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SUPPLEMENTO

Critical Issues in English –
Medium Instruction at University

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Critical Issues in English – Medium Instruction at University

Edited by Jennifer Valcke, Amanda C. Murphy, Francesca Costa

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Indice

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The Introduction of English as an Academic Language in a Faculty of Physics and Mathematics in Italy

Francesca Costa

The use of English as a medium of instruction at university level has increased dramatically in the last 15 years all over Europe. English-taught programmes are often imposed top-down, and this article presents one of the very few cases in which the process and decision-making have been documented, in terms of a pre-feasibility study conducted through a student questionnaire and interview with the Dean. The research is set within the Italian context of a Faculty of Mathematics and Physics. Results reveal that in general students have a positive attitude towards this implementation, but many adjustments still need to be carried out.

Keywords: EMI, English as an academic language, Mathematics and physics

Introduction

Five years after the much-contested decision of the Politecnico di Milano to offer their second-cycle degree programmes entirely using English as an Academic Language, English-taught programmes in Italy (ETPs) have increased and become almost the norm. Despite all these years of prolonged and unresolved debate, around 85% of universities are in the process of implementing these types of programmes[1].

The object of this study is an Italian university which, partly for the utilitarian reasons of attracting foreign students and professors in order to survive, has made the institutional choice to introduce ETPs in the Faculty of Mathematics and Physics, where the enrolment level is not very high.

ETPs are often implemented top-down[2], but in very few cases have the process and decision-making, in terms of a pre-feasibility study by means of a student questionnaire and interview with the Dean, been documented. This type of documentation is precisely the object of this research. A few studies have investigated students' linguistic profiles and attitudes towards already existing ETPs[3] (see section on students' questionnaires) in the

[1] S. Broggini – F. Costa, *A survey of English-medium instruction in Italian higher education*, "Journal of Immersion and Content-based Language Education", 5, 2017, pp. 240-266.

[2] F. Costa, *English-medium instruction in Italian universities. If we're gonna do it do it right, right?,* in *Sharing perspectives on English-medium instruction*, K. Ackerley – M. Guarda – F. Helm ed., Peter Lang, Frankfürt 2017, pp. 79-93.

[3] K. Ackerley, *What the students can teach us about EMI language issues,* in *Sharing perspectives on English-medium instruction*; C. Clark, *Perceptions of EMI the students' view of a Master's degree programme,* in *Sharing perspectives on English-medium instructio*n, pp. 285-308; F. Costa – C. Mariotti, *Students' profiles and their*

Italian context, even though none of them was complemented with an interview with the Dean nor taken the form of a pre-feasibility study. These previous studies showed some common results, with students generally being satisfied with English-taught courses, even if they think there is room for improvement in lecturers' linguistic competence.

The context for this study is a Mathematics and Physics faculty founded at the beginning of the 1970s in which, at the time of writing, there are no ETP courses. The procedure in this case mainly involved gauging the interest of students (as they would be the first to experience these courses) through a questionnaire. To better understand the rest of the procedure of ETP introduction and to complement the study, the Dean of the faculty was also interviewed.

The first part of this article deals with the use of English as an Academic language and the context of Science Faculties in Italian universities. The second part focuses on the results of the empirical study (student questionnaire and interview with the Dean).

2. *The use of English as an Academic Language*

It is a fact that, above all for scientific subjects, English is the most common language, even for non-native speakers. It is widely used in scientific publications and at international conferences[4]. This linguistic monopoly has come to impact not only several fields of learning but also teaching activities in these fields, as shown by the enormous growth in recent years in ETPs. Thus paradoxically the concept of the internationalisation of universities (an objective of the Bologna Process), which in theory was supposed to lead to multilingualism, has been reduced to the Englishisation of the curriculum[5].

Regarding this issue, several researchers feel that English will engulf the other languages[6], while others are less dire in their predictions, foreseeing at most a diglossic future[7] with the co-existence of two languages (in this case English and Italian). Ammon and McConnell[8] claim, on the other hand, that Anglification exists only in certain fields of learning: in the Hard Sciences publications are mainly in English, while in the Humanities they are mainly

reception of English-medium instruction in Italian universities, in English in Italy, C. Boggio – A. Molino ed., Franco Angeli, Milano (in press).

[4] R. Wilkinson – V. Zegers, *Introduction*, in *Researching content and language integration in higher education*, R. Wilkinson – V. Zegers ed., Universitaire Pers Maastricht, Maastricht 2008, pp. 1-10; J.R. Alexander, *International programmes in the German-speaking world and Englishization: a critical analysis, ibid.* pp. 77-95; B. Wächter – F. Maiworm, *English-taught programmes in European higher education. The picture in 2014,* Lemmens, Bonn 2015.

[5] J. Coleman, *English-medium teaching in European higher education*, "Language Teaching", 39, 1, 2006, pp. 1-14.

[6] R. Phillipson, *Lingua Franca or Lingua Frankensteina? English in European integration and globalisation,* "World Englishes", 27, 2008, 2, pp. 250-257; S. Dimova – A.K. Hultgren – C. Jensen ed., *English-medium instruction in European higher education*, De Gruyter Mouton, Berlin 2015 (Language and Social Life, 4).

