13.3	7.4	17.8	11.7	8.7	21.4	8.4	*100.0*	8.8	5.3	3.8	6.9	6.4	4.1	6.8	4.6	*5.8*
Sum	*7.5*	*14.5*	*11.3*	*14.9*	*10.7*	*12.3*	*18.4*	*10.5*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Year of enrolment[3]																		
1	8.0	16.5	9.2	11.1	9.3	12.3	20.7	12.8	*100.0*	24.3	26.0	18.4	16.9	19.9	22.8	25.7	27.6	*22.7*
2	6.3	15.1	12.0	11.2	9.1	12.9	22.1	11.4	*100.0*	19.8	24.8	25.2	17.8	20.3	25.0	28.5	25.7	*23.7*
3	7.6	13.1	10.4	21.3	10.9	12.8	15.0	8.9	*100.0*	25.0	22.3	22.7	35.3	25.4	25.9	20.3	20.9	*24.7*
4	8.6	15.5	13.6	10.7	8.9	13.6	21.5	7.7	*100.0*	14.5	13.6	15.3	9.1	10.6	14.1	14.8	9.3	*12.7*
5	8.0	12.3	13.1	19.4	15.1	9.6	11.9	10.8	*100.0*	16.3	13.0	17.7	19.9	21.7	11.9	9.9	15.7	*15.3*
6	2.4	4.8	9.5	19.1	28.6	4.8	19.1	11.9	*100.0*	0.3	0.3	0.7	1.0	2.1	0.3	0.8	0.9	*0.8*
Sum	*7.5*	*14.5*	*11.3*	*14.9*	*10.7*	*12.3*	*18.4*	*10.5*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

1 Details on cluster partitioning and variable under analysis are discussed in Section 3.3.

2 Degree Course: L: Bachelor Degree; LM: Master Degree; LM5: 5-year Degree; LM6: 6-year Degree.

3 Year of enrolment: 1, 2, 3 are the first, the second and the third year, respectively, of a bachelor's degree, 4 and 5 are the first and the second year of a master's degree or the fourth and the fifth year of a 5-year degree, 6 is the last year of a 6-year degree.

ANNEX 3 - *Simple correspondence analyses between clusters and independent variables: Area of study, Degree course of studies, Year of course, Quartiles of ECTS credits acquired with respect to achievable credits, Gender*

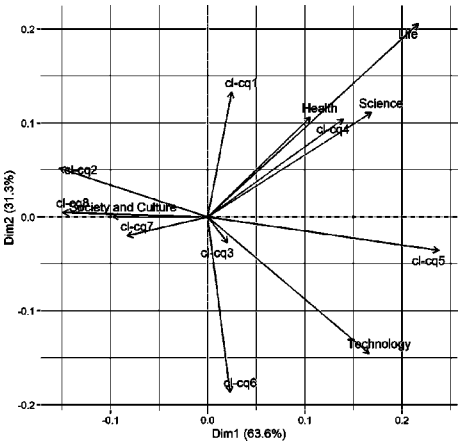


Fig. A3.1: Area of study
Thin arrows are clusters, thick arrows the modalities of the variable area.

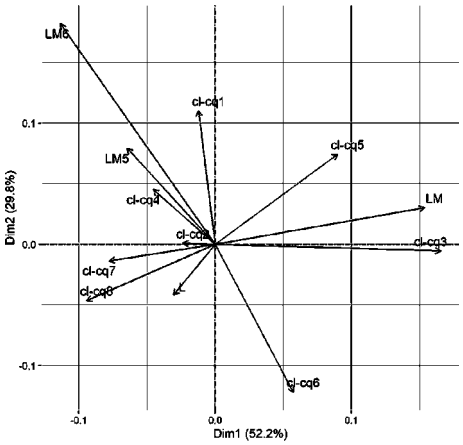


Fig. A3.2: Degree course of studies
Thin arrows are clusters, thick arrows the modalities of the variable course type: L=bachelor's degree, LM=master's degree, LM5=5-year degree, LM6=6-year degree

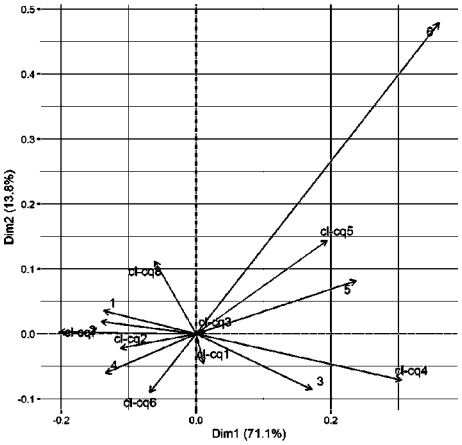


Fig. A3.3: Year of course
Thin arrows are clusters, thick arrows the modalities of the variable course year: 1, 2, 3 are the first, the second and the third year, respectively, of a bachelor's degree, 4 and 5 are the first and the second year of a master's degree or the fourth and the fifth year of a 5-year degree, 6 is the last year of a 6-year degree.

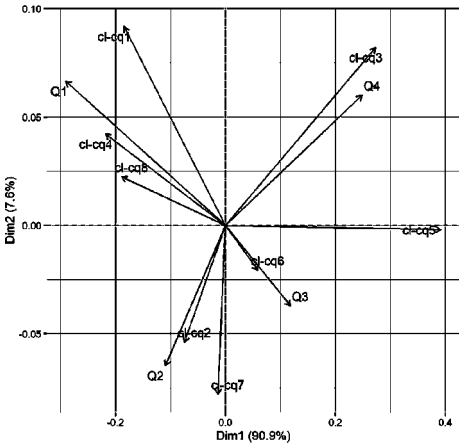
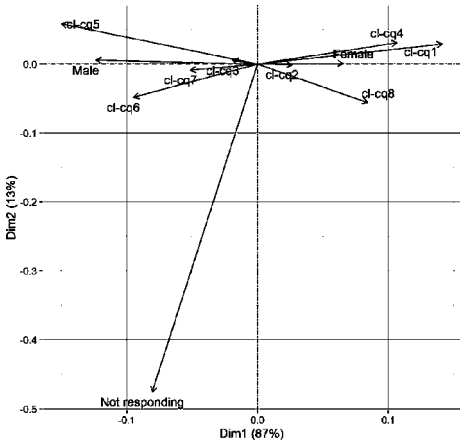


Fig. A3.4: Quartiles of ECTS credits acquired with respect to achievable credits
Thin arrows are clusters, thick arrows the modalities of the variable number of credits acquired with respect to the total achievable credits: Q1=below the 1st quartile, Q2=between the 1st and 2nd quartile, Q3=between the 2nd and 3rd quartile, Q4=above the 3rd quartile.

