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Brian Nolan

Institute of Technology, Blanchardstown, brian.nolan@tudublin.ie

Lorraine Leeson

University of Dublin, Trinity College

John Bosco Conama

University of Dublin, Trinity College

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TOWARDS BLENDED LEARNING FOR DEAF STUDIES AT THIRD LEVEL IN IRELAND

L. Leeson¹, B. Nolan², J.B. Conama³

¹ Trinity College Dublin (University of Dublin) (IRELAND)

² Institute of Technology, Blanchardstown (IRELAND)

³ Trinity College Dublin (University of Dublin) (IRELAND)

leesonl@tcd.ie, brian.nolan@itb.ie, comama@tcd.ie

Abstract

Irish Sign Language (ISL), an indigenous language of Ireland, is recognized by the EU as a natural language. It is a language separate from the other languages used in Ireland, including English, Irish, and, in Northern Ireland, British Sign Language. Some 6,500 Deaf people use ISL on the island of Ireland. Deaf people are the most under-represented of all disadvantaged groups at third level, posing two challenges: (1) getting Deaf people into third level and (2) presenting education in an accessible form. Two institutions, Trinity College Dublin (TCD) and the Institute for Technology, Blanchardstown, Dublin (ITB) have partnered to create a unique elearning environment based on MOODLE as the learning management system, in the delivery of Deaf Studies programmes at TCD. We deliver third level programmes to students online to resolve problems of time, geography and access, maximizing multi-functional uses of digital assets across our programmes. Signed languages are visual-gestural languages and online content is required to be multi-modal in nature and utilize rich-media learning objects. This presents many important challenges, including (1) Universal design in an online curriculum for Deaf students, (2) Assessing signed language interpreting skill in an online context, (3) Using the Signs of Ireland corpus in blended learning contexts in a MOODLE environment and (4) Issues of assessment in an elearning context. In this paper, we introduce the Irish Deaf community and their language; the educational context that leads to disadvantage and negative outcomes in employment and our work to date in developing accessible elearning for Deaf Studies programmes at TCD.

Keywords: Elearning, Deaf Studies, Strategic Innovation Fund, Irish Sign Language, Accessibility, Inter-institutional collaboration.

1. Background

This paper outlines the establishment and development of blended learning at two partnered institutions in Ireland, namely Trinity College Dublin (TCD) and the Institute of Technology, Blanchardstown (ITB). This paper focuses on the creation of a unique elearning environment delivered on the learning management system, MOODLE, for the delivery of Deaf Studies programmes at TCD. We will describe how we deliver third level programmes to students online to resolve problems of time, geography and access, maximizing multi-functional uses of digital assets across our programmes, and outline work in progress to maximize the “Deaf-friendliness” of blended learning delivery for Deaf and hard of hearing students. We also touch on how our engagement in two Leonardo da Vinci Projects feeds into our wider agenda for innovation in Deaf Studies in Ireland, supported by the Higher Education Authority’s Strategic Innovation Fund. First, it is useful to contextualise the situation of Deaf people in Ireland and briefly introduce Irish Sign Language and the Signs of Ireland corpus.

2. The Deaf Community

Deaf signed language users form Deaf communities that have identifiable cultural and behavioural norms which include use of a shared (signed) language (though signed languages differ from territory to territory), similar educational experiences (which we describe further below), endogamous marriage patterns, close community ties, and a strong sense of communion with other Deaf people in other countries (see Ladd 2003, Matthews 1996, Lane, Hoffmeister and Bahan 1996). This differentiates them from non-signed language users, including those who are hard of hearing or who become deafened post-lingually, but who use spoken language as their preferred means of interaction. Approximately 1 person in a 1000 is a signed language user (Johnston 2004, Conama 2008), which suggests that there are some 490,426 Deaf signed language users in the EU¹. In Ireland, there are approximately 5,000 Irish Sign Language users in the Republic (Matthews 1996) and an approximate 1,500 ISL users in Northern Ireland (Janet Beck, Personal communication, 2009).

Only 5-10% of deaf children are born to Deaf parents, which means that for the majority, the acquisition of a signed language does not follow a normative path. That is, deaf children with Deaf parents, acquire signed language in a natural way, following the same general milestones, that hold for hearing children acquiring a spoken language. For the majority of deaf children, the acquisition of signed language is bootstrapped on “home sign” use – a highly idiosyncratic and systemised use of gesture developed in individual hearing families to bridge the language gap - with fully grammatical signed language use developing only when a deaf child comes in contact with other deaf children and adults (see Goldin-Meadow 2003 for detailed description of this process).

