Aqua-tnet

Annual 'state of the art' report

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Annual report about the state of innovation in the higher education area in the field of Aquaculture, Fisheries and Aquatic Resource

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1. Master programs in aquaculture, fisheries and aquatic resource management

INTRODUCTION

The Master has a crucial role to play in the knowledge society. It assures the acquisition of competences on which doctoral research depends. It develops human capital in many fields and should be accessible from as many points and by as many persons as possible. Its range of core activities, delivery modes and durations make it a hugely flexible instrument with which to confront the challenges of the global economic crisis (Davies 2009).

STATE OF THE ART IN MASTER EDUCATION

In 2009 the report "Survey of Master degrees in Europe" by Howard Davies (EUA Publications) was published. This report gives a good overview of the state of the art or master degree programmes in Europe. Important findings from this report are presented below.

Master programmes represent the second cycle in the EU - Bologna process. Progress has been uneven: some countries have implemented this stage, some have just started and some have not even started. Of those who have implemented Bologna, the Master programmes have different formats, such as research- intensive and taught Master courses.

The Master cycle may look well-defined in terms of the bands of full-time duration and credit points determined by ministers. However this does not mean that the Master is 'readable' across the 46 Bologna jurisdictions. Its profile remains clouded by titles and nomenclature which, although usually clear at national level, lose clarity when viewed across external borders. It is not yet universally simple for students and other stakeholders to be guaranteed first-glance recognition of what a particular Master offers. A set of informative markers should be developed for the benefit of all users. Transparency at European level may be compromised by the very distinctions introduced to clarify matters at national level. 'Research Master', 'professional Master', 'continuation Master', 'consecutive Master', 'advanced Master', 'top Master', 'lifelong Master', 'European Master', 'international Master' are terms which reveal the shortcomings of the apparently common language of description. The understanding of each depends on its precise legal and administrative context. This context is usually national. At European level, the danger of misrecognition has not yet been dispelled. Increasing numbers of students will complete the new generation of Bologna Master Programmes in the post-2010 period. Regular monitoring and stocktaking are therefore essential to ensure that the Master gains in definition and readability.

STATE OF THE ART IN MASTER EDUCATION - the Aqua-tnet domain

Within Aqua-tnet a specific Work Package is dedicated to Master education. Several participating universities offer Master programmes within the aquaculture, fisheries and aquatic resource management area. During the previous phase of Aqua-tnet the lack of a comprehensive portal site, where all available Master programs within the sector are presented with sufficient consistent and relevant information, was felt as a drawback for further harmonization in this field. It was therefore decided to develop such a portal (or database) in the next phase of Aqua-tnet. Recommendations on the contents, functionality and operation of this database have been issued, and the initial web design work has been completed A brief review of master education programs in aquaculture from major contributors in Aqua-tnet has been compiled and is available on the home page.

In previous Aqua-tnet meetings and in discussions concerning the Master portal, much confusion in the use of terminology between the EU countries was observed. This finding corroborates the general observations made by Davies (2009) on Master programmes. Such confusion regarding the

use of basic terminology represents a major problem when discussing and describing topics regarding Master programmes. A brief report describing this problem within the Aqua-tnet domain has therefore been made, also giving some recommendations for uniform future nomenclature. Through presentations at various Aqua-tnet events this has been brought under the attention of the entire Aqua-tnet consortium, stimulating general awareness of the problem and promoting the use of generally accepted terminology.

2. PhD curriculum development

INTRODUCTION
*Doctoral education is a major priority for European universities and for EUA (*European University Association*). It forms the first phase of young researchers' careers and is thus central to the drive to create a Europe of knowledge, as more researchers need to be trained than ever before if the ambitious objectives concerning enhanced research capacity, innovation and economic growth are to be met"* (Professor Georg Winckler - EUA President 2005-2009)

STATE OF THE ART IN PhD CURRICULUM DEVELOPMENT – general EC level
Doctoral programmes are not only the third cycle of higher education, but also constitute the first phase of a young researcher's career. The core component of the third cycle is the advancement of knowledge through original research, and this makes the third cycle unique and different from the first and second cycles. The doctoral training phase constitutes the main link between the European Higher Education and Research Areas, and high quality doctoral programmes are therefore crucial in achieving Europe's research goals.

