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BOUNDARIES AND BRIDGES: A FRENCH TRANSLATION OF THE CDIO SYLLABUS

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ABSTRACT

This paper aims to provide a contribution to the discussion of the inclusion of different voices in the diffusion and implementation of the CDIO syllabus. Since 2001, the syllabus has been constantly updated and enriched, to include global social issues and the specifications of different national accreditation bodies. It is presented as a reference which can be adapted to the program requirements from different national cultures. However, without a critical examination of the terms adopted in the original version in English, some elements may be misunderstood, whereas others could be lost in translation. As Intercultural researchers from two French Engineering schools, we analysed the issues involved in the translation of the framework into French by interdisciplinary teams from Telecom-Bretagne, a CDIO collaborator. Our data includes first-hand experience of the translation, mediation and transformation process and interviews with the other participants. Based on the premise that different languages can relay different sociocultural realities, we first explore the boundaries or faultlines, (Kramsch 1993), between the semantic fields of English and French. These differences are first felt in the translation of the title “CDIO”, where “conceive” becomes “imaginer” and “design” “concevoir”. Other issues were terms which appear similar but have different connotations or a totally different meaning, or which do not exist in French, are unacceptable in France or remain embedded in American culture. Our analysis of the underlying cultural differences and dimensions which emerged highlights the importance of the act of translation and transformation into different languages in the appropriation and implementation of the CDIO framework. We stress the need for interdisciplinary translation teams of policy makers, Top Management, the Academy and intercultural and linguistic mediators. Further exploration of the boundaries and bridges between the CDIO syllabus in English and in other languages by members of the CDIO community is also recommended.

KEYWORDS

French; Translation; Intercultural; Mediation; CDIO syllabus; CDIO standard 2

INTRODUCTION

This paper aims to provide a contribution to the discussion on the inclusion of different voices in the diffusion and implementation of the CDIO syllabus, through an intercultural analysis of issues of translation of the framework into French by an interdisciplinary team from Telecom-Bretagne, the first CDIO collaborator in France. After a brief description of our working context, we provide an overview of developments in the CDIO syllabus since its beginnings

in 2001, with examples from accounts of the implementation of the CDIO syllabus in various countries. We then present our theoretical framework, which draws on linguistic, intercultural and translation theory and our own research on intercultural competences. This is followed by a report of the translation work from English to French at Telecom-Bretagne, leading to a discussion of the different issues which emerged from each part of the process, based on notes taken by the translators and researchers and interviews with the Deans, the administrator and some of the Faculty. Finally, we analyze and discuss the results from an intercultural perspective, using the cultural dimensions and intercultural theory described in our theoretical framework

CONTEXT

The school in this study, Telecom Bretagne (TB), is a French public research institute and graduate engineering school (Grande Ecole) founded in 1977. TB offers a degree in ICT at MSc level, accredited by both European and national higher education Engineering Accreditation Boards. The school has a strong international dimension, with a multicultural campus, 45% International students and more than 70 international agreements. All French students are required to spend a period of 4 months abroad and the study of two foreign languages is compulsory. Over the last 20 years, projects have been gradually included in the program and Project-BL and active pedagogies have been in place since 2003. There is a strong focus on team work, project management, preparation for the workplace and interpersonal and intercultural skills. The school has been using the CDIO standards since 2008 as a dynamic tool for continuous improvement of its curriculum and practice (Gourvès-Hayward et al., 2013). At first, the original English version, complemented by the Canadian French translation was used, but wider appropriation of the standards throughout the Faculty led to a need for more clarification and adaptation. Indeed, although the majority of staff and students are proficient in English, the CDIO framework needed to be translated into French, in keeping with French and European policy to defend the use of all national languages and multilingualism. Furthermore, as David Crystal (1997) points out, in spite of the value of a common language to improve international understanding, in this case “World or Global English”, there is a fundamental value in multilingualism which provides different perspectives and insights and deeper understanding.