Deaf people across Europe share a history of linguistic suppression, ‘normalisation’, and oppression. Since the 1880s, across the western world, signed languages have been suppressed in education, with significant negative educational outcomes for Deaf people, including functional illiteracy levels for averagely intelligent Deaf people in the majority language of their country (see Conrad 1979, EUD Update March 2001, Kyle and Allsop 1997, Ladd 2003, Lane 1984, Leeson 2006, 2007). Part of the reason for this is the fact that in many states, including Ireland, teachers of the deaf are not required to know or use a signed language in their work and are often still actively discouraged from signing (Leeson 2006). Deaf children too have been actively discouraged from signing, or even punished for using signed languages: in Ireland, for example, children were forced to sit on their hands to prevent signing and encouraged to give up the use of signed language for Lent, the Catholic period of preparation for Easter, while parents were advised (incorrectly) that use of a signed language would impede acquisition of oral language skills (e.g. McDonnell and Saunders 1993, Leeson and Grehan 2004, Leeson 2006, Leeson 2007).

In some countries, eugenics movements targeted Deaf people, leading to forced sterilisation (Biesold 1999), while the implementation of widespread cochlear implantation programmes coupled with genetic selection technologies (Johnston 2004), the closure of many schools for the deaf and the trend towards mainstream education (which impacts on use and trans-generational transfer of signed language and cultural norms) has been tagged “linguistic genocide” (Skutnabb-Kangas 2000). The fact that signed languages are still not considered official languages in many countries, including Ireland, with Deaf people considered as disabled rather than as members of a linguistic minority community, conspires to mark Deaf people as a disadvantaged minority in Europe (Timmermans 2005, Krausnecker 2001). Signed languages are recognized as “real” natural languages worthy of protection by international organisations however: the European Parliament has passed 2 resolutions on signed languages (1988, 1998) while in 2003 the Council of Europe’s parliamentary assembly passed a resolution calling for the protection of signed

¹ This figure is based on an EU population of 490,426,060 (July 2007 est.) www.cia.gov/library/publications/the-world-factbook/print/ee.html

languages (Leeson 2004, Timmermans 2005). UN documents also recognise the value of signed languages: both UNESCO's Salamanca Statement (1994) and the UN Convention on the Rights of Persons with a Disability (2006) call for the use of signed languages in education.

2.1 Deaf communities in Europe as educationally disadvantaged

The fact that signed languages are not formally recognised, and in many EU countries, not actively used or encouraged in education limits educational attainment for Deaf children. In countries where signed languages are not included in national curricula, and where children are still expected to learn via lipreading ("oral education"), the average reading age for Deaf school leavers is comparable to that of an 8-9 year old hearing child (Conrad 1979, Leeson 2006, 2007). While figures for participation at tertiary level are not available on a European level, we know that Deaf students are severely under-represented (EUD Update 2001, Kyle and Allsop 1997). In an Irish context, Deaf and hard of hearing students are amongst the most under-represented categories of students, making up just 2% of the student population (consider that 1 in 7 of the population has a hearing loss of some kind). Table 1 provides an overview of the most recent statistics available regarding the Irish situation:

	Total d/hh students 2004/2005 (O'Shea)	Total d/hh students 2006/2007 (Mathews)	Change in d/hh from 2004 to 2007	Total students with disability 2006/2007	Percentage of d/hh of total students with disabilities 2006/2007
NUI Galway	19	16	-3	265	6.03 %
Trinity College Dublin	36	39	+3	400	9.75%
University College Dublin	23	21	-2	374	5.61%
University College Cork	27	29	+2	430	6.74%
University of Limerick	4	6	+2	280	2.14 %
Dublin City University	5	6	+1	142	4.23%
NUI Maynooth	No data given	11	Not available	172	6.40 %
Total	114	128	+3	2063	6.20%

Table 1: Deaf and Hard of Hearing Students in Universities in Ireland²

In an increasingly globalised world, where literacy is key to full participation, educational progression and employment success, the barriers to participation in education for Deaf sign language users represent a challenge to our assumption that a meaningful education is available as a right to all EU citizens in the 21st century. In this context, elearning is a tool for greater equalisation of opportunity for Deaf people generally, and Irish people specifically, insofar as we can harness the potential for streaming video content in signed languages, with associated text-based content in an accessible manner. Providing training in an appropriate language (i.e. a signed language), with associated on-line supports (e.g. online tutorials) and assessment is a significant step in the direction of facilitating access to third level programmes for Deaf people.