Findings in the Trends V report (EUA, 2007) indicate that while the third cycle came late to the Bologna process (or vice versa), the speed of change in recent years has been quite extraordinary. Institutions need to take responsibility for the further developments in this crucial cycle to sustain and enhance Europe's research and innovation capacity.

Also the European Commission supports university action to modernise doctoral programmes, involving stakeholders from industry. Growing numbers of mobile researchers, and in particular doctoral candidates, receive support under the Marie Curie Actions, Erasmus, Erasmus Mundus and the European Institute of Innovation and Technology (EIT).

Bologna reforms contribute to putting European higher education on the global map. Many courses, particularly at master and doctoral level, are now taught in English. This factor, and many other factors, help European universities to become global players. Relations with other continents are supported through a series of bilateral cooperation programmes: EU-USA/ Canada, EDULINK, and ALFA for Latin America and the new Nyerere Programme for Africa. A new multilateral framework for supporting cooperation with industrialised countries has been launched by the Commission in 2007. Of special importance in this context is the EU's flagship programme for worldwide academic cooperation, Erasmus Mundus. Highly integrated European Masters and doctoral courses, consolidated international academic partnerships, and competitive scholarships are making a powerful contribution to improving the attractiveness of 'destination Europe'.

STATE OF THE ART - PhD's in the aqua-tnet domain
Within aqua-tnet a specific Work Package is dedicated to PhD curriculum development. Many universities in Europe have departments and research groups that are specialised in research topic related to the aqua-tnet domains. Yet in many cases these departments and research groups do not form big clusters, indicating that there might be a lack of critical mass in a particular university.

Hence the aqua-tnet project is aiming to provide the European PhD student operational in the aqua-tnet domains, information in relation to the taught as well as the research phase.

In the previous aqua-tnet phase, doctoral students in the aqua-tnet network have been consulted in relation to their needs for PhD training. One of the findings was that training in generic domains, under which we consider a wide range of research, workplace and life skills that are not specific to any one discipline, including languages, communication, scientific methodology, IT and management, is highly recommended and appreciated. These types of courses are likely to be available at a local or neighbouring university. On the other hand there is also a very diverse need for training in specific, tailor made PhD subjects. In the latter cases there is often a problem of matching supply and demand of these types of courses at the local level, and most often this match is not available.

Hence the aqua-tnet project is planning to set up an internet based database of PhD courses available in Europe. This action might help to match supply and demand of specialised course in Europe and stimulate mobility of the PhD student during the taught phase of their doctoral research.

In relation to the research phase, the aqua-tnet project offers an internet based database of finished PhD's in the aqua-tnet domain. This offers the students the opportunity to have direct and easy access to finished PhD thesis and presentations.

In the aqua-tnet domain a lot of research institutes are operational. They often have of lot of experience in research in the aqua-tnet domain, but are only to a variable extent involved in PhD training. The aqua-tnet project aims at increasing the links between universities and research institutes, offering PhD students more opportunities for mobility between research environments.

3. Mobility in aquaculture education in Europe

INTRODUCTION
EU education and training policy has been given added impetus since the adoption of the Lisbon Strategy in 2000, since they are essential to the development and success of today's knowledge society and economy. In order to progress in knowledge and innovation, particularly as global competition becomes more intense in all sectors, key issues such as mobility across countries is essential for improving education and training providing more chances of jobs and growth, as well as to allow higher opportunities of participate fully in society.

STATE OF THE ART IN MOBILITY – general EC level
One of the most successful programs of the EU and even one of the most important achievements of the EU from its beginning has been the Erasmus initiative (3 million students by 2012). This program has allowed thousands of students across Europe to know other countries, to be trained in a foreign institution, to learn languages and to get to know a different society. Similarly, programs such as the Leonardo da Vinci have contributed to the mobility in the area of training. Since it has become very clear that such approaches are the successful ones, the strategic objectives in higher education concerning mobility should include:

1. Making *mobility* a real issue for the majority of students in the EU
2. Improving the training of EU workers and vocational students by increasing mobility
3. Improving efficiency in recognition both for vocational and academic training
4. Promoting equity, social cohesion and active citizenship
5. Enhancing creativity and innovation, through the knowledge of other environments
6. Promoting the mobility at all ages for the lifelong learning programmes

In order to expand participation of all kinds of European citizens in the educational opportunities, and to guarantee transfer and recognition of learning outcomes, the EC has proposed the establishment of a European Credit System also for Vocational Education and Training (ECVET 2009/C 155/02).

