Technology-Geeks Speak Out: What Students Think About Vocational CLIL

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Abstract
In order to better prepare future engineers for the international nature of their occupation in a globalized industry, colleges of engineering, arts and crafts in Austria have been employing CLIL in engineering subjects. The present study seeks to unveil some of the effects this has had on the student body. Our findings are derived from a questionnaire answered by 1660 former engineering students (alumni) and in-depth interviews with 20 current students (aged 15-19) from five different engineering colleges offering CLIL.

The overall evaluation of CLIL by current participants is highly positive, with a somewhat toned-down but still positive evaluation coming from the alumni. In self-reports on speaking, reading, listening, writing skills the CLIL alumni rated their abilities significantly higher than colleagues who had not experienced CLIL during their school days. The most important aspect, however, is the significantly lower inhibition level when actually speaking the foreign language.

Furthermore, the students pointed out that a tighter and more transparent structure and organisation of CLIL provision would be preferable, as would a higher degree of consistency in terms of how much use of the L1 is acceptable in class. Concerning their teachers the students regard as positive the changed role-relationship brought about by the fact that the teachers, too, are in a situation of being imperfect communicators in the foreign language. At the same time, students stress that a certain threshold proficiency level is necessary for a teacher to operate effectively in the language of instruction. In sum, the evidence obtained in this study shows that the stereotype of the techno-geek who is averse to everything to do with languages has outlived itself.

Keywords: vocational CLIL, student experiences, classroom learning, organisational structure, teacher qualification

1. Introduction
The spread of CLIL in Europe over the last 15 years has drawn its impulse from numerous sources: the perceived need for a response to internationalization and language policies fostering multilingualism, the wish to widen access to formerly elite forms of bilingual education, the necessity of educational reform and several more. The voice of vocational and professional education has also been part of the choir discussing and debating the perspectives that CLIL might offer (cf. Wolff, 2007; Fortanet Gómez and Räisänen, 2008).

The field of engineering in particular has the reputation of harbouring people who do not like foreign languages, in fact, people who do not like to talk much at all. The image of the geek who will potter for endless hours in contented isolation, who is absolutely fascinated by the intricacies of technological problems and their solutions but averse to talking about them to the rest of the world, represents a powerful stereotype. All stereotypes do have some foundation in reality and so does this, but – like all stereotypes – it also draws its force from being habitually recreated by the discourses of society. These discourses can be personal conversations, media products, and movie characters or, indeed, the content of curricula designed for engineering and technology education. Two further tendencies tie in with this: the fact that technical subjects are predominantly chosen by men on the one hand, and the belief that women are ‘better at languages’ on the other. It is thus that several factors collude in propagating a stereotype which also strongly influences the self-perception of technology people but which may be in need of revision.

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If it was ever true that the working lives of mechanical, electrical and other engineers could be spent quietly designing or fixing machinery, production plants, or installations, the world has certainly changed. Besides exercising their specialist technological knowledge and skills the professional lives of engineers require them to write and talk in person or via the telephone to co-workers and management, customers and bureaucrats. What is more, this increasingly needs to be done in English. A recent survey among 1660 Austrian engineers has shown that for over 50% a considerable part of their professional contacts are conducted in English (Schneeberger et al., 2008). The exact proportion varies, of course, in different branches of industry, with automobiles being the most international (over 80% of interactions conducted in English), but there are few jobs where no foreign languages are needed at all, and fewer still, where no English is needed. It is also important to point out that international communication is required not only of the employees of large international firms but also those of small and medium sized companies that occupy small niches in a global market.

The curricula for engineering education have traditionally allowed little space for language education, a fact which was mirrored in the relatively marginal status of language teaching staff in such institutions as well as the marginal role foreign languages have occupied in the self-image of the students and graduates. Almost imperceptibly the latter has already started to change and now educational institutions are also beginning to respond. In Austria the Ministry of Education is now working on a plan to enhance the foreign language education of engineering students at secondary level and CLIL is intended to play a significant part in the new curricular concept. For this reason, a nation-wide study of CLIL provision in the secondary engineering, crafts and arts sector was commissioned in 2007, of which this article will report on one particular aspect.