² Data in Table 1 is from Leeson (2007) and all statistical data was compiled by Elisabeth Mathews. This report was submitted to the NCSE in October 2007. The National Council for Special Education funded this research. Responsibility for the research (including any errors or omissions) remains with the author. The views and opinions contained in this report are those of the author(s) and do not necessarily reflect the views or opinions of the Council.

2.2 Irish Sign Language (ISL) and the Signs of Ireland (SOI) corpus

Irish Sign Language is an indigenous language of Ireland. It is used by some 5,000 Irish Deaf people as their preferred language (Matthews 1996) while it is estimated that some 50,000 non-Deaf people also know and use the language to a greater or lesser extent (Leeson 2001). While ISL is not officially recognized by the Irish government, it has *de facto* recognition given the range of provisions made for criminal proceedings for Deaf defendants and witnesses (Leeson 2004) and the range of educational supports in place to facilitate deaf and hard of hearing students at tertiary level such as signed language interpreting, note-taking and reading support. ISL (along with British Sign Language) is recognized in Northern Ireland (by the British government).

In terms of their production, signed languages are articulated in three dimensional space, using not only the hands and arms, but also the head, shoulders, torso, eyes, eye-brows, nose, mouth and chin to express meaning (e.g. Klima and Bellugi 1979 for American Sign Language (ASL); Kyle and Woll 1985, and Sutton-Spence and Woll 1999 for British Sign Language (BSL); and McDonnell 1996; Leeson 1996, 1997, 2001; O'Baoill and Matthews 2000 for Irish Sign Language (ISL)). This complexity leads to highly complex, multi-linear, potentially dependent tiers that need to be coded and time-aligned when signed languages are captured, stored, annotated and analysed electronically. As with spoken languages, the influence of gesture on signed languages has begun to be explored (Armstrong, Stokoe and Wilcox 1995, Stokoe 2001; Vermeerbergen and Demey (2007)), while discussion about what is linguistic and what is extra-linguistic in the grammars of various signed languages continues (e.g. Engberg-Pedersen 1993, Liddell 2003, Schembri 2003).

While these remain theoretical notions at a certain level, decisions regarding how one views such elements and their role as linguistic or extra-linguistic constituents plays an important role when determining what will be included or excluded in an annotated corpus, such as the Signs of Ireland (SOI) corpus, which forms part of the Languages of Ireland programme at the School of Linguistic, Speech and Communication Sciences, TCD and comprises data from 40 Deaf Irish Sign Language (ISL) users across Ireland. Thus, decisions about linguistic description also determine how ISL items are notated, particularly in the absence of a written form for the language being described. This in turn is a pre-cursor for any follow on work that makes use of these and other signed language digital learning objects in elearning contexts.

The complexity of the ISL data captured in ELAN (and which is available for analysis by students and researchers) is evidenced in Figure 1 below:

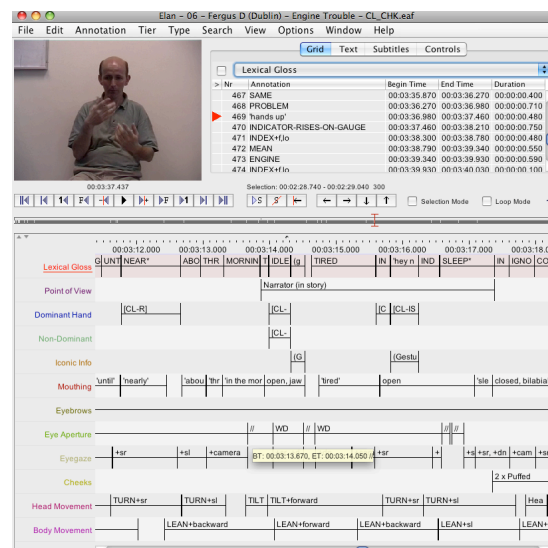


Figure 1: A screenshot from the Signs of Ireland corpus

3. Use of the Signs of Ireland Corpus and Other Digital Learning Objects in eLearning/ Blended Learning Contexts

The Signs of Ireland corpus has been piloted in blended learning at the Centre for Deaf Studies with increasing sophistication since 2006-7. Today it features in Irish Sign Language courses, introductory courses on the linguistics and sociolinguistics of Irish Sign Language, and a course that focuses on aspects of translation theory and interpreting research (TIPP). From September 2009, it will be at the heart of our new Bachelor in Deaf Studies programme, a four year pathway with specialisms in ISL/English interpreting and ISL teaching. At present the corpus exists on each client-side computer. Students are provided with training in how to use ELAN in order to maximize use of the corpus. The implications of this are that students must be able to access the corpus in a lab, presenting a challenge for blended learning delivery where students require Internet access to the corpus. We also use the corpus as part of the continuous assessment of students in our Introduction to the Linguistics and Sociolinguistics of Signed Languages course. For example, students are required to engage with the corpus to identify frequency patterns, distribution of specific grammatical or sociolinguistic features (e.g. lexical variation) and to draw on the corpus in preparing end of year essays. In the Translation and Interpreting: Philosophy and Practice course, students engage with the corpus to explore issues of collocational norms for ISL, look at the distribution of discourse features and features such as metaphor and idiomatic expression (See Leeson 2008 for further discussion).

Beyond the corpus, the challenge of creating “Deaf-friendly” academic content which can facilitate blended learning more generally is one we are tackling head on. Amongst the work in progress is work on SIGNALL II³, a Leonardo da Vinci funded programme which focuses on digitizing a first year course on Deaf history, culture and the experiences of being deaf, Perspectives in Deafness, and delivering content in ISL (and, in partner countries, in British Sign Language, Finnish Sign Language, Czech Sign Language and Polish Sign Language) with some spoken/written materials to support learning for deaf and non-deaf students. Another Leonardo da Vinci funded project is D-Signs, coordinated by the University of Bristol’s Centre for Deaf Studies. D-Signs aims to deliver an online course in five signed languages (BSL, ISL, Cypriot Sign Language, Greek Sign Language and Czech Sign Language) in a programme aligned to the Common European Framework of Reference for Languages (CEFRL) at A1-A2 level (i.e. for basic users). The added value of D-Signs is that it offers a rare opportunity for Deaf people to acquire some knowledge of another signed language via a formal route. Figure 2 offers a screen shot of how D-Signs will look, embedded in a MOODLE platform:

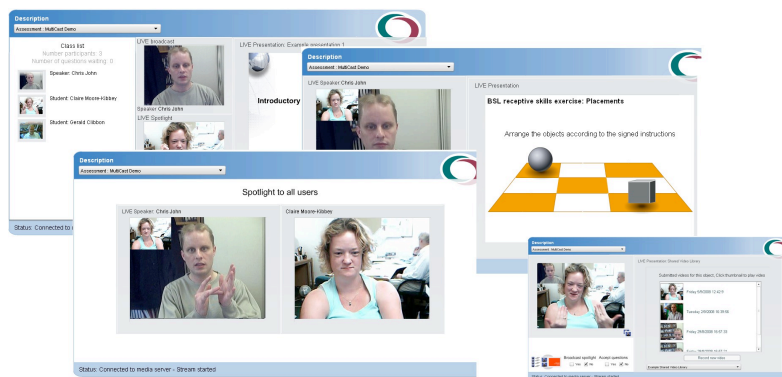


Figure 2: Online delivery of signed language teaching via MOODLE for the D-Signs Project (as developed by the Centre for Deaf Studies, University of Bristol)

³ See www.signallproject.com for SIGNALL I products and www.signallproject.eu for work in progress on SIGNALL II.

The whole act of moving towards online and blended learning in the area of Deaf Studies creates challenges in terms of data protection legislation, distribution, copyright and general access issues that need to be resolved as we move forward. For example, subsets of data from the Signs of Ireland corpus are already used as digital learning objects, but no decision has yet been made regarding optimal management and deployment of the corpus (or, for that matter, other digital learning objects). In our teaching and learning of Irish Sign Language, for example, we have developed assessments to Council of Europe Common European Framework of Reference levels B1 and B2 (independent users) for ISL and are working towards the development of digital learning objects that map onto levels C1 and C2 (proficient users). This includes receptive skills tests which includes multiple choice questions linked to data taken from the Signs of Ireland corpus. Working with D-Signs project partners, these will be brought to a new level, allowing for interactive tests of (e.g.) student capacity for understanding how objects are placed in signing space (known as “placement” in sign language teaching and learning), whereby signs are mapped to real world or notional locations, a threshold concept for learning and using signed languages.