STATE OF THE ART IN MOBILITY – Academic level
The European policy in terms of higher education has launched a number of initiatives in order to involve an increasing number of people in the mobility and life-long learning strategy. The initiatives concern students (studying abroad, traineeship abroad, linguistic preparation), higher education institution staff (teaching abroad, receiving training abroad), institutions (intensive programmes, academic and structural networks, multilateral projects) and enterprises (hosting students' placements, teaching abroad, participating in university cooperation projects).

Being these initiatives a desirable objective, it is necessary that the EU institutions, the national governments and the local institutions provide economic funds, and a dynamic structure to accomplish these initiatives as much as possible. The experience of aquaculture mobility across Europe indicate that students and staff participate in such mobility strategy but that more financial help should be available both for students and vocational training. Otherwise the mobility issue may risk involving only part of the university students (those with familiar or local extra help) and being limited to the university environment without a relevant participation of vocational or enterprise workers.

STATE OF THE ART IN MOBILITY – Internationalization
Another important issue in mobility is related to the internationalization process. At present mobility is still a concentrated activity (73% of the international mobility is concentrated in 5 countries) that mostly involves Europe as a first host region and United States the first host country. On the other hand regionalization is a strong pattern across countries, since most mobility students go to neighbour countries. Only developing countries send their students to developed ones being not in the same region. In addition, new student flows have appeared with strong incidence in the near future. These new flows come from Asia and in particular China and south East Asia. Both a strong increase in the regional mobility around China and an increase of south East Asian student mobility will need a new strategy regarding EU mobility. There are more opportunities for EU students to get to know and experience higher education exchanges in Asian countries and also there is an increasing demand in training and education from these countries.

The fact that aquaculture in Asia and specifically in China has different characteristics and features, new opportunities for mobility among students, professionals and trainers will be opened. The experience of Europe in harmonizing and developing mobility frameworks, may help in designing a new global strategy in mobility

4. New Generic Skills and Competences Approaches in Europe

INTRODUCTION AND STATE OF THE ART IN GENERIC SKILLS – general EC level
The European Commission recognises that both labour markets and the skills people need change ever faster, and that we must anticipate future needs and respond by enabling people to develop the right skills. It is anticipated that more and more jobs will require high and medium education levels from the working population. Across sectors, transversal and generic skills will be increasingly valued on the labour market: problem-solving and analytical skills, self-management and

communication skills, the ability to work in a team, linguistic skills and digital competences[1]. To put Europe on the road to recovery from the present financial crisis it is essential to enhance human capital and employability by upgrading skills and ensuring a better match between the supply of skills and labour market demand. Several related factors will stimulate demand for better and better-adapted skills: globalisation and increased international trade, the transition towards a low-carbon economy; the application of new technologies, and changes in work organisation[2].

Such considerations clearly apply to the fisheries and aquaculture sectors. Among the provisions of the European Fisheries Fund, which is a Financial Instrument designed to secure a sustainable European fishing and aquaculture industry, is that all persons engaged in fisheries and fisheries-related occupations may benefit from aid for training and upgrading their professional skills. Member states are required to formulate National Strategic Plans[3], which should include consideration of "preserving human resources in the fisheries sector, in particular through upgrading professional skills, securing sustainable employment and enhancing the position and the role of women"[4].

STATE OF THE ART IN GENERIC SKILLS – University level
The Bologna Declaration and Lisbon Strategy have stimulated extensive discussion of generic skills training and it is possible to quote only a few examples. The 2006 workshop held in Brussels by the European Universities Association, which focused on doctoral programmes, emphasised the role of generic skills training in preparing students for employment, and in making them more aware of the skills they acquire. It identified examples of good practice (such as summer schools and specialised training centres within universities), outlined the scope of generic skills training, and highlighted the potential role of industry in assisting academics with provision of generic skills training[5].