Fig. A3.5: Gender
Thin arrows are clusters, thick arrows the modalities of the variable gender.



ANNEX 4

d_23 *How satisfied are you with your global distance learning experience?* (graded from 1 to 10)

Clusters ranked by decreasing order of median of answers to question d_23; boxes' width: proportional to the share of students in each cluster

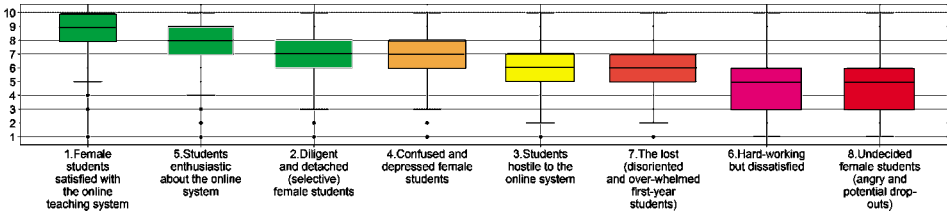


Fig. A4: ***Box plot of satisfaction level of the students with the distance learning experience (d_23), by cluster***

ANNEX 5

Table A5: ***Corpora created on free texts: respondents, types, tokens and measures of lexical diversity by corpus***

Corpus	Number of respondents	Number of types[1]	Number of tokens[2]	Mean of tokens by respondent[3]	Type/ Token ratio[4]	% hapax[5] by token	% hapax[5] by type
Ongoing Changes [q16]. Describe how and in what way (positive and negative) the COVID-19 emergency has changed your life in general, apart from your study activities	5,607	10,858	234,677	41.8	4.6	47	2.2
Strengths [q30]. Report up to a maximum of 3 strong points of your distance learning experience	2,152	3,027	35,779	16.6	8.4	51.5	4.4
Weaknesses [q31]. Report up to a maximum of 3 weak points of your distance learning experience	2,319	4,535	50,443	21.7	8.9	52	4.7
Suggestions and proposals [q32]. Please provide your suggestions and proposals	1,398	4,629	38,277	27.4	12.1	53.5	6.7

1 Number of different words present in the corpus
2 Number of occurrences of the types
3 It provides an assessment of the average text's length of the answers
4 It provides an assessment of the lexical diversity of the corpus. A higher index value indicates greater linguistic diversity and thus less repetition of the same words in the corpus. However, this ratio is highly dependent on the text's length, making it difficult to accurately compare corpora of different sizes.
5 Forms that appear only once in the corpus.

ANNEX 6 - Characteristic dictionaries identified in the Corpus *Ongoing changes*

The Corpus Ongoing changes refers to the free text in question d16-"Describe how and in what way (positive and negative) the COVID-19 emergency has changed your life in general, apart from your studying activities"

- The characteristic dictionaries in the original language (Italian) of each cluster are listed in descending order of test-value. Statistics on the terms characterising each cluster (frequency within the Corpus and within the cluster, t-value and probability) are available from the authors on request

- *cl-txt1 –Students with changes in the personal sphere and in relationships with family members and friends [Sfera personale, relazioni nella famiglia e amici]*
- about 22% of the respondents.

  cose, piccole, importanza, vita, persone, famiglia, scontato, valore, amici, importanti, importante, scontate, libertà, care, gesti, riscoperto, permesso, nonni, piccoli, passeggiata, paura, natura, portato, potere, resa, manca, persona, amiche, prova, mondo, virus, fidanzato, posto, dura, caffè, piacere, genitori, stile, quotidiane, ansia, tranquilli, banali, giardino, persa, spazi, peso, aspetto, privato, sole, negativo, quotidianità.

  [things, small, importance, life, people, family, taken for granted, value, friends, important, taken for granted, freedom, dear, gestures, rediscovered, permission, grandparents, small, walk, fear, nature, brought, power, yield, missing, person, friends, test, world, virus, boyfriend, place, hard, coffee, pleasure, parents, style, daily, anxiety, quiet, trivial, garden, lost, spaces, weight, appearance, private, sun, negative, everyday]
- *cl-txt2 – Students evaluating negative and positive aspects of the new context [Valutazione del contesto (aspetti positivi e negativi)]*
- about 25% of the respondents

  negativi, aspetti, positivi, tempo, attività, sociali, mancanza, amici, fisica, hobby, svago, relazioni, rapporti, lettura, contatti, sociale, contatto, libero, movimento, routine, limitato, studio, attenzione, minor, impossibilità, interazioni, maggiore, interessi, fisiche, noia, sport, limitazioni, gestione, sonno, dedicato, sedentaria, Vita, disposizione, aperta, parenti, passioni, esterno, aria, limitazione, spostamenti, mancanze, monotona, umore, socialità, socializzazione, uscite, giornata, allenamento, tipo, fisico, stimoli, lati, palestra, personali, quotidianità, abitudini, essenziale, sviluppo, persone, nuove, quotidiana, viaggi, eliminazione, film, teatro, manca, umani.[negative, aspects, positive, time, activity, social, lack, friends, physical, hobby, leisure, relationships, reading, contacts, social, contact, free, movement, routine, limited, study, attention, minor, impossibility, interactions, major, interests, physical, boredom, sport, limitations, management, sleep, dedicated, sedentary, Life disposition, open, relatives, passions, outside, air, limitation, movements, lacks, monotonous, mood, sociality, socialisation, outings, day, training, type, physical, stimuli, sides, gym, personal, daily, habits, essential, development, people, new, daily, travel, elimination, film, theatre, lacks, human]
- *cl-txt3 – Students with changes in the organization of the family life and of the study [Organizzazione tra casa e lavoro/studio]*
- about 24% of the respondents casa, lavoro, emergenza, dovuto, situazione, momento, causa, positiva, periodo, universitaria, sorella, biblioteca, regione,