DEVELOPMENTS IN THE CDIO SYLLABUS AND IMPLEMENTATION ACROSS CULTURES

The original 2001 CDIO syllabus has maintained a stable core but has also been constantly updated and enriched to include different perspectives and voices. For instance, the first draft from 2000 was reviewed from a European perspective and the more specifically US or MIT elements were “translated” into generic form (Crawley et al. 2011). The four categories of the syllabus (Technical Knowledge and Reasoning, Personal and Professional Skills and Attributes, Interpersonal Skills: Teamwork and Communication and Conceiving, Designing, Implementing and Operating) are very similar to the UNESCO 4 pillars of learning (learning to know, learning to be, learning to live together and learning to do) which is the product of many years of international collaboration with both Western and Eastern partners (Delors 1996). The 2009 and 2011 versions of the CDIO syllabus were expanded and updated, based on user feedback, to include contemporary preoccupations such as entrepreneurship, innovation and invention and global social issues such as ethics, diversity and social responsibility. More references to informal and interpersonal communication and internationalization and mobility were also added, for example, “Developing a Global Perspective” [4.1.6] or “Working in International Organizations” [Item 4.2.5]. Strong alignment with different national accreditation bodies, such as the National Agency for Higher Education in Sweden, the Canadian Engineering Accreditation Board (CEAB) or the

European EUR-ACE framework standards has been found (Crawley et al, 2009; 2011). Furthermore, the founding members stress that the syllabus is intended to provide guidelines and can be adapted to meet local requirements:

“Of course, the Syllabus is just a reference document, and it is not prescriptive. If programs feel that the Syllabus is not appropriate for their programs, or needs to be expanded, they can modify it in any way desirable to them.” (Crawley et al. 2011).

One striking example of this is the Pontifical Catholic University of Chile, who added a culture-specific item to [2.4], namely: “Commitment to Christian principles; Concern for those in great need; and Concern for the environment” (translated from the Spanish in Crawley et al, 2009). The CDIO founders therefore show a commitment to a process of translation where all versions are regarded as equal and the original source can be reinterpreted and formulated (Brislin, Lonner & Thorndike, 1973).

The 2011 Syllabus has now been translated into Swedish, French, Spanish, Vietnamese and Chinese and applied in a large variety of educational contexts. A brief review of accounts of cross-cultural implementation of the syllabus, shows that some authors indeed focus on the need for the syllabus to remain a dynamic tool, which adapts to each educational context and requirements (Rouvrais and Chiprianov, 2011), or on the fact that engineering is not culturally neutral and that contemporary practices are: “embedded in institutional configurations, national strategies and cultural norms” (Hoffmann, et al. 2011). However, while the cultural context is taken into account, very little attention is paid to the implications behind the fact that many institutions are working with a translation from English. For example, Doan et al. (2011) provide a very interesting account of the benefits to Vietnamese Engineering Education in terms of improvements to programs, teaching and learning methods and environments, as well as promoting more scientific and professional working methods. However, although they describe the adoption and adaptation of the CDIO framework as “a process of cultural and organizational change”, with details of government policy, large scale dissemination and training, inclusion of alumni and companies for support and funding, exchange of ideas through an interactive website, language issues are not considered. The only specific reference is as follows: “We have translated the CDIO book into Vietnamese and gave it free to Universities attending workshops”.