Several publications of the COIMBRA group of universities address generic skills training needs. They state that "there is a need to strengthen the employability aspects at doctoral level and stress the generic and transferable skills obtained" and that "One important aspect of quality mobility is the opportunity to foster multilingual skills and thereby contribute to a growing sense of European citizenship"[6]. They also point out that apart from acquiring new knowledge and skills, students have to be trained as responsible individuals and mature citizens, thus ensuring that future graduates have the skills and the knowledge to contribute to the development of the societies they will enter[7]. Employers look for more than "employability" skills, notably they look for "attitude", i.e. things like enthusiasm, flexibility, initiative and confidence[8].

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The above-mentioned considerations apply as much to the fisheries and aquaculture sectors as any others. Typical generic skills training provisions at postgraduate level include data handling, statistics and other research and generic skills. Preliminary results from questionnaire surveys within the current project indicate that students recognise the value of a range of generic skills, including Statistical methods, Knowledge of English (if not first language), Scientific writing (papers, theses, abstracts, essays), Office software (word processing, e-mail, spreadsheet, presentation),

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[1] http://ec.europa.eu/education/news/news1110_en.htm
[2] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS:
New Skills for New Jobs Anticipating and matching labour market and skills needs {SEC(2008) 3058}
[3] http://ec.europa.eu/fisheries/cfp/structural_measures/arrangements_2007_2013_en.htm
[4] COUNCIL REGULATION (EC) No 1198/2006 of 27 July 2006 on the European Fisheries Fund
[5] EUA-BFUG Doctoral Programmes Follow-Up Project, Report from the workshop on 23 – 24 March 2006, Brussels
[6] Coimbra Group comments to the European Commission's Green Paper on Learning Mobility of Young People, December 2009
[7] The Coimbra Group and European Higher Education after Bologna 2010: Position Paper, March 2009
[8] Personal communication

Experimental design, Oral presentation, Critical review and Team working. However, it is sometimes overlooked that fisheries and aquaculture are multi-disciplinary sectors and that, for example, fishery scientists can benefit from an understanding and awareness of economic and social sciences as well as biology and applied mathematics. Understanding of other disciplines is perhaps almost as important as understanding other languages.

5. Learning innovation in higher education

INTRODUCTION
This report addresses the 'state of the art' of Information and Communications Technologies (ICT) use in teaching and learning in higher education, particularly in the field of aquaculture, fisheries and aquatic resource management. The increasing power of computers and particularly their interconnections through the Internet, is changing the social and economic landscape and presenting new opportunities and challenges for learners, educators and academic institutions. The opportunities for higher education institutions to use the Internet and digital tools to reach out to both on-campus and a wider constituency of off-campus students have increased enormously. At the same time, education is now framed within a wider policy of support for lifelong learning that encourages wider access to education and places new emphasis on the value and role of informal and non-formal learning, especially in the context of continuing adult education.

STATE OF THE ART IN LEARNING INNOVATION – general EC level
The European Parliament identified in 2006 key competencies "which all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment."
1 Communication in the mother tongue
2 Communication in foreign languages
3 Mathematical competence and basic competences in science and technology
4 Digital competence
5 Learning to learn
6 Social and civic competences
7 Sense of initiative and entrepreneurship
8 Cultural awareness and expression

The key competences are all considered equally important, because each of them can contribute to a successful life in a knowledge society.

   "Digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet."

A progress report by the Commission in 2008[9] reported that the impact of ICT on education has not been as great as expected and that much of the potential to develop a learning continuum supporting lifelong learning has not yet been realised. Nevertheless there are many examples of innovative and best practice, and the EC is supporting further development through the Lifelong Learning Programme (Key Activity 3: Information and Communications Technologies).