[7] J. Coleman, *English-medium teaching in European higher education.*

[8] U. Ammon – G. McConnell, *English as an academic language in Europe*, Peter Lang, Frankfürt 2002.

in the L1[9]. They also note that native speakers "control the rules" of publications (p. 21), a view in some way softened by Gotti[10] and Montgomery[11], for whom the Non-Native-Speaker (NNS) using English brings cultural elements that enrich the English-written texts he or she produces.

Precisely because the use of English as an Academic Language is still an area of debate, it is very important to analyse local contexts and needs in which ETPs could be implemented. Pre-feasibility studies that analyse stakeholders' views are thus very important in the decision-making process.

3. *Scientific Subjects in Italian Universities*

This part of the paper will provide an overview of the context of the study with data regarding scientific subjects in Italian universities in general and specific data on the courses and programmes offered in English at such institutions.

According to ISTAT data[12] referring to 2012-2013, for a vast subject group in which Mathematics, Physics and Informatics are also taught in English, enrolment in the first-level degree (Bachelor) and the second-level degree (Master) in Italy amounted to 9,677 students. The total number of students enrolled in all areas of study in Italian universities is 278,866, with only only 3.5% of students choosing scientific subjects.

According to Censis, for the 2014/15 academic year, 49 universities offered degree programmes in Mathematics and 42 in Physics. Therefore, around half of the universities in Italy offer degree programmes in Mathematics and Physics.

One fact that emerges immediately from these data is that in Italy Mathematics and Physics might not be the most commonly chosen among students, although there has been an increase from 2001. This creates problems of survival for some faculties, which must come up with ways to attract more students, one of which is the offering of ETPs. This is testified by a study carried out by the CRUI. In 2012[13] the following universities offered ETPs in Mathematics and Physics[14]:

[9] https://www.researchtrends.com/issue-31-november-2012/the-language-of-future-scientific-communication/ (last accessed: April 30, 2017).

[10] M. Gotti ed., *Academic identity traits: a corpus-based investigation*, Peter Lang, Bern 2012.

[11] S.L. Montgomery, *Does science need a global language?*, The University of Chicago Press, Chicago 2013.

[12] http://dati.istat.it/Index.aspx?DataSetCode=DCIS_IMMATRIC&Lang= (last accessed: April 30, 2017).

[13] CRUI provided an updated version in 2016 but no data were available as regards Bachelor Degrees, nor were the titles of the programmes stated.

[14] https://www.crui.it/HomePage.aspx?ref=2094# (last accessed: April 30, 2017).

Table 1. Mathematics and Computer Science 2011-12
(only institutions denominated as universities – excluding summer schools)

University	*Bachelor Degree*	*Master Degree*	*Phd*
Bolzano	Bachelor in Computer Science and Engineering	Master in Computer Science	Research Doctorate in Science and Informatics Technology
Bologna		Bioinformatics	
Camerino		Mathematics and Application Computer Sciences	
L'Aquila		Mathematical Engineering Distributed Systems and Ubiquitous Computing Global Software Engineering	
Milan		Computer Science	PhD Computer Science
Politecnico of Milan			Mathematical Models and Methods in Engineering
Padua		Mathematics	Mathematical Sciences
Pisa		Computer Science and Networking	Basic Sciences
Trento		Master of Science in Mathematics Master in Computer Science	
Venice		Computer Science	Computer Science

Table 2. Physics (only institutions denominated as universities – excluding summer schools)

University	*Bachelor Degree*	*Master Degree*	*PhD*
Camerino		Physics	
Ferrara		Physics	
L'Aquila		Physics	
Padua		Astronomy	
Tor Vergata in Rome		Physics for Instrumentation and Technology	
Turin		Science of Materials	
Politecnico of Turin		Physics of Complex Systems	Physics

Trento	Master of Science in Physics	
Bologna		Astronomy
Milan		Physics Astrophysics and Applied Physics
Politecnico of Milan		Physics
Federico II in Naples		Fundamental and Applied Physics
Sapienza University of Rome		Astrophysics
Siena		Experimental Physics
Trieste		Nanotechnology

The data in Tables 1 and 2 refer to 2012, but similar data (for all faculties) indicate that by 2015 around 90% of Italian universities offered ETPs, which shows that such programmes are rapidly rising[15].

4. *Students' Attitudes Studies in the European Context*

In order to outline relevant studies for this research, students' perceptions at university level were examined. The results of these studies can be grouped under the following categories: student expectations; the advantages and positive aspects of the courses; constructive criticism of the courses.

Student expectations. Two studies from the Netherlands[16], among the first carried out, revealed that students expected to learn English in addition to subject-matter content. Moreover, students thought their lecturers would have a high level of competence in English, would be able to adapt their teaching methods to such courses, and would represent a role model. Lecturers, on the other hand, felt that their proficiency in English was good enough.

Student-perceived advantages. The advantages that emerge in particular from studies carried out in Spain cover a broad range of language and content aspects. From the language point of view, students report improvements in vocabulary[17], pronunciation, listening and grammar, in that order[18]. In the study by Dafouz et al., the lecturers (n. = 70) felt up to the

[15] http://www.universitaly.it/index.php/cercacorsi/universita?lingua_corso=en (last accessed: April 30, 2017).