cosa, stato, sanitaria, bloccato, ansia, sola, economici, carriera, fase, concentrazione, studio, scuola, studi, sessione, settimane, credo, universitario, difficile, risultata, sospesi, inizio, economico, possibili, negozio, spazio, genitori, problemi, percorso, bologna, rossa, studente, biblioteche, giorni, fosse, condizione, week-end, data, costretti, famiglie, solito, confusione, vista, maniera, certezza, ritardo, libri, livello, abituato, quarantena, vacanze, giorno, esercizi, unica, lasciato, strutture, mansioni, disagi, silenzio, residenza, esame.[home, work, emergency, due, situation, moment, cause, , positive, period, university, sister, library, region, thing, state, health, stuck, anxiety, lonely, economic, career, stage, concentration, study, school, studies, session, weeks, I think, university, difficult, resulted, suspended, beginning, economic, possible, shop, space, parents, problems, path, bologna, red, student, libraries, days, was, condition, weekend, date, forced, families, usual, confusion, view, manner, certainty, delay, books, level, accustomed, quarantine, holiday, day, exercises, only, left, facilities, tasks, inconvenience, silence, residence, exam]

- *cl-txt4 – Students with problems in economic and living conditions [Problemi materiali e condizioni economiche]*
- *about 10% of the respondents*

  affitto, tirocinio, cassa integrazione, anno, tesi, lavoro, contratto, stipendio, laurea, azienda, pago, studentessa, appartamento, bollette, compagno, spese, figlio, madre, stato, sperimentale, origine, lavoratrice, bimba, tornata, crediti, genitori, educatrice, sede, farmacia, messa, progetto, causa, nido, conseguimento, anni, dovuto, marito, panico, economica, chiamata, fuorisede, arrivata, indeterminato, ritrovata, borsa, tasse, sospeso, laboratorio, attacchi, rischio, padre, interrotto, lavorato, piani, rimasta, lavorativo, soldi, estero, crisi, garantito, momento, ragazzo, scuole, percorso, emergenza, finito, costretta, Italia, studi, future, chiusura, città, magistrale, economico, tutor, dipendente, scuola, economiche, ritrovo, preoccupata.[rent, internship, year, thesis, job, contract, salary, degree, company, pay, student, flat, bills, partner, expenses, child, mother, state, experimental, origin, worker, child, returned, credits, parents, educator, seat, pharmacy, put, project, cause, nest, achievement, years, due, husband, panic, economic, call, out-of-school, arrived, indefinite, found, bag, taxes, suspended, lab, attacks, risk, father, interrupted, worked, plans, stayed, working, money, foreign, crisis, guaranteed, moment, boy, schools, path, emergency, finished, forced, Italy, studies, future, closing, city, master, economic, tutor, employee, school, economic, finding, worried]
- *cl-txt5 – Students focusing on the positive and negative novelties of online teaching [Lezioni e organizzazione della didattica di emergenza]*
- *about 18% of the respondents lezioni, online, esami, professori, registrate,*

lezione, docenti, connessione, prof, modalità, orari, caricate, video, esame, aula, studenti, distanza, corsi, argomenti, disponibili, materie, sessione, dubbi, orali, internet, appelli, materiale, e-mail, professore, frontali, università, docente, registrazioni, appunti, scritti, date, computer, diretta, presenza, orario, calendario, corso, videolezioni, domande, telematica, dolly, studio, diretto, stati, preparazione, distrazioni, estiva, materia, possibilità, didattica, ascolto, organizzazione, utile, risparmio, comunicazione, chiarimenti, mezza, svolte, qualità, fornito, piattaforma, eventuali, registrazione, audio, laboratori, tempi, complicato, risposta, sistema, carico, fissi, pubblicano, utili, classe, carica, notato, spostamenti.[lessons, online, exams, professors, recorded, lesson, teachers, connection, prof, mode, times, uploaded, video, exam, classroom, students, distance, courses, topics, available, subjects, session, doubts, oral, internet, appeals, material, e-mail, professor, frontal, university, teacher, recordings, notes, written, dates, computer, direct, presence, time, calendar, course, videolessons, questions, telematics, dolly, study, direct, states, preparation, distractions, summer, matter, possibility, didactics, listening, organization, useful, saving, communication, clarification, half, carried out, quality, provided, platform, any, recording, audio, labs, time, complicated, answer, system, load, fixed, publish, useful, class, charge, noticed, movements]

ANNEX 7 - Table A7: ***Descriptive statistics refers to the output of the ALCESTE method on the corpora Strengths, Weaknesses, Suggestions and proposals***

	d30: Strengths	d31: Weaknesses	d32: Suggestions and proposals
Number of respondents (texts)	2152	2319	1398
Number of textual segments	2198	2493	1636
Number of forms	3027	4535	4629
Occurrences	35779	50443	38277
Number of lemmas	2026	2822	2986
Active forms	1741	2494	2633
Supplementary forms	241	282	297
Active forms with a frequency >3	618	944	931
Average of forms per segment	16.28	20.23	23.4
Number of classes	2	5	4
Number of classified segments (absolute value)	2129	2227	1505
Number of classified segments (percent value)	96.86	89.33	*91.99*

ANNEX 8 – Network graphs of the terms of each thematic cluster identified by the ALCESTE method in the corpora *Strengths*, *Weaknesses* and *Suggestions and proposals*