4. Leveraging Digital Learning Objects

To optimally leverage the Signs of Ireland corpus within a learning environment, we have begun to determine what the actual functional requirements are with respect to how the application will be used by both students and academics in the blended learning context. At the moment, MOODLE is populated with a wide variety of modules delivered within the suite of CDS undergraduate programmes. The Signs of Ireland digital corpus is tagged in ELAN. We have traditional classroom and blended delivery of content. We also have (in preparation) digital signed lecture content embedded in powerpoint presentation (SIGNALL II, POD content) and are in the process of developing digital ISL resources which will supplement and enrich the delivery of ISL courses (via D-Signs). The present programme architecture is very vertical in orientation (Figure 3). The challenge is to achieve horizontal integration through the use of information technology, the Internet and a blended learning approach.

5. Architecture of an online MOODLE environment to support signed language learning

We have also given much thought to the overall architecture and framework for moving forward. We are in the process of determining what profiling and other user related information we require to capture and tag data regarding the user environment and their interaction with the digital classroom and curriculum. Additionally, we are in progress with the analysis of (i) types of learning objects required for each lecture for each of the programme’s modules and (ii) number and type of items, with the intention of making aspects of our blended learning Diplomas and Degrees available online from September 2009. Our initial base assumption is that target client devices are browsers on Internet aware laptops and desktops. This assumption can be expected to evolve, over time, into mobile devices such as the Apple iPhone, iPod Touch and similar computing appliances. This will deliver to us a plan for the capture and creation of the respective digital rich media that we intend to deploy within our learning objects. We are also keen to maximize quality by making use of high definition video capture data, and utilizing best practice guides for filming for Deaf audiences (in terms of background, lighting, quality, etc.) (Sheikh 2009, Hooper, Miller, Rose and Veletsianos 2007).