THEORETICAL FRAMEWORK

Our work is based on the premise that different languages can relay different sociocultural realities and different worldviews. According to Zarate (1983; 1986), “rupture points” may emerge in the gap between what is signified and its signifier in a foreign language, between the logic of the mother *languaculture* (Agar 1994) and the foreign one. These “rupture points” (Zarate, 1983) may be experienced as a space for negotiation, a symbolic space in the interstices and fissures between *languacultures*. This space, which Kramsch (1993) calls a “Third place”, represents a dialogic process which occurs at the moment of rupture between the presuppositions and expectations of speakers from different cultures (Kramsch, 1995). As Kramsch (1998) reminds us, there is also a possible gap between the denotative, connotative or symbolic meanings which can be attributed to words across cultures. For instance, the English word “rose”, the French word “rose”, the Spanish word “rosa”, or the German word “Rose”, denote an object which is grown in a garden, or in a greenhouse, which generally smells sweet and has petals and thorns. However, these words, which are similar but embedded in different cultures, do not necessarily have the same connotations or associations; our cultural experience of roses may not be identical. In the same way, the different translations of the term for “engineer” do not necessarily convey the same educational, sociopolitical or practical realities. For instance, a French *ingénieur* denotes a high status, well-paid and respected profession with a specific technical expertise, whereas

the Chinese term 工程师 (Gong Cheng Shi) denotes a master of projects and can also refer to architects or mechanics (Morace & Gourvès-Hayward 2012).

The exploration of the boundaries or faultlines, (Kramsch 1993), between languages inherent in the act of translation can thus reveal differing interpretations of reality, different assumptions and presuppositions which are usually left unquestioned. Furthermore, as Cronin (2003), drawing on Debray 2000, explains, the post-modern view of translation goes beyond a view of direct equivalence or immediate “communication” to a wider dimension of “transmission” which relies on social vectors such as the school, university, church or family to carry out a more long term social transfer of knowledge.

As we have seen, language and translation problems are often due to the fact that words and expressions are embedded in different national cultures. Differences of culture can be measured and partly explained by the means of “cultural dimensions”. Hofstede, (2001), Hofstede & Hofstede (2005) define “cultural dimensions” as “cultural phenomena expressed in numbers”. Dimensions such as “Individualism” versus “Collectivism”, “High Power Distance” versus “Low Power Distance”, “High Uncertainty Avoidance” versus “Low Uncertainty Avoidance” can be measured on a scale from zero to one hundred. Hall and Hall (1990) view culture as communication and focus on the differences between “Fast and Slow “ and “Low and High Context” messages.

Trompenaars (1993) explains that cultures have common needs and problems but that people in different cultures find their own solutions which may vary from one culture to another and may even be diametrically opposed. He defines culture as a “solution to dilemmas” (1993) which concerns relationships with people, attitudes to time and to the environment. These dilemmas take the form of bipolar dimensions such as, for example “Universalism versus “Particularism” or “Specific” versus “Diffuse”. Based on Lewin’s work on the public and private sphere (1948), Trompenaars draws a parallel between specific and diffuse cultures and stresses the “danger zone of the specific-diffuse encounter”. For instance, the French tend to consider personal values as specific and private, whereas the Americans may see them more in a diffuse and public sphere which would be considered as invasive by the French.

As Demorgon states (2005, 2010), although these dimensions appear to be bipolar and antagonistic, for instance for “high versus low Uncertainty Avoidance”, they are also complementary to each other. To solve dilemmas, individuals can oscillate and adapt on a scale between the two opposites. Demorgon explains that cultural adaptation is possible within his Six-Approach-Model if the following aspects are considered: Context (1) (religion, politics, economics and globalization); situation in present (2) and past (3) (synchrony-Diachrony); level (4) (individual, organization, society), strategy (5) and self(dis)organization (6) as cultural adaptation is systemic in an international environment of complexity. This model shows that we do not translate mere words but human activity in time and space with the use of different strategies. In this article we will thus argue for a “transmission” view of the translation of the CDIO syllabus, which can reveal individual, institutional, national or cultural differences of interpretation or issues which could otherwise be glossed over, ignored or simply not seen. Indeed, without a critical examination of the terms adopted in the original version in English, some elements may be misunderstood, whereas others could be lost in translation.