Students, while being the target group and intended beneficiary of CLIL education, have at this point not had much of a voice in the development of and discourse on CLIL in general. They are, of course, regularly tested for assessment and research purposes in order to be able to gauge outcomes and they are occasionally asked how much they like or do not like CLIL, but on the whole their role has been defined as a purely receptive one by most researchers. The study reported on here has stepped over this threshold by conducting 20 in-depth interviews with students from several upper secondary institutions and the students have indeed emerged as active participants in the CLIL enterprise, who are capable to reflect on their own experience at the receiving end of an educational innovation. The research questions we pursue in this article are as follows:

- What are the most significant observations / perceptions of the students as participants in a CLIL programme?
- Are there any common themes which emerge?
- How is a CLIL experience evaluated in hindsight?
2. Context of the study

2.1 Institutional and educational context

The student voices we draw on in this article come from Austrian upper secondary colleges of engineering crafts and arts, known by the abbreviation HTL, which stands for Höhere technische Lehranstalt. A HTL takes 5 years and encompasses the grades 9 to 13. HTL alumni acquire a full university entrance qualification. This type of school is quite specific to the Austrian education system, as in many other countries these specialisations are only offered at a tertiary level. A wide range of specialisations in the technical sector are offered, ranging from mechanical engineering, construction mining and textile product engineering to materials engineering and many more.

CLIL is used in 65% of the Austrian HTLs and approximately half of these colleges plan a further increase of CLIL. As for the colleges without CLIL, 80% of them report to be interested in introducing it; however, the majority has no concrete plan to do so. In the HTLs with CLIL, theoretical specialist subjects clearly dominate, which are taught at 98% of all CLIL sites. General knowledge subjects are also quite frequent (76% of all CLIL sites). Practical technical subjects, however, are rare (21% of all CLIL sites). The most frequently taught theoretical specialist subjects at HTLs with CLIL are computer science, foundations of data processing, electronics and programming. The most frequently taught general knowledge subjects are geography, history and chemistry. Of the practical subjects mainly IT-workshops and chemistry labs are taught in English. The majority of CLIL teachers are subject specialists without formal qualifications in the foreign language and/or language pedagogy. What our study also shows is that teachers and principals with practical CLIL experience consider counter-arguments and drawbacks less weighty and generally evaluate CLIL more positively than people without such experience.

2.2 Research design

The findings presented here have emerged in the context of a larger study addressing all stakeholders in CLIL education at HTLs through a variety of research methods: document analysis, questionnaires for school managers and alumni, student interviews, teacher interviews. A two-case study comparing English language proficiency of CLIL and non-CLIL students at two colleges was also carried out (Jexenflicker, forthcoming) The following diagram gives an overview of the research design.

Diagram 1. Design of study on CLIL in colleges of engineering arts and crafts in Austria

http://www.icrj.eu/12/article2.html
For the present article we will mainly draw on two of our sources: the data obtained by an on-line questionnaire addressed to alumni and the student interviews. The on-line questionnaire received 1660 responses, 186 (11%) of which from alumni who had experienced some kind of CLIL during their upper secondary education. The student interviews were conducted at five institutions selected on the basis of a national survey of CLIL provision at colleges of engineering, crafts and arts (questionnaire school principals; N=103). The interviews were fully transcribed, coded and analysed using Atlas.ti software. The 20 interviewees were attending year one to year five (grade 9 to grade 13). Their age ranged from 15 to 20 years. Except for one student the interviewees were all male.

3. Findings

3.1 Outcomes of CLIL: in hindsight

In this section we present the most important results from the alumni questionnaire. Among others, the alumni answered questions concerning the amount of English needed in their professional life or their studies and the amount of CLIL during their upper secondary education. Moreover the respondents were asked to evaluate their own English competence.

