Anttoni Lehto (ed.)

DEEPENING THE CARPE DIMENSION

TUAS papers from the second CARPE networking conference in Manchester on 4–6 November 2013

TURUN AMMATTIKORKEAKOULU
TURKU UNIVERSITY OF APPLIED SCIENCES

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CARPE

Consortium on
Applied Research
and Professional
Education

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CONTENTS

PREFACE

This electronic publication collects together the papers submitted by the staff of Turku University of Applied Sciences (TUAS) for the second CARPE networking conference. CARPE (short for *Consortium on Applied Research and Professional Education*) is the first strategic consortium in the field of applied sciences in Europe. The biennial networking event in question was organised by Manchester Metropolitan University, taking place in Manchester on 4–6 November 2013.

The collection at hand consists of 14 contributions drawn up for the Manchester conference. The texts vary from scientific articles to co-operation proposals relating to the conference themes:

- Applied Arts
- Continuing Professional Development (CPD)
- Creative Engineering
- Entrepreneurship
- Future of Health Care
- Quality Assurance in Higher Education
- Reinventing the Humanities
- Social Innovation
- Spaces of Interdisciplinarity
- Sustainability.

The papers are arranged theme by theme in the order above, and all texts are marked according to the themes they belong in. The first paper, which was presented to the CARPE Steering Committee during the conference, outlines a more general approach to enhancing project co-operation within the network.

The next CARPE networking conference will be held in Turku in May 2015.

Turku, May 2014

Anttoni Lehto
Research & Development Centre
Turku University of Applied Sciences

TOWARDS HIGH QUALITY CARPE PROJECT PREPARATION

Harri Lappalainen
Senior Advisor

Juha Kääriä
RDI Manager

Turku University of Applied Sciences

INTRODUCTION

During last few years, Turku University of Applied Sciences (TUAS) has participated in several CARPE project preparation processes. We have various experiences, some of them quite good but unfortunately still too many of them being frustrating and leading to an undesirable ending. CARPE is a very young consortium, and now it is time for both constructive criticism and suggestions for paths for better tomorrow. In our opinion, there are two main themes to be discussed:

- **What does our strategic partnership mean for different members of the consortium?**
- **How could we improve the quality of joint CARPE project preparation in practice?**

Our aim is to increase the quality level of joint project preparation to lead into more competitive proposals, smooth project implementation and finally sustainable impacts. Therefore we propose here some concrete improvements grouped under the following headings:

1. Level of involvement of all partners
2. Joint format for presenting project ideas
3. Real and active collaboration in project preparation
4. Project's convergence to partners' curricula

5. More updated information about themes and key persons of CARPE consortium members
6. Resilience in applying external funding
7. Importance of regular thematic CARPE workshops
8. Trust between project partners

1. LEVEL OF INVOLVEMENT

Nowadays, all CARPE partners have rather scarce resources to prepare and plan new projects. Therefore there is a great need to

- concentrate well on all project preparations
- have a tight focus on our basic tasks and selected themes.

Professional level project preparation means that in the **identification** phase joint understanding should be created. *It is highly recommended to have face-to-face meetings with partners already before starting to write the proposal.* Some future challenges are common to all CARPE partners, but there are a lot of issues where the state-of-art varies between countries. Joint need and objective analysis should be created before proceeding in project preparation.

Project planning is largely about the involvement of the all partner organizations. If partners cannot invest some money for travels to prepare joint understanding and form a base for proposal writing, do they have interest and resources to implement the project?

Investing to the project planning is of course a question of money. At TUAS, we see this issue from the perspective of input–output analyses (cost–benefit theory). For a couple of years, we decided to invest our own money to project preparation processes. We have a kind of internal fund from where we can apply for a grant for project preparation (salary, travels etc.). It enables us to concentrate more professionally on preparations we see important to us. At least in our case this ideology works very well and we have received several times more money back from successful applications. The amount of money needed for one project preparation varies typically between 5 000 to 30 000 €.

In addition to monetary aspects, there is also a humane reason for more systematic project planning. Project planning on the side of all other commitments, without chances to mentally invest in the preparation and without money to

meet partners, is really wearing business. This is a vicious circle that leads into even less quality input for daily work of forthcoming project preparations. In worst cases, it may lead into burn-out (this is unfortunately a rather common phenomenon among project workers, a kind of project world's taboo).

2. JOINT FORMAT FOR PRESENTING PROJECT IDEAS

We propose that all CARPE members should use the same format in describing new project ideas. One possibility is to utilise the NABC model. Based on NABC and our internal needs for relevant information, we have developed a Project Idea Presentation Form (Appendix 1). If all CARPE members would use the same format, it would be easy for all partners to present their project ideas and evaluate partners' ideas.

Another option is to use the Logical Framework Matrix[1] to present the intervention logic, indicators, means of verifications as well as the main assumptions and risks of the project. This globally used manner of representation for projects would serve the stakeholders' need for information both inside and outside of the CARPE consortium.

In some cases, project preparation has to be started before funding authorities have released application forms for a certain call. Therefore a joint – and not dependable on the funding source or application templates – way of presenting (preliminary) project ideas is highly recommended to be taken into use in the CARPE consortium.

3. REAL COLLABORATION IN PROJECT PREPARATION

We believe in collaborative project preparation. It means that we should better share responsibilities also in the **formulation** (proposal writing) phase. Nowadays we too often face preparations where the project coordinator is overloaded with work. Free riders are not needed and accepted even in the preparation phase.

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1   Project Cycle Management Guidelines. European Commission. Brussels 2004.

Budget should be finalised after careful consulting of all partners. The coordinator can prepare the common framework for the budget based on requirements set by the funding authority. Drafts and final versions must be available in good time beforehand for amendments and fine-tuning.

4. PROJECTS AND CURRICULA

Innovation Pedagogy is a strategic choice at TUAS[2]. Applying innovation pedagogy in practice means a holistic view to enhance our student's innovation competencies. At least in Finland, there is a lot of discussion related to interlinking teaching and RDI. According to our philosophy, RDI operations and joint projects should be seen as a pedagogical method, just like lectures or other traditional learning methods. Projects are a magnificent learning platform for our students. Therefore we should always define projects' convergence to our curricula already at early phases. CARPE projects are fuel for our engine in applying innovation pedagogy in daily work.

5. INFORMATION ABOUT THEMES AND KEY PERSONS

At TUAS we have defined our strategic focuses for RDI. From our website one can find more precise descriptions of themes with which we are working. There are also bios' of our Research Group leaders as well as lists of group members. This kind of presentation model (or smilar one) would help all CARPE members to find right persons to contact, also in the preliminary phases of project planning.

6. RESILIENCE

Competition is high when applying for EU grants. Overall success rate is rather low and usually less than 20% of all proposals are funded. We should be perseverant and not to give up after one negative result from a proposal

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2   Liisa Kairisto-Mertanen and Harri Lappalainen (2013): "Innovation Pedagogy in Boosting Innovation Competencies in Higher Education." In Proceedings of the European and international Conference LINQ 2013, Rome, Italy, on 16th and 17th of May 2013, pp. 127–134.

assessment. Maybe not always, but at least very often a new Call for Proposals for the same kind of projects is released. Sometimes it takes a year or even two, but the most essential thing is to understand the time frame and intervention logic of EU projects: all projects should be planned to meet the needs of forthcoming years, meaning a period of 5–10 years from today. At most of cases one year's delay should not be a critical issue for implementation. We should more often learn from assessors' feedback, update our plans and try again! All partners involved in the proposal at issue are obligated to participate in the aftercare process but the coordinator of that proposal is in key position in organising the next steps.

7. THEMATIC CARPE WORKSHOPS

It is recommended to have thematic CARPE workshops where joint guidelines can be set. These kind of events – just like CARPE workshops in Hamburg (Environment) and Turku (Active learning methods) in February 2013 or in Utrecht (Entrepreneurship) in May 2013 – are extremely important especially in the transition phase of EU's programming periods. In addition to immediate project preparation activities, preliminary goals can be set to meet the priorities of the forthcoming calls. All CARPE partners should identify and name key persons for different themes (so-called CARPE ambassadors) and thus secure their chances to participate in all thematic CARPE workshops.

8. TRUST

Our last but certainly not least point is trust. Already during the preparation phase all necessary information should be divided between all CARPE partners regardless of their role in the project. There must be full trust between CARPE consortium members.

If our project consortium is enriched with corporate partners, the rules of project preparation should be communicated with companies in advance to enable full information flow between partners. Of course general IPR rules must be respected, but all necessary information (e.g. contents of all work packages) must be available for all partners.

APPENDIX 1: PROJECT IDEA FORM

Project title (working title)	
Duration	**Total costs (estimate), EUR**
Sources of funding	**Application deadline**
Short project description and justification, including especially novelty value and objectives (for more thorough justifications see the fourfold table)	
Keywords	
Project partners (implementers)	
Other partners in cooperation	
Degree programmes related to project	
Publications planned and other dissemination of results	
Project working group (person in charge in bold type) **with contact information**	
Project idea drafter / Date	

Fourfold table of project idea justifications

This NABC (Need, Approach, Benefits, Competition) model is intended for describing a new project idea. Justify your project idea according to the fourfold table below.

Need (which client need the project meets)	**Benefits** (to whom, what sort; assess also from point of view of sustainable development)
Competition (why is the solution offered by the project better than others?)	**Approach** (methodology of the project)

PHYSICALITY: EMBODIED ACTS & MEDIATING TECHNOLOGIES

Andy Best-Dunkley
Principal Lecturer (until end of 2013)
Arts Academy

Conference theme: Applied Arts

ABSTRACT

Our current lifestyle is reliant upon media technologies. Our lives are organised through and by technology, such that we can easily forget the importance of physical social interaction and creative, playful activity. Instead of being empowered by technology, humans are enslaved to its seductive powers. Can the creative arts be utilised together with media technologies to empower those on the margins of society?

This paper explores the possibilities for bringing students from different disciplines together to work on creative projects that can have long lasting and meaningful impact on people's lives by approaching the development of new media-based games and performance through an individually focused, participatory design process. Working with people who are excluded from everyday society, such as those with disability or severe illness, students learn to understand and think through the bodies of their collaborative partners.

The projects described illustrate interactive and participative media performance and game-like activities. The embodied act of participation, whether within a small group or on a stage in public, is an empowering cognitive experience for the active participant with long lasting consequences for their mental and physical health and well-being, as well as their self-image in society.

INTRODUCTION

We live in a world dominated by media technologies. We are enslaved to our fetish for the latest shiny gadgets. When our lives are organised through and by technology, are there possibilities for creative actions that use technology for helping, healing and empowering people, especially those on the margins of society? Can artists, designers, health workers and engineers work together WITH *active-ated* participants to create empowering, creative, playful technologies that foster both physical healing and also social interaction and group community?

BACKGROUND

My personal interest in using art and technology skills to work with people outside of mainstream society began in 2008 during a residency at the Lanternhouse arts centre in Ulverston, Cumbria, UK. I was introduced by local musician Alan Fitzgerald to Beaumont School in Lancaster, a high school for students with cerebral palsy. One day when a small group of students came to visit and try out one of my interactive inflatable sculptures, a small smile appeared on the face of one of these students. An unremarkable thing, maybe, but one of the carers told me afterwards that "she never smiles." Something in that experience had touched her, had managed to reach deep down inside and cause a positive reaction.

On their current website Marc Garrett and Ruth Catlow, artists and founders of the gallery and social arts organisation Furtherfield give their vision statement:

> *We believe that through creative and critical engagement with practices in art and technology people are inspired and enabled to become active co-creators of their cultures and societies. We can make our own world – together!* [1]

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1   Furtherfield (2013) [Online] http://www.furtherfield.org/content/about [Accessed February 4 2013].

Yoshihara Jiro, founder of the Gutai (or "embodiment") art movement in Japan stated:

> It is our deep-seated belief that creativity in a free space will truly contribute to the development of the human race.[2]

Looking outside of traditional artistic methods and materials is nothing new in contemporary art. Writing in 1956, Allan Kaprow wrote in response to Jackson Pollack's paintings:

> Pollack, as I see him, left us at the point where we must become preoccupied with and even dazzled by the space and objects of our everyday life, either our bodies, clothes, rooms, or, if need be, the vastness of Forty-second Street. Not satisfied with the suggestion through paint of our other senses, we shall utilize the specific substances of sight, sound, movements, people, odours, touch.

> Objects of every sort are the materials of the new art: paint, chairs, food, electric and neon lights, smoke, water, old socks, a dog, movies, a thousand other things that will be discovered by the present generation of artists. (Kaprow, 2003, p. 7–8)

According to Nicholas Bourriaud, curator and author of Relational Aesthetics:

> The artist's practice, and his behavior as producer, determines the relationship that will be struck up with his work. In other words, what he produces, first and foremost, is relations between people and the world, by way of aesthetic objects. (Bourriaud 1998, p. 42)

For Bourriaud the emergence of a kind of collective online consciousness had influenced artists in their relationships with audiences. Social media has exploded becoming a global phenomenon. After the Edward Snowden affair we are now somewhat more cynical and aware of the dangers entwined with our fully networked world, but we can say that people in general are used to the idea of sharing and collaboration brought about by Social Media, and so the concept of collaborative social art practice is not as alien as it once might have been.

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[2]   January 1, 1955 quoted in *What's Gutai?* Shoichi, H. (2004) Hyogo: Bijutsu Shuppan-Sha.

Shannon Jackson views participatory art practices from the perspective of theatre and performance as well as community and social arts, rather than the narrow lens of the visual art world, which finds it very difficult to accept any work that possibly compromises the authenticity of the singular 'author' through a genuinely collaborative creation process. Jackson draws up what she calls a 'critical barometer' to contrast with critic Claire Bishop's over dominating criteria for art that should be "critical, illegible, useless, and autonomous" (Jackson, 2011, p. 48):

1. Social celebration versus social antagonism
2. Legibility versus illegibility
3. Radical functionality versus radical unfunctionality
4. Artistic heteronomy versus artistic autonomy.

I would argue that, in contrast to traditional visual arts, interactive art and participation in media performance demand an embodied experience. The physical act of *doing* and *being* in a public space leads to an empowering cognitive experience with long lasting consequences for the *active participant*. Within a therapeutic context, involvement in the development of interactive tools and games has the potential to revitalise the healing process, as the patient is no longer just a passive object but an active partner in their own rehabilitation.

In a similar vein, Ivan Illich writes "Tools foster conviviality to the extent to which they can be easily used, by anybody … for a purpose chosen by the user..." In his discussion of contemporary life he continues "the majority of people were certified as unfit for higher grades of enlightenment and had to be discarded as unprepared for the good life in a man-made world". (Illich 1973, p. 22)

For people with disabilities this is the situation they face every day – they are given little choice in where or how they live, what they do, or even if they can work. The disabled person, going about their everyday life, disrupts the rhythm of public space. They do not move at the same speed as the general population. They require lifts, ramps, wider doorways. They move at their own pace and take their space. Why do we not see disabled people out in public, in the shopping malls and on the high street? For many of them, just getting to the city centre is a struggle, as they live in homes that are out of the way, requiring a taxi ride to get anywhere. They may need assistance. Helpers are

hard to come by. The disabled person is constricted to being in public at times that suit others, and in places that are deemed accessible. They are at the mercy of both the architecture of the environment and the whims of other people.

Susan Schweik has researched the so-called Ugly Laws which sought to forbid disabled people to appear in public in various cities in the USA – thereby in many cases restricting their ability to earn a living[3]. The categorisation of ability according to visual appearance is deep-rooted across society. Arthur Franklin Fuller, who was afflicted with chronic illness which confined him to a lying position, wrote in his autobiography: "The pianist could not play nearly as well as I, even in dance music. But these folks have well, normal bodies, and that makes all the difference in the world." In the 21st century the cult of celebrity makes physical beauty even more of a social currency, yet for some, media technologies help to address the balance and empower otherwise marginalised individuals.

The Eye Writer project is a superb example of media technology being used to empower a specific individual, Tempt One, who has the disabilitating motor neurone disease. As Tempt One states:

> *Art is a tool of empowerment and social change, and I consider myself blessed to be able to create and use my work to promote health reform, bring awareness … and help others.[4]*

It is clear that the act of empowerment for Tempt One comes through a combination of access to the technology, the ability to once again create graffiti art, and his possibility to have a presence in the public city environment through the large scale urban projections of his tags. As Rancière illustrates, emancipation can arise through actions and activity which question the roles allocated to us by society. (Ranciere 2011, p. 19–21)

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3   "Be it enacted, that on and after the passage of this act it shall be unlawful for any person, whose body is deformed, mutilated, imperfect or has been reduced by amputations, or who is idiotic or imbecile, to exhibit him or herself in any public hall, museum, theatre, or any public building, tent, booth or public place for a pecuniary consideration or reward, or to solicit or receive charitable relief, or to go from house to house or to stand or display themselves upon any public street or place to solicit or receive alms" A suggested draft of a city ordinance by Charles D. Kellogg c.1891 New York City ordinance, quoted in The Ugly Laws Disability in Public, Schweik, Susan M. (2009) New York: NYU Press.

4.   The EyeWriter Project website. Free Art and Technology (FAT), OpenFrameworks and the Graffiti Research Lab: Tempt1, Evan Roth, Chris Sugrue, Zach Lieberman, Theo Watson and James Powderly. [Online] http://www.eyewriter.org [Accessed June 28, 2011].

Australian Danielle Wilde has researched embodied engagement using various techniques, including "dummy" prototypes of future fictional devices, to help us imagine what technology may become. By using the imagination and creative process, participants in her workshops are able to think freely without the constraints of today's technologies.[5] Wilde has also used LEDs and small lasers to project and magnify movements in a playful way, so engaging the participants in a deeper interaction than just by saying "raise your arm". This is particularly of use for patients recovering after injury or surgery, who need to be encouraged to take regular exercise.

Participatory Design has at its core the principal that the end users should be involved in the design process from the outset. This is in contrast to genius design where the process is led and controlled by design professionals who "instinctively" know what is best for the users. Participatory design itself has come under criticism for the imbalance of power amongst the design stakeholders. One of the responses to this is Participatory Action Research where the motivation comes from within the community itself, with the academic researcher taking the role of facilitator and compiler of the research outcomes. Rob Kitchin has highlighted the problems of exploitation that many people with disabilities feel when confronted by academics working with disability research. Kitchin states that although many researchers have good intentions to "help" the subjects of their research, the "traditional theories of ethical practice failed to consider .... the imbalance of power ... and the privileged position of the researcher". (Kitchin, 2011) Within a multi-disciplinary project such that I am proposing, including artists, therapists and engineers, the possibilities for imbalance of power within the academic team itself are indeed high. Thus the research team must be extremely aware of their responsibility and personal relations with other (less academically skilled) participants and students. It must be remembered that every participant IS an expert in their own life and circumstances!

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5   Dr Danielle Wilde's website [Online] http://www.daniellewilde.com [Accessed October 1, 2013].

RESEARCH TO DATE

My personal research involves using wireless sensors attached to either the body or to objects that are then moved. These sensors can detect movement in various ways. Put simply, any type of movement can be measured depending on the type of sensor used and how the data is collected and measured. I have been working closely with two people who have cerebral palsy, making interfaces that allow them to create electronic sound and music performances. They have had few prior possibilities to make sound or music, although one of them is a great singer and tells fantastic jokes! The collaboration process started with getting to know each other via 'off the shelf' solutions. A midi keyboard and controller were used with Max/MSP and Reason software, so samples and sound parameters could be easily modified. Even at this basic level, the experience of hearing one's own voice played back and modified to create interesting or weird sounds was stimulating for the participants. They were excited to learn to make uploads to the internet and add them to websites such as SoundCloud and Facebook.

Gradually different types of electronic sensors and interfaces were introduced, allowing the participants to experiment and play with sound in totally new ways. It was necessary to develop the electronics so that they would not restrict the users' limited physical movements. Wireless radio, together with Arduino compatible sensor modules has been utilised. The emphasis on hardware development had been on the novel use of existing electronic components. The exploitation of small wireless devices means that the usual restrictions caused by signal wires are removed, and any impediments to the physical body are minimized. The approach used is to concentrate on the movements that the participants are able to make, rather than design an interface that they would have to adapt to. An example is a control interface made as a cushion for one of the participants who can control media and play sounds by shifting her weight as she sits in her wheelchair. The interface is very sensitive, intuitive and fun to use. It can be thought of as a dance mat for wheelchair users, yet it is equally useable by the able-bodied.