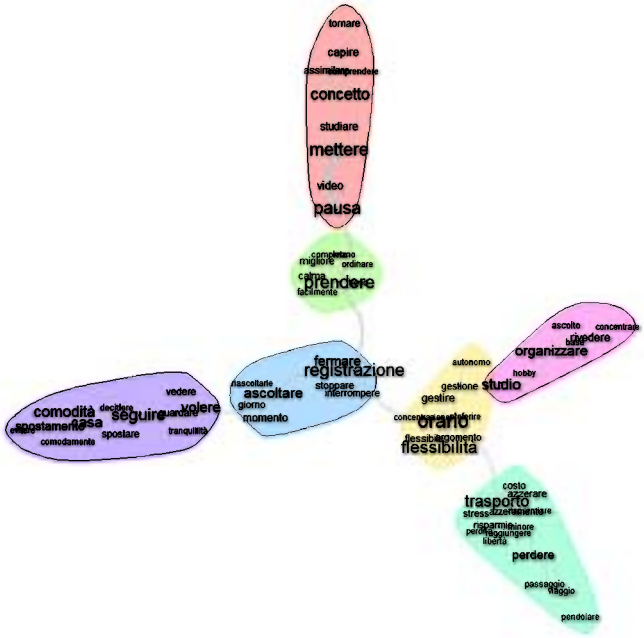


Fig. A8.1: Corpus Strengths – Thematic cluster 1

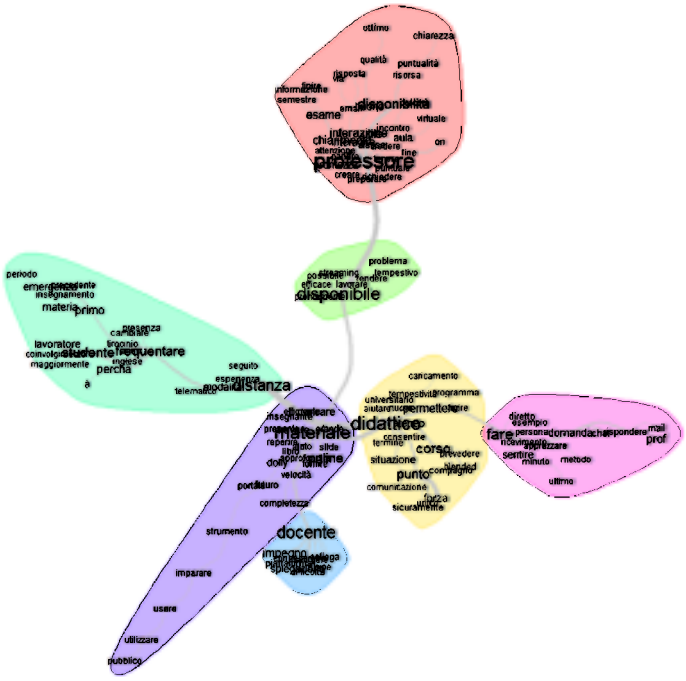


Fig. A8.2: Corpus Strengths – Thematic cluster 2

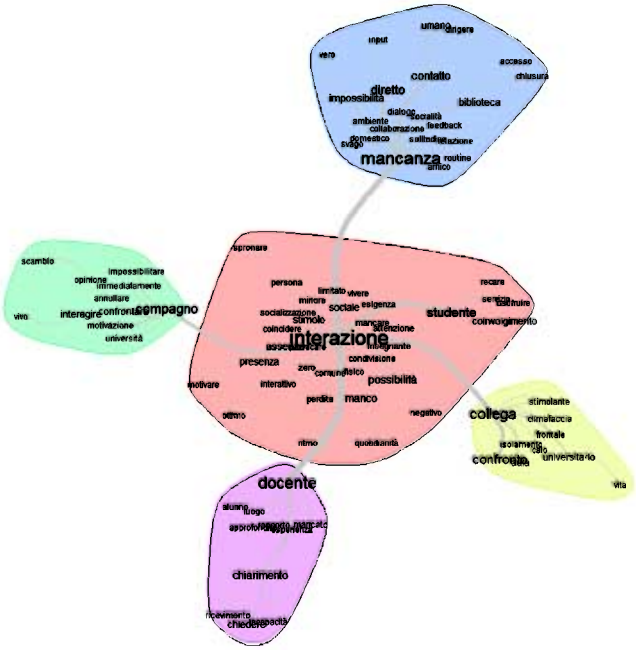


Fig. A8.3: Corpus Weaknesses – Thematic cluster 1

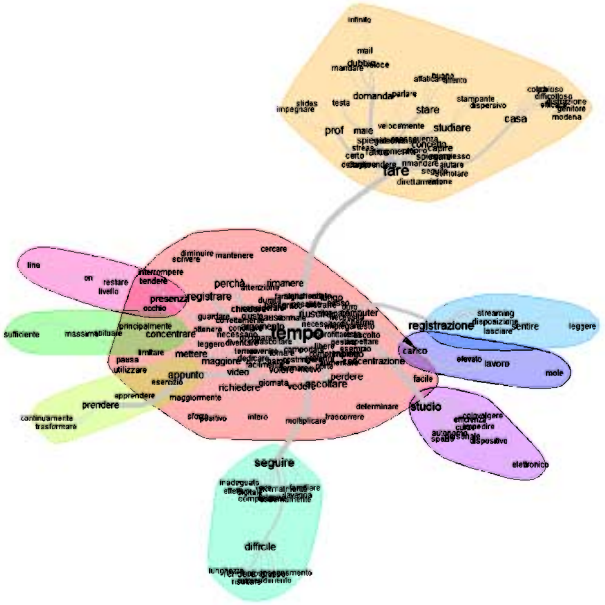


Fig. A8.4: Corpus Weaknesses – Thematic cluster 2

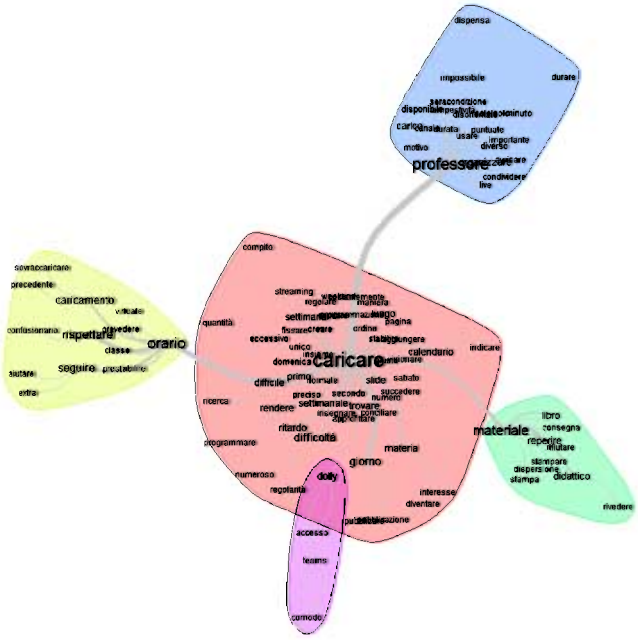


Fig. A8.5: Corpus Weaknesses – Thematic cluster 3

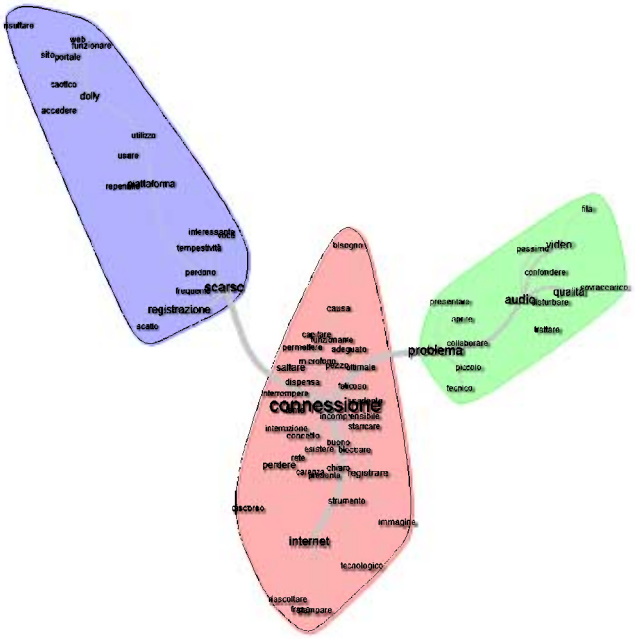


Fig. A8.6: Corpus Weaknesses – Thematic cluster 4