As for the amount of English needed in professional life or studies, more than 50% of the respondents state that they frequently need the foreign language. However, there is also a small minority of 20% who need English rarely or not at all. As already mentioned before, only 11% of the 1660 respondents had enjoyed some form of CLIL during their upper secondary education; a trend for higher rates, however, has been clearly visible since 2002. Overall, this experience with CLIL is considered as satisfactory. The percentage of those alumni who gave their CLIL experience a high or low mark respectively is equally high. In comparison with the values obtained from the school-principal questionnaire it is striking that the evaluation of former CLIL students is somewhat less positive than that reported of other groups of people (teachers, parents, future employers).

Turning to the self-evaluation of language skills, the alumni with CLIL experience rate their English competence in all language skills significantly higher than the alumni without CLIL experience. I have less fear of speaking the foreign language is the statement with the highest maximal agreement. Almost 70% report to have developed a higher motivation for the foreign language through CLIL. Regarding effects on subject knowledge the CLIL alumni have divided opinions. Approximately the same proportion of respondents (50%) agrees or disagrees respectively with the statement I learned less subject matter because it was taught in English. However, there are also 20 % of respondents who strongly disagree with this statement.

3.2 Views from the coalface

In this section we report on the experiences rendered and views expressed by 20 students from five different locations who were experiencing CLIL lessons during the academic year of the interviews. For purposes of exposition the evidence has been bundled into three thematic strands: organisational structure of CLIL provision, lessons and learning, and teachers.

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2 CLIL related questions for the present study were kindly hosted by an alumni survey of the IBW (Institut für Bildungsforschung der Wirtschaft). See Schneeberger et al. 2008.
On structure and organisation

The interviews show that the students reflect carefully on matters of organisation of CLIL and non-CLIL lessons as well as the relationships between EFL lessons and English as medium of instruction. As regards the latter, the interviews have underlined the relevance of English language classes in that most students stress the different, but important role the EFL classes play in their language learning, complementing the focus on subject-oriented language use in the CLIL classes. In this light, students appreciate the focus on grammatical and stylistic fine-tuning that characterizes the EFL classes:

Weil im Englischunterricht versucht man halt schon, dass man grammatikalisch richtig ist, dass man sich gewählter ausdrückt und unter der Stunde versucht man einfach, dass man es technisch korrekt sagt.  
In the EFL class you try to talk grammatically correctly, to use more elaborate expressions und in the CLIL lessons all you go for is to remain technically correct.

Additionally, the English language classes give practice time for important communicative skills, such as giving English presentations in preparation of such tasks students need to do in their CLIL lessons:  
Dieses Jahr […] haben wir jetzt nur mehr Präsentationen [im Englischunterricht […] und das ist das, was mir und, ich glaub auch meinen Kollegen, extrem viel hilft, dass man sich nachher auch richtig artikulieren kann.

This year we only do presentations [in the English class] and this is what helps me - and I think my mates, too - the most, so that we know afterwards how to express ourselves correctly.

In a more general comment, one student puts in a nutshell what the interviewees seem to have felt:

Eine Sprache lernt man ja trotzdem nicht in CLIL sondern im Englischunterricht  
Still, you don’t learn a language in CLIL but in the English lesson.

In view of the centrality of the medium of instruction to the learning process, the majority of the students interviewed confirm their conscious decision for the CLIL strand. Surprisingly, however, a sizable number of the students were not fully aware of the use and implications of CLIL before joining the respective colleges.

Also wir haben halt einen Zettel bekommen. Ich habe geglaubt, dass ist ein Rhetorikkurs in Englisch.  
Well, we got a [n information] leaflet. I thought it concerned a course in English rhetorics.

While such experiences point to an informational deficit in advertising school portfolios, it is reassuring that all students interviewed agree on the usefulness of CLIL and express their satisfaction with this teaching and learning approach.

