Empowering Language Minorities through Technology: Which Way to Go?

Dr. Melinda Dooly
Faculty of Education, Universitat Autònoma de Barcelona

Summary

The term 'Information Age' has been applied to the current era we now live in, based on the fact that technology and Internet are continuously changing the way people work, learn, spend their leisure time and interact with one another. At the same time, access to this means of interaction is not always equal -whether due to lack of experience, knowledge or economic access. The rate of these changes -and a feeling of uncertain consequences- can create a sense of uncontrollably rapid social changes and possible social fragmentation. In the face of this, education stakeholders must seriously consider how schooling can confront these challenges.

This article will first give a brief overview of how the notion of social cohesion has been used in social and educational policies, focusing especially on two central points that emerge: social equality and education as a nexus for social cohesion. Next, the text looks at how education can undertake the challenge of eliminating social inequality and promoting social cohesion, followed by an analysis of one potentially disadvantaged group: speakers of minority languages. Perceptions of minority language groups in the EU are discussed and a general outline of potential educational disadvantages and social exclusion they may face is broached.

Next, ways in which Technologically Enhanced Learning (TEL) can be applied in order to rectify these possible risks are advanced. This section includes an interrogation of the 'digital divide' and what it can mean for minority language groups; and the importance of using technologies to bring 'mainstream' public awareness to the issues associated with minority language education (including the promotion of the many benefits of multilingual practices for society). Some examples of TEL practices which have been undertaken to ameliorate educational inquality with minority language groups are provided. Finally, the article considers the role of TEL in teaching practices, teacher education and continued resources for teacher development.

Keywords: social cohesion, accessibility, multilinguism, linguistic minorities, technology enhanced learning, teaching practices

Introduction

Discourse centred on the notion of social cohesion is, at times, rather vague as to what the term actually means. According to Jenson (2002), 'social cohesion' is rarely defined explicitly in policies; instead the term is often invoked as a policy reaction, used to describe general feelings of unease in front of massive rapid social changes. Chan et al. (2005) posit that, despite its growing currency in public discourse, the term still lacks a clear definition and that its use often creates confusion between policy content and causes or effects of social cohesion.

Social cohesion has been defined quite differently throughout history; often according to the focus taken when it is defined. Social cohesion can be seen from an individual level -involving factors which contribute to making persons perceive themselves as members of a specific community. This micro-level approach was the principle focus of sociologists in the 1960's and 70's. However, nowadays, most policies tend to be more focused on the 'macro-level' of social

cohesion. On an even more 'macro-level', Burke & Shields (1999) suggest that the era of globalization requires new measuring factors: exclusion from labour market, wage polarization, employment vulnerability. Nonetheless, according to Dragojevic (2001), historically, the concept of social cohesion has usually surfaced at times when people are disquieted by apparent effects of rapid social change. (Indeed, lack of social cohesion has been deplored in literature as far back as Milton's *Paradise Lost*.)

One main point does emerge from most policies on social cohesion: equal opportunities and shared responsibilities. Jeannotte (2000) provides a working definition: Social cohesion is the ongoing process of developing a community of shared values, shared challenges and equal opportunities [...] based on a sense of trust, hope and reciprocity (p. 5). The Council of Europe, in their 2001 document on social cohesion describes it as a process as well.

> *A strategy of social cohesion refers to any kind of action which ensures that every citizen, every individual, can have within their community the opportunity to access, to meeting their basic needs, to progress, to rights and protection and to dignity and self-confidence.* (CoE, 2001: 5)

Another point that is alluded to quite frequently is the importance education may have to achieving social equality and cohesion. Arguably, the role of education can be critical to equalising life chances. There is a need for educational policies that aim to narrow achievement gaps associated with identified disadvantages and discrimination and that attempt to make learning more inclusive and engaging.

> *Educational policies and practices have the possibility of either reproducing social structures, or of changing them. If a society has substantial and persistent inequalities - whether of the distribution of wealth or of recognition of rights or of access to social provision, or of recognition of culture or language - then it is possible, indeed probable, that educational practice will replicate these inequalities.* (Ross, 2009:3)

It can be argued, however, that a focus on the equality of educational *outcomes* for disadvantaged groups, rather than equality of educational *opportunity*, holds more promise as a starting point. If a group within the population are achieving a less favourable distribution of educational outcomes it is reasonable to make an initial presumption that there have been inequalities in social and educational policies, whether 'equal opportunities' have been provided or not. This implies that, at times, it may be necessary to provide 'unequal' opportunities (e.g. more resources) to ensure equality.