[16] A. Vinke, *English as the medium of instruction in Dutch engineering education*, Doctoral thesis, Delft Technische Universiteit, Delft 1995; R. C. Klaassen, *The international university curriculum: challenges in English-medium engineering education*, Doctoral thesis, Technische Universiteit, Delft 2001.

[17] M. Aguilar – R. Rodríguez, *Lecturer and student perceptions on CLIL at a Spanish university*, "International Journal of Bilingual Education and Bilingualism", 15, 2012, 2, pp. 183-197.

[18] E. Dafouz – B. Núñez – C. Sancho – D. Foran, *Integrating CLIL at the tertiary level: teachers' and students' reactions,* in *Diverse contexts-converging goals: CLIL in Europe*, D. Marsh – D. Wolff ed., Peter Lang, Frankfürt 2007, pp. 91-101.

task and thought their receptive skills in English were good enough, although they felt that an improvement in their speaking skills might be needed. From an attitudinal perspective, a large majority of students (71% of respondents) reported increased motivation and felt that these courses led to increased student participation.

Criticisms and needs. A 2011 study of a Master's level engineering programme in Austria[19] found students lamenting the fact that the course content had to be simplified and, at the same time, also that there was a heavier workload for courses in English. The study also involved eight lecturers who were satisfied with their teaching even though they did not feel completely adequate as regards productive skills and found it hard to cope with classes of students with different levels of English. Moreover, in a 2012 CLIL study at the tertiary level[20], students felt that the course was too slow. There were complaints about the teachers' level of English although the lecturers themselves were not aware of these problems. Some of the lecturers, though, declared uneasiness in the use of paraphrases. Some of the students stated the need for a glossary, materials in English and more class interaction. In a survey of the Belgian context involving graduate-level programmes[21], students responded that English-taught courses required more concentration and effort; at times they were also critical of the lecturers' pronunciation, and even the lecturers had reservations about their speaking abilities; however, some students viewed the latter aspect in a positive light, as this made it easier to understand lectures.

5. *Methodology of the Study*

A questionnaire was sent out to investigate the opinion of students regarding the future introduction of ETPs in the Mathematics and Physics Faculty at a university in Northern Italy. As a complementary study, the Dean of the Faculty was also interviewed.

To undertake the survey a questionnaire was prepared, based on several questions that drew on previous studies in the literature (see section on students' questionnaire). The questionnaire contains 13 questions, one of which is open-ended (see Appendix).

The questionnaire was delivered on paper personally to 135 attending students (studying either Mathematics or Physics in a first-cycle or second-cycle degree programme), all of whom responded. There are 234 students in the faculty, and thus the sample survey represents good coverage and is representative of the total number of students (58%). The SPSS programme was used for the data analysis.

The survey is divided up in the following manner: 65.2% of the respondents are from the Mathematics programme, while 34.8% are from Physics (Table 3).

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[19] D. Tatzl, *English-medium Masters' programmes at an Austrian university of applied sciences: attitudes, experiences and challenges*, "Journal of English for Academic Purposes", 10, 2011, pp. 252-270.

[20] M. Aguilar – R. Rodríguez, *Lecturer and student perceptions on CLIL at a Spanish university*, "International Journal of Bilingual Education and Bilingualism", 15, 2012, 2, pp. 183-197.

[21] J. Valcke – K. Bartik – I. Tudor, *Practising CLIL in higher education: challenges and perspectives*, in *Quality interfaces: examining evidence & exploring solutions in CLIL*, D. Marsh – O. Meyer ed., Eichstaett Academic Press, Eichstaett 2012, pp. 141-155.

Table 3. Maths and Physics Students.

		Frequency	*Percent*
Valid	Physics	47	34.8
	Maths	88	65.2
	Total	135	100.0

The degree programmes of the respondents can be broken down as follows (Table 4): 77% are doing the first-cycle degree while 23% the second-cycle degree.

Table 4. Bachelor's and Master's Students.

		Frequency	*Percent*
Valid	Master	31	23.0
	Bachelor	104	77.0
	Total	135	100.0

The data analysis took two main directions. First and foremost, a univariate descriptive analysis was carried out on all the questions, following which an inferential bivariate analysis was done on several of the key questions in relation to the type of student (first-cycle degree or second-cycle degree; Mathematics or Physics). Some of the bivariate analyses led to statistically significant results using Chi-Square tests.

The interview with the Dean was sent by email and was written by him directly in English. A content analysis was carried out[22].

6. *Interview with the Dean and Context of the Study*

In order to provide an overview of the institutional choices that a university has to carry out to implement ETPs, an interview with the Dean of the Faculty was conceived.

He first presented the ideas for the upcoming year: «in the next year we will offer a Bachelor (first-degree) programme in Mathematics with two sub-programmes, one in Maths and one in Physics, and two second-degree programmes, one in Mathematics and one in Physics».

