This inaugural edition of MJET is dedicated to Alex Moon (1970 - 2010), the founding editor of the journal.

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Models of Webcasts and Webinars: Towards Interactive New-media Webcasts

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Abstract

In this paper we provide a context for models of webcasts and webinars from the perspective of a UK higher education Institution and the corporate training setting. Our synthesis of technical and pedagogic elements arises from these e-learning and marketing considerations and forms a proposal for the Interactive New-media Webcast design (INWeb). Three webcast models are compared with respect to moderated text discussion, the presenter's capacity and the type of content engagement for the online event as a key component of the new design model. These e-learning webcast models are triangulated with Garrison's (2004) distance learning historical timeline and Pincas' (2007) collection of pedagogic designs known as the 3Ps (Presentation, Practice and Performance). A critique of our mini-case studies is our way to ground the e-learning theory in real-world examples of use. These webcast illustrations are presented from both a business and academic perspective. Moore's (1993, 1996) Transactional Distance Theory (TDT) is critically reviewed for its application to the pedagogic design of the INWeb model. Dialogue and structure are analysed to see the impact on the autonomous learner as a webcast participant. The transactional distance between the webcast presenter and the online viewer/ callers is explored in the context of the webcast content as a learner-generated Web 2.0 dynamic resource for learning and marketing. Our summary reflections then discuss how the current webcast models may be extended if we provide a framework informed by the Evolutionary Graph Theory and Metcalfe's Law (Hendler, 2008) as possible theoretical positions to tie together the professional social network and Web 2.0 elements to future interactive New-media Webcast Designs.

Keywords: e-learning, e-learning, web casts, webinars, learning technology design

Introduction

E-learning has been evolving since the text-dominated days of the early internet from a content-focused model to one that embraces communication and collaboration. With the introduction of broadband networks there has been a growing trend in learners generating new media content (e.g. video clips, podcasts) in places such as YouTube, Photobucket and others.

Another growing communication medium is the use of web video conferencing. This streaming technology now allows anyone to produce webcasts, webinars and other variations of interactivity. The drivers of this media type are two-fold. On the one side, webcasts are very good for marketing the activity of the business. But there are

also the education and training benefits. What is needed is a pedagogic webcast model of interactivity that can also produce valuable marketing resources.

Our answer is a marketing and e-learning design called the Work Based Learning Wednesday's webcast project ('WBL Wednesdays', 2009). We researched, designed, implemented and evaluated the interactive new media webcast model to blend real-time / asynchronous new media tools and e-learning pedagogies to produce an innovative learning situation for our stakeholders.

We have blended an interview design with a 'viewer call-in' feature using a webcast with live text discussion and a landline conference phone. The focus is on the guest's story. This learner-generated style shifts the ownership of the narrative dialogue from the interviewer / presenter as facilitator of the questions to the guest as they share their knowledge and experience. The exchange of practice and lessons learnt makes the recordings of the event a valuable e-learning resource for many groups. The video and audio recordings also provide the marketing team with honest, powerful testimonials in addition to academics having illustrations of good practice to help new learners. We have even found that the recordings are also a valuable development resource for our new members of staff that do not yet understand the 'big picture' of our work-based learning system.

Along with the technical tools we needed a good theoretical foundation upon which to build the interactive new media webcast model. We realised early in the project that this e-learning design is flexible and scalable but these very features need a framework for academic rigour.

Models of Engagement

This initial section of the paper provides some models of engagement as a descriptive and not prescriptive explanation towards the pedagogic designs of webcasts. There are several ways that the participants in a webcast, webinar or Interactive New-media Webcast (INWeb) can communicate. We will critically review the strengths and weaknesses of each e-learning model.

