

# Foresight of Technology Enhanced Learning – How to see some light in the murky crystal ball?

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**Abstract** — *This short paper addresses how we make sense of future technologies within the Technology Enhanced Learning (TEL) community. The paper highlights a number of methodologies and processes available to those predicting the future and is illustrated by cases from European practice. The study identifies inadequacies of the process that could, arguably, limit their effectiveness.*

**Keywords** – EU projects; roadmapping; foresight studies; sustainability of technology enhanced learning; scenario planning; Future of TEL

## I INTRODUCTION

Technology can have a transformative role in education, informal learning, and learning in the workplace. Learning technologies are emergent [1]; therefore, the trends, the critical challenges to prepare for, and the specific technologies to monitor are difficult to make sense of for those who should have a stake in strategic planning.

Observation, foresight, horizon scanning, technology watching, roadmapping, etc. are used in diverse sectors including health, water management, agriculture, city planning, labour market planning, etc.; and by many international organisations [2, 3]. In the late 1990's a number of foresight and horizon scanning initiatives were launched on the web in an attempt to engage their constituencies in information gathering and dissemination<sup>1</sup>.

A cursory glance of these activities shows that the applied methodologies are discussed in general terms without attention to the detail and in particular as to how the findings are produced. As participation by key stakeholders is identified as a key component in most approaches the use of expert panels, expert work groups and expert surveys are identified as the primary method of validation.

In the TEL domain a fundamental challenge to projects is identifying and recruiting contributors to expert panels and surveys. The authors argue that the focus should be on developing more sophisticated approaches to solicit wider community engagement with the “end” users of these technologies.

## II CONTEXT OF THE HORIZON SCANNING PROCESS

The EU supported Foresight Network for Regional Development Network has developed a practical guide to regional foresight [4]. This guide sees foresight as “a systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process aimed at present-day decisions and mobilising joint actions” [4]. The guide explains that foresight arises from a convergence of trends underlying recent developments in the field of ‘political analysis’, ‘strategic planning’ and ‘future studies’. Foresight has five essential elements, according to the guide, - anticipation, participation, networking, vision and action [4]. This understanding of foresight activities has been adopted by a number of European projects, e.g., projects within the 6th Framework Program the European Commission [5].

In 2004 the European Commission's Directorate General Joint Research Centre, that has been instigating much of the foresight activities, organised a EU-US scientific seminar to discuss methods of future-oriented technology analysis. Scapolo reported “one of the main issues introduced was methodology selection and the perennial conflict between the search for methodological perfection and ease of implementation” [6].

Roadmapping activities have been part of a number of European TEL projects (e.g., Prolearn, ICOPER, TEL-Map). Each project has developed unique methodologies and approaches to solicit information and engage their communities; and each arguably appears to have prioritised methodological rigour over concerted effort to engage with their communities.

## III HORIZON SCANNING PROCESS AND ACTIVITIES

In 2010 the UK Joint Information Systems Committee (JISC) established a Technology observatory facility for the UK Higher and Further Education sector. The facility was jointly managed by two of the JISC Innovation Support Centres, JISC CETIS and UKOLN.

The purpose of the activity was to provide verifiable evidence of emerging and future technologies and speculate as to their future impact on the sector. The explicit objective of the work was to produce detailed outputs by way of technology reports to help inform future priorities for JISC

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<sup>1</sup> Foresight websites (in order of Google hits): [iknowfutures.eu](http://iknowfutures.eu), [euroscan.org.uk](http://euroscan.org.uk), [foresight.gov.uk](http://foresight.gov.uk), [millenium-project.org](http://millenium-project.org), [foresight-platform.eu](http://foresight-platform.eu), [horizonscanning.gov.au](http://horizonscanning.gov.au), [efmn.info](http://efmn.info), [foresight.jrc.ec.europa.eu](http://foresight.jrc.ec.europa.eu), [techcast.org](http://techcast.org), [shapingtomorrow.com](http://shapingtomorrow.com), [unido.org/foresight](http://unido.org/foresight), [forlearn.jrc.ec.europa.eu](http://forlearn.jrc.ec.europa.eu), [sesti.info](http://sesti.info), [forwiki.ro](http://forwiki.ro), [horizonscanning.defra.gov.uk](http://horizonscanning.defra.gov.uk), [sigmascan.org](http://sigmascan.org), [wfsf.org](http://wfsf.org), [farhorizon.portals.mbs.ac.uk](http://farhorizon.portals.mbs.ac.uk), [innovation-futures.org](http://innovation-futures.org), and [hsc.gov.sg](http://hsc.gov.sg).