When asked the reasons why there is a willingness to implement ETPs, the Dean said that it was for utilitarian reasons: «as for my personal opinion, I would not start a complete English-taught programme, and perhaps my colleagues would agree, but our Faculty is in some sense compelled to: since we are lacking Professors, and, due to the restrictions imposed by the Education Ministry, we cannot start a first-degree programme in Physics, therefore we must transform our Physics second-degree programme into a full-English taught one, in order to be able to count on two more visiting Professors. Moreover, both our University and the Education Ministry strongly sponsor the introduction of ETPs, so

[22] B. Gillham, *Case study research methods*, Continuum, London 2000.

we hope to get some extra resources on this basis. Finally, since our University will start a Development Plan with, among others, the goal of increasing international exchanges of students (which in turn implies a better international ranking), we want to contribute to this».

When asked if he feared the implementation, his view was that English is not always an advantage (i.e. for future teachers and for certain kind of fields). «It depends: I have many fears. My biggest fear is that there will be less chances for those who don't really need a deep knowledge of English in their future working experience (as, for example, high school teachers: the required level for the teacher is far below what would result by a full ETP, but on the other hand a full ETP is in my opinion much more difficult). Also for future researchers I don't see only advantages: there are branches of Physics, such as Theoretical Physics, which are very difficult to understand already in native language. To hear them in English will be an additional obstacle, and since Professors will take this into account, the result will be a lower level of understanding of the whole matter. This is, at least, my fear. But I have also a hope: I hope that a full ETP will attract foreign students, but if it is not to be the case, then it would be reasonable to re-discuss these changes».

When asked about the institutional path to be followed in order to implement ETPs he said: «we will simply present the proposal to the Faculty, then next to the University Senate, and subsequently the whole proposal will be examined by the Education Ministry».

When asked about the results of the student questionnaire he spoke of problems present in the literature (see section on students' questionnaire) related to other contexts (pronunciation, fluency, watering down of content and adaptation time). «[...]I expected both enthusiasm and fear. Enthusiasm is comprehensible since ETPs seem to help in a future career[...]. Fear is also very understandable: when I teach, for example, I notice that many students copy what I write on the blackboard, try to understand the correctness of the reasoning or of the Mathematics involved and sometimes write a short comment. All this will be slowed down by the need of comprehension of the English, until the terms are fully and fluently understood, and only at that time will there be perhaps an acceleration. Incorrect pronunciation, moreover, may worsen the problem. Another aspect is the oral exam: learning by heart many technical terms is already hard, but to tie them together in a decently fluent way is much more than this. So, as I said, the whole will result in a simplification of the subject matter, which may result in less prepared students».

When asked the way the lecturers reacted to ETPs he answered «some of them are very enthusiastic: of course, they are those who haven't got any difficulties in using English. Others are quite against the idea, but as I explained above, we have no choice. Finally, some of them see it the right way, in my opinion: English must be present but it must be an opportunity, not an obstacle. I am sure that having notes in English and only a part of the programme in English could be largely sufficient. None of my colleagues had courses in English but every one of us can successfully interact and communicate with foreign colleagues in English. We learned it on the go. Perhaps it could be made better, but the problem is the price we have to pay».

7. Summary of the Questionnaire Data

The first analysis is univariate and provides an overview of all the questions included in the questionnaire. In order to make the description more relevant, the questions have been grouped into the following four topical macro categories (corresponding to varying numbers of questions on the questionnaire): student interest (questions 1, 2 and 7), previous student experience (3, 4, 5, 6 and 12), current student experience (10 and 11), and future plans (questions 9, 8 and 13) with regard to ETPs.

7.1 Univariate analysis.

Student interest (questions 1, 2 and 7)

Student interest in EMI (English-medium Instruction) was assessed through three questions: 1) Are you interested in courses (Mathematics or Physics) taught in English?; 7) Would you enroll in a degree programme taught only in English? A third question was linked to the previous two: whether or not students thought courses taught in English helped or hindered learning 2) Do you think a foreign language helps or hinders the understanding of the course content?

Student responses to the first question were clear-cut: 78.9% were in favour of such courses against 21.1% who were opposed to them (Table 5). For this and the subsequent questions it was decided to analyse only the valid responses, ignoring those few students (two) who did not respond. Thus, in general students were interested in taking courses given in English.

Table 5. Are you interested in taking courses (Mathematics or Physics) given in English?

		Frequency	*Percent*
Valid	No	28	21.1
	Yes	105	78.9
	Total	133	98.5
Missing		2	1.5
Total		135	100.0

However, when asked if they would enrol in a degree programme taught only in English, student responses were more varied (Table 6). The majority of students (47.4%) were in favour of this, while 33.8% were opposed, a result which slightly contradicts that of the previous question; however, in this case we are dealing with a degree programme taught entirely in English, with regard to which students revealed more concern. 18.8% were in favour of this possibility only if given the choice to do their exams in Italian. Therefore, in general 66.2% of students were in favour of doing English-language degree programmes, but they would like to be able to choose whether or not to do the exams in English or Italian. In fact, the final mark is one of the most important aspects for students, who do not

want to be penalized for poor competence in English. Only two students did not answer this question.