Table 1 summarises some of the components of the learning model such as the text moderator's role, the presenter's capacity and the relationship of content to the e-learning model. Garrison (2004) sees a 'correspondence model' as a stage-one level of distance learning design. The first generation, industrial era webcast approach shares characteristics such as learning in isolation and communicating privately with the tutor. There may be no interaction with the other audience members or learners. The webcast model is like the BBC/ Open University's old broadcast design. Information is transmitted one-way to the generally passive audience which Garrison (2004) identifies as second generation.

e-learning model	Text discussion moderated activity	Presenter's capacity	Content type
Webcast **'cast' is one-way**	None to Low	Presenter as teacher	Information
Webinar **'seminar' is two –way**	Medium	Presenter as seminar tutor	Information-led Some discussion available
Interactive New-media Webcast (INWeb) **'3D discussion'/ time**	High	Presenter as interviewer	Application of knowledge seen through peer-to-peer stories – anecdotal knowledge

Table 1: Webcast models and components

There may be no person designated in the role of a moderator to promote discussion about the topic or issue addressed during the webcast lecture. Some webcast pedagogic designs do encourage follow-up activities that may involve live or asynchronous text discussions. The speaker or presenter is seen in a teacher/ lecturer role to control the flow of the content to the learner. This content may be media rich with a blend of text, graphics and video to help inform and motivate the students.

Pincas and Basiel (2007) describe this classic lecture style in terms of the 3Ps (Presentation for content, Practice for activity, and Performance for assessment). In this pedagogic structure the content leads the learning design. A follow-up activity reinforces the understanding with a final summative assessment to demonstrate mastery.

A webinar tries to encourage a critical dialogue between the presenter and the audience, in much the same way a face-to-face seminar may be conducted. The webinar's two-way interaction may be facilitated by a text discussion moderator. The primary dialogue is between the presenter and audience, but the text discussion board provides the opportunity for 'classroom whispers' or passing a note in class. The moderator can help steer the questions to the presenter as needed.

The webinar text moderator is a new and evolving role in real-time online learning. This new facilitator's role in our project is still under development and can vary in the pedagogic balance of each e-learning event's design. A webinar presentation does require a script to lead the navigation through the flow of the learning narrative as it is not restricted to the content of the talk slides. There lies the possibility to get some unexpected or a more informal discussion.

The 3Ps learning design introduced earlier identifies a seminar as a problem-based model which promotes virtual community discussions (Pincas & Basiel, 2007). The webinar model moves us into an interesting blend of online communication options.

The interactive New-media Webcast model takes us into a 3P discussion style as it moves from the webinar's two-way discussion to explore a blending of live and recorded events in web video, audio and text.

In this interactive model the role of the text discussion moderator is critical to address the audience's questions and comments while the presenter is taking the role of 'chat show host' to interview the guest speaker. The 'content' of the online session becomes the informal discussion between the webcast host and guest. The audience provides the unexpected, serendipitous element to the webcast.

Garrison (2004) would place this last webcast model in the 3rd and 4th generation distance learning through a blended learning approach to computer mediated conferencing. In our Work Based Learning Wednesdays webcast model discussed in the next section, we used Adobe Connect as the web video conference platform and a landline conference phone to provide access to any audience members with firewall security issues.

Mini Case Studies

This section of the paper grounds the previous discussion and models with some real-world examples. We show the implementation of some of the webcast variation designs as instances of the online pedagogic principles. The three general models of webcast, webinar and Interactive New-media Webcast (INWeb) are summarised in Table 2 and broken into business and academic categories.

The samples provided are reviewed critically from the two perspectives: business and academic approaches. It is true that these two approaches may have overlapping qualities, but for the sake of this discussion we look at the academic context in a higher education setting, while the business perspective takes place in a corporate training context.

Webcast		Webinar		Interactive New-media Webcast	
Business	**Academic**	**Business**	**Academic**	**Business**	**Academic**
Adobe – Products	RSA – Lectures	Learning & Skills Group Professional Network	Glyndwr University, e-learning Module	WBL Wednesdays Marketing	WBL Wednesdays Learning
Learning design	***Learning design***	***Learning design***	***Learning design***	***Learning design***	***Learning design***
Product presentations about new trends in industry	Lectures to live audience sent out and recorded	PowerPoint voice talks. Professional moderator with text discussion for large group size. Annual f2f conference	Limited class size. Tutor as moderator with audio option for questions. Module reading with follow-up activity.	Guest brings in audience. Organisational networks can share info and partner in R&D projects.	Students tell one another tips on success and learning at distance advice.