Although it stands to reason that all of disadvantaged groups could, and should, benefit from the application of new technologies to enhance educational equality and social cohesion, given the amount of recent interest in new technologies and language learning, one particular group emerges as potentially being in a position to especially benefit from novel research and practices that integrate technology and learning: linguistic minorities.

> *This research orientation has evolved over recent years in connection with the development of language technology. The next step is to incorporate culturally, politically and linguistically sensitive issues into this research field.* (Franceschini, 2009: 49)

Nonetheless, before looking at ways in which Technologically Enhanced Learning (TEL) can be applied to language minority students' fight against social exclusion, it is important to first establish what groups are understood as language minorities in this article and what potential educational disadvantages they face.

Perceptions of minority languages in the EU

There are inherent tensions in the different European perceptions of minority language groups. At the European (administrative) level, linguistic diversity is seen as a patrimony that must be protected, thus leading to the promotion of the teaching of European languages (albeit principally English, French, German, etc.) and the maintenance of minority languages is also seen as a priority on the European level although specific policy measures on how to accomplish this are not always given. On more local levels it is often the minority language groups themselves who promote a positive image of minority language use and try to focus on the underlying importance of language maintenance.

Moreover, the concept of language community is not contingent upon the number of language speakers. There are several minority language groups that are not necessarily perceived as a community (and the positive connotations this can carry). This is often directly linked to public discourse concerning the idea of multilingualism. Multilingualism is frequently categorised as result of globalisation (mobility of populations; flow of goods; capital, etc.) which is in turn linked to the common perception that certain language groups –and subsequent linguistic diversity- is a secondary component of immigration (Heller 2007). In other words, globalised population movements are seen as bringing 'new' languages into a homogeneous, principally monolingual nation-state (*ibid.*).

> *In fact, the monolingual European nation is a myth. Minority languages are spoken in all of the European countries; rough estimates place minority language speakers at approximately 55 million people. Nonetheless, some languages are commonly afforded more legitimacy than others through their unquestioned connection to 'symbolic power' (Bourdieu 1977a, Bourdieu 1977b, Bourdieu and Passeron 1977). Historically, one official national language -in a standardised form- has been taken on as the 'legitimate' language, (although some variations and different languages may have received public recognition). In contrast, minority language groups may be perceived negatively and seen as direct threats to a supposed national cohesion; a concept closely tied to the idea of one state equals one language.* (Dooly et al. 2009: 4)

Many different definitions and classifications have been assigned to the notion of minority language groups: territorial or non-territorial (which would include, for instance Roma people), national or trans-national (Catalan, Basque, Breton), historical or new (immigrant languages, sometimes called heritage languages). Given that the focus of this article is on ways in which technology and Internet can be applied to enhance social inclusion of minority language groups, the definition taken here is subject to whether there are disadvantages manifested towards the minority language group, whether they are traditionally linked to the nation-state, non-territorial languages, or 'newly arrived' language groups associated with immigration.

Academic disadvantages for minority language groups

For minority language groups, a common axis of educational disadvantage lies in the concept of evaluation, whether for placement purposes, diagnostic purposes or for academic purposes. This is especially the case for 'new' languages. Placement practices (whether to decide the level of school entry for newly arrived immigrants or for access to academic-track courses) can result in uneven representation of language minority students in lower level courses and lack of access to academic content courses. Those students who are considered to have 'limited language proficiency' are frequently placed into lower level content courses that are intended for students with learning disabilities or placed in language courses during content course hours.

Apart from placement, assessment of general academic progress can also lead to educational inequality for minority language students. Teachers generally use assessment practices designed for the *majority language* group to monitor overall language development. Furthermore, teachers track the quality of students' day-to-day development in other subject matter through competences directly related to language, such as vocabulary tests or reports (August and Hakuta 1998). This issue of validity of testing becomes critical, especially

considering that test scores are used as part of the basis for minority language students' placement, selection, certification, and promotion; all of which have significant long-term consequences for these students (Murphy 2007).

These assessments are often accompanied by a lack of awareness of the multilingual resources of the minority language students. Underneath the assumption that there is a correlation between language competence and educational outcomes may lie a hidden agenda based on assimilationist beliefs that attribute school failure to linguistic and cultural mismatch (language deficiencies of the minority group) rather than recognising that schools do not always build on children's "funds of knowledge" (Gonzalez and Moll 2002).