METHODOLOGY

In 2008, when the CDIO standards were first adopted at TB, the syllabus was translated by the two Deans of studies, using the original English and the French Canadian translation. It was then checked by two bilingual translators who, at the time, had little knowledge of the CDIO endeavour. After experimentation by Faculty, it became clear that certain elements needed to be clarified, modified or omitted, an appropriation recommended by the CDIO founder members as seen above (Crawley et al. 2009; 2011). The TB version was therefore revisited by a team of one of the Deans, an administrator and two bilingual translators (one of the original translators and one of the authors of this article). In the period between the two translations, the team had gained detailed knowledge of the CDIO syllabus and a fruitful exchange, much appreciated by the participants resulted in a new translation of some key elements. For research purposes, the other author of this paper also did his own independent translation. To carry out our analysis, a description of the different issues which emerged from these different steps was obtained through the translators' notes and informal interviews with the translation teams and some Faculty.

RESULTS AND DISCUSSION

In the following, we discuss the issues which were revealed through these different processes of explicitation, mediation and transformation before analyzing them, using the theoretical framework as described above. We deal with the items from the CDIO syllabus in chronological order, using the main headings of the original syllabus in English.

From the offset, the acronym CDIO poses a problem of translation into French. Indeed, "Concevoir" in French can mean both "Conceive" (to think of) and "Design". To complicate matters further, the French word "le design" has a very strong connotation in the Arts for style, arts and crafts as well as architecture. The translation teams agreed with the Canadian version, which substituted "imaginer" for "conceive" and "concevoir" for design. As we can see later in the syllabus, the French translation of the English expression "Utilization of Knowledge in Design" [4.4.3] the word "design" was simply removed.

The translation of the word "knowledge" [1] was also problematic, as it has two different meanings in French which may be translated by "savoir" and "connaissance". The term "savoir" denotes the result of a learning and mental process through assimilation and accommodation, performed by an individual. Personal "savoir" is used for action, performance and success and can be translated as "knowing what". On the contrary, the word "connaissance" means abstract knowledge and is not linked to action or to performance. The translation of the terms "knowledge" [1], skills [2] and "attributes" [2] was a particular preoccupation for the Deans, as they were involved in a National think-tank consisting of representatives from the French Graduate engineering schools whose brief was to work on the notion of "compétences" (Conférence des Grandes Ecoles). This group had adopted Le Boterf's (1999) definition of "compétences", which includes knowledge, skills and attitudes and can only be used in a professional context. The original work by the two Deans, based on the French Canadian translation also showed some obvious differences in the two versions of the same language. As one of the Deans pointed out:

"Of course we couldn't use the word "habiletés" ("skills" [2]) which doesn't exist in France", so we used "compétences" but of course that's not really the same thing and people don't really agree on what it means". We added "capacités" [2], because the students are developing "compétences" but haven't been able to operate them in the workplace."

The word “attributes” in the same heading originally led to a mistranslation as “aptitudes” by the Deans which was later rectified by the translators. Here the problem was that the word “attributes” exists in French but has a totally different meaning, such as “property” or “symbol”, although this did not appear to pose problems for the Canadians.

Many of the English terms in the original syllabus, particularly in Section 2 on personal and professional skills and attributes, such as “knowledge discovery” [2.2] “tradeoffs” [2.3.4], or “creative thinking” [2.4.3] simply do not exist in French and need circumlocution to be understood. Discussion of such points was found very rewarding by the teams as one of the translators observed:

“It was really great to go through these as a team and I enjoyed the discussion which makes a change from working in isolation.”

Some terms just “didn’t sound right” to French ears, so were either omitted, such as “will to deliver” [2.4.2] or adapted, such as “proactive vision and intention in life” [2.5.3] which became “projet de vie & projet professionnel” (project for life and career). Other terms in Sections 2 and 3 were difficult to understand for the French participants in the team and had to be explained by the translators. As one of the translators noted:

“They simply couldn’t understand some of the notions, such as “Equity” [2.5.5] even though the French word “équité” exists. They had to adapt it to the professional context and call it “déontologie” (professional ethics). “Advocacy” [3.2.9] was another term which was totally incomprehensible for them.”