Table 6. Would you enroll in a degree programme taught only in English?

		Frequency	*Percent*	*Valid Percent*
Valid	exams in Italian	25	18.5	18.8
	No	45	33.3	33.8
	Yes	63	46.7	47.4
	Total	133	98.5	100.0
Missing		2	1.5	
Total		135	100.0	

In apparent contradiction with the two previous responses, when students were asked if they thought language helped or hindered learning (Table 7), a clear majority (74.6%) took the latter position. This probably reflected the main fear of students: not being able to understand and learn subjects taught in another language adequately enough.

In short, students desired course offerings with more ETPs as they have come to realise that English is necessary in the labour market, even while they fear their English skills are not up to the task, which is also demonstrated by the fact they seek the security of choosing the language in which they will be examined. Only five students did not respond to this question.

Table 7. Do you think a foreign language helps or hinders the understanding of the course content?

		Frequency	*Percent*	*Valid Percent*
Valid	Facilitates	33	24.4	25.4
	Hinders	97	71.9	74.6
	Total	130	96.3	100.0
Missing		5	3.7	
Total		135	100.0	

7.2 Past experience (questions 3, 4, 5, 6, 12)

In terms of students' past experience with ETPs, the relevant questions were: 3) Have you ever taken courses given entirely or partly in English?; 4) How would you assess the effectiveness of any courses you have taken which were given in English?; 5) What were the positive features of the courses given in English?; 6) What were the negative features of these courses?; 12) Did you use English texts in the writing of your first-cycle degree thesis?

The first, more exploratory question revealed that around half the students (48.1%) had already taken courses given in English, while 51.9% had not (Table 8). All the students answered this question, which was not limited only to university courses; thus, some students may have taken such courses during high school.

Table 8. Have you ever taken courses given entirely or partly in English?

		Frequency	*Percent*
Valid	No	70	51.9
	Yes	65	48.1
	Total	135	100.0

The second question aimed at finding out the students' opinion about such courses (Table 9). Most students held that ETPs were good (43.1%), which, when added to the 38.5% that considered them to be fairly good, represented 81.6% of respondents. 6.2% considered such courses to be excellent while 9.2% viewed them as sufficient. Only 3% of the students considered them to be poor or insufficient.

Table 9. How would you assess the effectiveness of any courses you have taken which were given in English?

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Poor	1	.7	1.5	1.5
	Insufficient	1	.7	1.5	3
	Sufficient	6	4.4	9.2	12.2
	Fair	25	18.5	38.5	50.7
	Good	28	20.7	43.1	93.8
	Excellent	4	3.0	6.2	100.0
	Total	65	48.1	100.0	
Missing		69	51.1		
		1	.7		
	Total	70	51.9		
Total		135	100.0		

When asked to state the positive features of such courses (more than one answer was possible here), 55.4% of the answers mentioned the specific terminology as the main advantage of ETPs, 20% mentioned both the specific terminology and pronunciation, and 15.4% both the specific terminology and the slower pace in the explanation of concepts (Table 10). As can easily be seen from the data, most respondents held the learning of specific lexis to be fundamental, because this entails the epistemology of a particular discipline.

Table 10. What were the positive features of the courses given in English?

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Slower pace	1	.7	1.5	1.5
	Pronunciation	1	.7	1.5	3.1
	Specific terminology lower pace pronunciation	3	2.2	4.6	7.7
	Specific terminology pronunciation	13	9.6	20.0	27.7
	Specific terminology Slower pace	10	7.4	15.4	43.1
	Specific terminology	36	26.7	55.4	98.5
	Slower pace greater clarity	1	.7	1.5	100.0
	Total	65	48.1	100.0	
		69	51.1		
Missing		1	.7		
	Total	70	51.9		
Total		135	100.0		

Regarding the negative aspects (Table 11), 56.1% of answers brought up the difficulty in understanding the lessons, 19.3% the difficulty in both understanding and pronunciation, and 12.3% the difficulty due to pronunciation. It should be noted that 57.8% of the students did not answer the question, presumably signifying they had no difficulties in this type of course.

Table 11. What were the negative features of these courses?

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Note-taking	1	.7	1.8	1.8
	Comprehension	32	23.7	56.1	57.9
	Comprehension pronunciation	11	8.1	19.3	77.2
	Everything	1	.7	1.8	78.9
	Nothing	4	3.0	7.0	86.0
	Pronunciation	7	5.2	12.3	98.2
	Specific terms	1	.7	1.8	100.0
	Total	57	42.2	100.0	
		69	51.1		
Missing		9	6.7		
	Total	78	57.8		
Total		135	100.0		

When asked whether they had used English texts in writing their first-cycle-degree thesis, 74.2% of the students who answered the questionnaire said they had while 25.8% said they had not (Table 12). 77% could not answer the question as they had not yet completed their degree programmes. Thus, English is clearly a working language for students given that the scientific disciplines are mainly presented in English.

Table 12. Did you use English texts in the writing of your first-cycle degree thesis?