FUTURE DEVELOPMENT

Together with Camilla Laaksonen of TUAS Faculty of Health and Well-being, I am in the process of launching a new initiative to develop games and therapeutic exercises, using creative, artistic methods together with various new technologies. Small games or creative exercises shall be developed to act as aids for physiotherapy. Equally, actions that activate participants both mentally and physically can be desirable for groups such as seniors and marginalised youth. We believe that one practical group to focus on would be recently retired people who are still active and mentally aware, but who cannot for one reason or another do some of the activities they used to enjoy, such as knitting, crochet, woodwork and fishing.

We intend to embed small wireless sensors into familiar objects (knitting needles, cooking utensils, tools, pieces of wood, fishing rod, etc.) and then to use movement data sent from these objects to control a virtual interface that would provide creative satisfaction to the users. It can be thought of as game-like, but may also be a stimulating way of passing the time while activating thoughts and developing motoric skills. Alternatively, or in addition, camera tracking techniques may be used, such as Microsoft Kinect or other camera vision technologies. In this case, it is purely body movement that is tracked, not any particular object, which results in a different type of end-user experience. Combinations of both approaches are also possible.

One of our ideas is to create a virtual fishing experience. There already exists a number of American sport fishing style applications based on an arcade-type of experience. We thought that the casting of the line and feedback from fish biting might be an interesting technical challenge to develop. Another proposed idea is using video projection to create fish swimming around the player, who then has to try to catch them. This could possibly be extended to include video projection onto a swimming pool, to encourage people having physiotherapy sessions. It might be possible to develop an interactive game that works in the water.

We also keen to develop the idea of using the metaphor of knitting or crochet to control and create images on a monitor, or to make sound. Rather than making stitches on the screen, it maybe 3D blocks or forms that are manipulated, or the knitting action plays music. Using the already deeply embodied knowledge

of how to knit, the participant can enjoy new musical experiences instead. Similar functionality could be attached to any embodied skill such as using a knife and fork, or various hand tools like a hammer and drill.

CONCLUSIONS

Active participation in media performance is an empowering experience. The possibility to be deeply involved in the development process creates a fundamentally stronger and long-lasting effect on the *active* participant. The therapeutic consequences can therefore be great – for example, speeding recovery time or decreasing the chances of repeat injury.

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DEVELOPING MULTIPROFESSIONAL WORKING SKILLS IN ART AND SOCIAL WORK

Anna Tonteri
Project Planner
Faculty of Health and Well-being

Conference theme: Applied Arts

ABSTRACT

This paper introduces the idea of the project Modelling Multiprofessional Competences (MOMU) which was prepared in 2013 in cooperation with Turku University of Applied Sciences, Manchester Metropolitan University and two other higher education institutions. The project aims to define the competences in multiprofessional teamwork in art and social work. Its emphasis lies on dividing work between professionals while working together with young people and on the definition of genuine multiprofessional cooperation based on experiences from working life. It is important to define the job-specific and transversal skills and responsibilities of different actors in art and social work while working together to reach common goals and to avoid situations where people do not understand the value of each other's expertise.

In MOMU, multiprofessional work is seen as an integral part of basic teaching, instruction and education. In each partner country, lecturers of art and social work, as well as associate partners from working life with long-term experience from work with the youth, are committed to develop and pilot the existing studies of art and social work in order to meet the demands of multiprofessional teamwork in working life.

ART PROMOTING THE WELL-BEING OF YOUNG PEOPLE

Social exclusion of young people is a widely recognised problem in Europe. The EU Youth Report from 2012 calls for youth employment, social inclusion, health and the well-being of young people to be top priorities in Europe's youth policy. The report underlines that the European Union and Member States must do more to support young people, who have borne the brunt of the economic crisis. The situation of young people is extremely difficult in today's Europe. The EU Youth Strategy 2010–2018 proposes cross-sectorial approaches with both short and long-term actions involving all key policy areas that effect and empower young people in Europe. The main objectives of EU Youth Strategy 2010-2018 are (1) to provide more and equal opportunities for young people in education and in the labour market and (2) to encourage young people to be active citizens and to participate in society. The strategy promotes social inclusion and solidarity. Emphasis is placed upon the idea that there must be a greater deal of co-operation on national, regional and local levels. In a rapidly changing world, new methods to tackle and prevent the social exclusion of young people must be created.

Problems that many children and young people are facing nowadays have become more complicated. This challenges professionals working with young people and requires development of new ways of working to support traditional working methods. At the same time there are artists who cannot employ themselves by practicing art and for that reason they need to expand their field of working. Large social and health care sectors offer multiple target groups for artists to use art for enhancing well-being. In order to prevent social exclusion, the need for multiprofessional collaboration is crucial in preventive work with children, young people and their families. More holistic ways to approach young people are needed. Traditional methods and professionals working with one aspect or problem are not efficient and the real issues might not be noticed at all. All children and young people, but especially those who are growing in difficult circumstances, need multiple ways to be seen and heard and to get in touch with their emotions (Terveyden ja hyvinvoinnin laitos, 2011).

The advantages of art and culture in promoting well-being has been recognized in Europe on a political level. For example the EU Youth Report from 2012 states that creativity should be nourished at all levels of education and training, since it represents an important set of transversal soft skills that facilitate the process of learning, the use of knowledge for creating innovation, cultural

participation and the development of entrepreneurial and professional skills. The benefits of creativity in an individual level are associated with the development of personal aptitudes such as problem solving, experimentation, risk-taking and learning from mistakes, use of imagination and hypothetical reasoning, and a sense of entrepreneurship. The Cultural Learning Alliance (2011) has outlined five key research findings from large cohort studies that show that

> *learning through arts and culture improves attainment in all subjects, participation in structured arts activities increases cognitive abilities, students from low income families who take part in arts activities at school are three times more likely to get a degree, employability of students who study arts subjects is higher and they are more likely to stay in employment and students who engage in the arts at school are twice as likely to volunteer and are 20% more likely to vote as young adults.*

STRUCTURING AND EDUCATING MULTIPROFESSIONAL TEAMWORK

There are artists who are willing to work in new kinds of environments. In the field of social work there is a growing will to apply art, but it is not always easy when different professional cultures confront. Artists might feel that they cannot get inside the community of social work professionals, who might be overloaded and feel that collaboration complicates their work. Examples of multiprofessional teamwork done by art and social work professionals naturally already exist, but working practices are not structured. The concept of multiprofessional collaboration is widely used, but not often specifically defined. The essential questions are: How can we clarify the roles of different professionals and structure multiprofessional work when working with young people? And how can we develop education of art and social work students so that their competences for multiprofessional co-operation are enhanced?

The project *Modelling Multiprofessional Competences (MOMU)* responds to these challenges by defining competences and skills needed in multiprofessional teamwork of art and social work professionals and by combining the existing knowhow and perspectives promoting the creation of innovations on the borderlines of art and social work. The project will also define the roles of

professionals and the distribution of work between them. Simultaneously, MOMU affects attitudes to become more favourable towards collaboration. Real dialogue, understanding of one's own skills, and the possibilities of collaboration will play a crucial part in answering future working demands. The idea of the project was developed in cooperation with Turku University of Applied Sciences (FI), Manchester Metropolitan University (UK), University of Tartu Viljandi Culture Academy (EE) and University of Castilla-La Mancha (ES). The project consortium attended to the EU's Lifelong Learning Programme call for proposals in 2013, but the proposal was not accepted for funding in this call.

NEW WORKING SKILLS FOR PROFESSIONALS

The main objective of MOMU is to develop new multiprofessional working skills and environments for professionals in art and social work. These skills will respond to the needs of the European labour market in a rapidly changing society and meet the demands of different client groups. MOMU develops a model for the process of customer-orientated multiprofessional teamwork of art and social work professionals and defines the skills needed in well-functioning and purpose-oriented teamwork. When defining the competences in multiprofessional teamwork in art and social work, the emphasis lies on division of work between professionals while working together with young people and on the definition of genuine multiprofessional cooperation based on experiences from working life.

In MOMU, multiprofessional working is seen as an integral part of basic teaching, instruction and education, keeping in mind that different actors have different goals and priorities and might also mean different things with the same terms. The aim is to reach an understanding between different professions about the skills and processes in well-matched multiprofessional teamwork when working in the field of preventative youth work. For example professionals of social work are used to cognitive working (working with your head) while the artists are used to more holistic working methods (working with your whole body and soul).

The MOMU project aims to develop the studies of art and social work in order to meet the demands of multiprofessional teamwork in working life on the European level. Each partner has working life representatives as

associate partners to guarantee fresh opinions and well justified content to the development of a study module. In each partner country lecturers of art and social work as well as associate partners from working life will develop the module together. Development within the project consortium will be executed in the MOMU lecturer team. The target result is an enterprising curriculum responding to identified labour market demands and needs in multiprofessional teamwork competences. Multiprofessional teamwork skills are needed as part of working life skills already before graduation. Therefore supporting the professional growth and self-reliance of students of social work and art students is the most important goal when considering students as a target group. Preventive work with young people is the targeted cooperational field in working life. The multiprofessional student teams will be testing their skills and abilities with selected youth groups (in close guidance of their instructor and working life contact person). The goals of the youth groups will be set case by case through negotiations with working life representatives.

DEVELOPING STUDIES AND DEFINING COMPETENCES

The major activities of MOMU are: 1) defining preconditions (competences, division of work, process chart) and existing promising practices for successful multiprofessional teamwork between professionals of art and social work, 2) training the MOMU lecturers who will be responsible for the planning and implementation of the MOMU study module, 3) planning and piloting the MOMU study module in partner countries, 4) designing a common European study module based on the experiences and results of a pilot course, 5) modifying and finalising the skill and work distribution definitions and the study module, and 6) disseminating the project outcomes.

Defining preconditions for multiprofessional teamwork starts by collecting existing multiprofessional practices in art and social work, examining the existing definitions of competences in these two professions, and finding out the commonly used working methods when working collaboratively with young people. In order to gain a good perspective of the needs and expectations of the field of art and social work, working life representatives will also be interviewed. These results will be used in the development of a training package targeted to MOMU lecturers who will be participating in the development of the new study module. The conducted research and interviews

will be the core materials when defining the competences of art and social work professionals and the division of work in the context of multiprofessional work with young people.

The study module will be piloted in each partner organisation. The study module will partly have common European content, but in order to demonstrate the flexibility of the structure and content of the plans, the study module will be modified according to each partner country's systems and needs. The basic structure of the study module consists of three different parts: theory, experimental part/method courses and practical training. Theory increases the students' understanding of the field in which they are going to work with young people as a target group. For social work students the definition of art and its context is important and art students will benefit from learning group pedagogy, professional ethics and service systems. Experimental/method studies give the students a chance to familiarise themselves with those useful exercises and art-based methods that have been successful when working with young people. Practical training will be implemented in small multiprofessional student groups that will work on the field in close cooperation with the associate partners. At the end of the study pilot, the lecturers and students from different partner countries will meet in order to share experiences and evaluate the piloted module together.
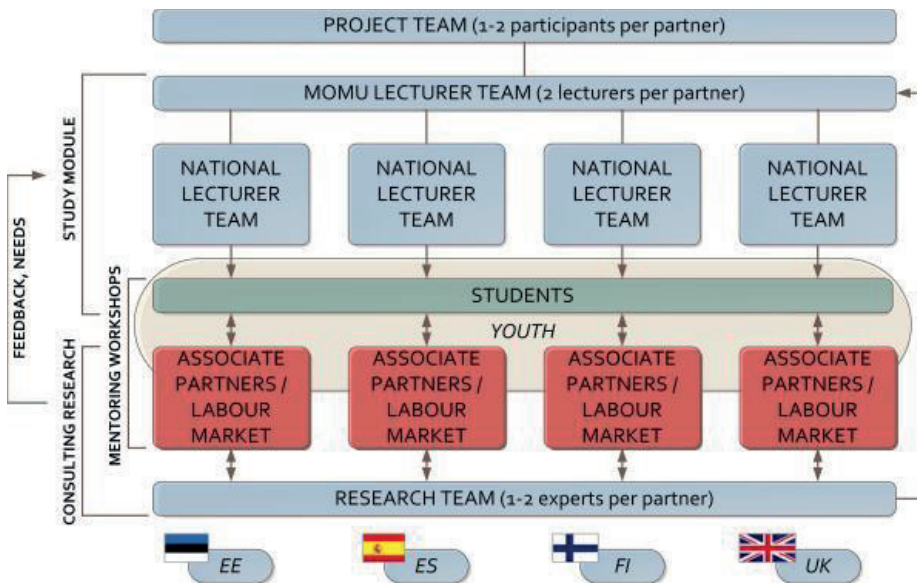

FIGURE 1. *Actors, roles and interconnections in the MOMU project.*

TRAINING FUTURE PROFESSIONALS

Higher education institutes in Europe are the ones to see to the future and to train future professionals to tackle the challenges of working life in the future. In addition to the development of professional and transversal skills of social work and art students, the new MOMU study module will teach them new ways of learning and help them to find and identify their own strengths as a part of multiprofessional team. For the students it is important to realise that they can reach a common goal by working together, making the most of their own knowledge and respecting the skills of others.

The lecturers of social work and art need to develop their own skills to answer the needs of the changing professional roles of the future. To be able to achieve that and to train professionals to answer the needs of working life the lecturers need to change their traditional way of thinking about education as means to one specific profession and also to acknowledge their role in multiprofessional training. For this, MOMU will provide education and training. Training and the practical experience from MOMU will give them new perspective to their profession and also to their essential role as educators.

Working life representatives will be involved in the process of planning and executing a new study module of multiprofessional teamwork in art and social work from first drafting to feedback, evaluation and modification. They can make an effect to the education of future professionals to their specific fields of expertise and they can also gain hands-on experience about the new ways of working through the activities organised to youth groups by the students of partner higher education institutions. The aim is to find all the youth groups from the framework of associate partners. The dialogue between associate partners and partner organisations is the key to a successful and useful end result.

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WELL-BEING IN, WITH AND BY CULTURE – A PROPOSAL FOR COOPERATION

Liisa-Maria Lilja-Viherlampi
RDI Manager

Marja Susi
Lecturer

Arts Academy

Conference theme: Applied Arts

ABSTRACT

In our presentation we will introduce our Research group Arts, Health and Well-being and the theme Cultural Well-being as it is articulated in Turku area multiprofessional discussion among Arts, Health and Social sector. We will introduce some pathways of the theoretical backgrounds and the setting and the main agenda of our group. The main goal in this presentation, however, is to start a discussion about co-operation in CARPE network within this theme. What would be the current issue in Europe that we could work on together? What kind of development task could be found that would be relevant among the partners' RDI interest and the current situation in each country, city and society as well as in different cultural settings?

THE RDI GROUP OF CULTURAL WELL-BEING
AND ITS REFERENCES

The main goal for the research group *Arts, Health and Well-being* in Turku University of Applied Sciences is to outline, develop and strengthen the idea of *cultural well-being* in Turku area and on national level. Within the theme we apply and refine art-based and multiprofessional approaches and working methods in cooperation with various fields of art, health care and well-being. Culture and Well-Being is currently one of the major profiles in Turku area and it was also strongly emphasized in the programme of the Turku Culture Capital year 2011 – *Culture does good!* as it was articulated. Due to this there has now also emerged a coherent and dynamic network of the active developers of this field in Turku area. In this network there are representatives from i.a. City of Turku Recreation division, Turku University, Turku University of Applied Sciences, Turku Health-Care Sector and Arts Promotion Centre Finland.

At Arts Academy, there have been several projects carried out within this context in co-operation with the Faculty of Health and Well-being. For example under the theme Music in Health and Well-being, developing music work in hospital and elderly care settings, there has been three EU-funded projects where the skills for new professional prospects have been created for musicians and music pedagogues. Also the professional role in hospital and elderly care settings of being a hospital musician has been discussed as well as the resources needed (www.musicare.fi).

Another, even bigger branch in our work has been a large Central Baltic-funded project MIMO (Moving In, Moving On!). It provides new methods for multiprofessional teamwork in social and youth work. The methods are developed by using art-based methods and cross-disciplinary teaching in the fields of for example dance, theatre, puppetry, media, nursing, social work and occupational therapy (www.mimo.turkuamk.fi).

The aim of the research group is to work in a cross-disciplinary way, to promote a continuum in the development themes chosen and to implement and implant art-based and multiprofessional working methods in working life settings – and at the same time in the curricula at our university. Study models for continuing education for both the professionals of arts, health care and well-being are important outcomes of the work.

The current main development tasks within the context of our RDI group are

1) developing art-based methods in different contexts, cross disciplinary
2) developing multiprofessional teamwork in using art-based methods
3) promoting arts and art-based approaches in different surroundings and contexts (health care and social work, education, work welfare, work communities, leadership)
4) promoting cultural accessibility and involvement, answering to human cultural needs that exist regardless of different living conditions
5) outlining of the competencies needed to apply arts in different contexts, to use art-based methods and to work in multiprofessional teams
6) working on defining the concepts 'applied arts' and 'art-based methods' in relationship for example to the role of arts as actual purpose or intermediating factor in well-being
7) promoting and applying research about the efficacy of art and art work, i.e. the meaning and potential they are conveying into human life.

In other words, we aim to strengthen the substances and methods that upwell from the co-operation among different branches of art, health care and social sector as the ways to promote health and well-being. We connect the communal and inclusive art work with developing health care and promoting health as well as developing applications for social work settings and work communities. Cultural well-being is also an aspect in audience education, audience development, outreach and community programmes. The goal of the group is to work in a multidisciplinary way to build a continuum of projects and to establish cultural well-being in the learning settings within our multidisciplinary university.

MULTIPROFESSIONAL APPROACHES

Our approach to art and art work is both theoretical and practical. The theoretical aspects arise from the meanings and possibilities of art as a human phenomenon, and the practical points of view illustrate and apply these

qualities. We use the word 'art' in a broad meaning consisting of the variety of creative arts. Turku Arts Academy represents the diversity of arts with its specialization lines: advertising, animation, circus, dance, digital arts, film art, fine arts, journalism, media management, music, music pedagogy, music therapy (until 2013), photography, puppet theatre and theatre.

Our concept of applied arts and art-based methods is based on the essential nature of creativity. Creativity is a way to communicate and interact in life. On the other hand, there is the creative excellence that communicates with its environments – and on the other hand, there is the individual creativity that can find ways to be expressed through art.

Art is a way to express and influence. As an artistic expression a picture, music, dance, drama etc. can have very explicit meanings without them being able to be verbalized explicitly. Experiences of art and artistic interaction can be very comprehensive and socially shareable, yet non-discursive. Art could be seen as a means to see and experience the world. Through it we reflect our perceptions, thoughts, emotions and give forms to our experiences. Art conveys information that could be most significant to the one who expresses or experiences it, yet this information is a sort of 'empty schema' that anyone could fill with his own contents. An artist can provide and share these aspects and attitudes when working in various environments and with professionals from the other fields of working life.

Getting into a dialogue with each other, professionals of health care and social work such as nurses, social workers and occupational therapists can provide artists important information and knowledge about essential issues concerning the work with different groups. What should we know about the target group, their abilities and restrictions concerning age, health conditions, the ethics of the work, legal restriction etc. in order to focus and to set realistic frames to ones' work? Is there something more to learn about the interaction with the client or of group dynamics? How can we combine the professional knowledge we already have and what kinds of things and skills do we share? There have been many interesting and inspiring moments of finding and creating a common understanding of how to structure and try out multiprofessional work with different target groups. How to go on with this?

CURRENT QUESTIONS

One of the most relevant questions now in the knowledge formation and expertise of the theme of cultural well-being is the question of competencies. What kind of skills are needed for the future work in the field of cultural well-being?

How could we raise the knowledge and accessibility of art-based methods in the fields of health care and social care? What are the professional competencies artists need in their future jobs concerning the use of art-based methods?

As an example, in our plan modelling multiprofessional competencies (MOMU) there are three key concepts:

> 1) multiprofessional cooperation
> 2) definition of transversal and job-specific skills
> 3) use of art-based activities.

Within this frame, art represents a source of creative thinking, and the project is meant to create innovations on the borderlines of art and social work. The project is planned to be carried out via six milestones:

> 1) Defining preconditions and existing promising practices for multiprofessional teamwork between professionals of art and social work.
> 2) Training the MOMU lecturers.
> 3) Planning and piloting the MOMU study module in partner countries.
> 4) Designing a European study module based on the results from the pilot.
> 5) Finalising the Process Chart and Description of Competencies and Work Distribution.
> 6) Disseminating the outcomes.