STATE OF THE ART OF LEARNING INNOVATION – University level
The traditional roles of higher education are being challenged. The role of academic institutions as guardians and deliverers of knowledge (through lectures and library collections) is under pressure not only by the open-access to other institutional providers but also the increasing volume of user-

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[9] Commission staff working document: The use of ICT to support innovation and lifelong learning for all – A report on progress SEC(2008) 2629 final

generated materials available. In addition, the role of intuitions as setters and validators of standards in education, is challenged through increasing internationalisation of standards and the development of validation systems that do not equate qualifications with having undertaken formal courses. Current institutional models will perhaps become increasingly unsustainable, and both institutions and individual lecturers will have to re-evaluate their role, the value they can add, and how their activities can be financially rewarded. Nevertheless, EC policy stresses the importance of higher educational institutions, seeing them as critical partners in bringing about the knowledge driven society envisaged by the Lisbon Declaration. A key component of this is undoubtedly the direct contact that students have with cutting-edge research and the spirit of enquiry which is central to the innovation process. Much of this comes through face-to-face contact in lectures, seminars and supervised projects. Indirect contact through written materials and indirect communications has often been perceived as less engaging and therefore second-best by both students and teachers, perhaps accounting for the relatively slow uptake for ICT identified by the 2008 Commission study. However, most universities are continuing to implement institutional-level learning management systems and these are having an increasingly important role in delivering student support (including access to learning materials) and maintaining quality. They are also providing a range of Web 2.0 style tools for more innovative teachers to explore. In particular there is growing use of video conferencing to broaden participation in learning (e.g. to make lectures accessible in remote locations, or to bring remote teachers or experts into the classroom). The recording of lectures (either video or as audio podcasts) is also becoming more common, allowing students to review lectures, or access them remotely. The sharing of teaching materials more broadly between institutions or on open-access platforms (for instance MIT in the USA and Open University in the UK, or services such as YouTube EDU or Wikiversity) is receiving greater attention with considerable debate about the protection and valuation of intellectual property rights verses the desire to make learning as accessible as possible. Perhaps the greatest rate of change however, is being driven by developments outside of Universities.

STATE OF THE ART OF LEARNING INNOVATION – Communities of Practice
Arguably the most dynamic area for ICT in lifelong learning is the emergence of "Communities of Practice" – loosely organised web-based communities of people with shared interest, willing to learn from each other by sharing knowledge and experience. Such communities lack the structured learning that is provided by formal education, and quality control is dependent on peer review and comment. However, they engage people active in the field and therefore capture a great deal of relevant expertise. Such communities typically use popular Web 2.0 services such as YouTube, Flickr, SlideShare and discussion groups based on the Ning platform or somewhat older Google or Yahoo groups. The involvement of academics and students in these communities is opening up the potential for real integration of lifelong learning in a way that is running well ahead of formal developments in this field.

6. Lifelong Learning in Europe

INTRODUCTION
Education and training are essential to the development and success of today's knowledge society and economy. EU education and training policy has been given added impetus since the adoption of the Lisbon Strategy in 2000, the EU's overarching programme focusing on growth and jobs. Knowledge, and the innovation it sparks, are the EU's most valuable assets, particularly as global competition becomes more intense in all sectors. The EC now recognises that *Lifelong Learning* must become a reality across Europe. It is key to growth and jobs, as well as to allow everyone the chance to participate fully in society.

STATE OF THE ART IN LIFELONG LEARNING – general EC level

EU member states and the European Commission have strengthened their political cooperation regarding lifelong learning. This has been done through the Education and Training 2010 work programme launched in 2001 and its follow-up, the strategic framework for European cooperation in education and training ("ET 2020") adopted by the Council in May 2009.

The strategic framework identifies four long term strategic objectives:
   1. Making *lifelong learning* and mobility a reality;
   2. Improving the quality and efficiency of education and training;
   3. Promoting equity, social cohesion and active citizenship;
   4. Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training.

To improve participation of all European citizens in lifelong learning programmes, and to allow transfer, recognition and accumulation of individuals learning outcomes achieved in formal, non-formal and informal contexts, the EC proposes the establishment of a European Credit System for Vocational Education and Training (ECVET) (June, 2009) (2009/C 155/02).