Table 2: Business and academic exemplars

The three models (webcast, webinar and Interactive New-media Webcast) each have two threads. Each is examined in relation to the related learning design. The business focus looks at the examples of product exposure and profession related discussion from a marketing perspective. The academic perspective examines the

lectures and interactive e-learning opportunity pedagogic designs using Web 1.0 and 2.0 systems and approaches.

Business Exemplars

There are three business exemplars. The business examples for the webcast are the Adobe software webcasts on their software products. These provide a one-way presentation on the features and toolsets for the Adobe system. These are also reinforced by the Adobe TV website and video e-learning resources ('Adobe TV', 2009).

The webinar model focuses on the knowledge domain expert as presenter / lecturer. They usually give a PowerPoint talk (generally audio only) to a select professional audience. The Learning and Skills Group provides the audience for a professionally moderated real-time text discussion option to promote interactivity (Figure 1).

In the INWeb model the recording of live events creates marketing testimonials. This interactive web scenario sees a peer-to-peer model with successful business students or, in Work Based Learning (WBL) terms, 'candidates' telling their stories of successful research and development (R&D) projects impacting on the organisation. We also hear about 'success tips' for distance and WBL learners.
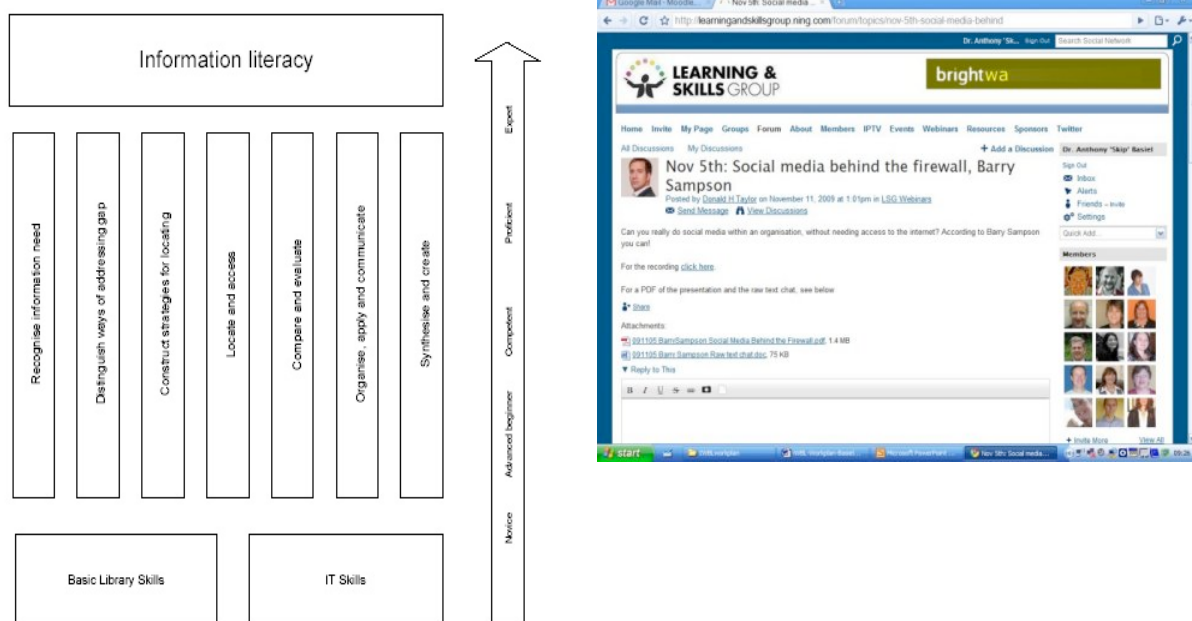

Figure 1: SCONUL: Seven Pillars of Information Literacy and RSA & Learning Skills Group screen grab examples.