Social exclusion

> There is a dearth of general awareness within existent educational policies concerning the minority language groups' perceptions of their needs as minority language speakers. Most policies and programmes are written with little input from the minority language communities and few try to elicit suggestions on ways in which language provision for them might be improved (Dooly et al., 2009:10).

According to Priven (2008), resistance of mainstream European educational institutions to implement minority language programmes is grounded in differential treatment of minority languages in the mainstream educational discourse -some minority languages are treated as more legitimate than others in contrast to mainstream curricular practices. Often, members of minority language communities who do not have social and political recognition are faced with seemingly implacable social, political, and economic pressures to acquire the language of their host countries – often at the expense of their own language (Hornberger 1998).

Furthermore, the push for 'Europeanization' of some countries can be detrimental to minority language rights (Brown 2005) as government-supported initiatives use education to cultivate a strong national identity while promoting a European identity, resulting in the marginalisation of regional minority language group identity. In face of these challenges to minority language identity, the significance for the construction of individual identity can be crucial in helping these students develop their self-esteem, acquire positive personal qualities, and support the belief that they can excel academically, in accordance with his/her ability (including their multilingual competences). Indeed, language attitudes, language choice and perceptions of how these fit into cultural capital can shape the educational process and career aspirations of minority language speakers (Rassool 2004).

The perceptions of professional educators can also have an important effect on minority language students. While many educators share the democratic values espoused by laws aimed at regulating 'attention to diversity', they often struggle to reconcile these values with traditional pedagogical positions concerning the necessary inculcation of pan-European, traditional academic knowledge and skills (Harry *et al.* 2008). This often results in the conclusion that the only way to include 'outsiders' is to require a high level of linguistic and cultural assimilation; with the tendency to place the onus for adaptation on the minorities (Harry 2005).

How can ICT be used to ameliorate these risks?

In view of the many potential risks of educational disadvantages for language minority groups such as, but not limited to, language assessment, unequal distribution of resources, inequitable education systems and the potential social exclusion due to lack of representation, affective problems related to identity, confidence and self-esteem and negative attitudes towards the minority language, the importance of inclusion seems paramount. Does technology have a role to play in reducing these risks? Is it a question of accessibility only? Factors contributing to the digital divide include poorly stocked libraries; excessive costs of inter-library lending and the high cost of international journals and books, as well as lack of awareness of certain issues due

to underexposure of the materials themselves. However, Warschauer (2003) highlights the danger of simplifying the 'digital divide' to a mere question of haves and have-nots, focusing instead on the social context in which such technologies are embedded in communities, institutions, and societies. Perhaps the issue of eInclusion for minority language learners implies taking into account *how* the technology is used more than *how much*.

Digital technology use among different communities who are often considered as socially excluded has been linked to collaborative practices that help enhance their inclusion in social worlds beyond their immediate communities. For instance LeDantec and Edwards (2008) found that technology was an essential element in connecting the homeless with friends and family. Many local and regional governments are currently promoting adapted technology to help disabled people participate more actively in different areas of society while research into the link between poor health and digital exclusion is also an area of growing interest for policy-makers, as well as the link between other potential disadvantages and social exclusion, just to cite a few examples[1].

It is heartening to see that there are cases of good practice that involve the application of technology as part of the aim to bring forth more social inclusion. Within the field of education, given the continuous advances made in the integration of Technology Enhanced Learning (TEL), it remains to be seen what further steps and strategies can be taken to bring about more equality for language minority groups. There are brilliant examples of some highly commendable policies and practices taking place throughout Europe, put into place through TEL, that aim to ensure full equality in education of language minority groups. For instance, in the interdisciplinary project, Fabula, software was used to enable children to create bilingual digital books in European minority languages and to share their work with other readers (Edwards et al., 2002). Still, these practices remain small and isolated and have yet to become an integral part of mainstream education. The question remains: what 'macro' steps might be taken?