Das war eigentlich schon eine Überraschung, aber ich bin dann gleich geblieben, so eine Chance bekommt man nicht jeden Tag. Also eigentlich durch Zufall reingerutscht, aber es hat schon gepasst.

Well it was a bit of a surprise but I stayed, an opportunity like this doesn’t come your way every day. So I got in by chance, but it was just fine.

Despite the overall support for the use of English in the subject classroom, students criticise organizational weaknesses they perceive in the ways CLIL has been implemented in their respective institutions. Reflecting the grassroots’ approach applied in Austrian schools in general, CLIL is experienced as spontaneous, diverse and flexible, but also as relatively unplanned. The latter becomes particularly obvious to students when comparing the use of English in two consecutive year groups:

In der Klasse, wo ich jetzt bin ist es nicht sehr viel. In der letzten Klasse, weil ich einmal repetiert habe, war es vor allem in Elektrotechnik sehr viel.  
In my present class there isn’t a lot. In my previous class – because I repeated it once – there was a lot [of CLIL], especially in electronics.
On teachers

Not surprisingly, the teachers and student-teacher relationships are important topics, which the interviewees tackle in comparing non-CLIL with CLIL classes. While the former are reported to foster traditional role relationships the latter are characterized as allowing for more diversity and equality. Especially English language teachers who team-teach in subject lessons are experienced as entering the new role of ‘colleague’ in as much as they function as language experts, with the students taking on the roles of subject experts.

Es ist im Englischunterricht ein Lehrer-Schüler Verhältnis und dort ist es mehr so die Kollegin. Also wir sind die technischen Experten und sie die Sprachexpertin. Das ist klass. Das ist ganz angenehm.

In the English class it's a teachers-student relationship and there [i.e. the CLIL classes] she’s more like a colleague in that we are the technical experts and she is the language expert. That’s ace. That’s great.

In terms of the teachers’ use of English, the student responses reveal their appreciation of a teacher’s active role in fostering English language use in class. Even though German remains the easier language option for the learners, students do express the wish that teachers should be pro-active in insisting on English as primary, even if not exclusive language choice in class.

Es fehlt die Konsequenz dass man wirklich immer nur Englisch spricht.

The consistency is missing. That you always only speak English.

As regards the teachers’ own language proficiencies, the interviewees are clearly aware of differences but also of the different communicative needs. So “grammar mistakes” are tolerated as long as the teachers can make themselves understood.


The [teachers] themselves often make grammar mistakes as well. Quite often we realize ourselves that something isn’t right. […] As long as we get it, I think it’s okay.

In specific cases, however, language proficiency levels are considered lacking and further language training is suggested.

Dass manche Lehrer vielleicht besser ausgebildet sind in Englisch, dass sie vielleicht für ein Jahr ins Ausland gehen sollten.

Some teachers could be better trained in English. Perhaps, they should go abroad for one year.
On lessons and learning

The CLIL pupils interviewed showed a differentiated picture of the CLIL lessons they were part of and of the effects of CLIL on their learning processes. While many interviewees highlighted the similarities to regular classes, e.g. by saying "es läuft ganz normal ab […] Es ist nur die Sprache verschieden, der Stoff bleibt der gleiche – it’s just as always […] It’s only the language that’s different, the content stays the same", there were some positive and negative aspects of CLIL lessons that the pupils were aware of. On the positive side, they noted that lessons were often more carefully prepared than regular classes and that the teachers had spent considerable time and effort on presenting the material in an accessible way in English.

Additionally, CLIL is seen as responsible for higher levels of student activation. This is related on the one hand to a higher intensity of learning (Es ist halt intensiver. It’s just more intensive), but importantly also to the need of re-conceptualising CLIL classes as giving joint responsibility to teachers and pupils, especially in the use of English as the medium of instruction. This working together in the explaining and understanding of, especially technical terms, was seen as positive by the pupils involved.

der Schüler ist mehr miteinbezogen, weil der Lehrer vielleicht nicht immer gleich weiß wie er etwas sagt.
The pupil is more involved because the teacher does not always know straight away how to say something in English.