		Frequency	*Percent*	*Valid Percent*
Valid	No	8	5.9	25.8
	Yes	23	17.0	74.2
	Total	31	23.0	100.0
Missing		1	.7	
	not yet	103	76.3	
	Total	104	77.0	
Total		135	100.0	

7.3 The present (questions 10, 11)

The following questions concerned the students' present circumstances: 10) Did you have a general level of English competence when you entered university? If so, what was it?; and 11) Do you use English texts to prepare for exams?

The question regarding competence in English was the most difficult one to analyse since, being open-ended, the students gave a wide variety of answers (Table 13). The levels were determined as: scholastic, intermediate and advanced. It should first be noted that 33.3% of the students did not respond to the question, either intentionally or because they did not know their level. The majority of students (51.1%) assessed their level as basic while 47.8% as intermediate. In general, the levels were not high, though this likely was due to the open-ended nature of the question, which led students to underestimate their level.

Table 13. Did you have a general level of English competence when you entered university? If so, what was it?

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Advanced	1	.7	1.1	1.1
	Intermediate	43	31.9	47.8	48.9
	Basic	46	34.1	51.1	100.0
	Total	90	66.7	100.0	
Missing		45	33.3		
Total		135	100.0		

Regarding the use of English in preparing for exams (Table 14), 50.4% of students said they use English while 49.6% said they do not.

Table 14. Do you use English texts to prepare for exams?

		Frequency	*Percent*
Valid	No	67	49.6
	Yes	68	50.4
	Total	135	100.0

7.4 The future (questions 8, 9, 13)

To examine how students viewed their future in terms of ETPs the following questions were included: 8) Do you believe your English skills will improve by taking courses in English?; 9) Would you be happy having a non-native-speaking teacher?; and 13) Would you be interested in taking supplementary language courses to go along with the courses given in English?

When students were asked whether they thought EMI improved their level of English, their answers were unequivocal: 94.8% said "Yes", showing they grasped the importance of learning a language (Table 15).

Table 15. Do you believe your English skills will improve by taking courses in English?

		Frequency	*Percent*
Valid	No	7	5.2
	Yes	128	94.8
	Total	135	100.0

When asked their feelings about having a native-speaking teacher, 74.8% answered negatively thus opting for a non-native-speaking teacher, presumably because the latter is easier to understand and thus provides more reassurance to students (Table 16).

Table 16. Would you be happy having a non-native-speaking teacher?

		Frequency	*Percent*
Valid	do not mind	2	1.5
	No	32	23.7
	Yes	101	74.8
	Total	135	100.0

There is instead a clear division among students when it comes to their interest in taking supplementary language courses (Table 17). 56.5% were interested in such courses while 43.5% were not. The fact that more students were not interested in these courses is perhaps due to the additional workload they would entail. Only four students failed to respond.

Table 17. Would you be interested in taking supplementary language courses to go along with the courses given in English?

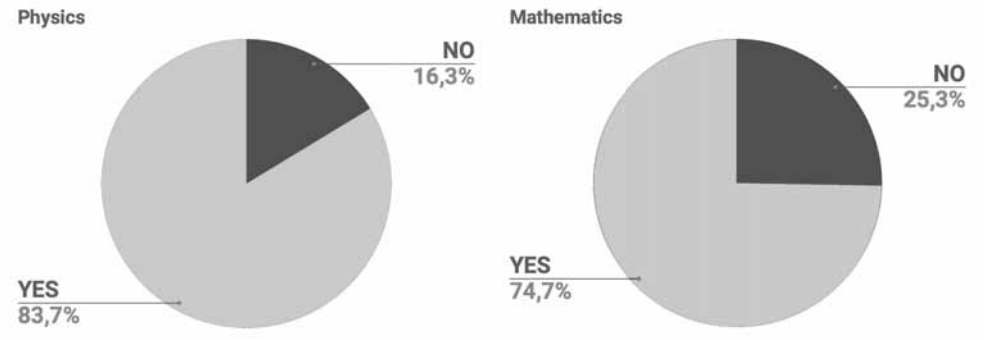
		Frequency	*Percent*	*Valid Percent*
Valid	No	57	42.2	43.5
	Yes	74	54.8	56.5
	Total	131	97.0	100.0
Missing		4	3.0	
Total		135	100.0	

8. *Bivariate Analysis*

For the bivariate analysis only some of the parameter relationships were chosen to cross-check in part based on the quality of the data and the type of questionnaire. Only the cross-checked data that showed statistical significance are described here. In order to have a more intuitive interpretation, the data are presented by means of pie charts.

It was decided to cross-check interest in ETPs (question 1) with both belonging to the Faculty of Physics rather than Mathematics and being enrolled in the first-cycle or second-cycle degree programme in order to see if there were differences in the different cohorts of students. The data show an association between belonging to one faculty as opposed to another, in that physics students were more willing to take part in this type of teaching (83.7% - Figure 1). On the other hand, there was only slightly more interest (though not significant) in EMI among second-cycle students than among first-cycle ones.