On the whole the translation team came to a consensus about most items, although the translators did not always understand modifications which were made by one of the Deans after experimentation with Faculty. For instance, she pointed out:

“It’s no point putting “thinking holistically” [2.3.1] as they won’t immediately see what it means, so we put “Penser globalement”.”

However, this was felt to be an unsatisfactory translation by the translators, as was the transformation of “Time Management” [2.4.7] to “gestion des délais”, which reduces time to organization of deadlines. On the other hand, the Deans took on board the translators’ comments about the item “Establishing diverse connections and networking” [4.1.6] which they had first reduced to IT social networks. The final version therefore also included the word “diversifiés” and also referred to professional networks, although some clarification is perhaps still lacking.

Other modifications were made to adapt the syllabus for use in TB. For instance some items were omitted after experimentation by Faculty, who considered that items such as “integrity” [2.5.1] or “values” [4.1.5] were not acceptable expressed as learning outcomes by the French education system. One of the Faculty remarked:

“You can’t talk about values here which is strange because Republican values are very important in France but you’re supposed to automatically share them.”

Items such as “developing a global perspective” [4.1.6], which was translated literally in the Canadian version as “développement d’une perspective globale”, were also adapted and expanded to fit into the strong international remit of the school. The expression is difficult to translate because the adjective “global” and the noun “globalization” have a political and economical connotation, so they were translated into “mondial” and “mondialisation”, which is more neutral. The terms “internationalisation” and “interculturalité” were added to include the idea of exchanges and negotiation between institutions and individuals from other cultures, a major preoccupation at TB. The translation of the syllabus was seen as a dynamic and

rewarding process at TB which can be extended in the future to include the sub elements which have not yet been translated. The team stressed that different opinions from Top Management, Faculty and the translators should be included.

In the following we interpret the different issues which emerged through processes of explicitation, mediation, transformation in the light of our theoretical framework. The original CDIO syllabus was the result of international and interdisciplinary teamwork and has evolved considerably since 2001 to include other perspectives. The translation process at TB began with a comparison between the original English syllabus and the translation into Canadian French and mediation between Canadian French and the French used in France, as we saw in the example “habiletés” (“skills” [2]). This translation was not possible through a literal translation only but required adaptation through mediation between faculty, translators and researchers. Working through the boundaries or rupture points as described by Kramsch and Zarate allowed the team to explore the spaces between terms. For instance, the translation process revealed differences between semantic fields in French and English, where similar words, such as “conceive” and “concevoir” or “attribute” (skill or competence) and “attribut” (property or symbol) do not have the same meaning. This led to new understandings for all members of the translation team.

Some English words, such as “tradeoffs” [2.3.4], which do not exist in French, needed circumlocution to be understood or disappeared completely in the French translation. These apparently simple decisions required careful consideration which went far beyond the linguistic dimension. The example of “knowledge” [1] showed that one single word in English may have different meanings in a foreign language which makes translations difficult. Different connotations can also lead to misunderstanding and possible mistranslations. As we have seen, some notions, such as “thinking holistically” were deemed to be unsuitable in the TB context and it required mediation by Top Management to find an appropriate term. This also revealed differing views of translation between the translators and the Top Management and Faculty, where the linguists were more concerned with linguistic equivalence, whereas the other staff favored appropriate usage in their context.