PROJECTS IN OUR RDI GROUP

At this moment, we are in the closing stages of many projects that have created bases for understanding and formulating art-based work in different environments and contexts. We have gained important experience, significant

results and fine networks in applied arts in Finland. As many other developers and researchers, we are now in the situation of seeking for new prospects. On the other hand, the frames for art-based work and applied arts methods in multiprofessional contexts need implanting and validating. So, we need resources for more practice, more experiences and cases of real life and real environments, and on the other hand we need refining and dissaminating the results created so far. There is also a strong need for more research evidence about 'the efficacy of arts', though it is not a phenomenon that can be quantitatively measured. What kind of research design is needed and possible now, and how to organise it? Below is a list of our most recent and on-going projects.

Projects finished, with developing work continuing within these themes:

- Musicare Network / Music and Well-being – ESF (www.musicare.fi)
- A Good Everyday Life for the Elderly – ESF
- Music in Health Settings: training trainers / Music and Well-being – Leonardo TOI (www.musique-sante.org).

On-going projects:

- Care Music − Music work in hospital as a profession – ERDF (www.musicare.fi)
- EldMo − Elderly Move
- MIMO − CB (www.mimo.turkuamk.fi)
- Cultural Access – Turku 2011 funding
- TAIKA [Well-being at Work / Using Art based methods in Developing Work communities and Leadership] – ESF.

Under preparation:

- SAIRAALA SOI! [Hospital sings]
- MoMu: Modelling Multiprofessional Competencies (www. projektori.turkuamk.fi)
- Well-being at Work / Using Art based methods in Organisations
- Puppetry as a Method in Working with Children and Adolescents.

CONCLUSION

This is essentially a proposal for co-operation. Are there similar questions or settings in your organisations? Are you working on project ideas or applications concerning our themes? What kind of synergy could be found? Have you developed study models in applied arts, art-based methods or multiprofessional teamwork? If you have, what kind of needs there have occurred considering RDI work?

We would like to invite you to come along to seek answers also to the questions about the future professions within arts or applying arts. What is the work of an artist, art educator or professional in arts pedagogy like today and in future in Europe? We are also interested in how the concept of cultural well-being is considered and discussed in Europe in working life, social and health sector and educational organisations.

As for our setting in Finland, there is also a strong need to integrate academic research with the practical work on culture, health and well-being – what kind of European research there is or should be about the actual art-based work and multiprofessional teamwork and its impact?

There are also other questions to be answered and found – could art-based methods and multiprofessional teamwork in cultural well-being be the answer?

EUROLTA-EUROVOLT – BRINGING NEW LIFE INTO MULTIMODAL LANGUAGE TEACHING

Marjo Joshi
Lecturer

Mervi Varhelahti
Project Coordinator and Communication Trainer

Development and Administration

Conference theme: Continuing Professional Development (CPD)

THE ELTACS PROJECT

The ELTACS project (European Language Teachers Assessment and Certification Scheme) was a dissemination project funded by the European Commission (LLP). The aim of the project was to update and disseminate the existing European Certificate in Language Teaching to Adults (EUROLTA). Eurolta is an internationally recognised qualification for those who wish to teach modern languages to adults. It is recognised by all member organisations of the ICC (international language association).

BACKGROUND AND NEED FOR THE PROJECT

The changes in the ways of working have led to a new kind of need to be taken into account in language teaching: digital skills in teaching communication skills, language skills and cultural awareness. At higher education institutions (HEIs), we are preparing our students for working life, and studies on future point out the importance of teaching these new skills. The future prospects are that more than a third of the world's workforce (about 35%) was involved in mobile work in 2013 and in the near future, employees will be involved in mobile work over 10 hours/week, utilising communication technologies. Due to these changes it is extremely important to offer the language teachers possibilities for continuing professional development to ensure the quality language teaching that can respond to the needs of working life in both content and methodology.

The need for language teachers to develop their skills in online teaching and working in virtual learning environments was addressed in project Eurovolt as part of Eurolta concept. As a result of Eltacs project, which was a dissemination project of Eurolta, TUAS implemented Eurolta-Eurovolt training, which emphasizes the methodologies of learning-by-doing, collaboration and self-reflection for teaching languages online. Theoretical knowledge is reflected in practical, authentic online teaching activities and creation of online teaching materials. The training offers an opportunity for professional development at work through updating skills and knowledge in three Eurovolt focus areas: Online teaching, Online learning and Planning and evaluation.

The following sections present the Eurolta-Eurovolt Diploma training in more detail and explain how it supports the professional development of language teachers.

EUROLTA-EUROVOLT

Target group

Trainees entering a course to gain the Eurolta-Eurovolt Diploma will be experienced face-to-face language teachers with at least basic knowledge of IT related issues in teaching. They will be familiar with a repertoire of teaching strategies in a face-to-face context and might also have little or wider experience

in IT and delivering courses online. Ideally they will have worked with various groups at different levels in a variety of contexts. The entry requirements to this level are a mastery of the language(s) trainees teach that is appropriate in their working environment. Trainees must also have an adequate mastery of the language in which the training takes place. It is highly recommended for trainees wishing to qualify for a Eurolta-Eurovolt Diploma that they also have experience in the fields other than teaching, as one of the concept areas of Eurolta is VOLL, i.e. vocationally oriented language learning.

Content areas of the training

The training offers an opportunity for professional development in teaching languages online through updating skills and knowledge in the six content areas of the Eurolta framework:

- Language Awareness, such as language use in terms of terminology, pragmatics, grammar and usage of CEFR
- Language and Culture, such as understanding different cultural backgrounds, developing cultural sensitivity and learning about communication in intercultural situations
- Language Learning Processes, such as identifying learner types, recognising learning strategies for adult learners and supporting learner autonomy
- Language Teaching, such as dealing with difficult classroom situations, using blended learning approach and creating motivating, authentic materials
- Planning and Evaluation, such as creating and evaluating lesson and course plans, giving feedback, preparing needs analysis and assessment criteria utilising CEFR
- Self-Assessment and Development, such as micro-peer teaching, continuous self-assessment, self-development and collaboration with colleagues.

All of these content areas are tied into the pedagogy of online teaching, and will give teachers an insight into proper ways of transferring their knowledge from the classroom into a virtual learning environment.

LEARNING OBJECTIVES OF THE EUROLTA-EUROVOLT DIPLOMA

The first focus area is teaching online. This means that after the course the teachers are able to effectively use blended teaching methods or teach using virtual learning environments (VLEs) and illustrate practical skills, knowledge and confidence to incorporate online tools and techniques into teaching languages to adults. They are also able to design online tasks and activities for their target groups using multimedia material and resources effectively, formulating instructions for individual learning tasks as well as setting up more complex activities, such as collaborative group tasks. In addition, they are capable of effectively moderating in an online learning environment.

Secondly, the teachers concentrate on the topic of learning online. Upon successful completion, they are confident with their roles as online teachers, and are able to create a stimulating learning atmosphere, managing and promoting collaborative learning effectively. They understand the principles of learning online and can create materials and assignments accordingly. Cultural awareness is one important aspect of Eurolta concept, and in the diploma training they become aware of cultural aspects of learning online, and can thus incorporate cultural awareness and cross-cultural communication into teaching languages to adults using online or blended learning methods.

The third aspect of the course is planning and evaluation. At the end of the course the teachers are able to produce an effective course design for blended learning or online courses using appropriate tools and techniques. They understand the organisational aspects with regard to context, support and technology, and can choose appropriate methods in the assessment of online assignments/courses.

Finally, throughout the course the teachers follow their own progress through self-evaluation and self-reflection. They are aware of their own strengths and weaknesses in different areas of knowledge, skill and expertise. They are able to reflect on and evaluate their own performance in the online learning environment, to make use of feedback and draw conclusions for their teaching, and can thus identify resources to support them in their further professional development.

PHILOSOPHY

The philosophy of Eurolta-Eurovolt is based on empowering and encouraging autonomy – trainees plan and track their own professional development. It is also competence-based, and teachers show their competencies through a dossier at the end of the course. There is continuing reflection on teaching methods and social roles, and teachers evaluate their own performance as well as give peer feedback. An important factor is transparency of contents, objectives and assessment criteria.

The training is available for all language teachers, despite the language taught. It also cuts across educational sectors and national boundaries, thus making competences transferable internationally and institutionally. Most importantly, the training course emphasizes active participation of trainees and collaborative methods in achieving the objectives.

METHODOLOGY

The teaching methodology on the Eurolta-Eurovolt course is learning-by-doing. It is important that the teachers can put theory into practice immediately, and produce materials that are directly transferrable into their own courses. The teachers also continuously reflect and share ideas, both online and face-to-face, in order to further develop their ideas and online teaching methods and materials. In order to ensure this, the course includes reflection and observation/analysis of teaching online, which is done in cooperation with other course members as a small-scale project work. The objective is to integrate of practical exercises into all stages of training courses, and to help trainees develop strategies to continue their professional development after the training period. Eurolta-Eurovolt Certification In order to gain the Eurolta-Eurovolt diploma, the trainee has to complete contact days, distance work, participate actively and demonstrate understanding and application of the knowledge and skills learnt on the course by submitting the dossier and giving a demonstration online. There will also be a group project. The course duration is 5 ECTS: 5 contact days and distance work (portfolio and dossier). All tasks in the dossier should reflect understanding and ability to apply knowledge and skills of topics covered in the modules; the trainee should be able to explain and justify the choice of methodology and tools used for each task.

CONCLUSION

Experiences of the Eurolta-Eurovolt training are very positive, and language teachers have expressed a need for such training. They have considered the practical aspect of the training very useful, and felt that the results of the course are directly transferable in their own work. They also said it gave them new ideas about theories, methodologies and the possibilities teaching online can offer. Most importantly, they said the collaborative element of the training was invaluable. The training offers a possibility for life-long education and it is hoped that in the future there will be an online community for language teachers in order to facilitate continuing dialogue. The Eurolta-Eurovolt concept offers language teachers in European HEIs an opportunity to create and support quality learning and teaching online using shared approaches.

IT IS TIME FOR A EUROPEAN CPD NETWORK FOR JOURNALISTS

Pär Landor
Senior Lecturer (until spring of 2014)
Arts Academy

Conference theme: Continuing Professional Development (CPD)

ABSTRACT

Continuing professional development has not been an issue in the journalism business. Keeping up with the latest trends have been journalist-individuals' own matter and responsibility. CPD has simply not been anything necessary or interesting to journalists or publishers.

Now the news industry is facing its first paradigm shift. The industry is turning onto digital media surfaces, and the news business desperately needs new business models. This situation urgently calls for CPD for journalists. In the high-stress world of journalism – now also needing to change – the newsrooms have problems understanding that they need CPD, as well as where to find good CPD solutions that would not drain the daily newsroom resources too much.

Journalism schools could play a leading role in creating good CPD platforms for journalists. The Tutka cross-media education environment (www.tutka.pro), at the Turku University of Applied Sciences, could function as one European journalistic CPD milieu.

In this paper, the Degree Programme in Journalism at The Turku University of Applied Sciences invites members of the CARPE network to start up a network for providing quality CPD solutions for journalists.

WHEN EVERYTHING CHANGES – EXCEPT THE WAY JOURNALISTS THINK LIFELONG LEARNING

The journalism industry in the Western world is not only facing its biggest change since it was born. It is erupting into the digital world with its multichannel ways of distributing journalistic work and products. The change is driven by two groups of actors; the advertisers, who want to be where the potential customers are, i.e. online, mobile, in social media, and in any combination of these. The advertising barometer by the Association of Finnish Advertisers is predicting the biggest drop in advertising volume ever for print media in Finland. The advertisers' money seems to be going to digital media (The Association of Finnish Advertisers). The same trend can be seen throughout Europe and Northern America. The second group is the news consumers, who seem to be turning away from conventional print and broadcasting and adapting to mobile platforms and on-demand news consumption.

The journalism industry is facing a total rethinking of its business models. The American media thinker Jeff Jarvis puts it as: "Journalism is no longer in the communication business, but in the relationship business" (Jarvis 2011).

Jarvis suggests a total reinvention of the news business. Journalism should start working like Google does, which would mean managing scarcity, not abundance. The news media should be joining the open source gift economy instead of thinking that it knows everything better than the consumer. Mass communication no longer exists; the mass market is dead, long live the mass of niches, Jarvis says.

Paolo Mancini points out the role of journalism in the democratic society. He states that there is no time for fatalism now, but for a renewed commitment to journalism and its role in democracy – from journalists themselves, and from media managers and policy-makers, all of whom can learn from professional, commercial, and policy developments beyond their own countries. (Mancini 2004).

Journalism schools and journalist educators have started asking themselves where their position is in the huge business transition. At the 3rd World Education Congress in July 2013 in Mechelen, Belgium, one track was dedicated to the theme if journalist educators should be steerers or followers

in the industrial change. The outcome was weak. Anyway, it did not seem very important among the educators to start thinking how they, i.e. <u>we</u>, should change in order to be able to more efficiently serve a totally changing industry.

I participated in this track, and I felt the same confusion as many of my colleagues. Can educators steer an industrial change? If so, then how? News business is hard and severe business, i.e. maximizing the profit for its owners. How can the educators steer anything, while the owners are sketching the road maps? Should not the business set up the road sign before we, the educators, start to educate journalists for the new industry? These and many more questions were asked in the discussion. We did not come up with that many good answers.

Many colleagues also pointed out that we are now discussing the huge change in the journalism industry, and asking ourselves what we can do for them. What we journalist educators do not ask ourselves is how <u>we</u> should be changing in order to be able to serve the tomorrow's journalist industry good professionals.

In Mechelen we did not end up very far from what Jerome Aumenten stated in Nieman Reports, already in 2007: the task faced by journalism and communication schools and departments in upgrading their curricula is akin to training pilots to fly experimental planes that are only partially operational for an aviation industry being totally transformed.

He claims that the journalist educators seem to be lost; some are headed toward wholesale revision of their course offerings; others are choosing to retrofit their existing courses to accommodate the interactive, multimedia world. A go-slower, gradual revision approach might work best for some programmes, or it might simply be dictated by the lack of a budget to do much more. But all agree that new course work is required, so students have a comprehensive, hands-on experience working simultaneously in doing stories for print, broadcast and the web. These skills – taught until recently as separate majors – must be converged in the curricula as they are now being used in newsrooms.

Let me conclude. The journalism industry is changing because both the money and the consumers are turning away from conventional media, and adapting to digital and mobile news platforms. Whether or not print media is dying, or the time for its death, is irrelevant here. The ongoing change, creating new journalist jobs that today's journalist are not educated to perform, is the issue. Every media business, that wants to stay alive in the Western world,

has already implemented myriads of developing projects. Many newspaper businesses have started to realize that they made a mistake in thinking that managing the New News Age is another day at the office, while it de facto is a whole new product, built on whole new business models and whole new consumer behaviours. And of course: carried out by whole new professionals.

At the Turku University of Applied Sciences we feel that the news businesses have been fairly unwilling to ask themselves how continuing professional development among their journalists could fire up the metamorphosis. The reason seems to be the everyday pace in the industry: somebody has to come up with tomorrow's news, while the news companies are adapting to falling advertising income by sacking journalists. And then, of course, the money issue: print papers are still good, although declining, business. You cannot jump head first from that into digital waters without being sure the advertisers' money follows you.

And we, the journalist educators, should not be pointing finger at anybody. We have not exactly been the fastest changers either. We are traditional academics. We are slow. We are thinking inside the curriculum box.

I suggest that the changing news business calls for changed ways of educating journalist professionals, and for a new attitude towards journalist CPD. The industrial change is accelerating, and it is trying to manage with the professionals it has got at the moment. I suggest that the best way of serving the changing news business is to introduce continuing professional development for journalists in the industry.

I build my suggestion on two arguments. First, the speed of the change in the news business calls for very fast educational solutions. The fastest educational solution is to coach pros in the business to better suited pros for the New News World. We have no time to start from scratch, if we, the journalism educators, still want to be helpful to the journalism industry – which is our mandate – in its change. By starting up a European network for journalism CPD, we could be even faster and more efficient. In the era of communication sharing, we should be able to share best CPD practices through our European CPD network.

If we are successful here, the next step would be to spread our best practices into curricula at journalism schools. The CARPE network is a good place to start.

HOW COULD IT BE DONE – CHOOSING A STARTING POINT

At the Turku University of Applied Sciences the journalism students spend a lot of time studying in the the Tutka newsroom. Tutka (Tutka is Finnish for "radar") is a multimedia journalistic news journal, and a journalistic learning environment based on innovation pedagogy. You will find Tutka at www.tutka.pro. A video poster for Tutka is found at https://vimeo.com/65894194.

Tutka is

- an authentic newsroom, in which the students can grow to cross-media journalists by producing online multimedia journalism before a real audience of approximately 14000 consumers a month
- offering a non-stop CPD milieu for professional journalists
- an innovation driven think tank of critical an innovative thinking among teachers, students and CPD journalists.

In the Tutka newsroom the students learn everything from the basic skills of the journalistic production process to more advanced multimedia journalistic experimenting. The Tutka courses also coach the students' journalistic way of thinking as well as teaches them how to handle video, audio, text and still pictures, and any combination of these in a multimedia journalistic context. When the students leave the Tutka learning environment for their internships or summer jobs, they are often asked to be consultants on how the media could develop its digital and multimedia content and news presentation.

During the Tutka courses the students produce news, reports, documentaries, and columns for a real audience. They get feedback from the lecturers, the audience, and from professional journalists. From time to time we bring in professionals to get to know the Tutka environment and to spur the students by giving them feedback.

When the Tutka lecturers discuss current matters in the industry together with the visiting pros, the professionals almost always say that the Tutka environment would be an excellent milieu for their own organization for testing multimedia journalistic solutions or to learn, for example, how to handle videos and audio in a multimedial journalistic way.

We get exceptionally good feedback from the Finnish news industry on the high standard of our trainees and graduates. The media companies are especially pleased with the fact that the Tutka learning environment teaches every student to handle all the ways of journalistic expression you need in a multimedia context, i.e. text, still pictures, video and audio, and any combination of these.

We are being told by the professionals over and over again that one reason why the digital journalistic product is more or less "print online" is that the professionals come from an age where the photographers produce still pictures and videos, the radio journalists the audio, the print journalist the text, and the TV journalists the TV content. Since journalism is a process of refining information, multimedia journalism can be made only if all the journalistic ways of expression is molded together with the journalistic thinking in the same brains of the journalist.

So why does not the news industry in the Turku region grab the chance and throw in some of their pros into the Tutka and update them to multimedia journalists? Probably due to two reasons: the news industry is not familiar with further educating journalists and CPD, since keeping up to date with skills and knowledge for good stories has been the responsibility of the journalist individual. Secondly, as the business cut the number of journalists in the newsrooms, CPD loses the race to tomorrows' news. Or as William Peter Hamilton, the fourth editor of the Wall Street Journal, once put it: "A newspaper is a private enterprise owing nothing whatever to the public, which grants it no franchise. It is therefore affected with no public interest. It is emphatically the property of the owner, who is selling and manufacturing a product at his own risk".

But at some point the journalism industry has to wake up to the fact that the New News World needs new journalists. Let us show them that we are good and ready to face that CPD challenge.

AN EXAMPLE OF A JOURNALIST IN A CPD PROCESS

Let me look at a single CPD definition. The following commonly used definition of CPD was developed as far back as 1986 by the Construction Industry Council (UK). However, Friedman et al. (2000) found that it was still the most commonly cited definition of CPD among UK professional bodies in 1999.

> *The systematic maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for execution of professional and technical duties throughout the individual's working life.*

Within this definition, multiple purposes of CPD can be observed:

- CPD is concerned with maintaining knowledge and skills. More recently, this would be summarised as maintaining one's competence or competencies; in other words, CPD is about keeping up-to-date.
- CPD improves and broadens knowledge and skills; that is, CPD is intended to support future professional development.
- CPD develops personal qualities necessary to execute professional and technical duties; such personal qualities that may be needed to achieve the above two purposes.

This could be a very good start for CPD for journalists. A journalistic CPD method could, for example, look like this:

1. Reflection

"Even though the basic way of journalistic thinking is the same in the New News Age, I don't cope with the digital demands. I cannot produce good multimedia journalism. My superior wants me to join CPD."

2. Goals

"I need to learn some basic coding, and multimedia expression skills; audio, video, still pictures, graphics, and any combination of these."

3. Development Plan

"My plan for achieving these skills is to get good CPD education in any of the journalism schools in the European CPD network for journalists. They all have good learning environments, and I might be able to contribute something to the students, as well."