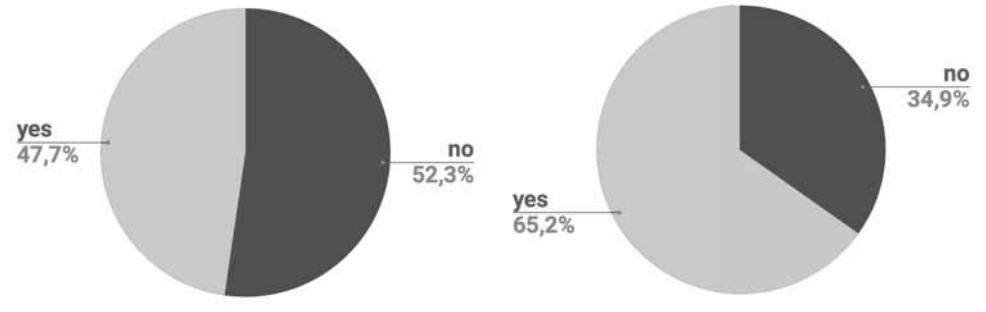
Figure 1. Bivariate analysis (interest and type of faculty).



However, when the need for supplemental language help (question 13) is cross-checked with past experience (question 3) there is an association, in the sense that those with prior language-learning experience declared they were less interested in such support (52.31%) (Figure 2). This may signify that those who had already experienced ETPs felt more secure and had less need for language help. Therefore, one may conclude that an initial language course for those doing an ETP for the first time could be useful, while for those who have

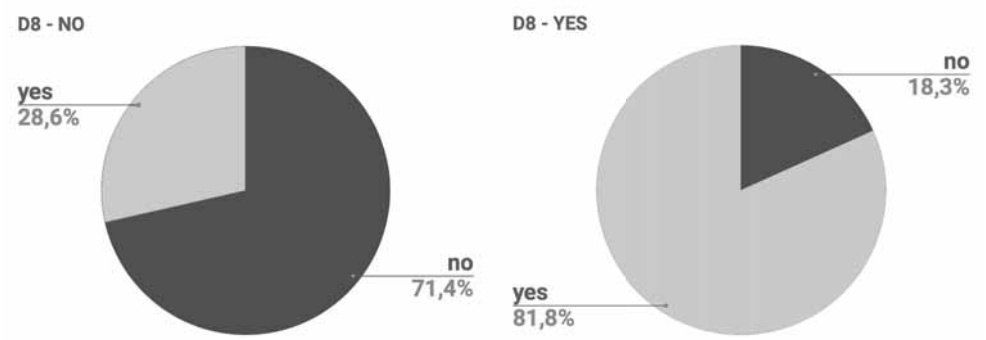
had this experience for some years already a form of adaptation to the foreign language and a gradual intensifying of the language element in the ETPs could be introduced, thus rendering a supplemental language course less useful.

Figure 2. Bivariate analysis (interest in supplemental language help and prior experience).



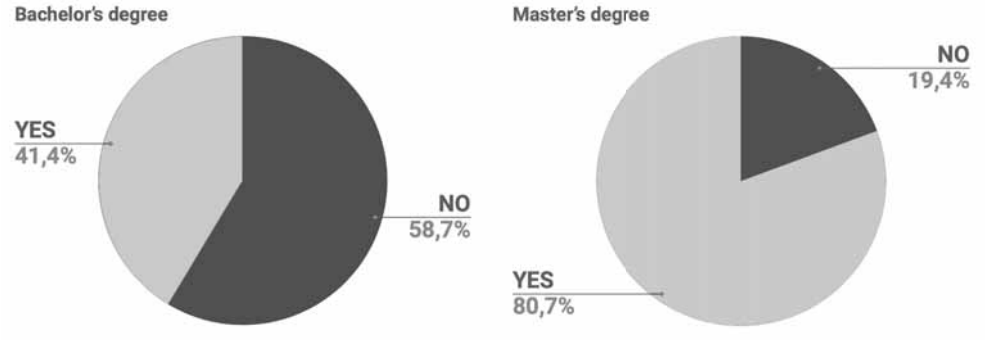
The bivariate analysis between questions 1 (interest) and 8 (language learning in ETPs) reveals a strong association between those answering "Yes" to the former and those who felt this type of course brought with it advantages in language learning (81.75% - Figure 3); on the other hand, those answering "No" felt ETPs entailed no such advantage. Therefore, the most motivated students thought they would also gain in terms of language learning by participating in ETPs.

Figure 3. Bivariate analysis (interest in ETPs and concomitant language learning).



The bivariate analysis between the question if students used English texts to prepare exams and whether or not they were doing a first-cycle or second-cycle degree showed an association between the latter degree and the use of English texts (Figure 4). 80.65% of

second-cycle degree students used English texts compared to only 41.35% of first-cycle students.



9. *Final Considerations*

This study focused on the prospect of implementation of English-taught courses of a whole faculty of Mathematics and Physics in Italy. In particular it took the form of a pre-feasibility study (completely unexplored in the Italian context) by means of students' questionnaire and an interview with the Dean to gain insight into stakeholders' ideas on the implementation of ETPs. The peculiarity of the study lies also in the bounded context that this Faculty represents and the reasonably high response rate of the students' questionnaire (58%). Although whole country surveys are still very useful in detecting the trends of ETPs, local pre-feasibility studies can reveal more context-dependent needs. In this unique context, the interview with the Dean confirms that the reasons for implementing English as an Academic Language are mainly utilitarian and linked to the survival of the Faculty; therefore, at times, he revealed worries about the real added value of this type of teaching for the students. Data from the students' questionnaires instead reveal several inclinations in the Mathematics and Physics Faculty with regard to ETPs.