The difficulty of translating words and the need to adapt foreign expressions in another language, circumlocutions and different connotations reveal many cultural differences. These cultural dilemmas can be analyzed by using the cultural dimensions in the literature, as explained above. For example, Hall and Hall’s cultural dimension of “Low and High Context”, which roughly means explicit or implicit, is apparent in different items in both the English and French versions. As we saw earlier, the word “knowledge” covers implicitly the meaning of two different more explicit words “savoir” and “connaissance” in French. On the other hand, low context and explicit expressions such as [2.2.2] “Survey of Print and Electronic Literature” became “State of the Art” (“Etat de l’art”) which is implicit and high context in the French translation. The difficulty of translating expressions such as “Initiative and the Willingness to make decisions in the face of uncertainty” [2.4.1], “Proactive vision” [2.5.3] or “Will to deliver” can be explained using Hofstede’s dimension of “Uncertainty Avoidance” (2005). Such elements could be difficult to apply in the context of the high “uncertainty avoidance” in French culture. In a similar vein, the translation of “Time Management” [2.4.7] into “gestion des délais”, which, as we saw above, reduces time to organization of deadlines, could show that the polychronic French focus on time in terms of project management and outside pressures rather than a general preoccupation.

Besides translation problems due to linguistic issues, the collaborators from English and French speaking cultures also discovered cultural resistance. Words like “equity” and

“values” are important but expressed in an implicit way in French culture. It is not considered appropriate to include them in an explicit way as they belong to the private sphere rather than the public one, or “specific” rather than “diffuse (Trompenaars, 1998).

If we use Demorgon’s framework (2010), the translation process between languages and cultures, which required adaptation and mediation between collaborators can be posited as strategies of cultural translation. Expressions such as “values”, “equity” or “advocacy” and “proactive vision” are deeply embedded in the context of American culture and history. During the translation process, French collaborators reacted on three levels as individuals who represent their institution and French society. They struggled for a translation strategy in order to find some equivalent expressions which may not exist. This attempt remains possible as the guidelines of the CDIO can be adapted to local requirements.

CONCLUSION

In this paper we have argued for the inclusion of different voices in the diffusion and implementation of the CDIO syllabus to continue the foundations laid by the founder members. One of the means to achieve this objective is the use of translation as a dynamic, collaborative tool. For instance, the present version of the French CDIO translation at Telecom Bretagne was achieved by far more than literal translation. This involved the inclusion of different interpretations in the spaces between languages, as well as discussions allowing meta-cognition and meta-communication between the French and English speaking collaborators. Mediation between both languages and an interdisciplinary team allowed an end result which could be considered far more “transmission” than “communication” (Cronin 2003). The act of translation revealed the values inherent in both versions and the boundaries and bridges between them. As Brodeur (2012) points out, social location has an influence on the way reality is experienced and there is a need to examine the underlying cultural values, such as different understandings of the ethics of globalization, behind engineering program strategies. Our analysis highlights the importance of the act of translation and transformation into different languages in the appropriation and implementation of the CDIO framework. The need for interdisciplinary translation teams of policy makers, Top Management, the Academy and intercultural and linguistic mediators is also stressed. This work could be extended by further exploration of the boundaries and bridges between the CDIO syllabus in English and in other languages by members of the CDIO community.

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BIOGRAPHICAL INFORMATION

Dr. Alison Gourvès-Hayward is Associate Professor and Head of Modern Languages at Telecom Bretagne. She was educated in the UK, France and Ireland, where she completed her PhD in Intercultural studies at Dublin City University. She has extensive experience in education, translation and education management and has worked as a teacher of French in the UK and as English and Intercultural lecturer for many French and European institutions. Her research interests include telecollaborative intercultural learning and self assessment of intercultural competences and she has published widely in this field. She is the French coordinator of LOLIPOP (Language On-Line Portfolio Project).

Dr. Christophe Morace is Associate Professor and Head of the Management department at ENSTA Bretagne. His background is both in industry, where he has worked as a key account manager and consultant for various multinational companies, and education, where he has taught Intercultural management and communication in many French and European Higher Education Institutions and companies. He was educated in France and Germany, where he completed his PhD in Intercultural Management at the University of Berlin (FU). His research interests include the analysis and evaluation of intercultural competences for practicing and student engineers and SME managers and he has published widely in this area.

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