In general, policymakers should bring more public awareness to the issue and provide adequate resources for implementation of sound practice. It appears that, although there have been many calls for greater awareness of language diversity, language rights and the recognition of assets associated with multilingualism, these insights have had little impact so far on mainstream educational discourse (Dooly et al., 2009). More positive attitudes towards language minority groups can be brought about through greater public awareness and public discourse on the gains that can be achieved through linguistic diversity. There have been projects aimed at raising awareness of what have been called "less widely used languages" (see for instance the project entitled *eEuro Inclusion: Developing a Pan-European network of Language Resource Centres for LWULT languages*). However, as with many such projects, a lack of continuity and longevity implies that there needs to be more emphasis in project planning on how to sustain such efforts. This is exemplified by the long-standing website of *European Bureau for Lesser-Used Languages*[2], which declared on 27 January 2010 that it has "decided to end the organisation after a quarter century of promoting the cause of Lesser Used Languages in the EU […] in large part because the funding mechanism of such an organisational model is not suitable in current circumstances".

Inevitably, there must be a commitment to these social issues on behalf of policy-makers, in order to bring about attitudinal and behavioural change, and to negotiate new social settings amongst the dynamic multi-stakeholder partnerships that make up society. Otherwise, as in the example above, the onus of funding, implementing and sustaining such efforts falls on the minority language groups only. Some efforts to bring these issues into the "mainstream" interests, through technology, can be seen in the establishment of research centres and research chairs that emphasize the link between "sustainable, equitable and functional strategies" for promoting multilingualism (especially minority languages) and "language

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[1] The Beacon Scheme (UK) exemplifies nicely the use of ICT to promote social inclusion, aimed at various areas of social services.[http://www.beacons.idea.gov.uk/idk/core/page.do?pageId=72179]
[2] http://www.eblul.org/index.php?option=com_frontpage&Itemid=1

technology [that serves] multilingualism" (Mission statement for the The Linguamón-UOC Chair in Multilingualism[3]).

As technology advances, new, faster, and more interactive means of access to information can be employed to ensure dissemination of these new discourses. In today's 'knowledge society', information is becoming more and more available to the public -principally due to technological advances. It is well-documented how this spread of knowledge has changed the way in which people tackle their problems, seek information and disseminate new theories and practice (Beck, 1992; Toffler, 1990). Education stakeholders must take advantage of new possibilities of informing the general population by fomenting, through new technologies, more substantial research and publicity of research results that demonstrate the beneficial correlation between multilingualism and economic and social development.

It is often said that the Internet has connected the world and that the massive expansion of new technologies have resulted in fundamental changes in knowledge production and transmission; placing the production of knowledge as a central economic resource. "Suddenly the answer is knowledge […]. The king of knowledge, Bill Gates, owns no land, no gold or oil, no industrial processes" (Thurow, 1999: 57). However, access to and production of knowledge must be equitably distributed for social inclusion and equality to be real. For minority language groups, there must be institutionally backed databases, shared virtual libraries and collaborative research portals in order to help overcome many constraints linked to the 'digital divide'. Some attempts have been made to compile diverse information about multilingual practices, for instance, the UNESCO Observatory Portal for Monitoring the Development of the Information Society towards Knowledge Societies[4] and the Lingu@net Europa site provides assessment of language skills in minority languages, some teaching ideas and various downloadable resources. Still, most such efforts remain largely ignored by mainstream educators and tend to lack the human resources needed to coordinate on a wider scale.

Efforts need not be limited to dissemination. New technology can also help strengthen the role of publishing in minority languages -the education sector requires relevant teaching and learning materials in minority languages and technology can have an impact on the production of these teaching materials.

> A major problem in the teaching of heritage languages […] is identifying and obtaining authentic materials for instructional purposes. […] A recorded oral history carried out by a member of a minority language group with another member of that language group, used to illustrate language use, falls into the "authentic materials" category. (Villa 2002: 93)

As Edwards et al. (2002) point out, "minority languages suffer from a dearth of electronic media suitable for children" (p. 59) due to the costs and effort need to produce such materials. "The availability of electronic media can be a powerful motivator for young people in particular, to develop and maintain their knowledge of a minority language" (ibid.) and yet, there is very little available material.

Furthermore, a general public exposed to minority language literature will adopt a more positive attitude towards the language and help create a more meaningful literate environment for the minority language (and increased prestige). Until now, the high costs of publishing, the need to guarantee a large readership to compensate these costs, the pressure of publishing houses to print on a for-profit basis, with the major incentive being to maintain or increase profit margins has posed an extremely effective gate-keeper for anyone trying to publish in a minority language. The potential of adopting new electronic publishing technologies, using the internet as a medium for transmission, can radically transform the current model of publishing. There are noticeable changes in the multilingual online publishing arena as technical issues of how to

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[3] http://multilingualismchair.uoc.edu/opencms/opencms/webs/projectes/multiling/EN/Presentacio/index.html
[4] http://www.unesco-ci.org/cgi-bin/portals/information-society/page.cgi?d=1

standardise computer representation of some languages are being slowly resolved through more advanced customization features. But this must be institutionally supported; otherwise the onus of shifting current attitudinal and behavioural perspectives on minority language publishing falls, once more, on the shoulders of the minority group itself.