STATE OF THE ART IN LIFELONG LEARNING – University level

End 2008, the European University Association (EUA), an organisation representing more than 800 universities across Europe, has launched the first European Universities' Charter on *Lifelong learning*. The Charter is based around a series of 10 commitments from universities in addressing the development and implementation of *lifelong learning* strategies, with a set of matching commitments for governments and regional partners to make. It calls on universities to make 10 clear commitments to *lifelong learning*:

1. Embedding concepts of widening access and lifelong learning in their institutional strategies;
2. Providing education and learning to a diversified student population;
3. Adapting study programmes to ensure that they are designed to widen participation and attract returning adult learners;
4. Providing appropriate guidance and counselling services;
5. Recognising prior learning;
6. Embracing lifelong learning in quality culture;
7. Strengthening the relationship between research, teaching and innovation in a perspective of lifelong learning;
8. Consolidating reforms to promote a flexible and creative learning environment for all students;
9. Developing partnerships at local, regional, national and international level to provide attractive and relevant programmes;
10. Acting as role models of lifelong learning institutions;

The EUA Charter also calls for concerted action from governments in providing the appropriate legal and financial frameworks to develop lifelong learning. It matches the 10 commitments from universities with an equal number of desired commitments for governments. These include: promoting social equity & an inclusive learning society; including lifelong learning objectives in national QA systems; recognising prior learning; removing legal obstacles that prevent potential learners from responding to LLL opportunities, ensuring the necessary university autonomy & incentives for universities; and acting as role models in relation to their own employees.

7. Linguistic Diversity/Multilingualism in Europe

INTRODUCTION

Since 2003, the EU Action Plan for mobility (2000/C 371/03) has prioritised the need to develop multilingual skills, as the ability to work in a multilingual environment is essential to European economic competitiveness. A specific objective is for every EU citizen to speak at least two foreign languages in addition to their native language, as knowledge of languages improves job prospects, communication and understanding. In its "*Key Competences for Lifelong Learning*" (DG Education, 2007), communication in foreign languages was placed as the second most important skill. Yet lack of language skills continues to be "a major barrier" to student and staff mobility within the European Higher Education Area (Trends V, p.43).

STATE OF THE ART IN LINGUISTIC DIVERSITY/MULTILINGUALISM – general EC level

To help overcome that obstacle, the Multilingual Portfolio was created on 1 January 2007, with its main objective, with the remit to develop a coherent and comprehensive language policy, to define the contribution of multilingualism to economic competitiveness, growth and better jobs; lifelong learning and intercultural dialogue; aiding European political dialogue through multilingual communication with the citizens. Several important initiatives have been created by Commissioner Orban, including the Multilingual Strategy Paper (COM(2008)566).

STATE OF THE ART IN LINGUISTIC DIVERSITY/MULTILINGUALISM – University level

Student mobility is a major aim of the European Higher Education Area (EHEA). "*Mobility shall be the hallmark of the European Higher Education Area', because, among other positive values, it 'encourages linguistic pluralism, thus underpinning the multilingual traditional of the EHEA*'.

The Multilingual Strategy Paper (COM(2008)566) suggested that higher education institutions play a more active role in promoting multilingualism among students and staff as well as the wider local community. The trend in non-English-speaking countries towards teaching through the medium of English instead of through the national or regional language may have "unforeseen consequences" for the vitality of those languages. This is a trend which has been highlighted by the enlargements in 2004 and 2007, and the official languages increased to 23. This has made the linguistic challenge greater than ever.

STATE OF THE ART IN LINGUISTIC DIVERSITY/MULTILINGUALISM – AQUA-TNET

The Multilingual Strategy Paper (COM(2008)566) also states that *"A better understanding of the potential of new technologies to attract and train language learners is needed".* A European-wide study on the provision of language in marine science institutions showed that students would welcome more online provision of language learning. To meet this new challenge, WP7 is using materials from an EV Leonardo da Vinci project, PESCALEX, which has developed inter-linked online language learning modules in English, French, Greek, Hungarian, Norwegian, Polish, Spanish, Turkish which will open up a wider range of opportunities for short exchanges and/or work experience placements. WP7 is also involved in conducting a more in-depth language needs survey, as well as developing a new language learning game to be used as part of exchange induction procedures.