4. Implementation

"I educate myself. I reflect on what I've learnt, and how it may improve my professional work as a multimedia journalist."

5. Professional Development Record

"I keep record on what I've learnt, and its effects on my work performances. Pluses and minuses. And examples."

6. Reflection and Re-Starting

"I analyse the pluses and minuses together with my superior. What could be done better? How can I now find a new CPD path, and through that improve our multimedia journalistic products? How can my experience be used in order to shape our new business models? Time for a new CPD round from this perspective."

The Tutka learning environment, described above, is only one of a number of qualitative journalistic learning environments in Europe. All good educational practices aiming for the New News World are probably good CPD milieus for journalists. One of the first things every tomorrow's journalist has to understand is the internet – both as a publishing medium, and as a source of news. The internet native generation is only beginning to enter the newsrooms, but being an internet native proves nothing. It is being a journalist mastering the internet, and all the journalistic skills needed in the multimedia world, that makes the difference.

In this context some minor European cultural differences do not hinder a European cooperation around CPD for journalists. The journalist educators together with European CPD professionals have got a golden opportunity to contribute to the New News World. If we believe that the journalists' skills will be the central component for the news industry of the future, we should start creating a CPD network for journalist right away. Thousands of journalists in Europe are in desperate need of learning the multiple skill handicrafts the business seems to be requiring today only.

What we need now is experience and data on journalist CPD making a difference for the news business in Europe. We need it fast in order to show the publishers that CPD is one of the key factors for future success in the industry.

I hope that we could start building a European CPD network for journalists. This network needs CPS professionals as well as journalist educator professionals. The network also needs to be in continuous contact with the news business in Europe.

We probably cannot change the fact that the journalism industry is very journalist individual driven, since you can be the best news journalist without any academic grades. But we can build a network that can show the news business that we will speed up the change, and quality, in the multimedia journalistic business. This, again, must have a positive impact on any news organisations' business performance.

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COMBINING EFFECTUATION AND INNOVATION PEDAGOGY TO ENTREPRENEURIAL LEARNING

Sirpa Hänti
Senior Lecturer

Helena Rantanen
Senior Lecturer

Faculty of Technology, Environment and Business

Conference theme: Entrepreneurship

ABSTRACT

According to European Union Comission study (2012) entrepreneurship education makes a difference. Those students who studied entrepreneurial programmes and activities display more entrepreneurial intentions and attitudes. They get a job earlier after finishing their studies, start more companies and can also innovate more as employees. That is why entrepreneurship should be included in all levels of education, because innovative ways of thinking and acting are the most valuable competences the society expects of graduates.

Finland's Ministry of Education published a report in 2009 about how to work for entrepreneurship in higher education (Korkeakoulupohjaisen yrittäjyyden edistäminen). In this report the writers encourage for interdisciplinary groups and modules to acquire new solutions.

According to the "Oivallus"report (Confederation of Finnish Industries 2011) we will have in the future more tasks that need improvising and working "without notes". The capacity to work in a new way to achieve new or improved solutions is becoming crucial.

Also The Rectors' Conference of Finnish Universities of Applied Sciences, Arene ry, has written recommendations (16.03.2011) on how to develop students' entrepreneurial attitudes. Their objective is that 15% of the students would start to work as entrepreneur on a 10-year time scale. (www.arene.fi)

One promising combination to entrepreneurial learning is the recent effectual logic to entrepreneurial opportunity creation (Sarasvathy 2001, 2003, 2008) and the emerging innovation pedagogy approach (Kairisto-Mertanen et al. 2010, 2011, 2012a) which emphasises the multilevel innovation competences between individuals, groups and networks.

The purpose of this paper is to present the results of a pilot study where the multidisciplinary student-owned firms worked in cooperation with the local innovation centre to develop pre-phase inventions with new entrepreneurs.

This is an exploratory case study and the results are promising from the point of view of entrepreneurial learning and innovation competencies. More cases are needed and broadening the study to international level would be fruitful.

Keywords: entrepreneurial learning, effectuation, innovation pedagogy

INTRODUCTION

According to European Union Comission study (2012) entrepreneurship education makes a difference. Those students who have studied entrepreneurial programmes and activities,display more entrepreneurial intentions and attitudes. They get a job earlier after finishing their studies, start more companies and can also innovate more as employees. That is why entrepreneurship should be included in all levels of education, because innovative ways of thinking and acting are the most valuable competences the society expects of graduates.

The "Oivallus" report (Confederation of Finnish Industries 2011) divides the working tasks in the future to three different categories:

> 1) tasks where both the objectives and methods are defined beforehand
> 2) tasks where the objectives are defined beforehand, but the methods the person can decide him/herself.
> 3) tasks where both the objectives and methods are open; they will be defined later during the working process.

There will be continuous improvement and creation of new methods and innovation. In the future, we will have more tasks that need improvising and working "without notes". The capacity to work in a new way to achieve new or improved solutions is becoming crucial.

Ministry of Education of Finland published a report in 2009 about how to work for entrepreneurship in higher education (Korkeakoulupohjaisen yrittäjyyden edistäminen). In this report the writers encourage for interdisciplinary groups and modules to acquire new solutions. They also mention that the first phase in the entrepreneurship education is to support the student's identification as entrepreneur. That is why we must offer them processes where they can find the best possible solution for their own pattern for working in entrepreneurial ways. After this identification the students start the innovation process, where they seek, create and recognise opportunities.

The Rectors' Conference of Finnish Universities of Applied Sciences, Arene ry, has written recommendations (16.03.2011) how to develop students' entrepreneurial attitudes. The main objective is that after their studies in universities of applied sciences all the students would have adopted entrepreneurial attitudes (intrapreneurship) and 15% of the students would start to work as entrepreneur on a 10-year time scale. (www.arene.fi)

A practice-based approach to entrepreneurial learning is needed and one promising combination to this challenge is the recent effectual logic to entrepreneurial opportunity creation (Sarasvathy 2001, 2003, 2008) and emerging innovation pedagogy approach (Kairisto-Mertanen et al. 2010, 2011, 2012a) which emphasises the multilevel innovation competences between individuals, groups and networks.

The purpose of this paper is to present the results of a pilot study. In this study the multidisciplinary student owned firms – consisting of engineering and business students – co-worked with the local innovation centre and a pre-phase new firm. Together they estimated possible production methods, tested materials and looked for distribution channels for a new innovative product.

THEORETICAL BACKGROUND

In more traditional learning approaches the goals of learning are set beforehand and are made visible at least in the general level in the curriculum, but also in a detailed manner in the implementation of the single course or module. This has been the pedagogical approach in universities for a long time (Dew et al. 2009). Recently, these learning goals are attempted to be expressed also in the form of competences which should not only be repeated to existing knowledge but they should be innovative and entrepreneurial (Kettunen et al. 2013). The traditional view to learning can be connected with causal logic which is based on the premise "to the extent we can predict the future, we can control it". The quite recent effectual logic is based on the premise: "To the extent we can control the future, we do not need to predict it" (Sarasvathy 2008, 17). The latter is parallel to the third view of future working tasks (Oivallus) where both the objectives and methods are open; they will be defined later during the working process. Effectuation logic leans on the means available for the entrepreneur to be used in interaction with other people to gain effectual stakeholder commitment which can result in new means as well as new innovations. This can be seen also as an entrepreneurial cycle of learning by doing or "learning by effectuating". The next figure describes the effectual process in which new means and innovations are essential part of contributing to entrepreneurial enhancement – learning and the creation of new firms.
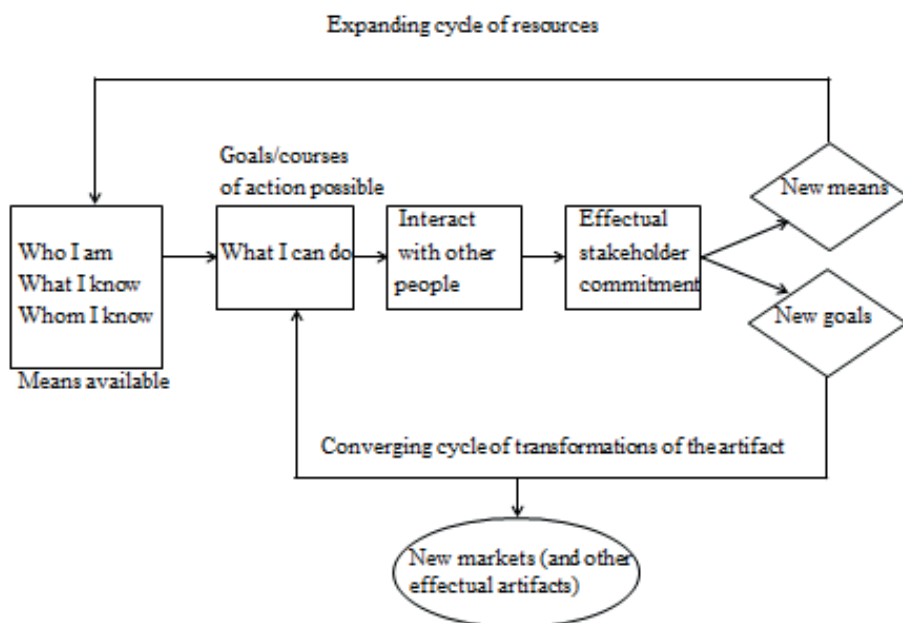
FIGURE 1. *Dynamic model of effectuation (Sarasvathy 2008, 101).*

According to Sarasvathy (2008, 73) effectuation "begins with a given means and allows goals to emerge contingently over time". The important base of this is the interaction and dialogue between individuals, groups and institutions which are the possible stakeholders to be committed to process. Effectuation theory is structured to six elements: 1) starting with means rather than ends 2) affordable loss rather than expected return 3) initial customers as partners and vice versa 4) ignoring competition and stressing partnerships 5) fabricating rather than finding a market 6) unanticipated ends as opposed to the preselected goal (Sarasvathy 2008, 33–38).

Innovation pedagogy is defined as "a learning approach that defines in a new way how knowledge is assimilated, produced, and used in a manner that can create innovations" (Kairisto-Mertanen et al. 2010; 2011). Kettunen et al. (2013) divide the conceptual core of innovation pedagogy to interactive dialogue between individuals, institutions and society – which forms the learning space. These reflect the innovation competencies at three levels: individual, interpersonal and networking, and the final learning outcomes results in the ability to participate in diverse innovation processes, as shown in Figure 2.
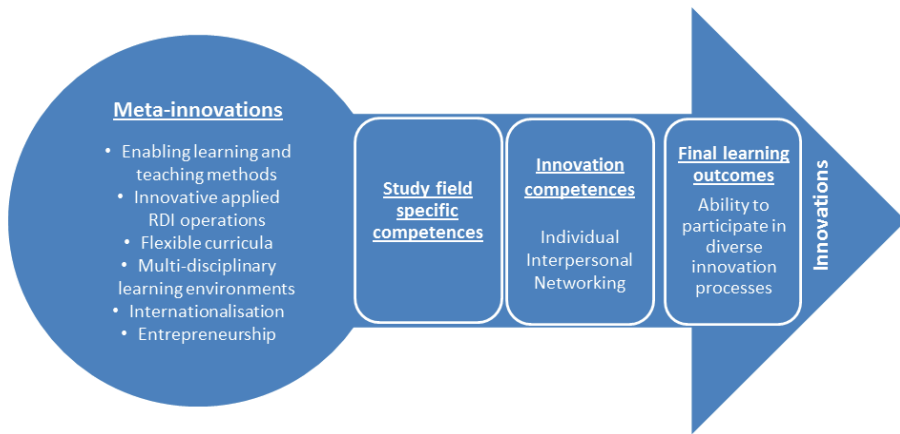
FIGURE 2. *Methods, objectives, and learning outcomes according to innovation pedagogy (Kairisto-Mertanen et al. 2012b).*

Innovation competencies can be divided into three spheres:

1) individual scale
2) interpersonal scale
3) network scale innovation competencies.

The role of individual learning is in forming the cognitive background – e.g. the concepts and basic theories – on the bases of lectures, reports and examinations etc. Argumentative learning, reflection, negotiation, debating or other collaborative learning platforms may be included in the group-based, interpersonal learning. Network learning takes place when the students cross the borders between their own institution and interact with working life and other institutions at national and international level. The examples of network learning are student mobility, entrepreneurship and the projects of partnering companies or other institutions. (Kettunen et al. 2013).

One can find many commonalities between effectuation logic and innovation. First, both concern innovations and the future "ontology" which are not known today. Both are dealing with new means – learning (what I know), interaction and networking with potential partners (whom I know), but also other tangible and intangible assets which become characters of the subject (who I am). Also the outcomes can be common, as innovation processes can – according to Schumpeter (1934) – result in new products, services, production processes,

or even new markets. Also the basic philosophy is the same – entrepreneurial approach to doing things and cooperation with possible stakeholders crossing over the disciplines, industries and national borders. Innovation pedagogy supports both entrepreneurship and internationalization. Comparing these approaches to the distinction of exploitative vs. explorative learning (March 1991), both are more explorative, turning out as risk-taking, experimental, discovering, playing and innovating behaviour. In accordance with these commonalities also differences can be recognised, e.g. the strong cyclical view of effectuation vs. the more linear approach of innovation pedagogy.

METHODOLOGY

This is a qualitative explorative case study which attempts to pilot one innovation project as a learning sphere of combining effectuation and innovation pedagogy to entrepreneurial learning. The pilot project was executed in 2009 in co-operation with The Foundation for Finnish Inventions and their invention development service for private people and micro-enterprises called Innovaatiopaja ("innovation incubator"). The tasks in the project were connected with defining the business potential of an invention or an idea. In practice this turned out different ways of contacting stakeholders to map the opportunities in general, but resulted also as concrete knowledge of pricing, producing, developing the product or idea further as well as sales channels and selling the idea. Data gathering methods included observations and discussions with the students and the representative of the Foundation for Finnish Inventions as well as discussions with the entrepreneur him/herself.

STUDENT CO-OPERATIVES

In Turku University of Applied Sciences, student enterprises, especially co-operatives, are used as a tool in entrepreneurship education. In our own faculty – Technology, Environment and Business (later TEB) – there are 12 student co-operatives. These co-operatives are owned by students, and they carry out different real-life projects for local business life. Participating students are mostly engineering and business students.

The working principles behind these co-operatives have some differences depending on the degree programme where the students are studying, but the basic objectives are the same: to let the students learn by doing, to let them work in more unpredictable environment, to solve real-life problems, to learn communications and organising skills, teamwork and how to organise your own work, but also to get basic knowledge about how to run a real business. At the moment about 200 of these students are working in co-operatives in TEB (in degree programmes like Mechanical and production engineering, Automotive engineering, Professional sales and Business logistics). This is one expression of innovation pedagogy, where one key element is that education should develop skills and attitudes that match with the new requirements of the operational environment. These skills are include creativity and problem-solving skills, preparedness for entrepreneurship as well as tolerating difference and uncertainty. (Kairisto-Mertanen 2011, 8).

All the co-operatives are independent companies with their own premises. They have a managing director, accountant, project managers etc. They pay salaries, taxes and for insurances, make marketing plans, contact local companies and so on.

The number of credits that the student gets depends on how many hours they work in the co-operative. To get one credit unit, the student needs to have 27 hour work, seminars, meetings etc. The students have meetings with teachers and also in multidisciplinary teams in order to take care of administrative tasks and to organise marketing and the implementation of the projects. They also have to search for information independently from different sources and to have courage to contact interest groups, i.e. to find out regulations and other basic information as well as to contact possible customers. They are in close co-operation with local companies and also network with students in other student co-operatives. (Hänti, Kairisto-Mertanen, Kallio-Gerlander, Rantanen 2008)

DISCUSSION AND THE NEXT STEPS

This pilot project showed promising learning outcomes of innovation pedagogy. Although the students felt confused during the project because there were neither explicit goals nor guidelines how the tasks should be done, they found afterwards this kind of innovative approach to learning by effectuating and the

involvement in real life ventures value-creating. Also the entrepreneurs found this co-operation promising, although the experiment was only a short-term project. As Bureau, Salvador and Fendt (2012) recommend, these kind of entrepreneurial learning experiments which are targeted to the mixed audience of small firm entrepreneurs and students might result in more value-creating for the students, faculty members and the external community.

In the future, this pilot project could be widened to become more systematic part of the students' learning approach. This could be executed also at international level so that there would be different universities from different countries which could co-operate in finding contacts and new opportunities for small enterprises, and at the same time the students could try to act and behave effectually as an entrepreneur themselves. This might also work as a template for fabricating one's own business when fostering international trade. To get more experience of this kind of learning which combines effectual entrepreneurial logic and innovation pedagogy together with universities in different areas of Europe, we need more research. For this purpose we have written a preliminary plan for an EU project for piloting this international effectual entrepreneurial learning where all parties – the students and their universities as well as the university staff and entrepreneurs in SMEs – can learn adopting the innovation pedagogy and effectuation logic.

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PROMOTING STUDENTS' AND PROFESSIONALS' SHARED LEARNING BY COMBINING JOURNAL CLUBS AND SIMULATION – AN INNOVATIVE APPROACH

Camilla Laaksonen
Lecturer
Faculty of Health and Well-being
Turku University of Applied Sciences

Hannele Paltta
Degree Programme Manager
Faculty of Health and Well-being
Turku University of Applied Sciences

Marjale von Schantz
RDI Manager
Faculty of Health and Well-being
Turku University of Applied Sciences

Minna Ylönen
Chief Nurse
City of Turku

Taina Soini
Administrative Chief Nurse
City of Turku

Conference theme: Future of Health Care

ABSTRACT

Background

Professionals and students need theoretical knowledge and clinical skills to produce high quality care. Combining journal clubs and simulation in professionals' and students' shared learning is an innovative approach implemented in the NÄYTKÖ project.

Aim

To pilot the combination of journal clubs and simulation in professionals' and students' shared learning.

Method and material

Journal clubs have been a part of the NÄYTKÖ project since 2009. They were combined with simulation in 2013. The participants in the pilot consisted of professionals (n=20) from different fields of nursing. Students (n=8) participated in implementing the pilot as part of their final theses.

Results

Combining journal clubs and simulation was seen to promote theoretical knowledge as well as transition of knowledge into clinical skills. The combination was deemed suitable both for basic nursing education and professionals' continuing education.

Conclusion

Combining journal clubs and simulation is recommended as an innovative approach to promote theoretical knowledge and transition of knowledge into skills. International research collaboration is sought to develop internationally valid, effective learning methods that promote theoretical knowledge and transition of knowledge into clinical practice in different fields of education.

BACKGROUND

Professionals working in the health care field are obligated to provide evidence based practice (Finnish Act on the Status and Rights of the Patient 785/1992, Finnish Health Care Act 1326/2010). Evidence based practice (EBP) consists of three essential components:

> 1. best available theoretical knowledge
> 2. strong clinical skills
> 3. the preference of the patient or customer.

Providing EBP requires skills in critical thinking, setting relevant clinical questions, researching and evaluating knowledge, implementing evidence based practice in collaboration with customers and others involved in the care process as well as competences in evaluating outcomes (Levin 2006).

Skills that are required for producing EBP need to be acquired on an ongoing basis (Goodfellow 2004, Fink et al. 2005, Levin 2006) and innovative learning methods need to be employed. Journal clubs and simulation have been suggested as a way to promote these competences (Fink et al. 2005, Laaksonen et al. 2012a, 2012b, 2013a). It has been brought forward that journal clubs promote critical thinking, setting clinical theoretical questions, searching and evaluating data as well as the implementation of scientific knowledge into clinical practice (Fineout-Overholt, 2006, Steenbeek et al. 2009, Laaksonen et al. 2012a, 2012b, 2013a). Simulation has been reported to promote transformation of theoretical knowledge into skills (Cant & Cooper, 2010, Berragan, 2011, Ricketts, 2011). The responsibility to ensure that professionals are competent to produce EBC rests both on organisations providing care as well as organisations providing education in the health care field.

The NÄYTKÖ project is an example of a collaborative effort by a health care service (The City of Turku's Welfare Division) and education provider (Turku University of Applied Sciences (TUAS), faculty of health care) to ensure the skills levels of clinical practitioners. The project follows the innovation pedagogy approach (Lind 2007, Penttilä et al. 2009, Kairisto-Mertanen et al. 2009) and focuses strongly on developing clinical practice and the working life. Students, professionals and teachers work in close collaboration as partners, and innovative learning methods have been implemented throughout the whole project (Laaksonen et al 2012a, 2012b, 2013a, 2013b).