Fig. A8.7: Corpus Weaknesses – Thematic cluster 5

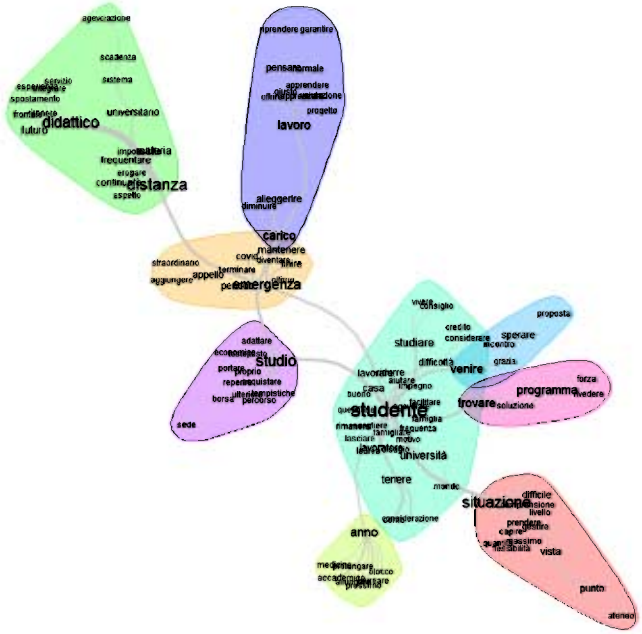


Fig. A8.8: Corpus Suggestions and proposals – Thematic cluster 1

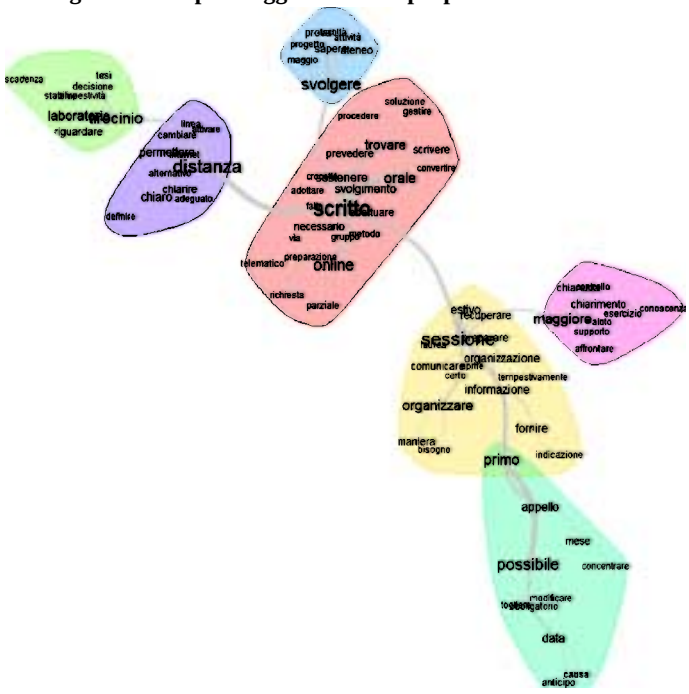


Fig. A8.9: Corpus Suggestions and proposals – Thematic cluster 2

Fig. A8.10: Corpus Suggestions and proposals – Thematic cluster 3

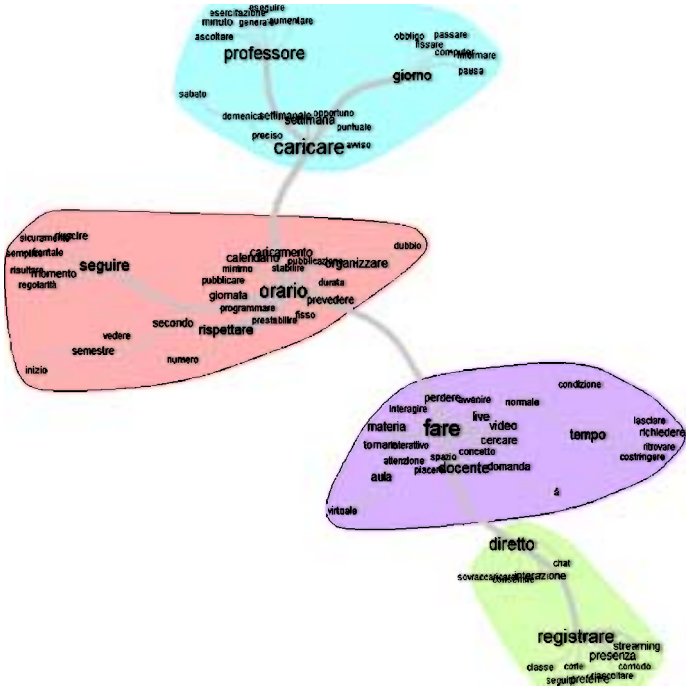


Fig. A8.11: Corpus Suggestions and proposals – Thematic cluster 4

ANNEX 9 – Selection of texts from the open-ended responses (in *Italian* and translated in English) on *Strengths, Weaknesses, Suggestions and proposals* Corpora