Academic Exemplars

In the academic or higher education (HE) institutional context we also look at the three variations of webcasting. Here the shift is from commercial product to intellectual capital in a work based learning context (Garnett, 2001).

The academic webcast focuses on the subject context in the online discussion as seen in the RSA example (Figure 1). The expert speaker tries to engage the audience with the information of the presentation and not the business side of the contextual discourse.

In the interactive webinar we see a focus on the online version of the 'Oxbridge model' of HE learning in the UK context. Small group discussions are conducted by web video and audio much like a face-to-face seminar model. Live text can also simulate the classroom whispers or note passing occurring during the lecture. A good example is the webinars carried out in Glyndwr University, Wales (Figure 2). Participants can use audio voice over internet protocol (VoIP) to speak to the presenter.

Figure 2: Webinars and Interactive New-media Webcasts

The .net magazine awards (2009) website is a showcase of vodcasts of the year. In this case the winner, DIGGNATION (2009) is a web TV show that blends humour, interesting content and high production value. The international publication reminds us that a successful webcast / vodcast doesn't mean that you have to be a big organisation or even a big audience. It may be that the online event just helps people.

These minicase studies illustrate some of the elements discussed below. Elements of structure and dialogue vary in the webcast models to support audience engagement and learner autonomy. The final section of this paper summarises these e-learning pedagogic design elements and provides predictions of future frameworks.

Learning Theory

There is a serendipitous or unplanned quality to the meaning-making that happens in a loosely structured critical dialogue. Basiel and Bell (2007) argue that it is this unexpected element of the e-learning opportunity that provides new situations for constructing knowledge.

A practical illustration is in the particular form of a PowerPoint presentation. The first part of the talk has some contextual information. Next, the speaker asks the audience a question to which he has a preconceived solution. The next slide, however, is blank to put in the responses from the learners. Using a 'brainstorming' instructional design strategy has the potential to capture the unexpected.

In the next slide the speaker can then cross-reference his solutions to those of the respondents. New elements may emerge from differences in prior knowledge, cultural perspectives, levels of mastery of the English language, differences in the

age of the presenter/ learner, capability, and confidence of using information and communication technology (ICT), or a variety of unexpected reasons.

An overview plan is suggested to coordinate or script an effective scenario described above. The dialogue and structure can claim to be linked to learner autonomy and learning outcomes in what has been termed transactional distance theory (TDT). See table 1 for expansion of these terms.

Moore (1993, 1996) states that TDT assumes that the most profound impact on distance education is pedagogy and not the physical or temporal distance that separates instructor and learner. He sees the extent of transactional distance in an educational programme as a function of three variables: dialogue, structure, and learner autonomy.

Informing the dialogue element of our model dialogue is not the number of verbal interactions that occur and transactional distance is not a perceived value of 'closeness'. Table 3 provides a summary of this operational definition according to Chen & Willits (1998).

Transactional Distance	Dialogue	Structure	Learner Autonomy	Learning Outcomes
Distance of understanding & perception	Frequency of communications	Implementation organisation	Independent; Interdependence	Extent of learning, anticipated impact

Table 3: TDT operational definition

Moore's theory (1993) evolves from basic insights regarding independent learning and learner autonomy to a multi-dimensional set of interrelated definitions, propositions and constructs. Garrison (2000) sees TDT as a basic analytical framework for understanding distance education systems:

1. Dialogue

Dialogue describes the extent to which the learner and educator are able to respond to one another or the learners respond among themselves. Some variables of dialogue are: the content, educational philosophy and components of the (virtual) learning environment e.g. the media type (text vs. video), or online tools used to support communication/ collaboration.

For example, dialogue is low in a one-way iPod lecture, but high in an interactive web videoconference. Murphy and Collins (1997) attempted to identify real-time communication conventions through text chat systems and to recognise the need to use these protocols to promote collaboration.

2. Structure

Structure is a measure of an educational programme's responsiveness to the learner's individual needs. Some elements of structure are the adaptability of learning objectives, teaching strategies, and summative/ formative evaluation methods used to support the e-learning experience.