investment by way of programmes and future innovation project activity.

One of the first activities of the Observatory was to commission the New Media Consortium (NMC) [7] to produce a UK specific version of the NMC Horizon scan. Since 2002 NMC has produced a number of International TEL Horizon scan reports, including region and more recently sector specific versions for Australia, Africa and Asia. In order to address the issue of direct practitioner engagement NMC employ a Delphi process. The Delphi process is premised on the principle that the forecasts and collective intelligence from structured groups are more accurate than those from unstructured or ad hoc processes. The process, which is primarily a communication activity, is mediated through a wiki based technology platform.

The technique is widely employed in technology future forecasting including the Techcast project [8]. This project employs Delphi techniques in order to forecast and track the “technology revolution” and in particular what is termed strategic breakthroughs. These are identified and selected technologies that have economic potential, profound social implications, or are of scientific interest.

In 2011 the JISC commissioned through NMC a UK Tertiary Education specific report. The report examined emerging technologies for their potential impact on teaching and learning and creative enquiry within the domain. The project employed the tried and tested NMC approach of appointing an advisory Board and the establishment of a wiki to facilitate the development of the report and identify key trends [9]. The advisory Board was established by NMC with input from the JISC via its Innovation Support Centres JISC CETIS and UKOLN.

The report findings were published in 2011 [10]. One of the key criticisms of the project was in the establishment, or more accurately, in the criteria for membership of the expert group. The group consisted of 108 “experts” in the domain selected by NMC and JISC, but how representative of the sector were these “experts”? It became clear that experts in “creative enquiry” were underrepresented and consequently the identified technologies were focused on the learning and teaching domain with research, arguably underrepresented. There seems to be a consistent issue in establishing representative groups. How representative should or could they be?

The technology platform underpinning the process provided adequate functionality. The mediated discussion on the wiki was extensive and vigorous but participation levels can be low and restricted to groups of enthusiasts with highly specific agendas.

#### IV DISCUSSION

A number of projects have shown that solicitation of structured group responses is work intensive and a potentially flawed way to assess the collective intelligence of the TEL users. With pressure on senior industry management due to the current economic environment, it has proved difficult to solicit meaningful input from the wider community. The, often bespoke, instruments, tools and strategy for engagement offered by many of the foresight projects have user designs that are incomparable

with many of the tools available on the Internet. It is evident that a combination of economic pressures and user experience issues are significant barriers to achieving the necessary stakeholder engagement prescribed in the foresight methodologies. Is striving for methodological rigour /purity at the expense of securing wider stakeholder input when “Just Enough” may be good enough and in doing so recognise the limitations of all methodological approaches to observation, future gazing and horizon scanning?

Are there viable alternatives to the existing methods and technologies that could be explored to ease the perennial issue of perfection vs. smooth implementation?

The Open source software community could offer a solution. Examples such as the Apache foundation [11] solicit community input in to activities in a highly effective manner, all be it from a restricted community; the key being that all involved seek to benefit from both the process and importantly the output. Arguably the keys to stakeholder engagement are both trust in the process and desire for the output.

#### V Conclusions

This short paper has identified an ambition gap between the prescribed methods for foresight analysis within the TEL domain and, highlighted by the experience of a number of projects, a lack of wider stakeholder engagement.

The authors argue that greater effort should be directed towards securing engagement and input from the practitioners of TEL; moreover that methodologies that inadvertently restrict participation to those academics and agencies directly funded to undertake the work could produce flawed results.

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