- Statistics on the terms characterising each class (frequency within the Corpus and within the class, t-value and probability) are available from the authors on request.
- Respondent ID generated by Survey Monkey
- In italics: original text in Italian

Corpus Strengths

Thematic cluster 1

* *11489097187 organizzazione flessibilità comodità.*
* *11490896693 flessibilità degli orari possibilità di riascoltare le lezioni possibilità di mettersi in pari con le lezioni.*
* *11512070162 grande flessibilità di orari possibilità di tornare su punti precedentemente discussi con molta facilità.*
* *11487505612 videolezioni sempre disponibili.*
* *11509041617 i docenti via mail sono sempre disponibili e anche via skype.*
* *11508704693 i professori sono molto disponibili.*
* *11509740650 1 professori molto disponibili e volenterosi 2 possibilità di bloccare e riascoltare le lezioni a piacimento 3 possibilità di ascoltare le lezioni in qualunque giorno*
* 11489097187 organisation flexibility convenience.
* 11490896693 flexibility of timetables possibility of re-listening to lessons possibility of catching up on lessons.
* 11512070162 great flexibility of timetables possibility to return to previously discussed points very easily.
* 11487505612 video lessons always available.
* 11509041617 teachers are always available via email and also via Skype.
* 11508704693 the teachers are very helpful.
* 11509740650 1 very helpful and willing professors 2 possibility of blocking and listening to the lessons at will 3 possibility of listening to the lessons on any day

Thematic cluster 2

* *11492927952 alcuni professori stanno sfruttando le lezioni online per creare maggiore interazione con noi studenti.*
* *11509485560 ottima organizzazione da parte dell'ateneo, l'impegno dei docenti.*
* *11516285371 maggior interazione col docente durante la lezione*
* *11522970349 organizzazione dei professori e università.*
* *11522685697 organizzazione costanza interazione con i compagni di studio.*
* *11491071763 c'è molta più interazione sia tra docenti che tra i miei colleghi durante la lezione.*
* *11492642993 azzeramento dei costi e tempi di trasporto 2 maggiore interazione e confronto con i compagni di corso*

* 11492927952 some professors are using online classes to create more interaction with us students.
* 11509485560 very good organisation by the university, the commitment of the teachers.
* 11516285371 more interaction with the lecturer during the lesson
* 11522970349 organisation of professors and university.
* 11522685697 organisation constancy interaction with fellow students.
* 11491071763 much more interaction with professors and fellow students during class.
* 11492642993 zero transport costs and times 2 more interaction and confrontation with classmates

Corpus Weaknesses

Thematic cluster 1

* *11489481689 mancanza di interazione diretta con i prof che spesso rispondono alle mail dopo molto tempo e o in modo non consono.*
* *11509716367 zero interazioni con i professori, zero interazioni con i colleghi.*
* *1150833588 manca interazione con gli insegnanti alcuni prof annullano le lezioni manca il confronto tra colleghi di corso.*
* *11489616068 no interazione diretta con i docenti, possibile accumulo delle registrazioni, mancanza di stimoli.*
* *11509785526 difficile interazione e confronto con i compagni chiusura delle biblioteche difficile interazioni con i professori*
* 11489481689 lack of direct interaction with professors who often respond to emails after a long time and or in an inappropriate manner.
* 11509716367 zero interaction with professors, zero interaction with colleagues.
* 1150833588 lack of interaction with teachers some profs cancel lessons lack of confrontation between course colleagues.
* 11489616068 no direct interaction with professors, possible accumulation of recordings, lack of stimuli.
* *11509785526 difficult interaction and confrontation with fellow students closure of libraries difficult interaction with professors*

Thematic cluster 2

* *11489650862 le lezioni a distanza non permettono di essere concentrati al massimo.*
* *11508518450 le lezioni online sono molto più lunghe delle lezioni in classe mi è difficile concentrarmi e studiare in casa la mole di studio è inadeguata alla situazione.*
* *11489926986 lezioni troppo lunghe e quindi difficile stare attenti continuamente, difficile rimanere in pari con tutte le materie da seguire.*
* *11488971315 ci metto più tempo ad ascoltare le lezioni rispetto alla loro durata effettiva.*
* *11492381861 impiego tanto tempo per ascoltare bene una lezione.*
* *11493253390 alcuni professori sono veramente pesanti da ascoltare non riescono a mantenere l'attenzione*
* 11489650862 the distance learning lessons do not allow you to concentrate to the maximum.
* 11508518450 online lessons are much longer than classroom lessons it is difficult for me to concentrate and study at home the amount of study is inadequate for the situation.
* 11489926986 lessons are too long so it's hard to pay attention all the time, it's hard to keep up with all the subjects to follow.

* 11488971315 I take longer to listen to the lessons than the actual duration.
* 11492381861 it takes me a long time to listen well to a lesson.
* 11493253390 some professors are really hard to listen to, they can't keep your attention.

Thematic cluster 3

* *11508329144 non vengono rispettate le durate delle lezioni sebbene sia stato detto che 1h 30 di lezione in presenza equivalga a 45min di registrazione spesso ci troviamo a seguire anche 4h di fila ed è insostenibile.*
* *11492335702 le lezioni registrate richiedono molto più tempo rispetto a quelle in presenza alcuni professori sembrano aver aumentato il carico di studi senza rispettare le tempistiche di una normale settimana di lezioni in presenza la preoccupazione di dover svolgere gli esami online.*
* *11489680249 3 i professori non rispettano il limite dei 45 minuti circa e fanno lezioni di oltre un ora e mezza.*
* *11509719266 troppo carico di materiale da parte dei professori non rispetto degli orari di caricamento delle lezioni.*
* *11512937188 disorganizzazione del corso ogni professore carica in una piattaforma diversa e molti professori non caricano il materiale didattico*
* 11508329144 the duration of the lessons is not respected although it has been said that 1h30 of lessons in person is equivalent to 45 minutes of recording, we often find ourselves following 4 hours in a row and it is unbearable.
* 11492335702 the recorded lessons take much longer than the face-to-face lessons some professors seem to have increased the study load without respecting the times of a normal week of face-to-face lessons the worry of having to take exams online.
* 11489680249 3 teachers do not respect the limit of about 45 minutes and give lessons of more than an hour and a half.
* 11509719266 too much material on the part of the professors not respecting the loading times of the lessons.
* 11512937188 disorganisation of the course each professor uploads on a different platform and many professors do not upload the teaching material.