Journal clubs have been part of the NÄYTKÖ project since the project's outset in 2009. The results of implementing journal clubs in students' and professionals' shared learning suggest that nurses perceive journal clubs as a forum for stimulating discussion, bringing new perspectives and collaboration to their clinical field and practice. Students perceive journal clubs as being quite a demanding and time consuming learning method but also as a method that develops their competences in researching, evaluating and discussing scientific data and implementing their knowledge into clinical questions. (Laaksonen et al. 2012a, 2012b, 2013a). In 2013, journal clubs were combined with simulation (Laaksonen et al. 2013b) in the NÄYTKÖ project to add more substance to the transition of strong theoretical knowledge into clinical skills.

AIM

The aim was to pilot the combination of journal clubs and simulation in professionals' and students' shared learning.

METHOD AND MATERIAL

In spring 2013, a six (6) phase journal club model that previously had been developed and tested in the NÄYTKÖ project (Laaksonen et al. 2012a, 2012b, 2013a) was combined with a new, seventh phase, simulation. The professionals that participated in the pilot consisted of nurses (n=20) working in different health care settings at the City of Turku's Welfare Division. The students' (n=8) were implementing the pilot as part of their final theses.

The main subject of the pilot was developing the care of patients with high blood pressure. The specific topics of the journal clubs were:

1. Discussing sensitive issues and consumption of alcohol (Laine, S. & Laurila, K. 2013)
2. Patient education in medication of patients with high blood pressure (Levonen, R. & Lamppu, A. 2013)
3. The right blood measuring technique (Leppänen, I. & Läntinen, A. 2013)
4. Simulation as a learning method in developing care (Lahtinen, R. & Qvist, M. 2013).

The journal clubs were implemented following the six phases. There were two separate journal club meetings arranged that each lasted for 1.5 hours. The simulation was performed within a month of the journal club meetings.

In the seventh phase, the simulation, the roles of the participants were:

1. the patient (a simulation doll)
2. the nurse
3. the observer.

The participants were told to perform a high quality blood pressure measurement situation. The observer used a check list to assess if the actor playing the role of the nurse managed to perform the essential features of the situation. Also the consistency between the blood pressure values reported by the nurse and the value fed into the simulation doll was estimated.

In its entirety, the model was carried out in the following seven phases:

1. Clinical questions or subjects for the journal clubs are set by following organisational strategies and the nurses knowledge needs.
2. A literature search according to the question or subject is conducted by the students. Main scientific nursing field databases (eg. PubMed/MEDLINE, Cinahl), practice guidelines and other relevant documents (e.g. legislation) are consulted.
3. Evaluation of the quality and relevance of the material found as well as the level of evidence is discussed together with the teacher.
4. Students prepare a written paper based on the knowledge found and evaluated.
5. The nurses acquaint themselves with the written paper as well as reflect on their practice and clinical expertise. Nurses prepare for the journal club meetings.
6. Journal club meeting (1.5 hours). Students present their written paper in brief. After the presentation, a collaborative discussion between the nurses, students and the nursing teacher is conducted.
7. Simulation where the theoretical knowledge discussed in the Journal Club meetings is implemented in a simulated environment.

A semi-structured questionnaire was used to collect preliminary data relating to the nurses' perceptions of the pilot. Perceptions of the students were not collected in the pilot as the students' participated in implementing the pilot. The data collected was analysed using content destruction.

RESULTS

Journal clubs were perceived as a way of supporting previous knowledge, advantageous recapitulation and generating new theoretical knowledge. The journal clubs related to patient education in medication and the correct technique for measuring blood pressure were mostly perceived as supporting previous theoretical knowledge and as important and advantageous replication. The journal club related to discussing sensitive issues and the consumption of alcohol was perceived as bringing new knowledge to several of the participants, and most of the participants reported that they would be interested in implementing the new theoretical knowledge into their clinical practice. Also the journal club regarding simulation as a method for developing care was perceived to contain lots of new and interesting theoretical knowledge. All journal clubs were perceived as supporting the development and implementation of evidence based care.

The combination of journal clubs and simulation was perceived by the participating nurses as a method to promote the transition of theoretical knowledge into clinical skills. Simulation was perceived as a new, interesting method by the nurses and the combination of journal clubs and simulation as a suitable method both for basic nursing education as well as professionals' continuing education.

DISCUSSION

The results of this pilot are in line with previous suggestions that journal clubs support the dissemination of new, research-based theoretical knowledge to clinical practitioners and support the development and implementation of evidence based practice (Fink et al. 2005, Fineout-Overholt 2006, Steenbeek et al. 2009, Laaksonen et al. 2012a, 2012b, 2013a). Also the results of this pilot regarding the perceptions of simulation as a means of supporting the

transition of theoretical knowledge into clinical skills as well as simulation being an interesting and motivating method to learn is in line with previous studies (Cant & Cooper 2010, Berragan, 2012, Ricketts, 2012).

Future research is recommended to test the combination of journal clubs and simulation as reported in the pilot. Also students' and teachers' perceptions should be assessed in the future and more sophisticated assessment tools for assessing knowledge as well as skills should be implemented. Future research combining journal clubs and simulation in different educational programmes and international settings is recommended as internationally valid, effective and important learning methods that promote theoretical knowledge as well as support the transition of knowledge into practice.

Ethical guidelines were followed throughout the process of the pilot. All participants gave their written consent to participate in the pilot. No ethically sensitive issues were identified in this pilot.

CONCLUSION

Combining journal clubs and simulation can be recommended as an innovative approach to promote theoretical knowledge and the transition of knowledge into skills. Further testing is desired to combine journal clubs with simulation, and international research collaboration is sought to develop internationally valid, effective learning methods that promote theoretical knowledge and support the transition of knowledge into clinical practice in different fields of education. International collaborators are warmly welcomed to join the NÄYTKÖ project and participate in further developing and testing combinations of innovative methods.

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PROMOTING MEMORY HEALTH THROUGH ART AND CULTURE

Helena Malmivirta
Lecturer

Suvi Kivelä
Project Planner

Faculty of Health and Well-being

Conference theme: Future of Health Care

ABSTRACT

Art and culture based memory and brain health promotion service models are developed and piloted in EAKR funded Pumppu project, TEHU Turku Region during 2012–2014. The project's aim is to map out a framework for the visual arts, photography, dance and drama based service models in cooperation with the third sector. The target group in this project is 65–75-year-old third age people. They have the opportunity to create creative senior culture, as well as pave the way for new types of arts and culture based health and well-being service models especially in promoting memory function and brain health.

In the first phase of this practical and emancipatory action research and development project, the focus is on designing the framework, piloting the service models, evaluating, analysing the results and constructing the first models for marketing.

The future follow-up project's goal is to expand the framework to multidiscipline and multi-professional cooperation within universities and universities of applied sciences (CARPE) together with the third sector. The aim is to find ways to implement the idea "Art and Culture in promoting brain health" in education, continuing education as well as in training practitioners in health, well-being and arts.

Keywords: memory health, brain health, art, culture, third age people, service model

BACKGROUND

Many adults living their third age may have father, mother, aunt or some neighbour who is living with dementia. They are sometimes worried about their future and maybe having dementia. This worry needs to be noticed. (Halpern 2008; Immonen 2012.)

According to the evaluation of Alzheimer's Disease International, there has been about 35.6 million people living with dementia in 2010, and in 2030 the number could rise up to 65.7 million. In Europe in 2010, there was approximately 7.3 million people living with dementia, and similarly the prognoses are that the number is growing in near future. The constant growth of memory illness is a big concern and challenge for social and health organizations in whole Europe. (Gränö 2010.) There is a special need to develop preventive brain health service models that promote holistic health and well-being and which can support citizens to live active and independent lives and even get resistance against dementia. It is possible to influence the self-care and health behaviour of the third age people with new kind of culture based service models.

Recent studies and the results of several development projects combining art, culture health and well-being have shown the power of art and culture when looking at the effects of human behaviour of the elderly (Lehikoinen & Heinsius 2013; Franklin Gould 2013). It has been shown that art and culture activities have great influence to elderly people living with dementia. There have been remarkable changes in posture, the ability to speak, finding forgotten words, recovering social interaction, being present more actively, being happy as well as in experiencing health and being meaningful person of the society. In several research and studies it has been proved that our brain needs good and suitable nutrition, physical exercise and also cognitive challenged intellectual activities so that the brain can continue creating new cells at any age. (Kramer & al. 2004.).

UNDERSTANDING HUMAN BEINGS

By understanding also third age people as psycho-, physic-, social and cultural human beings we can provide a framework for new kind of working methods with which we can enhance the activity of the brain and memory function.

The frame of this project is a construction of the research of art, education, art education, behavioural sciences and cultural history for creating the model *Art and Culture – keys for promoting brain health and memory function* in cooperation with the third sector actors (visual artist, dancer, actor and occupation therapist). The task was to create group activities where the aim is to provide cognitive ability – especially visual perception, visual thinking, reflective thinking and social interaction and also interactions that awake personal memories and life stories (Arnheim 1974; Dewey 1934/1980; 1997; 2010; Malmivirta 2011).

UNDERSTANDING THIRD AGE PEOPLE AS LEARNERS

The base of planning the art activities interventions of this project was to understand the meaning of earlier human experiences as knowledge (Dewey 1916/1966; Jarvis 1992; 1999; Usher & al. 1997). This implies commitment to pragmatist aesthetics and Dewey's theory of pragmatist arts education with special reference to the principles of means–ends action and sociocultural practice (Dewey 1934/1980; 2010; Malmivirta 2011). During the art activities one is reflecting his/her earlier experiences and one's memory is moving in past–present–future time continuum, where present experiences are reflected very carefully with the past experiences and also with the expectations, hopes and fears of the future. The expectation of one's future is constructed in interaction with the past (Immonen 2013).

Every new experience evolves in the recollection of the past. The past experiences serve the present activity. By bringing into mind the connections of the past situations, one's memory helps to act in new situations in guidance with these past experiences (Dewey LW 10; Malmivirta 2011). In our development and research project, we use old historical paintings, participants' paintings, photos of childhood, memories of childhood surroundings and architecture as well as personal stories for to wake up the past experiences. This kind of memory impulses function as a link between present and future. They help to open new angles to past experiences and to see new kind of possibilities – by understanding that the function of art and the function of the visual brain are one and the same, or at least that the aims of art constitute an extension of the functions of the brain. All visual art is expressed through the brain and must therefore obey the laws of the brain, whether in conception, execution

or appreciation, and no theory of aesthetics that is not substantially based on the activity of the brain is ever likely to be complete. (Zeki 1999; Malmivirta 2013.). Understanding also the biological basis of aesthetic experience (Zeki 1999) we claim that this kind of model including activities mentioned above promotes brain health and memory function and also improves one's ability to keep active. By experiencing art – making art or receiving art – has shown to have straight influences to health and well-being. Art and culture seem to be a special medicine for empowermental work when fighting against dementia.

ARTISTS FOR INNOVATION – ARTISTS IN NEW CONTEXT

It is argued that training artists for innovation is a contribution to the societal and business challenges of today (Heinsius & Lehikoinen 2013). The world economy challenges the structures and the conventions of our society and compels them to change. In order to succeed, organizations need to invest in creative innovation, cultural competencies, emotive knowledge and collaboration as well as in the well-being and the skills improvement of the skilled labor. Artistic and cultural competencies have a significant role in meeting these challenges (Kaunisharju & Niemi 2013, 6).

In this project, different kind of disciplines and also multi-professional team work have met each other in close collaboration: art, behavioral sciences, social sciences education and art education sciences, cultural history sciences – especially seen from the concept of lifelong learning. In planning the curricula for the art activity interventions, we have looked for the core competencies which are needed in constructing the framework for the model *Art and Culture – keys for promoting brain health and memory function*. This competence framework has a special role also as a diagnostic quality assurance mechanism in art interventions processes. The framework can also be used as a systematic scaffold through which work processes in art interventions can be evaluated. It is important to use such diagnostics as a means to keep up the professional standards in art interventions and also to improve different work processes on continuing bases (Lehikoinen 2013). In designing the curricula and pedagogy for the model, we have took into account how to activate cognitive abilities such as visual perception, visual thinking, reflective thinking and social interaction and also interactions that awakens personal memories and life stories.

In human behaviour and growth, art has a remarkable place (Dewey 1996/1925/LW 1; 1996; Malmivirta 2011). When planning art activities and noticing personal life experiences as knowledge and the base of the art activity, the group members engaged very strongly to the meaning giving processes of the art activities. They gave artistic expression to what they had experienced in their lives. Transcending the traditional boundaries of their world for something new has become possible as they have been engaged in artistic activities which have been research oriented and which have helped them to analyse, clarify and reshape meanings of the past life experiences to the present and future.

DESCRIPTION OF THE PILOT

In this pilot project, we have constructed four different models for promoting brain health and memory function in cooperation with the artists of several third sector representatives: Visual artist Satu Mäkipuro, Occupational therapist Hanne Suokas, Dancer Jonna Aaltonen and Actor Tiina Puranen. The models are:

1. What do I want to remember from my life?
   Meaningful life experiences and memories are visualised through the methods of visual art, childhood photos and personal stories for to activate brain and memory function.

2. Yellow cottage and a patch of potatoes
   Meaningful places and surroundings – nature, buildings and environments – are visualised through visual arts, childhood pictures, maps and architecture and with personal stories for to activate brain and memory function.

3. The stage of my memories
   Meaningful memories are visualised through all kinds of old pictures and paper theatre for to activate brain and memory function.

4. Genius Body
   Activating brain and memory function through creative moving and dancing.

FIRST LOOK AT THE DATA

Some of the participants from a group of six members describe their experiences after the artistic intervention of the first model (What do I want to remember from my life?) as follows:

My memory works now! Before participation in the group I said to my husband that I am worried about my memory, but not anymore. […] The art is soothing on the other hand, when you have to think over, ponder and strain yourself, and on the other hand when you think about the brain capacity it refreshes. Before I was not interested in my childhood, now I understand that how big role it has… to defragment. (Lady 1)

I started as a novice, but when we got to experiment with paintbrush to create different colors to clean white canvas, the brush begun to move almost by itself and the excitement was great – almost like a child. (Lady 1)

We added photographs and newspaper clippings to our paintings with decubas technology. The work took with it and I did not even notice to glance at the clock; I was amazed when the project leader Helena told me that the time is at the end. Image selection, layout and highlighting special sections with some color were fascinating. There was lot of pictures to choose from and I had to weed out some of the good pictures as well, because they did not fit into the painting, and it would have been confusing. (Lady 1)

I'm not just thinking about the past and the reminiscence of childhood. First of all, I do not have any proper highlights, but compared in the present day it was safe and filled with work and playing. (Lady 1)

We were at the Wäinö Aaltonen Museum of Art to see Tuula Lehtinen's exhibition. Distinctive feminine works of art. Stunning colors, daring to try out different. I did not know what to think of those art works. Clear landscapes and the flowers were into my mind, as well as the shoes and the blue stuff on the wall. It has required a lot of the patience and the imagination. Vision of what is the end result. (Lady 2)

Above all, the most important thing was our work on display. The result of many weeks of hard work. Was a fun and interesting. Learning new things making art for the first time – confusing. A new way to look and to see. (Lady 2)

The data of the four pilots was analysed during October 2013 – February 2014 and the results were ready in March 2014. The piloted service models were ready in May 2014.[1]

FUTURE PLAN

The future follow-up project *Culture as a key for better brain health* is based on the results of the piloted four models of the *Art and Culture – keys for promoting brain health and memory function* and will be developed further with the participating organizations.

The aims of the new project are:

1. To expand the frame of the piloted and modeled *Art and Culture – keys for promoting brain health and memory function* further (to strengthen the role of cultural history science, physical science and biological and health science etc.) with universities of applied sciences (CARPE) and with the Universities of Turku and Helsinki.
2. To construct the frame of the new project *Culture as a key for better brain health* on the base of the modeled Art and Culture – keys for promoting brain health and memory function.
3. To widen the cooperation with the third sector organizations.
4. To find ways to implement the idea of the expanded service model in education, continuing education and training practitioners in health, well-being and art.
5. To find something new and yet unknown in coming cooperation.

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1   The service models are presented in Finnish here: http://julkaisut.turkuamk.fi/isbn9789522164940.pdf

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HOW TO IMPROVE TEACHER MOBILITY? – DEVELOPING QUALITATIVE TEACHER MOBILITY

Antonella Storti
Lecturer
Arts Academy

Conference theme: Quality Assurance in Higher Education

ABSTRACT

The purpose is to present a simple model that would improve international teacher mobility between partner universities and at the same time function according the quality assurance principles of TUAS. Benefits of international teacher mobility have remained modest in most universities. We have partners around Europe, but we seldom invite exchange teachers to teach. The common excuse is that we do not know our partners' study curricula and their teachers well enough. So occasionally when you get an email offer for a teacher exchange, the courses have been fixed and there is no room to fit an exchange teacher. As we have come across this situation a number of times, we started to think if there would be a way to make teacher mobility more effective and systematic?

First we defined our target: 1) to have continuous teacher exchange which is integrated as part of our study curriculum, 2) to learn more about our partners' study curricula and find best practices which could be adapted as part of our own practices. Then action plan and follow-up how to do everything was made. The process followed the PDCA (Plan–Do–Check–Act) which is an iterative four-step management method for the control and continuous improvement of processes and products.

Cross-cutting issues: internationalisation, transnational collaboration

INTRODUCTION

The teacher and student mobility have been key elements of internationalisation from the very beginning of the Bologna process and the Erasmus programme. However, the mobility of teaching staff has been more or less modest in Finland. The decrease of mobility has been notified by the Finnish Ministry of Education too. A little more than a year ago (2012) in Arts Academy at Turku University of Applied Sciences, we started to think how we could improve teacher mobility. In what way a professional from the partner university could be integrated to our teaching process and how could we all benefit and share best practices we have? In addition, how would we learn more about our partner universities and their professionals? The questions above inspired us to think how to improve teacher mobility[1] and resulted in a simple model via which the mobility of teachers and researchers could become regular.

The well-known fact is that the statement in the bilateral agreement to agree to exchange teachers and researchers in not enough to increase and make mobility systematic. It seems to be obvious there should be a model or frame via which we could learn more about the teachers and study curricula among the partner universities. The paper at hand wishes to present a practical and flexible model that could help to improve mobility of teachers as well as integrate it to the study curriculum in a more systematic way. The model process consists of four elements:

> 1) Planning (setting goals)
> 2) Doing (practical application)
> 3) Checking and assessing (evaluation)
> 4) Acting (improvement).

The four-step improvement method is based W.E Deming's (1986) cycle of continuous improvement. Deming's cycle is the core framework for quality assurance (QA) which is overlapping strategic planning and management. The teacher mobility model has been planned by Ms. Taina Erävaara, head of Fine Arts and Ms. Antonella Storti, International Relations. The pilot model has been put into practice at the department of Fine Arts, Arts Academy at Turku University of Applied Sciences.

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1   Teacher mobility, here, refers to teaching staff, researchers and professionals who facilitate students' learning process. Later only "teacher mobility".

In addition, the purpose of the paper is to give an overall description of Finnish context regarding to the internationalisation of education. Next chapters will give a brief and general background to the internationalisation which can be considered integral part when reasoning the need to increase and improve mobility among teachers. Quality assurance is considered an integral element when developing assessing and improving internationalisation of education. Therefore the developed teacher mobility model will be monitored via the four step improvement cycle.

ON INTERNATIONALISATION

The term internationalisation appeared within the context of higher education in the early 1980s. Nowadays internationalisation and its definitions have broadened to include a wide range of activities in higher education. When internationalisation is understood in broader sense, it can take place between higher education institutions (later HEIs) and individuals working in higher educational institutions. When collaboration takes place across national borders, it includes teaching, studying, learning and research at the HEIs. The key point is how internationalisation influences HEIs activities and how HEIs change their activities in order to become more international. It is crucial how international activities will be integrated with and made part of other activities. (Välimaa et. al 2013:13.)

The justification for internationalisation in Finland is stated already in the legislation where the aim of the degree provided by university of applied sciences is defined. In addition, internationalisation is one of the educational policy goals. In order to promote and strengthen internationality, *Strategy for Internationalisation for Higher Education Institutions 2009–2015* was published by Ministry of Education of Finland in 2009. The purpose for the strategy is to set goals for the internationalisation of the higher education institution system, which is under reform. In the strategy, there are concrete measures and guidelines for internationalisation in a rapidly changing educational environment. The aim is to facilitate mobility and cooperation among higher education institutions. The strategy consists of five primary aims for internationalisation which will be briefly referred below (Ministry of Education, 2009: 10–11).