What is the role of TEL in all of this?

The reality of ethno-linguistically diverse student profile requires that teachers be skilled in using pedagogy that is sensitive and responsive to the developmental and educational needs of their students (Darling 2005; Hefflin 2002; Johnson 2005). In recent research, it has been found that visual aides and electronic media are extremely useful in these circumstances.

> *Through pictures, teachers display visual stimuli that can be universally understood by all students (Curtis and Bailey 2001). Visuals can be used in any subject area when teaching about concepts. Furthermore, hands-on materials and visuals that students can manipulate engage a variety of senses and help to make learning more meaningful, especially for diverse students who tend to be tactile, kinaesthetic learners* (Bruno 1982, Curtin 2006) (Allison and Rehm 2007:15).

Technology for language learning for minority groups need not be limited to aiding the teaching of the language of instruction (for newly arrived students) or the teaching of the minority language, however. As described previously, for minority language groups, a common axis of educational disadvantage lies in evaluation for academic placement. TEL can play a vital role in avoiding the tracking of students who are considered to have 'limited language proficiency' in lower level content courses by offering opportunities to learn concepts otherwise inaccessible to students -for instance the materials and content of academic-track courses the minority language students have been removed from. There is a growing number of examples of the use of multilingual open educational resources (OER), as witnessed by major universities around the world that offer OERs in a variety of languages. However, once more, these tend to be languages aimed at the profile of large student populations and not necessarily minority languages.

Publications concerning the ways in which different types of technology can be used to support and enhance learning are vast. Everything from video content and digital moviemaking to laptop computing and handheld technologies (Marshall 2002) are now being employed in classrooms and the availability of technology in the classroom ranges from simple tool-based applications (such as word processors) to two-way distance learning classrooms, including the use of cell phones to connect learners globally (Prensky 2005). According to Marshall (2002) TEL provides educators with the possibility of using educational technology that holistically integrates the learner, the teacher and the content being learnt. This augurs a more individual, learner-centred use of TEL so that it is not only used to supplement instruction, but also provides a means of tutorised self-study in order to increase student achievement. This may be especially important in the case of multilingual learners, considering that multilingualism carries with it the concept of multiple competences. The multilingual language learner has an "integrated system" of different languages that "constitute a repertoire" (Canagarajah 2009); 'competence' must no longer be seen as relying solely on knowledge; competence is an integral part of interaction strategies (ibid.).

This implies creating flexible teaching methods and curriculum materials that can reach diverse learners and improve student access to the general education curriculum. New technological tools can help promote a learning environment that not only *accommodates to*, but *makes use of* learner's differences (Bowe 2000; Rose & Meyer, 2002). TEL offers the means of presenting information in manifold formats and multiple media; giving students varied ways to express and demonstrate what they have learned and providing multifarious entry points to engage student interest and motivate learning (Honey et al., 2005).

The use of technology should be looked at holistically, not as a separate component of teaching. The aforementioned aim of fomenting research and wide-spread publication of innovative teaching approaches for minority language groups can also have an effect on local teaching practices as well. Most teachers are well-intentioned but at times their best efforts may be thwarted by lack of knowledge on how to achieve theoretically sound goals. Studies in the area of minority language students in the classroom indicate that teachers (both language and content) need to fully understand how language diversity supports individual development and learn to recognise the individual developmental stages of pupils. Teachers must also encourage positive learning environments by ensuring that all languages in the classroom - whether 'prestige' or 'non-prestige' languages- are legitimised. This implies accepting the presence and use of multiple languages and acknowledging that language-switching is not detrimental to the learning process (e.g. students should not be forced to only use the language of instruction). Parallel to this, teachers should avoid focusing on the prescriptive and formalised use of languages; knowing how to correct errors effectively and non-judgementally is crucial. In particular, teachers must recognise and encourage learners' use of inter-linguistic strategies and not label them as 'errors' or 'deficient'.