Thematic cluster 4

* *11490407742 a volte ci sono problemi di connessione e stare davanti al computer tutto il giorno è stancante. .*
* *11510305821 connessione internet non delle migliori.*
* *11519084549 1 problemi di connessione 2 il video a volte si blocca 3 non si sente l audio a volte.*
* *11489617698 stanchezza nel stare davanti al pc per ore problemi di connessione.*
* *11511897073 problemi con la piattaforma dolly nel reperire materiale online.*
* *11489201222 connessione che talvolta salta poca uniformità di sistemi scelti tems dolly skype.*
* *11489729038 carico registrazioni malfunzionamento piattaforma dolly.*
* *11508481309 microfoni mal funzionanti professori che non registrano lezioni ma assegnano libri o dispense.*
* *11496644258 spesso i docenti effettuando le lezioni in diretta non accettano che eventuali dispositivi come il microfono non possano funzionare oppure se funzionano il docente non riesce a sentire gli studenti per problemi tecnici*
* 11490407742 sometimes there are connection problems and being in front of the computer all day is tiring.

* 11510305821 not the best internet connection.
* 11519084549 1 connection problems 2 the video sometimes freezes 3 I can't hear the sound at times.
* 11489617698 tiredness in front of the pc for hours connection problems.
* 11511897073 problems with the dolly platform in finding material online.
* 11489201222 connection that sometimes breaks down lack of uniformity of systems chosen tems dolly skype.
* 11489729038 loading registrations dolly platform malfunction.
* 11508481309 malfunctioning microphones professors who do not record lessons but assign books or handouts.
* 11496644258 often teachers, when they do live lessons, do not accept that devices such as microphones do not work or, if they do work, the teacher cannot hear the students because of technical problems.

Thematic cluster 5

* *11489361109 mancanza di informazioni riguardanti la modalità degli esami le date precise scarsa comunicazione spiegazione delle differenze tra esame da frequentante e non se avessi date certe di esami riuscirei a farmi un piano di studio e organizzarmi*
* *11489748604 ritardo nel fornire informazioni circa gli esami.*
* *11519184370 poche informazioni riguardo gli esami o meglio nessuna.*
* *11534404004 incertezza sulle modalità e tempi degli esami per le materie di questo semestre soprattutto per gli esami scritti che alcuni professori sono convinti di poter svolgere a breve in presenza incertezza sulle modalità di recupero dei tirocini.*
* *11492560383 non vi è modo di sostenere gli esami scritti i professori non hanno ideato soluzioni alternative e la cosa mi mette decisamente in difficoltà.*
* *11508866947 poca chiarezza dei professori su alcuni argomenti pochi chiarimenti riguardo le possibili modalità di esame e assenza di pre appelli poche esercitazioni compiti progetti da fare a casa.*
* 11489361109 lack of information regarding the modality of the exams, the precise dates, poor communication, explanation of the differences between attending and non-attending exams, if I had certain dates of the exams, I would be able to make a study plan and organize myself
* 11489748604 delay in providing information about the exams.
* 11519184370 little or no information about exams.
* Uncertainty about the modalities and timing of the exams for the subjects of this semester, especially for the written exams that some professors are convinced they will be able to carry out shortly in the presence of uncertainty about how to recover the internships.
* 11492560383 there is no way to take the written exams the professors have not devised alternative solutions and this definitely puts me in difficulty.
* 11508866947 lack of clarity of the professors on some topics few clarifications regarding the possible exam modalities and absence of pre-trials few exercises tasks projects to do at home

Corpus Suggestions and proposals

Thematic cluster 1

* *11547817203 spero si possa utilizzare questa modalità anche in un futuro per chi lavora può essere un ottima opportunità.*

* *11508645481 continuare in futuro con la didattica a distanza con eccezione solo per materie obbligatorie e in laboratorio.*
* *11510614138 mantenere la modalità delle lezioni registrate anche in futuro al di fuori dell'emergenza per permettere anche agli studenti lavoratori o con altre problematiche di poter assistere alle lezioni anche da casa.*
* *11508441897 sotto certi aspetti si potrebbe tenere in considerazione la didattica a distanza anche in futuro.*
* *11487998284 bisognerebbe attivare la didattica a distanza sempre in qualsiasi momento dell'anno accademico.*
* *11508514494 continuare la didattica a distanza anche dopo.*
* *11489654484 mi auguro quindi di poter usufruire in futuro di materiale didattico di questa qualità senza rendere vano quello che questa esperienza ha da insegnarci.*
* 11547817203 I hope we can also use this method in the future for those who work, it can be an excellent opportunity.
* 11508645481 to continue with distance learning in the future with the exception of compulsory subjects and laboratories only.
* 11508645481 to continue with distance learning with the exception of compulsory subjects and the laboratory.
* 11508441897 in some respects distance learning could also be considered in the future.
* 11487998284 distance learning should always be activated at any time during the academic year.
* 11508514494 Distance learning should also be continued afterwards.
* 11489654484 I therefore hope to be able to benefit from teaching materials of this quality in the future without making what this experience has to teach us meaningless.

Thematic cluster 2

* *11508312488 stabilire quanto prima le modalità d esame nel dettaglio e comunicarle agli studenti.*
* *11508719487 chiarimenti sulle modalità d esame.*
* *11508380824 chiarire al più presto le modalità d esame. .*
* *11509951754 chiarimenti sulla modalità di esame pronto.*
* *11490071431 dare informazioni riguardo gli esami della sessione estiva se vengono modificate le modalità in modo da adattare lo studio in previsione della prova che verrà somministrata. .*
* *11512994728 dare delle regole di ateneo per quanto riguarda modalità di svolgimento di lezioni e esami che vengano rispettate da tutti i docenti.*
* *11509081868 bisognerebbe rispettare l orario di lezione inoltre sarebbe utile se venissero fornite a noi studenti maggiori indicazioni riguardo le modalità di esame per l imminente sessione ad oggi non è stato detto ancora nulla.*
* 11508312488 establish detailed examination procedures as soon as possible and communicate them to the students.
* 11508719487 clarification of examination procedures.
* 11508380824 clarify the examination procedures as soon as possible.
* 11509951754 clarification of examination mode ready.
* 11490071431 give information about the exams of the summer session if the modalities are changed in order to adapt the study in anticipation of the test that will be administered.
* 11512994728 to give the university rules for the conduct of lectures and exams that are respected

by all teachers.