- A genuinely international higher education community: The Finnish higher education institutions offer in their field of expertise education which provides competence to work in an international environment. Higher education institutions utilise international cooperation opportunities within the EU and Nordic countries. The aim is to increase considerably the number of international teachers, researchers and degree students, and that the working environment has become genuinely international.
- Increasing the quality and attractiveness of higher education institutions: Networked higher education institutions support internationalisation, competitiveness and well-being.
- Promoting the export of expertise: Finnish higher education institutions are reliable partners engaging in mutually beneficial international research, education and cultural cooperation.
- Supporting a multicultural society: Multicultural in the higher education community is supported. Foreign exchange and degree students, teachers, researchers and other foreign personnel are the resource promoting internationalisation at home.
- Promoting global responsibility: Research and expertise are ethical and sustainable.

Beside the strategy referred above, the education policy priorities are outlined in the Government's five-year *Development Plan for Education and Research for 2011–2016* adopted in December 2011. The document refers to the internationalisation of education as a way to be competitive in a global environment. These central documents underline the importance and necessity to have more mobility, to head for genuinely international higher education community, increase quality and attractiveness and export expertise, just to name few factors. These central features prove that Finnish policy makers see internationalisation of higher education as a central aim but also part of improving the quality of Finnish education and competitiveness. The strategy can be considered instrumental as internationalisation will help the Finnish society and education to become more competitive. On the other hand, internationalisation is expected to be included in the strategy of HEIs and follow the guidelines expressed in national internationalisation strategy (Välimaa et al, 2013: 14–15).

TUAS has adopted central features into its strategy from the national internationalisation strategy and the educational policy plan, and the elements have been filtered to the operational level; performance agreement of each faculty, study curricula and implementation plan. Each faculty produces follow-up and evaluation material by reporting and doing self-assessment on their activities, development and results in the strategically important areas.

DEVELOPING QUALITATIVE TEACHER MOBILITY

In Turku University of Applied Sciences, quality is understood as the ability of the university to fulfill its mission in its environment or of a study programme to fulfill its aims. The quality assurance system is an essential tool to develop activities covering the entire operation of TUAS. Continuous improvement is applied in all activities in quality assurance: within research, development and innovation, support processes and education (Kettunen et. al 2010). The definition is parallel with FINHEEC (2010) statement: "[…] QA system refers to the procedures, processes or systems that the HEI uses to maintain and develop the quality of its activities. In accordance with the principle of autonomy each HEI decide independently on the aims, structure, operational principles methods and monitoring of its own QA."

TUAS goals are set in the strategy, action plans, curricula and project plans, and the success is mirrored with the achievements gained. At TUAS, the term quality means supporting and enhancing the implementation of the strategy, action plans and curricula. The quality assurance system is based on a model of continuous development by W.E. Deming. The basic framework of QA is the PDCA cycle with four elements: setting goals (Plan), practical application (Do), evaluation (Check), and improvement (Act). The quality system is meant to ensure continuous development and learning in the organisation via feedback received on activities and results. When planning the model for teacher mobility, the above described method was followed in order to be able assess and improve the activity.

Planning (Goals)

The justification and context for the planning teacher mobility model is stated in Finnish education policy but also in the EU Bologna Process declaration. In Finland, it is assumed that internationalisation is included in the HEIs' strategy and that HEIs follow the general guidelines of national internationalisation strategy. Like other higher educational institutions, Turku University of Applied Sciences has integrated these policy statements to its strategy. From international, educational and research point of view the following aims are named in TUAS strategy (The Strategic Plan of the Turku University of Applied Sciences 2010–2013, 2010.)

> ### Domestic internationalisation as a stepping stone to abroad
>
> *Domestic internationalisation is supported by increasing studies offered in English through the Open university of applies sciences. All degree programmes will include a module on internationalisation so that it can be implemented flexibly as an international educational offering of high quality or as common studies within the degree programme. The number of foreign students and personnel will be increased. International counselling and tutoring will be enhanced.*
>
> ### Strategic collaboration will be increased
>
> *TUAS will deepen its strategic collaboration with Hogeschool Utrecht and, together with business and other institutions in Southwest Finland, broaden its network of strategic collaborators to geographical areas that are important for exports.*
>
> ### Teaching, research, and development activities reach and demonstrate high quality internationally
>
> *The number of international degree programmes will be increased. International initiatives of exporting know-how increase external funding and improve international competence. International professional books and journal articles will be increased.*

The strategic plan states the principles for internationalisation and teacher mobility. It is up to the faculty/department to include into its action plan how and in what way internationalisation will be implemented so that the stated qualitative and quantitative criteria will be met.

Doing (Practical Application)

It has been noticed that when in bilateral agreement there is an agreement on the exchange teachers, the mobility will seldom take place and be systematic. The common excuse for this sporadic mobility is that we do not know our partners' study curricula and their teachers well enough. So occasionally when you get an email offer for a teacher exchange, the courses have been fixed and there is no room to fit an exchange teacher. After experiecing this kind of ad hoc situation a number of times, we started to think how we could improve teacher mobility so that it really would be integrated as part of the study curriculum.

Brainstorming produced two sketches. The first was to realise a course/workshop with a specific theme (like sustainability) which would meet the learning outcomes stated in the study curriculum. A teacher would be in touch in advance with the colleague in the partner university and they would jointly make a draft for one/two week course, including the assignments. Students would get in advance preparatory assignments which would be discussed and treated during the course/workshop. Teachers would agree how they deal with teaching and coaching. The second or alternative model was to offer course content with learning outcomes to be realised by the partner university teachers. The teacher would make a draft for the implementation plan and possible assignments for the students which could be sent in advance. In both cases, the guest teacher's work should meet the minimum criteria stated in the Erasmus agreement.

However, both case models presented above would require contacting the partner university prior the implemented course. In order to learn more about the study curriculum, methods and philosophy of the partner university, one should visit the partner (for instance during the period when your student is on exchange). Therefore alongside modelling – how the teacher mobility would fit to the study curriculum – a check list for a teacher was formed. The check list decribes how to prepare oneself prior the visit and what would be the key points to be discovered during the visit.

- Get in touch with the partner university and ask for the study curriculum and pedagogy in advance or ask for the presentation of the curriculum in situ.
- Prepare a short presentation of own study curriculum and the courses wished to be taught by partner university colleague.

- Observe the teaching and teaching arrangements in host university.
- Assess similarities and differences in the study curriculum and pick some good practices you could assimilate into your own working.

The degree programme manager presented the models and the check list to the teachers and substantiated the importance of improving mobility with the partners significant to the programme profile. The degree programme manager and the teachers agreed on an action plan where the teachers would visit a partner university in order to learn more about them and to agree on the course cooperation. If possible, the aim was to link the visit to the period when one of our own students is on an exchange period in the partner university. The emphasis should be in the strategic partners at the UAS level but also in the key partners relevant to the faculty and degree programme.

Checking (Evaluation) and Acting (Improvement)

In order to develop activities, it is essential to stop and monitor if actions made meet the goals set in the strategy. Does the plan and the check list support and activate teacher mobility so that it results in a more systematic mobility and deepens the collaboration and mutual understanding between our partners? How the course models inspire teachers to do cooperation and how the implementation worked out? How the process and impact results have been documented in business intelligence systems of TUAS? In brief, the purpose is to find out how the modelling process meets objectives set in the strategy of UAS and should it need any improvements in order to respond to the requirements more accurately.

CONCLUDING REMARKS

Teacher mobility is an underused resource especially in the current educational climate which requires us to increase cooperation transnationally. According to the EU and national level policies, special emphasis should be paid into increasing education and research cooperation at the transnational level in order to improve quality and the export of expertise as well as to support a multicultural society and promote global responsibility. The new ERASMUS+ programme, for example, emphasises in the Key Action 2 (Co-operation for Innovation and Good Practices) transparency, innovation and the exchange of

best practices across Europe. The activities supported in this particular action will be very much project oriented and therefore would require us to know more than what is stated online about our partner university. By developing teacher exchange we will get acquainted more in depth with our partner university's pedagogy, methods and specialties. In addition, a guest teacher can give new sights and ideas for the students and teachers during the visit but also get new approaches to be experimented at their home university. When learning more about the study curricula, coaching and teachers of the partner university, there will be a real opportunity to create joint courses and research projects.

At any rate, if we count on only what has been agreed on in the bilateral agreement the teacher mobility will not become as integral part of the study curriculum. In addition, mobility rates wil not increase and we do not learn in depth the expertise our partner has. However, if there is a systematic frame and process how, in what way and when teacher exchanges will take place, there will be a better chance to integrate mobility as part of the study curriculum, develop cooperation and increase mobility rates. A clear and simple model will help us to assess and improve activities and results. The four-step PDCA cycle can be a useful tool in managing the success of the mobility.

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JOINING FORCES IN JOINT PROGRAMMES – CHALLENGES AND CHANCES

Anu Härkönen
Acting International Relations Manager
Turku University of Applied Sciences

Marlies Ngouateu-Bussemaker
Policy Advisor on Education & Internationalisation
HU University of Applied Sciences Utrecht

Conference theme: Quality Assurance in Higher Education

ABSTRACT

In some cases collaboration with an international partner university has turned out to be so fruitful that universities decide to set up a more structural collaboration, leading towards a double degree or a joint degree. In double degree programmes students obtain two diplomas from two different universities, after having spent part of their study programme in each of the universities. In joint degree programmes students obtain one single diploma that is jointly awarded by the universities.

Both TUAS and HU offer double degree programmes and have both recently been looking into 'the rules of the game' involved when offering such programmes. Presented here are some of the procedures and specific requirements as well as the challenges both universities have had to face to assure the quality of the programmes and value of the diplomas awarded, but also the added value of these kinds of programmes. Finally, ideas about developing joint programmes between the CARPE partners are shared.

INTRODUCTION

In 1999, the ministers of Education of all EU countries committed themselves to developing a transparent European Higher Education Area, by introducing a three cycle system of bachelor–master–PhD in higher education[1], as laid down in the Bologna Declaration. At present, the three cycle system is common practice in the higher education sector of most European countries[2]. One of the objectives of the Bologna agreement is promoting international mobility – of students, staff and graduates – which is being sustained by the uniformity of degree programmes. This uniformity also makes it easier for study programmes to exchange the content of their courses, i.e. recognizing the study modules of international partner universities as replacement for part of their own study programme. This makes a valuable contribution to the implementation and expansion of (Erasmus) exchange as well as more intensified ways of cooperation: through double or joint degrees.

In the last decade, double and joint degree programmes have strongly gained popularity among internationally oriented programmes and universities. Universities mostly choose the double degree construction above the joint degree construction, the latter being more difficult to set up because of legal constraints[3]. The CARPE partners TUAS and HU both offer double degrees and have been dealing with questions such as legal requirements and curricula comparison methods when elaborating the concrete details of their double degree programmes. The CARPE network, being a unique and ambitious network of European universities of applied sciences, seems to form a perfect base for developing joint educational programmes and has also nominated it as one of the aims of the collaboration[4].

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1   EUROPEAN COMMISSION (2013) The Bologna Process – Towards the European Higher Education Area. [Online] Available from: http://ec.europa.eu/education/higher-education/bologna_en.htm [Accessed: October 2013].

2   EURYDICE (2010). Focus on Higher Education in Europe 2010: The Impact of the Bologna Process [Online] Available from: http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/122EN.pdf [Accessed: October 2013].

3   INSTITUTE OF INTERNATIONAL EDUCATION (2011) Joint and Double degree programmes in the Global Context. [Online] Available from: http://www.iie.org/~/media/Files/Corporate/Publications/Joint-Double-Degree-Survey-Report-2011.ashx [Accessed: October 2013].

4   CONSORTIUM ON APPLIED RESEARCH AND PROFESSIONAL EDUCATION. (2013) CARPE website. [Online] Available from: www.carpenetwork.org [Accessed: September 2013].

Academics need to be aware, though, of the 'double bottom' when setting up a joint programme: there are many differences in rules and regulations at national and internal level. Looking into these aspects at an early stage will facilitate the process towards a concrete and realistic double or joint degree proposal. The authors of this paper want to share this information with CARPE colleagues at all levels, both academics as well as support staff, to offer them a solid pavement to reach their objectives on the level of joint programmes.

The structure of this paper is as follows: after a definition of *joint programmes* and *double/joint degrees*, the authors explain the added value of double or joint degree programmes. After this, the history of double degrees at HU and TUAS is described and authors share some concrete examples of challenges the universities were confronted with. To conclude, the authors reflect on the challenges and chances for the CARPE network to offer joint programmes and give some concrete recommendations.

THE DEFINITION OF JOINT PROGRAMMES AND DOUBLE AND JOINT DEGREE PROGRAMMES

In this paper we apply the following definitions:

- *Joint programme* is a jointly offered educational programme that may lead to a single, double or joint degree, depending on the agreement that is made on this between partner universities.
- *Double degree programme* is a joint educational programme in which students obtain two diplomas from two different universities, after having spent part of their study programme in each of the universities.
- *Joint degree programme* is a joint educational programme in which students obtain one single diploma that is jointly awarded by the universities: so one diploma with two (or more) university names and logos on it. Also here the student has spent part of the study programme in each of the universities.

THE ADDED VALUE OF DOUBLE AND JOINT DEGREES

Developing joint programmes which are implemented in international cooperation is an important part of international activities of European higher education institutions today. A well-planned double degree programme may:

- bring optionality to studies and complement one's specialisations
- enhance the international experience and intercultural competence
- increase goal orientation in study practices of both incoming and outgoing students
- attract talent and increase the number of foreign degree students and completed degrees
- act as a quality assurance (through benchmarking) for student and teacher exchanges
- develop international content and quality of education
- internationalise the higher education community
- deepen other cooperation with partner higher education institutions
- improve student's position in the (international) labour market and enhance workforce mobility.

The latter, improving position in the labour market, has recently been confirmed by the QS Global Employer Survey Report 2011 in which 60% of the graduate recruiters confirmed that they value an international experience[5].

In order to contribute to development of joint and double degrees through EU funding the Commission will support international HEI consortia to develop joint master degrees through Erasmus+[6].

One of the aims of the CARPE network is to strengthen its members' visibility at European level. Joint programmes under the auspices of CARPE would contribute to this aim.

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5   QS QUACQUARELLI SYMONDS LTD. (2011). QS Global Employer Survey Report 2011: How Employers Value an International Study Experience. [Online] Available from: http://content.qs.com/qs/qs-global-employer-survey-2011.pdf [Accessed: October 2013].

6   EUROPEAN COMMISSION (2013). European higher education in the world. [Online] Available from: http://ec.europa.eu/education/higher-education/doc/com499_en.pdf [Accessed: October 2013].

THE HISTORY OF DOUBLE DEGREES AT HU AND TUAS

In 2007, the Business School of HU and a group of European and non-European universities decided to create a partnership programme[7] aimed at offering chances for students from less developed countries to obtain a European Higher Education. Initially incoming students came for a full bachelor's programme, but at a later stage this was turned into a double degree (exchange) programme, allowing students to obtain a degree after one year of studies at HU degree and giving Dutch students the opportunity of a remarkable international experience and obtain a degree at one of the non-European partner universities. Recently the Business School agreed on another double degree programme with two European partners. Both programmes are liaised with the bachelor's programme International Business and Management Studies (IBMS) and are currently the only double degree programmes at HU.

At TUAS, double degree programmes have a longer history. The first double degree agreements were signed in the early 2000s. They were mostly initiated by the Erasmus partner universities which wanted to deepen the cooperation and attract more exchange students and teachers by offering something more than simple exchanges. Most of the double degree programmes were introduced in the five international degree programmes which TUAS offered at the time.

Currently TUAS has two double degree programmes in the degree programme International Business, one in Hospitality Management, six in Information Technology, three in Electronics and one in Business / Business Information Technology. Some of these programmes are active and have led to student and teacher mobility in both directions. Others have been inactive and some are about to end because project funding is ending.

Both TUAS and HU have in recent years felt the need for formalising procedures concerning double degree programmes. In 2012, the immediate cause for HU was to be able to guarantee the final level of graduates, both for incoming and outgoing mobility. At the time a lot of dispute and upheaval was going on after some cases of Dutch universities (of applied sciences) undeservedly awarding degrees to graduating students.

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7   The Kofi Annan Business School (www.kabsf.org) [Accessed: October 2013].

Even though double degree programmes were implemented at TUAS several years ago, before 2013 there were no common rules at the institution level, leading to a situation where TUAS campuses all had different processes related to double degrees. That is why TUAS decided to run an internal project which focused on institution-wide guidelines for the double degree agreement process.

At HU, a Guideline for International Double Degrees was stipulated by the Executive Board in April 2012. At TUAS, a double degree process guideline was approved by the TUAS board in February 2013.

SOME EXAMPLES OF STEPS TO TAKE: EXPERIENCES OF TUAS AND HU

To give an idea of what to encounter and expect when setting up double degrees, some of the steps to take towards the actual implementation of a double degree are described, divided into three categories: learning outcomes, programme structure and administrative matters.

Learning Outcomes – Curriculum composition and comparison

Both TUAS and HU prescribe that a double degree programme is based on a comparison between degree programmes involved. Curricula of the degree programmes are being compared with each other and a proposal is made on the structure and content of the double degree programme, fulfilling certain quality criteria (competence orientation, clear assessment criteria, study load). HU requires that a yearly review and re-assessment takes place whenever changes in one or both study programmes have been introduced. Regular visits to and from the partner university make part of this process, involving both programme co-ordinators as well as members of the exam board.

Programme Structure – Theses, internship/practical training, planning of exchange and compatibility of programme duration

At HU, all double degree students wanting to obtain a bachelor's diploma need to have their final assessment, i.e. the bachelor's thesis and internship, or one of both, supervised and assessed by HU. It happens that students are staying abroad or already returned to their home university. In that case the supervision and assessment is done through e-mail contact, Skype or other forms of digital communication.

Also at TUAS, a bachelor's thesis must be included in the curriculum leading to a double degree. It is recommended that the thesis is elaborated according to the criteria of one's home institution, but the guidance and evaluation may be realised in both partner institutions. This is also an excellent way of developing and deepening cooperation between colleagues and partner institutions.

A practical training period (internship) is included in both Finnish as well as Dutch UAS degree education leading to a Bachelor's degree. All double degree students must complete a training period either during their exchange at TUAS/HU or during their studies at the home institution. It is essential to agree about details on completing practical training, such as information related to study credits, duration, training location, guidance and evaluation.

In most cases, TUAS students completing a double degree leave for exchange on their third study year, but this may vary depending on the degree programme. At HU, in one case students go abroad in their final (fourth) year, in another in the third year. Either way, at least for these two HEIs, students may leave for exchange only after completing the first study year. At the time of the curriculum comparison and composition, conclusions can be drawn about the best moment to have students leave for exchange. A student completing a double degree completes a minimum of 120 ECTS credits at his/her home institution and at least 60 ECTS credits at the partner institution.

The extent (210 ECTS) of a 3.5-year-long Finnish BBA programme is rather rare elsewhere in the world. In most EU countries the study credit requirements for a Bachelor's degree lasting three to four years are normally either 180 ECTS or 240 ECTS credits. The difference between the extent of the degrees means that a TUAS student may obtain a double degree from a partner institution by completing studies which may include either 30 ECTS more or less credits. However, double degree students must always graduate

from their home institution before they may apply for a degree certificate from the partner institution. Thus, a double degree student will always study at least the minimum amount of ECTS required for his or her home institution degree.

Administrative Matters: Enrollment and tuition fees

Incoming double degree students coming to HU and TUAS on an exchange basis are awarded a special status in order to be recognised as degree seeking students.

The way tuition fees and enrollment of incoming double degree students at HU are arranged depends on whether the double degree programme is based on an exchange agreement or unilateral mobility. In case of exchange – while strictly demanding reciprocity over a period of 3 years – students only pay tuition fees at their home university. In case there is unilateral mobility, incoming double degree students need to pay the regular fee for degree seeking students.

Dutch law does not explicitly mention legal requirements that apply to enrollment and tuition fees concerning double degree students. This has led to clarification demands of the HEIs towards the Ministry of Education and Culture, but not to concrete results yet. Joint degrees requirements – formally possible as of 2010 – are clearer but the (accreditation) process is more difficult and intensive, and therefore most universities still opt for double degrees.