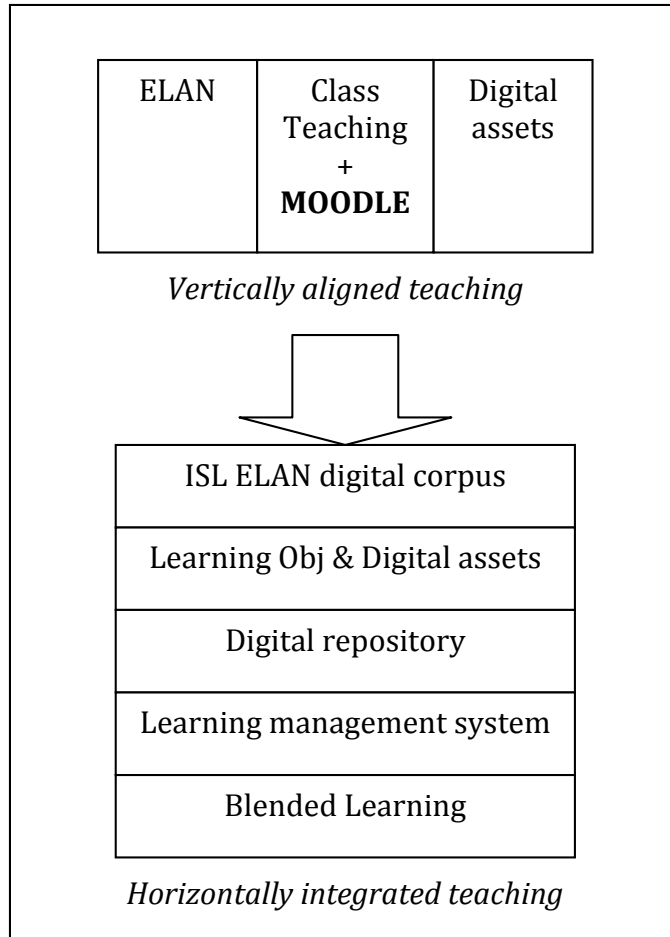


Figure 3: The Integrated Model

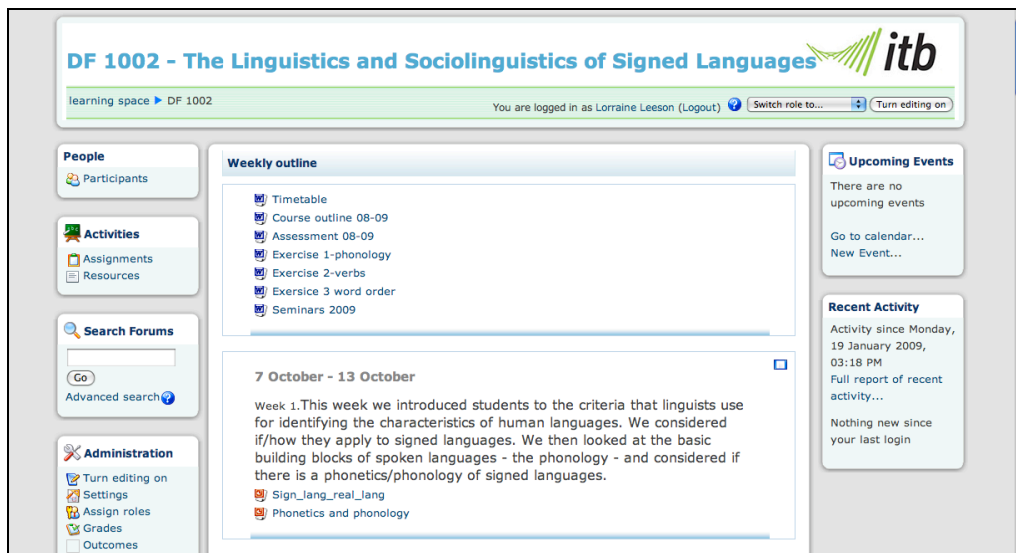


Figure 4: A MOODLE Screenshot

8. Issues of Assessment in an eLearning Context

We are also developing an assessment model, based on best pedagogical practice as appropriate to our online blended learning environment. From there, as an integral part of our design phase, we will determine how to implement this online. We will need to link, in a principled and structured way, the assessments to the learning outcomes of individual modules, for example, An Introduction to the Linguistics and Sociolinguistics of Signed Languages, and to a particular lecture's thematic learning outcomes as appropriate. This is something supported by the Bologna Process. We also consider the effectiveness of the assessment with students in a blended learning situation, and the embedding of multimedia Problem Based Learning exercises within the elearning environment.

9. Moving Forward with SIF II

Our Strategic Innovation Fund (SIF II) Deaf Studies project is scoped for a three-year window, which commenced in June 2008). A challenging year one plan has been created that will yield infrastructure changes, achievements and digital assets as well as the approval of a four year Bachelor in Deaf Studies (approved May 2009, due for roll-out in September 2009). We have completed an analysis phase to identify the learning objectives for all elements on the 4 year degree and, for some courses, have advanced our work to the point where themes (on a week-by-week basis) have been identified and aligned to learning objects and assessment frameworks. For example, week 1, lecture 1 has learning objectives LO1, LO2 and LO3, etc. Typically, this will broadly equate with a lecture plan that is rolled out over a semester (or term). For example, the module 'An Introduction to the Linguistics and Sociolinguistics of Signed Languages' is delivered over two semesters totaling 24 weeks with 24 2-hour lectures over the academic year. We will need to make explicit the learning objectives of each of these lectures such that each objective may be supported by up to, say, four learning objects initially (Figure 5).

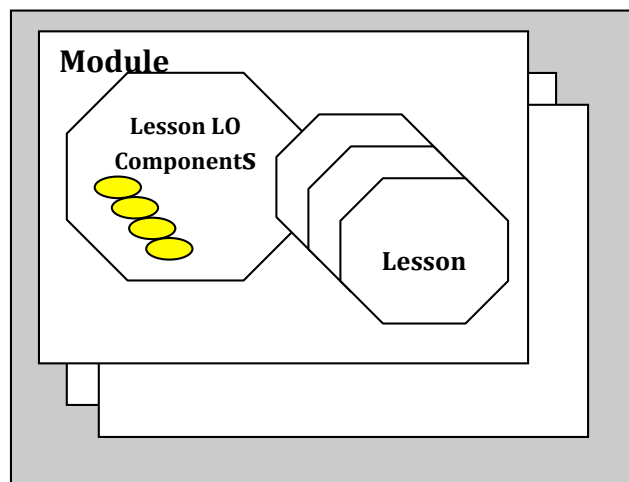


Figure 5: Learning object components as a unit within a module

These learning objects are expected to form a composite unit, but will be made up of different media types. A composite unit, therefore, will include the lecture notes (.pdf or .ppt), MOODLE quizzes and exercises, video data of signing interactions (in Macromedia Breeze, Apple QuickTime, Flash and/or other formats), and ELAN digital corpora. To make a composite unit, each learning object needs to be wrapped with proper tagging. This tagging will facilitate searches for these learning objects within a digital repository. We plan that this will be done for all modules across all weeks, across all four years of the Bachelor in Deaf Studies programme for courses delivered by CDS.