Highly structured programmes are determined for the learner in a linear, content-

driven design, while a loosely structured design allows flexibility to support a student-centred pedagogy (Baume, 1994). A current trend in the UK is towards personalised e-learning solutions (OPUS Project, 2002).

3. Learner autonomy

Learner autonomy is illustrated by students sharing responsibility and ownership for the education process. An example is when a student makes a presentation to the class face-to-face or online. In this context the learner assumes the role of teacher. Motivation and self-direction are supported by learners acting as human resources for each other (Moore, 1993).

The transactional distance apothem (Table 4) shows a relationship between dialogue, structure and learner autonomy. The greater the transactional distance, the more autonomy the learner will exercise. Low transactional distance can be achieved by a large amount of dialogue and little predetermined structure.

(+) Learner autonomy = (-) Structure + (+) Dialogue
(+) = an increase, (-) = a decrease

Table 4: TDT apothem

Gorsky and Caspi (2005) explain that if the TDT is to be useful to distance education (and possibly education in general), the variable 'transactional distance' must correlate in a significant and meaningful way with learning outcomes.

Our proposition is that the Interactive New-media Webcast (INWeb) learning design is informed by TDT. We do not try to validate TDT as suggested in Gorsky and Caspi's (2005) paper. Instead we analyse our interview scripts and actions to synthesise the TDT variables that create an e-learning event where the stakeholders in the webcast (interviewer, interviewee, audience and text moderator) can engage with a strong degree of autonomy.

In Gorsky's terms if TDT is

> *'a psychological and communication space to be crossed, a space of potential misunderstanding between the inputs of instructor [webcast presenter] and those of the learner',*

as Moore (1993) suggests, then

> *'transactional distance can be measured as student misunderstanding' (2005: p. 8).*

This comparison of the TDT components can be represented as the tautology:

> *'As understanding increases, misunderstanding decreases'.*

Our second proposition arising from the webcast project is that this misunderstanding is decreased when the e-learning experience is mediated through peers talking to peers. This dialogue becomes the learner-generated content. However, it may well not be possible for the misunderstanding (in the syntactic and semantic senses) to be reduced. For effective (i.e. valid) learning to be largely

absent, as exemplified by the 'blind leading the blind' situation, the peer learners would need guidelines and evaluation criteria.

Social constructivists believe that people construct their knowledge through engagement with others (Bruner, 1966). It is in the act of the (webcast) interactions that meaning is made. Interactive New-media Webcast (INWeb) designs promote the opportunity for critical discourse to occur at a distance using blended new media resources. Therefore, new knowledge is constructed by the participants in the webcast event by making new connections from their prior knowledge to unexpected informal learning opportunities.

One Way Forward

This section discussion visualises our previous webcast samples in a two-dimensional matrix. Next, we look at how these online models can be applied to a Pre-At-Post (PAP) model. Finally, Evolutionary Graph Theory is put forward as a possible theoretical framework to progress e-learning through webcasts, which is further supported by Metcalfe's law in Computing Science (Hendler & Golbeck, 2008; Kumar et al., 2006).