Also in Finland there is some confusion about the law related to joint programmes. The Universities Act and Polytechnics Act, the Finnish legislation documents aimed at Higher Education, are quite vague on this topic. The difficulty arises from the tuition fees that Finnish universities and universities of applied sciences are not allowed to charge at the bachelor level. Students from partner universities do not pay tuition fees at TUAS, but some interpret the law so that it includes also double degree students who must pay tuition at their home university. The Ministry of Education and Culture, however, encourages the Finnish HEIs to create joint programmes.

PAVING THE WAY TOWARDS DOUBLE OR JOINT DEGREES WITHIN CARPE

The International Institute of International Education (IIE) did a survey on joint and double degree programmes in 2011 and asked the HEIs involved to rate the major challenges when setting up these partnerships. The table below offers a good overview of all aspects to consider.

TABLE 1. *Challenges to Setting up Joint or Double Degree Programmes*
(1 = Not Challenging, 4 = Very Challenging).
Source: Survey on International Joint and Double Degree Programs 2011.

Rank	Challenge	Rating
1	Ensuring sustainability	2.85
2	Securing adequate funding	2.80
3	Curriculum design	2.57
4	Legal issues	2.54
5	Recruiting students	2.53
6	Securing support from (inter)national org'ns / gov'ts	2.47
7	Accreditation	2.39
8	Academic calendar differences	2.37
9	Institutional support	2.36
10	Credit transfer agreement	2.36
11	Communicating with partner	2.33
12	Fee structure agreement	2.20
13	Language issues	2.07
14	Degree duration agreement	2.04
15	Double counting of credits issue	1.97
16	Negotiating MOU	1.90

In this chapter the authors will give some recommendations that in their opinion should be considered and worked on before proceeding to the next steps.

First of all, rather than immediately develop a *joint* degree, it would be good to start with a *double* degree programme. Since, apart from the question whether a joint degree would add more value to a students' CV than a double degree, in all CARPE countries double degrees seem to be possible, while joint degrees seem to be more restricted by legal requirements[8].

A second recommendation would be to create a CARPE working group for double degrees and to make sure that for the planning and implementation of a double degree programme the participants have *working hours* and *commitment* to a long process. If it is decided that the programme should be planned, it is essential that the persons in charge have been named and the required working time resources have been reserved for the process at all partner institutions.

Thirdly, it is recommended to pay close attention to the national legislation related to double and joint degrees; even though legal issues and accreditation are not the first and most challenging aspects in Table 1, the authors of this paper consider these aspects to be challenges which should be looked into by priority. This guarantees that there will not be insurmountable obstacles in the implementation of double degree programme in the future.

The fourth recommendation would be to consult – in addition to CARPE partners' own guidelines – guidelines and good practices of other HEIs. The Joiman[9] network (Joint degree management network) and the Consortium for International Double Degrees[10] for example offer instructions and information to HEIs wanting to develop joint programmes. It is not necessary to invent the wheel again as many issues have been tackled already.

The fifth and last recommendation would be to collect information about which partners and which degree programmes are interested in developing double degrees and then to gather representatives of these programmes to a CARPE workshop during which issues related to basic degree requirements in each programme (such as number of ECTS, compulsory courses, practical training, thesis work, national legislation to take into account, etc.) would be discussed.

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8 EDUCATION, AUDIOVISUAL AND CULTURE EXECUTIVE AGENCY. (2013) Joint/double / multiple degrees in European countries. [Online] Available from: http://eacea.ec.europa.eu/erasmus_mundus/beneficiaries/documents/action1/jointdegreeprogrammes_may2013.pdf [Accessed: October 2013].

9 https://www.joiman.eu/ProjectResults/default.aspx [Accessed: October 2013].

10 http://www.cidd.org [Accessed: October 2013].

Even though double degrees are usually issued by only two partners, all five CARPE partners could contribute in the educational programme. Only after this, the work related to curriculum composition, formal agreement, implementation and finally evaluation (in accordance with each partner's quality assurance process) can begin.

In this article we have tried to give an impression of the issues CARPE colleagues can expect to encounter when working towards the development of a double degree. Not to discourage them, but rather to invite them to and make them aware of the importance of involving international relations and legislation experts in the first steps towards a double degree proposal. We look forward to continuing this discussion within CARPE, with those interested in a double or joint degree project!

THE APPLICABILITY OF COMPLEXITY THEORY FOR STUDYING SOCIAL INNOVATION

Harri Jalonen
Principal Lecturer
Faculty of Business, ICT and Life Sciences

Conference theme: Social Innovation

ABSTRACT

Social innovation refers to the novelty in action which aims to satisfy the social needs that would have been unrecognised by commercially motivated actors. Social innovation has conventionally been described as a systemic process aiming at achieving added value for the whole society. By 'systemic' it is meant that social innovation requires several actors from public, private and non-profit sectors, whereas 'process' refers to social innovation being simultaneously both the means and the ends of action. Despite all the promises related to social innovation, the concept and the phenomenon are still relatively under-theorised. Presumably, this is, at least partly, due to that social innovation poses methodological challenges that are not yet fully addressed. The paper explores the applicability of complexity theory *as a useful resource for studying and conceptualising social innovation. By drawing on the concepts, such as emergence, self-organisation, connectivity, diversity, co-evolution feedback and nonlinearity, the paper also proposes some policy implications.*

INTRODUCTION

Social innovation is a positively charged concept. Broadly understood it refers to the novelty in action which aims to satisfy the social needs that would have been unrecognised by commercially motivated actors. Social innovations are valued because they generate societal good in a way which cannot be provided by the market. Finnish school system, for example, has been reckoned as a bundle of social innovations, which produce societal good in a way which cannot be provided by the market forces. Again and again, the Finnish model has been evaluated as one of the most advanced educational systems in the world. Appreciation of and strong confidence in teachers' profession, pedagogical and didactical methods based on equality, early intervention for learning difficulties, subsidiarity principle in administrative decision-making and school catering provided by tax revenue, among others, have been mentioned as reasons behind of the success of the Finnish school system.

Social innovation is high on the policy-makers' agenda both at national and international level. The Europe 2020 strategy of the EU, for example, counts on social innovation as a focal means to achieve smart, sustainable and inclusive growth. Similarly, at national level, social innovations are linked to nations' and citizens' welfare. It is argued, for instance, that the new participatory elements of policy-making have not only deepened the democracy but also helped to develop more customer-oriented public services. Social innovation is needed for coping with the challenges posed by the ageing population, anaemic economic growth and worsening environmental conditions. Social innovations are valuable as they generate not only well-being for individuals but also added value for the whole society (Phills, et al., 2008).

Seen from the political decision-makers' point of view, social innovations are tempting because they provide a legitimate way for dealing with diverse societal needs (Borzaga & Bodini, 2012). A bit exaggeratedly, social innovation resemblances the Holy Grail, which is seen having a power to heal societal wounds. Social innovation links to the efforts of improving the productivity of welfare service systems and reassessing the relationship between the government and citizens. Despite all the promises related to social innovation, the concept and the phenomenon are still relatively under-theorised. Presumably, this is, at least partly, due to that social innovation poses methodological challenges that are not yet fully addressed.

The aim of this paper is to explore the applicability of *complexity theory* as a useful resource for studying and conceptualising social innovation. Instead of being a unified theory, complexity theory refers herein to a wide set of conceptualisations which are tied together by the idea that many long-held views of science (reductionism, rationality, linearity) should be questioned. By drawing on the concepts such as emergence, self-organisation, connectivity, diversity, co-evolution, feedback and nonlinearity, the paper also proposes some methodological recommendations and draws policy implications.

DEFINITION OF SOCIAL INNOVATION

Social innovation can be characterised as a chameleon concept whose content depends on the perspective of the person using it. Pol and Ville (2009) have depicted social innovation as a buzzword with multiple and contradictory meanings. Although there is no 'one-size-fits-all' approach to social innovation, however, there are three rather commonly accepted attributes of social innovation identified from the literature. Firstly, social innovation addresses the basic societal needs and demands of society's most vulnerable groups (e.g. unemployed, the elderly, non-educated persons). Social innovation fixes the problems in which the market fails. Secondly, social innovation refers simultaneously to both the means and the ends of action. Social innovation encompasses new products and services that address social needs and new processes that make use of social relations to deliver products and services in more efficient ways. Thirdly, social innovations are 'systemic' referring that they require several actors from public, private and non-profit sectors. This means that social innovation necessitates reconciliation of various interests and co-operation over organisational and administrative borders. (Mulgan et al., 2007; Phills et al., 2008.)

Defining social innovation as a systemic process addressing the needs of society's vulnerable groups begs the question of whether the needs can be properly understood on the basis of knowledge which roots from industrial logic. Mulgan et al. (2007), for example, have noticed that contrary to many commercial/technological innovations whose consequences can more or less precisely be predetermined, social innovation goes beyond enabling new kind of communality which, in turn, may have unpredictable consequences. At best, social innovation evokes positive spillovers to the whole society. To understand the dynamics of social innovation, this paper takes advantage of complexity thinking.

EXPLAINING 'COMPLEXITY LENS'

'Complexity lens' refers herein to a wide set of concepts that can be used to explore the dynamics of socio-economic systems. It is not a unified theory in a strict meaning. Instead, complexity thinking refers to a multidisciplinary approach in which comprehensive, holistic thinking replaces a world-view where simplifying causal relations and reductionism as well as a linear reasoning, control over matters and predictability are emphasised (cf. Mitleton-Kelly, 2003).

Complexity thinking has become as one of the most promising approaches during the past two decades (Oswick et al., 2011). Particularly this is a case within the research exploring public-private partnerships. Special issues on complexity have been published in many leading public management journals (cf. Public Administration Quarterly, 2005, 29:3 and 2008, 32:3; Public Management Review, 2008, 10:3). Its popularity is likely related to the inadequate explanation power of traditional models. Complexity thinking has been seen useful as the world has moved toward increasing connectivity and networking.

Emphasising the emergence engendered from interactive relationships within the system and beyond its boundaries, complexity thinking "offers a structural (systemic) understanding of complexity" (Morcöl, 2010). Instead of denoting complexity 'bad' or 'good', complexity is seen as a natural and fundamental part of the activities in every socio-economic system. Complexity manifests itself in the relationships and interdependencies between actors, and the systemic wholes they constitute together (ibid.).

Complexity thinking does not constitute a single approach, but consists of several approaches. There is no lack of definitions of complexity. One of the leading complexity scientists, Seth Lloyd (2007), has found 42 different definitions for complexity. In addition to various definitions, there are fundamental distinctions between the presumptions of different complexity approaches. Richardson (2008) has identified three different schools in complexity thinking. Firstly, *the neo-reductionist school* aims to uncover the general principles of complex systems, familiar to equations in physics. Richardson (ibid.) is sceptical about searching for over-arching laws and principles in the field of socio-economic systems. According to him, it is impossible to achieve workable theory of every 'thing' in the everyday world of

human experience. If Theory of Complexity existed, it would be too abstract to be useful. Criticising the neo-reductionist approach, Richardson (2008), ironically points out that

> despite the all rhetoric about reshaping our worldview, taking us out of the mechanistic (linear) science into a brave new (complex) world, many complexity theorists of this variety have actually inherited many of the assumptions of their more traditional scientific predecessors by simply changing the focus from one sort of model to another, in very much the same way as some managers jump from one fad to another in the hope that the next one will be the ONE.

Secondly, *the metaphorical school* provides a point of view through which to 'see' socio-economic systems. The metaphorical approach is based on the idea that social world intrinsically differs from the natural world, and therefore, in order to understand the complexities of social world, the new vocabulary is needed. Although Richardson (ibid.) deems metaphors as "ubiquitous and essential" for understanding – he, however, is concerned about using metaphors too loosely. Adapting von Ghyczy (2003), Richardson (2008) warns that "instead of being seduced by the similarities between business and another field, you need to look for places where the metaphor breaks down". The problem is that "metaphors are often improperly used".

Thirdly, *the critical pluralist school* focuses more on what we cannot explain, rather than what we can explain. This approach is concerned about the limits when explaining the world around us. For Richardson (ibid.), the critical pluralist school represents "the art of maintaining the tension between pretending we know something, and knowing we know nothing for sure". As the knowledge is always limited, it is worthwhile embrace pluralism, open-mindedness and humility.

Although the boundaries between the three complexity schools are nothing but clear-cut, Richardson (2008) suggests that one must decide which of the three he/she is trying to exploit. This paper resonates with the metaphorical school. Instead of seeing social innovation as a 'rational' process that consists of consecutive acts of creation and adoption of novelty intended to added value (cf. Aasen, 2009), this paper supposes that social innovation emerges from complex intra- and inter-organisational interaction processes. *Complexity thinking is used as 'lens' through which the social innovation is seen. Instead of 'Theory of Everything', complexity thinking enables to see social innovation in a new light.*

SOCIAL INNOVATION THROUGH 'COMPLEXITY LENS'

In complexity thinking, the utilisable terminology depends on the perspective and what is being examined. Within the context of social innovation, relevant complexity concepts may be considered to be, at minimum, self-organisation, emergence, feedback, nonlinearity, connectivity, interdependency, co-evolution and diversity.

Self-organisation is more or less spontaneously occurred order that has no hierarchical designer or director. Emergence refers to a complex organisational structure growing out from simple rules, and which cannot be predicted or decided in advance. Positive feedback enhances and stimulates, whereas the effects of negative feedback are the opposite, in other words detracting and inhibiting. Nonlinearity implies that the development may not depend on the values of the initial conditions, i.e. small causes can have large results and vice versa. Connectivity and interdependency point out that actions by any individual may affect (constrain or enable) related individuals and systems. Co-evolution means that evolution of one entity is partially dependent on the evolution of other related entities. Diversity is the state or quality of being different. It is a prerequisite source for unpredictable self-organising and the emergence of novelty. (Fonseca, 2002; Mitleton-Kelly, 2003; Aasen, 2009.) In the following, social innovation will be discussed through above-mentioned concepts.

Social innovation is a demand-driven process aimed at helping the life of the most vulnerable ones in our societies. Social innovation is not a product whose consumption can be detached from its production. Instead of a top-down rational planning process, it is claimed that social innovation arises from bottom-up interaction. The outcome of the process cannot be known in advance. Seen through a complexity lens, social innovation emerges from a self-organising process. A clichéd saying "the whole is more than the sum of its part" implicates that self-organisation can produce emergence, which cannot be predicted or decided in advance. Adapting Snowden (2013), this paper argues that acknowledging and accepting this complexity is better than placating it with a planning model.

In everyday practice, emergence and self-organisation happen when public organisations, private firms, third sector organisations as well as citizens continually decide with which other entities and initiatives to engage and what information they will share. Worth noting is that emergence does not only imply an upward-going process. Blitz (1992), for example, has argued for "downward causation", referring it to the way in which a higher-lever emergent process causally influences their lower level constituents. In line with the critique concerning the usage of originally biological concepts (e.g. Richardson, 2008) in the societal domain, this paper reminds that social-economic systems differ from natural ones because man-made ones have the mind and capacity for intentional actions. Therefore, due to the bidirectional influence, it is important that policy-makers make sure that the emergent pattern does not become too powerful.

Connections and interdependencies between different actors reflect systemic nature of social innovation. Social innovation is needed for tackling complex societal problems. This means that there is no particular organisation or individual that should be responsible for developing and leveraging social innovation. Social innovation cannot be produced in an organisation's R&D laboratory. In practice, social innovation requires crossing several administrative, organisational and sectorial boundaries. Social innovations grow up from societal interfaces. Social enterprise, for example, which many see as a typical social innovation of our time, is a result from concerted actions taken by policy-makers, socially oriented entrepreneurs, third sector organisations and volunteers (Mulgan, 2008). Actually, it can be described as a co-evolutionary process in which both supply and demand conditions change. Social enterprises which have been set up for meeting particular needs may have proven out for successful system, which will be charged with the new tasks. This, in turn, has consequences for public and private services.

The emergent whole is highly dependent on the nature of feedback processes. Feedback processes serve as a mechanism conveying the individual actions into broader collective actions. Complexity thinking suggests that negative feedback has constraining effects while positive feedback stimulates the behaviour. In (social) innovation context, feedback processes are important as they enable multiplying the consequences of small actions as such. Feedback processes can launch nonlinear and unpredictable chain of actions. At best, the outcome may be positive development in which events and actors feed themselves. Innovative purchasing is a typical everyday example of positive development.

It can deliver value, more than just savings, back to the society. Innovative purchasing can stimulate social innovation in a way which produces solution, which cannot be achieved by traditional procurement based on tendering service providers.

Social innovation is as much with people as for people. Therefore, the diversity of participants is a critical factor in social innovation. Particularly important is the involvement of the most vulnerable. The rationale behind this argument is rather simply: people are the best experts with respect to their own needs. Putting people with different backgrounds together increases the system's diversity and its ability to see things in a new light.

CONCLUSIONS

Based on the above-mentioned brief review, it can be argued that complexity concepts are useful in exploring characteristics of social innovation. The value of complexity concepts is that they enable to conceive structural and procedural factors that contribute or inhibit social innovation. The complexity lens also offers some methodological and policy recommendations related to social innovation.

Methodologically, at least two remarks should be drawn. Firstly, as social innovation is a systemic whole which emerges from interaction between actors from public, private and third sectors – not as aggregation of the actors (cf. Mörcol, 2010) – complexity thinking favours the contextuality of the knowledge. In order to understand the complexity of social innovation, the methods should embrace contextual knowledge. Social network analysis, agent-based simulations and qualitative case studies, to name a few, have been offered as suitable methods for complexity-oriented studies (e.g. Morcöl, 2010). Secondly, as Richardson (2008) has pointed out, one must be aware how one uses the complexity lens. Although the neo-reductionist, the metaphorical and the critical pluralist schools have certain similarities, they are derived from different thinking within the complexity movement. Misunderstanding is sure to arise, if metaphorically intended complexity concepts are used for explaining causal connections in the real world. A bubble is a bubble, even if a complex one.

Complexity thinking also offers some policy implications. The bidirectionality of the emergence (upward and downward) forces to acknowledge the interdependencies the decisions have on micro, meso and macro levels. In the context of social entrepreneurship, it is important to notice that although social enterprises have their own strategies and objectives, their collective behaviour creates a landscape which influences operational preconditions of all other public, private and third sector organisations. Institutional arrangements, particularly legislation and financing, affect the atmosphere of social entrepreneurship, which, in turn, guides social entrepreneurs' and wannabe entrepreneurs' choices. The more tempting the social entrepreneurship is seen, the more likely social entrepreneurship emerges. Policymakers can make the circumstances more friendly to social entrepreneurship, among other things, by exercising positive discrimination. However, as complexity thinking suggests, every action has potentially unpredictable and detrimental consequences. Promoting social entrepreneurship may consume space from commercial entrepreneurship in a way which generates worse results than was originally intended. These interdependencies are complicated and the logic behind them does not necessarily obey causality. Things just happen. Instead of just seeing what is happening, the complexity lens can be useful in policy-making, because it provides a language and enables exploring and understanding real life (and, in some cases, even to predict the future).

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THE ENVIRONMENTAL EXPERTISE PROGRAMME AT TUAS – ANSWERING TO THE CHALLENGES OF ENVIRONMENTAL PROTECTION

Juha Kääriä
RDI Manager

Piia Leskinen
Project Manager

Faculty of Technology, Environment and Business

Conference theme: Sustainability

INTRODUCTION

The environmental expertise programme rises to the challenges originating from local and global environmental problems. The programme is divided into three sections: environmental technology, responsible business activities and environmental communication.

The programme strengthens the skills and know-how of staff and students in the technologies involved in the monitoring and improvement of the state of the environment. It also promotes networking with other organizations and enhances the competitiveness of Southwest Finland in the growing market of environmental expertise.

The programme combines teaching and RDI activities in projects which offer students a new kind of learning environment to improve their skills and capacities for working life and to give them contacts with companies working in the field. The students' participation in RDI activities is seen as an essential learning method which is in line with the innovation pedagogy developed at TUAS. The RDI activities take place in research groups which represent a wide range of expertise from engineering to business and environmental issues.

The financing of the projects implemented in the programme is based on external funding programmes and internal TUAS funding. Yearly, there are around 100 different projects and funding between 3-4 million euros. A notable aim is to promote both national and international networking between different players in the field, such as universities, research institutes, companies and environmental authorities.

PROJECTS ARE FUEL FOR OUR ENGINE IN APPLYING INNOVATION PEDAGOGY

The Faculty of Technology, Environment and Business of Turku at TUAS is a multidisciplinary and international actor whose research and development activities provide solutions for the development needs of its operating area and the business sector.