* It would also be useful if we students were given more information about the examination procedures for the upcoming session, but nothing has been said yet.

Thematic cluster 3

* *11490999323 pagine dolly meno confusionarie.*
* *11508516154 migliorare la piattaforma dolly.*
* *11510487010 fornire libri in pdf sulla pagina dolly poiché non tutti i libri sono di facile reperibilità. .*
* *11489018378 caricare materiale su dolly e non su altre piattaforme nelle lezioni registrate ricordarsi che gli studenti devono prendere appunti e non possono chiedere di ripetere.*
* *11522791588 la piattaforma dolly deve essere migliorata e i professori dovrebbero caricare le lezioni in formati che funzionino in maniera fluida.*
* *11508482205 mettere a disposizione materiale quali libri di testo come file pdf sul portale dolly causa la difficile reperibilità semplificare i canali di comunicazione.*
* *11512060656 migliorare la qualità delle registrazioni.*
* *11508341491 rivedere assolutamente la qualità audio delle registrazioni.*
* *11492627690 migliorare la qualità audio delle lezioni. .*
* *11512228427 migliorare qualità audio e video di alcune lezioni.*
* *11508803630 migliorare la qualità delle lezioni che sono poco comprensibili a causa di problemi tecnici.*
* *11489588693 fornire ai professori attrezzatura adeguata a realizzare registrazioni di buona qualità.*
* 11490999323 less confusing dolly pages.
* 11508516154 improve the dolly platform.
* 11510487010 provide pdf books on the dolly page as not all books are easy to find. .
* 11489018378 upload material on dolly and not on other platforms in recorded lessons remember that students have to take notes and cannot ask to repeat.
* 11522791588 the dolly platform needs to be improved and professors should upload lessons in formats that work fluidly.
* 11508482205 make materials such as textbooks available as pdf files on the dolly portal because of the difficult availability simplify communication channels.
* 11512060656 improve the quality of recordings.
* 11508341491 absolutely revise the audio quality of the recordings.
* 11492627690 improve audio quality of lessons.
* 11512228427 improve the audio and video quality of some lessons.
* 11508803630 improve the quality of the lessons that are not understandable due to technical problems. .
* 11489588693 provide teachers with adequate equipment to make good quality recordings.

Thematic cluster 4

* *11508312612 i professori dovrebbero caricare le lezioni negli orari stabiliti non alle 11 di notte e non il sabato e la domenica perché noi studenti non abbiamo il computer in mano in ogni momento della giornata e dobbiamo organizzarci anche noi con le lezioni e lo studio.*
* *11508530059 penso sia opportuno che i professori si organizzino per caricarci le lezioni in giorni*

prefissati da loro perché ora tutti i giorni occorre salire sul portale per verificare se sono state aggiunte le lezioni e facendo così è impossibile organizzarsi con lo studio.

* *11510153433 le lezioni dovrebbero essere più concise è molto difficile seguire bene una lezione online perché richiede molto più tempo di una lezione normale..*
* *11489588416 cercare di far rispettare il più possibile ai docenti il proprio orario o per lo meno la giornata in cui avrebbero lezione lasciare il tempo materiale di studiare e assimilare i concetti affrontati a lezione.*
* *11508624193 rispettare l orario assegnato.*
* *11489760464 far rispettare un orario preciso per la pubblicazione delle lezioni esattamente come avverrebbe in caso non ci fosse tale emergenza quindi seguendo un orario normale di lezioni.*
* *11508680987 rispettare il caricamento o il sostenimento delle lezioni negli orari previsti dall'orario delle lezioni: ci siamo ritrovati alcuni giorni senza avere nessuna lezione e altri in cui si accumulava talmente tanta roba da aver bisogno di passare tutta la giornata al computer.*
* *11508576980 cercare di far rispettare il più possibile l orario delle lezioni ai professori e cercare di incentivare i professori a svolgere prove intermedie scritte.*
* *11489435884 rispettare il numero di lezioni che si ha a settimana senza approfittare del fatto che siamo casa non à corretto.*
* *11489807647 consiglierei ai professori di rispettare i 45 minuti stabiliti per ciascuna lezione.*
* *11534365431 incentivare caldamente il rispetto delle ore di lezione e la serietà dei professori nel rispettare il numero di ore assegnate senza chiedere di fissarne tante in più.*
* 11508312612 the teachers should upload the lessons at the fixed times, not at 11 o'clock at night and not on Saturdays and Sundays because we students do not have the computer in our hands at all times of the day and we also have to organise our lessons and study.
* 11508530059 I think it would be a good idea for the teachers to organise themselves so that they can upload the lessons on days set by them, because now every day we have to go on the portal to check whether the lessons have been added, and by doing this it is impossible to organise our studies.
* 11510153433 the lessons should be more concise, it is very difficult to follow an online lesson well because it takes much more time than a normal lesson....
* 11489588416 try to make the teachers respect their own timetable as much as possible, or at least the day of the lesson, leaving them enough time to study and assimilate the concepts covered in the lesson.
* 11508624193 respect the assigned time.
* 11489760464 to respect a precise timetable for the publication of the lessons exactly as it would happen in case of no such emergency, therefore following a normal timetable of lessons.
* 11508680987 to respect the uploading or the taking of lessons at the times foreseen by the lesson timetable: we have found ourselves some days without having any lessons at all and others where so much stuff accumulated that we needed to spend the whole day at the computer.
* 11508576980 try to make the teachers respect the lesson timetable as much as possible and try to encourage the teachers to carry out written intermediate tests.
* 11489435884 respect the number of lessons you have per week without taking advantage of the fact that we are at home is not correct.
* 11489807647 I would advise the professors to respect the 45 minutes set for each lesson.
* 11534365431 strongly encourage respect for teaching hours and the seriousness of professors in respecting the number of hours allocated without asking for many more to be scheduled.