We will identify and implement appropriate assessment models for a blended learning delivery of signed language programmes. This will be aided by our participation in the D-Signs Project, led by Bristol University. In addition to an assessment model, we need to devise a model for determining the overall effectiveness of the programme within the blended learning approach that will take a more holistic and pedagogical perspective to the programme objectives. Effectiveness key performance indicators will determine the answer to the question: Are we successful with this programme and how can we tell? The overarching trajectory is roll-out of our blended learning programmes on a national basis (i.e. SIF II funded aspects), with aspects rolled out internationally (i.e. the Leonardo da Vinci funded aspects).

Following from our initial trial period, and with a sufficiency of initial data, we will compare and contrast assessments with anonymous (but marked for age and social background, gender, hearing status, etc.) and start to compare longitudinal figures with the initial first year outputs for this blended programme. As this programme is to be modeled for a blended learning environment, we will need to build in a model of student support to include in an appropriate way, online college tutors, peer-learning and mentoring, in order to address any retention issues that may arise and provide the students with the ingredients of their learning success within a productive and engaging community of practice.

We intend to create a website for this SIF II Deaf Studies Project with links to the learning management system/MOODLE, other technology platforms including, for example, Flash, and the rich digital media assets as we determine to be useful in support of the teaching of Irish Sign Language within 3rd level education. We will also use this website to disseminate programmatic and research outcomes and other relevant information. We will address the technology related issues pertinent to the design and implementation of the framework for digital learning objects in a repository to facilitate access-retrieval, update, and search. We will determine the tagging standards that will operate across this. We have already piloted data in the Centre for Deaf Studies in Dublin from September 2008 as supplementary to traditional modes but plan a more integrated delivery of multimedia digital blended content in September 2009 (with roll out of digital content from SIGNALL II). We will capture feedback from students and analyse this critically.

In terms of the human resources required to build the framework and create the digital assets for the full programme, and the appropriate skill-levels required, we have had setbacks as a result of the global economic situation, which resulted in a reduction in funds made available via SIF II. Given this, we have had to significantly curtail our initial plans to roll out our blended learning programme in 3 other institutions nationally, and our recruitment plan was affected. However, we have in place one SIF II funded Deaf academic⁴ who will manage many aspects of the SIF II work (notably, coordination of the Bachelor in Deaf Studies and participation in the digital data creation process) and have just recruited two PhD students to work on key research questions aligned to the SIF II project. While additional funding has been secured via Trinity College Dublin's Faculty of Humanities, Arts and Social Sciences Innovation Funds, ring-fenced for additional staffing for this project, it remains to be seen if we will gain permission to recruit given a national moratorium on recruitment to public sector posts exists at present.

Moving forward, there are considerations regarding the cultural and work practice implications for academic staff delivering curricula in this manner. There are also corresponding implications for students receiving education in a blended learning approach via elearning technology. What will assume a greater importance immediately for academics and students is the minimum level of computer literacy skills and access to modern computing equipment and a fast broadband network required to engage in this kind of learning environment. We also plan, therefore, to devise a training programme for academic staff to induct them into the new teaching and learning environment and plan for a similar induction for students enrolled on the programme.

⁴ We note that at CDS, $\frac{3}{4}$ of the full-time academics are Deaf and all full time academics are fluent ISL users.

10. Summary

In this paper we have discussed decisions we have made regarding annotation of the Signs of Ireland corpus. We discussed ongoing work to place Irish Sign Language learning online through the application of MOODLE as the platform of choice as we move forward. We outlined the range of applications currently made with respect to the Signs of Ireland corpus in elearning/ blended learning contexts and noted the added value of our participation in the SIGNALL II and D-Signs projects, both Leonardo da Vinci funded activities, which have a focus on elearning. We indicated how we will leverage the corpus within a framework for elearning and blended learning, situated in an online architecture to support signed language learning. Issues of assessment in an elearning context were also addressed.

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