The RDI activities are also a learning environment for TUAS students. A new kind of learning approach – *innovation pedagogy* – combines learning and development projects in a way that improves the students' capability of producing innovations (Kairisto-Mertanen, L. and Lappalainen, H. 2013; Penttilä, T., Kairisto-Mertanen, L. and Kettunen, J. 2013). In practice, innovation pedagogy denotes a holistic view to enhance our students' innovation competencies. According to our philosophy, RDI operations and joint projects should be seen as a pedagogical method, just like lectures or other traditional learning methods. Projects are a magnificent learning platform for our students. Therefore, we should always define the project's convergence to our curricula already at the early stages of project planning. Projects are fuel for our engine in applying innovation pedagogy in daily work and students are involved in all projects, e.g. through thesis projects, training periods and special courses.

Our research groups form the basis of research, development and innovation activities at TUAS, with expertise ranging from engineering, business and sales to environmental issues (Figure 1).
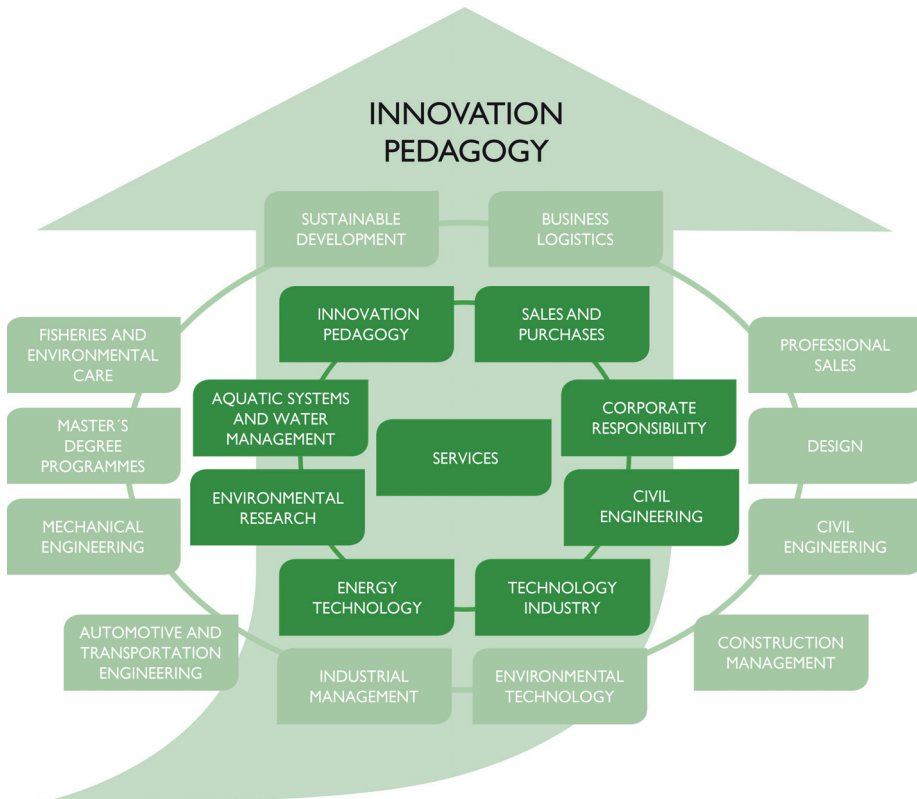

FIGURE 1. *Degree programmes (outer circle) and Research Groups (inner circle) at the Faculty of Technology, Environment and Business.*

AQUATIC SYSTEMS AND WATER MANAGEMENT

The Aquatic Systems and Water Management group carries out projects related to water monitoring, protection and restoration. Aquatic ecosystems are simultaneously affected by a number of human-induced and natural processes, such as eutrophication, climate change and normal weather variations. Continuous monitoring technology combined with on-line data transfer makes real-time follow-up of water quality changes possible.

Integrated management plans of drainage areas, cost-efficiency comparison of waterprotection measures, comprehensive management of nutrient flows, co-operation with companies linked with water issues and the development of oil prevention in archipelago areas are a few examples of how the group strives to promote water protection at the strategic level.

ENVIRONMENTAL RESEARCH GROUP

The Environmental Research group is a versatile expert and developer of environmental protection and sustainable solutions. The group's focus areas include energy efficiency, control of waste flows and material flows, renewable energy sources, natural materials and environmental communication and education.

ENERGY TECHNOLOGY

The Energy Technology group has conducted applied research on internal combustion engines and offers expertise in energy recovery systems and the improvement of energy efficiency of vehicles. Economical low-emission engines are needed to minimise environmental impact and to control climate change. Engine research will be an important cornerstone of our operations as the EU's emission standards are becoming more and strict and fossil fuel prices are rising.

CORPORATE RESPONSIBILITY

The Corporate Responsibility group's primary objective is to participate in the development of responsible and successful business and to promote responsible business to improve the competitiveness of companies. Corporate responsibility is an open and sustainable activity where a company takes responsibility for the effects of its operations on society, its stakeholders and the environment. The group's research interests are the generation of sustainable innovations, resource efficiency and corporate networks, environmental business, cleantech and responsible business as well as business ethics.

CIVIL ENGINEERING

Underpinning is one of the fastest growing sectors of renovation construction both in Finland and abroad. The Civil Engineering group has been focused mainly on strengthening the expertise on underpinning and the development of a new type of drilled pile. A theme for the future is linking ground-heat recovery to the foundations of houses in conjunction with renovation construction.

Wood construction is another focus of the group – more specifically the patented "Timperi" technique, which refers to the developing of glued laminated wood components that can be used e.g. in apartment buildings.

SALES AND PURCHASES

The Sales and Purchases group studies and develops sales and purchasing expertise in order to improve the competitiveness of companies. High-quality products and services are not enough – a company must also be able to sell them both locally and globally. Research on purchase operations seeks to meet the challenges presented by the ever-increasing strategic importance of purchase operations to organizations. Other important research topics include supplier evaluation and responsible procurement.

INNOVATION PEDAGOGY

The Innovation Pedagogy group is a developer of learning and teaching, a training provider and a research body. The central aim of the group is to be involved in the development of innovation pedagogy and, consequently, future experts and business achievers. In addition to research and development activities, operations include the commercialisation, training and consulting of innovation pedagogy.

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METHOD DEVELOPMENT TO OPTIMISE BIOGAS PROCESSES

Tony Wahlroos
RDI Manager
Faculty of Business, ICT and Life Sciences
Turku University of Applied Sciences

Miitrei Sorsa
Martti Sinnelä
Annika Brandt
Jenni Yli-Puntari
Janina Lehtonen
Students
Faculty of Business, ICT and Life Sciences
Turku University of Applied Sciences

Juha Nurmio
Project Manager
Faculty of Business, ICT and Life Sciences
Turku University of Applied Sciences

Anne Norström
Lecturer
Faculty of Business, ICT and Life Sciences
Turku University of Applied Sciences

Yong-Sung Kim
Assistant
Hamburg University of Applied Sciences

Paul A. Scherer
Professor of Applied Microbiology
Hamburg University of Applied Sciences

Conference theme: Sustainability

ABSTRACT

Today, around 80% of the world's overall energy supply of 12 billion ton per year is derived from fossil fuels, and 10%–15% of this demand is covered by biomass resources (European Biogas Association, 2011). This fact justifies biomass as the most important renewable energy source used to date. Biogas is a renewable energy source that is technically fully established, producing heat, steam, electricity and vehicle fuel. Biogas plants can be established in different geographical areas and biogas processes can be easily up and down scaled. Processes need only feeding material to keep the biogas producing microbes alive and methanogenesis ongoing.

In this paper, we describe biogas process optimisation methods, developed in cooperation with Hamburg University of Applied Sciences (HAW) and TUAS. Methods described here can be used for different biogas processes to get optimal gas production for further use. We will address methodological development of the biogas process and provide ideas to enhance such processes.

Keywords: sustainability, biogas, 454 sequencing, optimisation, microscopy

INTRODUCTION

Biodegradable waste is generated by consumers and industry (Wirth et al., 2012). Biogas is formed when biodegradable waste is anaerobically decomposed. The decomposition occurs due to various microbes that metabolise organic matter and its decomposition products as their energy source. Degradation process produces biogas and it can be collected for further use. Biogas is often used for heating or electricity processes. In Finland, biogas plants can be divided to four different categories

1) waste water treatment biogas plants
2) agriculture/farm biogas plants
3) multipurpose plants
4) industrial biogas plants. (Latvala, 2009)

All biogas plant types share a common problem: how to maximise biogas production.

Currently, running a biogas plant profitably is very challenging, when sludge is the sole feeding material. It is known that co-digestion of sludge and organic waste gives much higher gas production than sludge monodigestion (Ahring et al., 1992). Several studies have showed that, independent from the substrates, a mixture of diverse substances is superior to monofermentation. (Chen et al., 2009; Kacprzak, et al., 2010). Co-metabolic effects account for an increased process stability and raise in biogas yield (Koch et al., 2011).

The aim of this study was to investigate different approaches for optimising biogas production in monodigestion process. In this study, some applied methods for biogas process optimisation in general are described. To get comprehensive insight to such optimisation, three different ways of working were chose for the study:

1) creating a 16S rRNA gene based identification method for the bacteria involved in the biogas reacto
2) applying quantitative microscopy fingerprinting to study the number and percentage of living methanogens among other microbes in the biogas reactor
3) measuring gas potential with Automatic Methane Pontential Test System (AMPTS).

The 16S rRNA gene is evolutionary well conserved and is widely used for phylogenetic classification. The 16S rRNA gene sequence includes both conserved and variable regions. The conserved regions offer an excellent corner stone identification method for microbes, whereas taxonomic identification is performed by using variable regions. The sequenced variable regions of 16S rRNA genes are flanked by the conserved regions and offer the basis for the sequence identification. Whereas genome-based analysis provides detailed information about microbes, the microscopic quantification of cells can give an indication of cell activity and performance of fermentation. It is a faster, simple and a more reliable method when compared with molecular methods. A positive relationship between coenzyme of F420 content and gas production has been reported (Dolfing et al., 1985, Kubota et al., 2009). However, there still lacks a direct relationship between the number of cells and process phenomena. This method, nevertheless, can be used to evaluate the performance of anaerobic processes (Scherer et al., 2012).

MATERIALS AND METHODS

Feeding material for laboratory studies

Parameters such as reactor temperature, mixer speed, feeding sequence, daily feeding amount and the active volume of the reactor can be controlled. Raw sludge is first manually pumped into the mixing tank. The sludge is then pumped into the reactor automatically. Before each feeding, the reactor must excrete the same amount of digestate to keep constant reactor volume. Sewage sludge was the sole feeding material during this test period. Organic loading rate was maintained inside previously set process window (2,0–3,0 kgVS/m³d).

Microbial laboratory work

Microbial DNA isolation was done according to instructions of the manufacturer (MO BIO Laboratories, PowerSoil DNA Isolation Kit Sample, Catalog No. 12888-S). Polymerase chain reaction for whole genome sequencing was done according to protocol from Roche Diagnostics FastStart – High Fidelity PCR System (PCR-optimization_1). Whole genome sequencing for 16S RNA gene was performed by GS-junior 454 next generation sequencer and according to instruction of Roche (Roche454_4, 2013).

Parallel assays to sequencing were applied to reveal methanogens rapidly from feed material in biogas reactor. A method developed at Hamburg University of Applied Sciences (HAW), "quantitative microscopy fingerprinting", was applied to study the count and percentage of native methanogens among other microbes in feed. Additionally, the microbes were classified by digital image analysis into 8 different types. The samples originated from biogas reactor were comparable to 16S RNA sequencing studies and therefore provided valuable data for recommendation a guideline for biogas production.

Biogas laboratory work

Biogas optimisation was studied also by biogas potential measurements. Samples related (but not the same) to microbial laboratory analyses were analysed by Automatic Methane Pontential Test System (AMPTS II) equipment (Bioprocess Control, Sweden). A multi-channel batch analyser consisting of 15 parallel 500ml reactors and the same number of gas flow meters (flow cells) attached to a data acquisition system allows the real-time investigation of a high number of samples. Experiments can be performed in mesophilic or thermophilic processes. Biogas is cleaned from CO_2 with NaOH solution, and after that the methane volume is measured. Biochemical methane potential (BMP) was determined using waste digested separately in 37 Celsius degree.
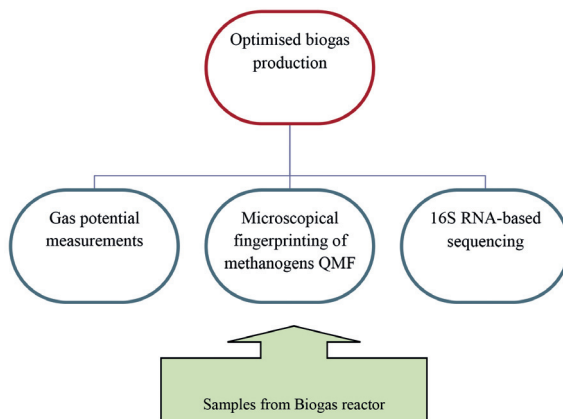

FIGURE 1. *Overall optimisation approach. Similar and comparable samples are collected from biogas reactor for further analysis (microscopy and sequencing). Gas potential measurement samples were collected in different time points but studied for process optimisation in parallel. Results from all studies are collected and compared.*

RESULTS

Samples from a 4m³ bioreactor were collected for optimisation studies in selected time points (Figure 2A). Those samples were used for quantitative microscopy fingerprinting and 16S RNA sequencing studies. The process was stable throughout the test period as can be seen from gas production and organic loading (Figure 2B).
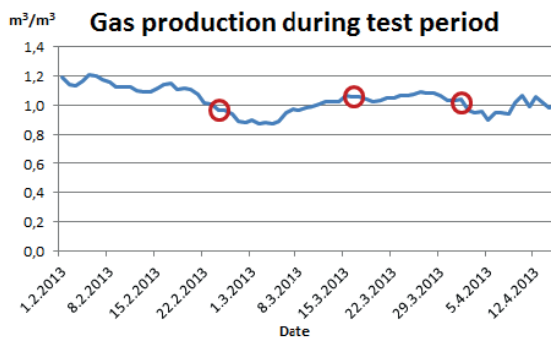
A)
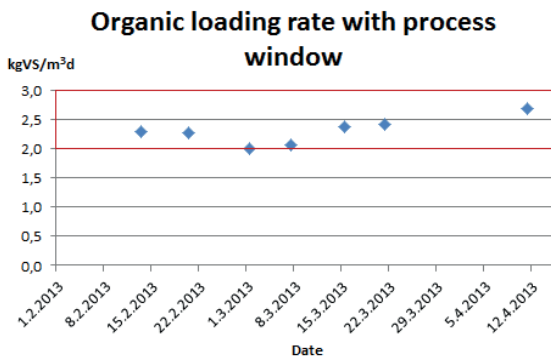
B)

FIGURE 2. *Sample collection in three different time points (A). Samples collected in various points (red circle) were used for microbial "fingerprinting" measurements as well as genome sequencing studies. Organic loading rate during the test period (B) was maintained inside the process window, indicating a stable process.*

Quantitative microbial fingerprinting measurements indicate a positive relationship between coenzyme of F420 content and gas production. In Figure 3 it can be seen that methanogens have different morphologies and also different response to 420nm excitation beam.
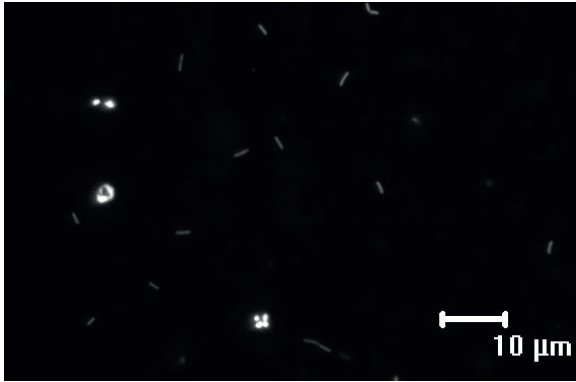
FIGURE 3. *Methanogen detection (1:20 diluted to inividualise the cells) based on fluorescent coenzyme F420 with excitation wave length at 420nm.*

Phylogenetic characterisation of the microbial populations in the anaerobic digestion of sludge was assessed from samples taken at two different time points with an interval of one month. During the times of sampling the methane production in the biogas sludge monodigestion conditions was stable. It was observed that > 90% of the identified sequences represented on the rank Phylum Firmicutes (Class Clostridia) and Bacteriales (Class Bacteroidetes), while 32–34% of sequences on the rank level Phylum were unidentified in the subsequent sequence analysis of 16S rDNA amplicons produced. The identified sequences in the Phylum Euryarcheota belonged to the orders Methanomicrobiales, Methanobacteriales, Methanosarcinales, Thermoplasmatales and one was classified to unidentified order. The composition of the methanogenic orders in the studied time points showed the dramatic decrease of the major species Methanoculleus from 65.2% to 39.4%. It may be partially compensated by the increase of other archaeal representatives belonging to the order Methanomicrobiales or to the genus Methanosarcina and Thermoplasmatales. There is a possibility that also the nonclassified archaeal bacteria may include species that are capable of methane synthesis.

When compared the 16S rDNA sequencing results to the microscopic method MQF by HAW, we noticed the absence of the genus Methanosaeta in the sequencing results. The microscopic method showed an 14.9% increase in the group of coccoid Methanomicrobia, while sequencing analysis detected a 25.8% decrease. The reason for the obvious discrepansies in the results using

these methods needs further clarification. The possible explanations may include PCR-mediated biases, inadequate depth of the sequence analysis or unintended differential processing of the cells in the isolation of DNA.
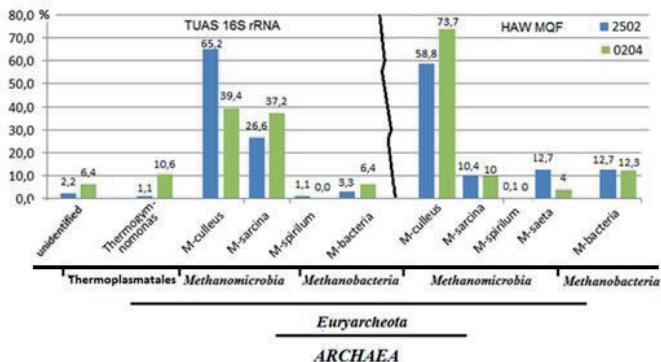

FIGURE 4. *16S RNA sequencing results compared with MQF results. Results from both assays have similarities, although there is an absence of the genus Methanosaeta and about 26% decrease among the genus Methanoculleus in the sequencing results. Taxonomy according to Boone et al. (1993) and Whitman et al. (2001).*

CONCLUSION

Marandat et al. (2013) have noted that classical culture-dependent microbiology, coupled to physical and chemical monitoring have reached their limits for processes optimisation and metabolic flows orientation. Culture independent approaches, analysing the biomolecular content of samples (proteins and nucleic acids), shade light on the complexity of functional microbial communities.

Several parallel methods were applied to study key elements in biogas production with selected feed material in monodigestion biogas process. Gas potential measurement studies, techniques for genome sequencing for 16S RNA genes and microscopical fingerprinting can be applied as a tool for planning the optimal feeding strategy for biogas production. However, biogas potential measurements are not necessarily needed. This relies on the fact that data received through our studies could be also obtained by other means as well in this type of experiments. We conclude that 16S RNA and microscopical

fingerprinting technique are applicable also to the mixed feed studies, such as the use of organic compounds and other elements. Also composition of feed for gas production can be studied in this way.

In summary, the sequencing results in this study are agreed to other phylogenetic studies on mesophilic anaerobic digestion as performed by 16S rDNA amplicon sequencing (Wirth et al., 2012, Li et al., 2013). Both the sequencing method and the MQF indicate that the order Methanomicrobia is dominated by the genus Methanoculleus representing the H2/CO2 methanogenic pathway, while the Methanosarcina is the dominant genus in the acetate pathway in the synthesis of methane during the sludge monodigestion conditions.

16S RNA sequencing measurements and quantitative microscopy fingerprinting studies revealed that methodology used in this study was useful for the optimisation. Perhaps the use of metagenomics-based methods together with the classic methods gives more comprehensive understanding of biogas production and its optimisation. We generally emphasise the cost-effectiveness of currently used metagenomics tools. However, it can be suggested that once the price of metagenomics drops, the approach becomes very attractive for the processes in question.

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