Unfortunately, these theories and practices are not widely understood nor implemented by teachers working with minority language students (Dooly et al., 2009). Studies show that teacher training, along with the trainee's personal experience with languages other than the language of instruction, has a significant impact on the role they take in the classroom in relation to the minority language (Lee and Oxelson 2006). For teachers working with minority language students, the databases, shared virtual libraries and collaborative research portals mentioned earlier are essential. Their own contributions, based on life experiences and action-research should also be a part of the constantly growing digital repository.

Teachers need to be made aware of the critical role they play in the personal, academic, and social trajectories of linguistic minority students. Joint training programmes -promoted and implemented through network-based collaboration -across regions or even cross-border in the EU- can be fertile ground for reflective action and research for teachers to help them come to understand this critical role. Technology Enhanced Teaching and Learning, through different network-based formats can deliver real-time, face-to-face interactions between teachers, using advanced visual, audio and collaboration technologies. These same technologies can also be used to put future teachers in virtual contact with the communities of minority languages where their students come from -thus further exploiting the possibilities of TEL, in this case for the teacher himself.

Technology Enhanced Learning can also play a significant role in creating opportunities for students to use minority languages (including majority language users learning the minority language). This implies establishing networks that go beyond the classroom and the school yard, including non-formal education systems (thus catering to minority language students who have dropped out of school). Additionally, creating virtual networks can lead to sharing of minority language resources and people 'know-how' and will maximise existing knowledge and expertise. Institutionally-backed, carefully organised peer tutoring (e-tandem) can provide opportunities for intensely communicative activities wherein the minority language student is exposed to and uses the language of instruction with their peer; and vice-versa. At the same time, this type of activity promotes cooperative learning and mutual sharing of ideas and opinions. The benefits of cooperative learning, collaborative work and peer work has been documented thoroughly (Slavin 1980, 1987; Johnson *et al.* 1993, 1994; Harmin 1994; Falchikov 2005), but it is especially important to underline the benefits for inter-ethnic, inter-linguistic peers.

The benefits of bilingual collaborative work amongst children has been documented by Edwards et al. (2002) in the Fabula project; for instance, they note advantages of bilingual collaborative writing measured in increased metalinguistic awareness. Other benefits of the use of TEL were mentioned as well.

One of the things that have become apparent in the evaluation of the Fabula software is the very wide range of ways in which this tool can be used in the classroom. Most possibilities involve collaboration between, on the one hand, children, teachers, and parents who speak the minority language and, on the other hand, children, teachers, and parents keen to acquire it. Such collaboration also offers opportunities to write for real audiences for a real reason, a feature that has frequently been identified as a fundamental in the successful development of writing skills (Hall & Robinson, 1994). (Edwards et al, 2002: 67)

Furthermore, the use of TEL heightened the pupils' motivation and self-image as users of a minority language as well as incrementing the prestige and accepted use of minority languages by the teachers.

We see this creation of a collection of electronic resources in minority languages as potentially a major benefit of the project. The prospect of having their work published for the rest of Europe to see has proven highly motivating, especially for the older children in the partner schools, and they are keen to see this aspect of the project progress, to make contact with other schools, to hear what they thought of their stories, and so on. This enthusiasm reflects the attitudes of the teachers who have given their own time to be involved in the project. What has become very clear over the course of the project is that Fabula is much more than a software package. While the software is a useful tool, it also forms the focus for a community of users with a commitment to high quality and innovative language teaching, keen to look outwards to share their experiences. (Edwards et al, 2002: 68)

As stated earlier, it is heartening to see that there are many examples that can serve as models of the implementation of TEL to the benefit of social inclusion of minority language groups. The benefits of doing so have been documented; it is now a question of whether such practices will become more widespread.

Final Words

It has not been the aim of this article to allocate blame for adversity faced by minority language pupils; the focus has been on making suggestions for practical interventions through the use of technology to alleviate these potential educational disadvantages and to support social inclusion. Interventions of this nature are inherently complex and require collaboration amongst all education stakeholders - policy-makers, teachers, teacher trainers, pupils, parents and language communities, to name only a few. More research is needed to formally evaluate how TEL can best support minority language speakers in different areas of learning (minority language, foreign language, language of instruction, content, etc.). Nonetheless, examples of good practice and preliminary exploration indicates that Technologically Enhanced Learning can offer promising solutions to many of the challenges described above, and inevitably new and exciting applications of TEL will be discovered in the immediate future.

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Author

Dr. Melinda Dooly
Lecturer
Faculty of Education, Language & Literature Teaching Methods Department
Autonomous University of Barcelona, Spain
melindaann.dooly@uab.cat

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