The results highlighted two specific areas which could be further investigated in other studies: the need for flexibility in the use of English and Italian and the linguistic benefits the students might gain from ETPs.

Most students are interested in ETPs and would enroll in a degree programme taught entirely in English as long as the exams could be taken in Italian. This pattern could resemble the Danish parallel language[23] use provided that the faculty offers some clear instruction on the use of the two languages. On this same vein, most first-cycle students used English in writing their theses, but less so in studying for their exams. This confirms, on the one hand, the strong presence of English in scientific fields, and on the other testifies to the fact that in Italy Italian is still used extensively in exam preparation. The situation is different

[23] A.K. Hultgren, *Domain Loss: the rise and demise of a concept*, in *English in Europe: contexts and agendas*, A. Linn ed., Mouton de Gruyter, Berlin 2016, (English in Europe, 6) pp. 153-158.

with regard to the writing of the final thesis, for which students are obliged to deal with the international literature.

Only half of the students had already had prior ETP experience, which they viewed quite positively. The positive assessment derived from the learning of specialist vocabulary and from pronunciation (fundamental aspects in order to master the discipline), while the negative view came from a fear of not being able to understand the lessons, in particular due to pronunciation. Therefore, students were happy to deepen their knowledge of language precisely in those areas which caused them less concern. In this sense, teachers need to pay particular attention to both pronunciation and the specific vocabulary for the discipline in question (see also Helm and Guarda)[24].

Students assessed their English level as mediocre, although they felt ETPs could help them improve their language skills. In this regard they understood the close link between content and language learning (see also Costa and Mariotti, in press)[25]. Moreover, students in favour of ETPs also felt such courses led to language benefits. However, they were not interested in taking supplemental language courses, probably because they saw these as leading to a heavier workload. For this reason, teachers of content-based courses should be at least minimally prepared to deal with several language issues that can arise during their lessons.

Finally, there seemed to be a greater interest in English as an Academic Language on the part of Physics students, which hints at possible disciplinary differences (see also Airey)[26] and to the fact that Mathematics uses a language of itself and might not be fully suitable.

Acknowledgements

I would like to thank Professor Elena Poli for her invaluable statistical help for this study.

[24] F. Helm – M. Guarda, *"Improvisation is not allowed in a second language": a survey on Italian lecturers' concerns about teaching their subjects through English*, "Language Learning in Higher Education", 5, 2015, 2, pp. 353-373.

[25] F. Costa – C. Mariotti, *Students' profiles and their reception of English-medium instruction in Italian universities, in English in Italy*, C. Boggio – A. Molino ed., Franco Angeli, Milano (in press).

[26] M. Kuteeva – J. Airey, *Disciplinary differences in the use of English in higher education: reflections on recent language policy developments*, "Higher Education", 67, 2014, 5, pp. 533-549.

Appendix

STUDENT QUESTIONNAIRE

The present questionnaire is part of a research project on student opinions about non-language content-based courses taught in English. The questionnaire is entirely anonymous. Please put a cross (x) over your answer and provide only one answer, except where otherwise indicated.

1) Are you interested in courses (Mathematics or Physics) taught in English?
Yes [ ] No [ ]

2) Do you think a foreign language helps or hinders the understanding of the course content?
Helps [ ] Hinders [ ]

3) Have you ever taken courses given entirely or partly in English?
Yes [ ] No [ ]

4) [if you answered "Yes":] How would you assess the effectiveness of any courses you have taken which were given in English?
Excellent [ ] Good [ ] Fair [ ] Sufficient [ ] Insufficient [ ] Poor [ ]

5) [as above] What were the positive features of the courses given in English?
[more than one answer is possible]
[ ] learning of specific terminology
[ ] concepts explained at a slower pace
[ ] learning of pronunciation
other (specify) _____

6) [as above] What were the negative features of these courses?
[more than one answer is possible]
[ ] slowing down of understanding
[ ] teacher's pronunciation
other (specify) _____

7) Would you enroll in a degree programme taught only in English?
Yes [ ] Yes, but only if the exams are in Italian [ ] No [ ]

8) Do you believe your English skills will improve by taking courses in English?
Yes [ ] No [ ]

9) Would you be happy having a non-native-speaking teacher?
Yes [ ] No [ ]

10) Did you have a general level of English competence when you entered university? If so, what was it?

11) Do you use English texts to prepare for exams?
Yes [ ] No [ ]

12) [second-cycle students only] Did you use English texts in the writing of your first-cycle degree thesis?
Yes [ ] No [ ]

13) Would you be interested in taking supplementary language courses to go along with the courses given in English?
Yes [ ] No [ ]

DEGREE PROGRAMME	TYPE OF DEGREE
[ ] Mathematics	[ ] First-cycle
[ ] Physics	[ ] Second-cycle