Statements like this are also an important indication that the teacher’s status as expert is not put into question by linguistic insecurities.

Apart from this overt involvement of the pupils, CLIL is considered a relevant factor in encouraging deeper processing and thus a better learning of content matter by the pupils. This is primarily related to a slower pace of teaching with more repetitions in CLIL and the need to engage more intensely with material as understanding was harder to achieve than in the L1.

Ich find es besser, weil man sich dadurch auch viel mehr merkt, weil man es sich selbst erarbeitet.

I prefer CLIL because through working things out yourself you remember a good deal more.

Although contrasting views were found, some students felt there was a benefit in using English rather than the L1 as asking questions was more encouraged and less face-threatening. It appears that this holds true even for questions related to the content and not to language-specific matters.

Although the interviewees mostly emphasised the positive aspects of CLIL classes, some negative points did come up in the interviews. One aspect mentioned focused on the perception of fewer contributions in CLIL classes, as some students felt intimidated by having to use English.

da denk ich mir oft ich lass es lieber, bevor ich was völlig Falsches sag.
I often think, I’d better not [say anything] rather than saying something completely wrong.

As we have seen that precisely the opposite view was also voiced by students, it has to be taken as a moot point or a problem for some students, but not all.

A point of criticism that came up was the almost exclusive focus on speaking and reading in CLIL classes with writing being relegated to a negligible role. This is indeed a relevant factor, especially so as the professional lives of engineers include the need for writing in English as well. However, in order to keep the anxiety levels of students low, limiting the writing they have to do in CLIL classes might be important.

Finally, it is important to remember the fact that not all pupils in Austria are native speakers of the majority language German, and, depending on the precise location of the school, considerable numbers of CLIL pupils might still be in a state of learning German, the language that will, despite the undoubted importance of English, remain the most important language for engineers working in Austria. That this situation is perceived as potentially difficult is shown in the following quote:

Ich hab nur Bedenken bei den Leuten, die eben nicht Deutsch sprechen, dass sie dann mit zwei Deutschstunden in der Woche doch etwas lang brauchen, bis sie Deutsch wirklich gut lernen.

I only have my doubts about those pupils, who do not speak German. With two lessons of German a week, it takes them a long time until they speak German really well."
4. Insights and prospects

The evidence obtained in this study shows that the stereotype of the techno-geek who is averse to everything to do with languages has outlived itself. It is not only pressures from the professional world which are working towards this, but also the intrinsic motivation of students which seems to have undergone subtle changes towards a more open attitude at least towards English as a Lingua Franca. The initiative on part of the Austrian ministry of education to upgrade the foreign language education of future engineers is thus very timely.

The insights which emerge from the student interviews at HTLs are manifold and we would here like to focus on those that we think impinge on educational planning in a direct way. The general heading under which these insights can be summarized is a need for transparency and explicitness which affects several areas. Firstly, there is the need to transfer the status of CLIL from that of a long term experiment into that of a fully-integrated (if optional) component of educational provision at the colleges of engineering. Properly articulated and coherent plans for CLIL provision over the entire school career of a cohort should go hand in hand with accessibly formulated goals for learning both in the content subject and the language. Schools and colleges would be well advised to create and explicitly formulate proper CLIL programmes not only in terms of learning goals but also in terms of staffing and financial planning and to communicate such programmes to their own students as well as the outside world. It is also evident, in fact quite urgent, that a national framework for and provision of teacher qualification regarding CLIL be developed.

On a more general level, the interviews have demonstrated to us that students, at least at upper secondary level such as the ones participating in this study, are very capable of reflecting on their educational experience in terms of its material and organizational conditions but also on their own learning strategies and behaviours. Educational research should certainly pay more attention to this than it has done so far.

References