Figure 3 provides a cross-comparison summary of our webcast models in relation to new-media elements and the interactivity of the presenter and audience. In this context new media refers to the technical aspects of the comparison while the interactivity focuses more on the human aspects of the various models.
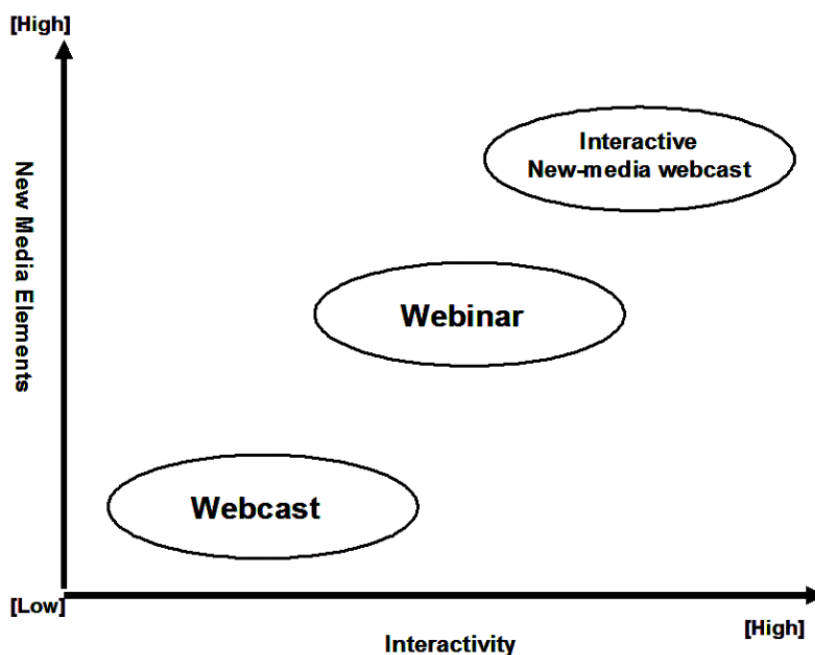

Figure 3: Summary webcast model matrix

The summary is not meant to be a value judgement to say, for example, that webcasts are weaker e-learning designs. There are times when a transmission model is appropriate for introducing procedural knowledge. The spectrum assists learning technologists to select options to pick the elements of New-media Webcast design that help get their message to their target audience.

A second factor to consider in these webcast designs focuses on the structure of associated activities around the live event. This can be expressed as the Pre-At-Post model (PAP, 2009). Promotion before the live webcast event happens is essential to generate an audience. Promotion may be done using a variety of advertising techniques such as email distribution lists. We have used html email newsletters. These contain an introductory context of the webcast given to the audience to prepare them for the structure and topics addressed. The webmail also contains links to past video clips of events and other resources.

The actual webcast can be captured. Many of the current commercial webcast software systems include the capacity to record the audio, video and live text discussions as a Flash video file. These may be viewed online or in some systems, such as Adobe Connect, the .flv files can be downloaded to edit the video and sound. Additionally, these recordings become a valuable online resource for learning and marketing. If organised properly these new-media e-learning and marketing resources can be associated with Web 2.0 meta-tags so that they are searchable (Google Labs, 2009). In our project we find the independent video and audio recordings more flexible for teaching and marketing purposes.

After the live online events, follow-up discussion and networking opportunities should be built into the design. These events may be face-to-face or asynchronously online. It is valuable to keep the energy from the webcast alive with a 'call to action'.

As Jennings (2009) declares, it is not the content or even the process of learning which is paramount, but the impact and application (or practice) of the knowledge to the organisation.

It is fitting to end this paper with a theoretical framework that can be synthesised to an e-learning context, since professional social networking (PSN) is dominating the e-learning news recently. We propose that Evolutionary Graph Theory provides a systematic approach to map out PSNs as they evolve (Kumar et al., 2006).

Lieberman et al. (2005) developed the Evolutionary Graph Theory with Harvard mathematics professor Martin Nowak. He helped to lay its foundation through the observation that most evolutionary theory deals with populations that have either simple shapes or no structure at all. The world around us is full of evolving systems with all kinds of internal structure – whether the networks of cells present in the human body or the social networks that occur in cyberspace.

However, Evolutionary Graph Theory provides a quantitative language that describes how replicators behave on networks which may lead to new ways to quantify the value of influence on the web. According to Lieberman, 'a replicator is an entity, be it an organism, a computer virus, or even an idea, that can somehow make copies of itself. Networks are a way of thinking about where the new copy can go' (Parker, 2009).

When we map over this theory to the context of webcasting models we can see how human networks of knowledge generation can support the replication process in several ways: expanding the network and expanding the knowledge base. Figure 4 illustrates how we can grow from the local core team of webcast stakeholders to the wider audience of participants within the organisation (e.g. Middlesex University) and the wider association of professional organisations (e.g. alumni and related business associates).

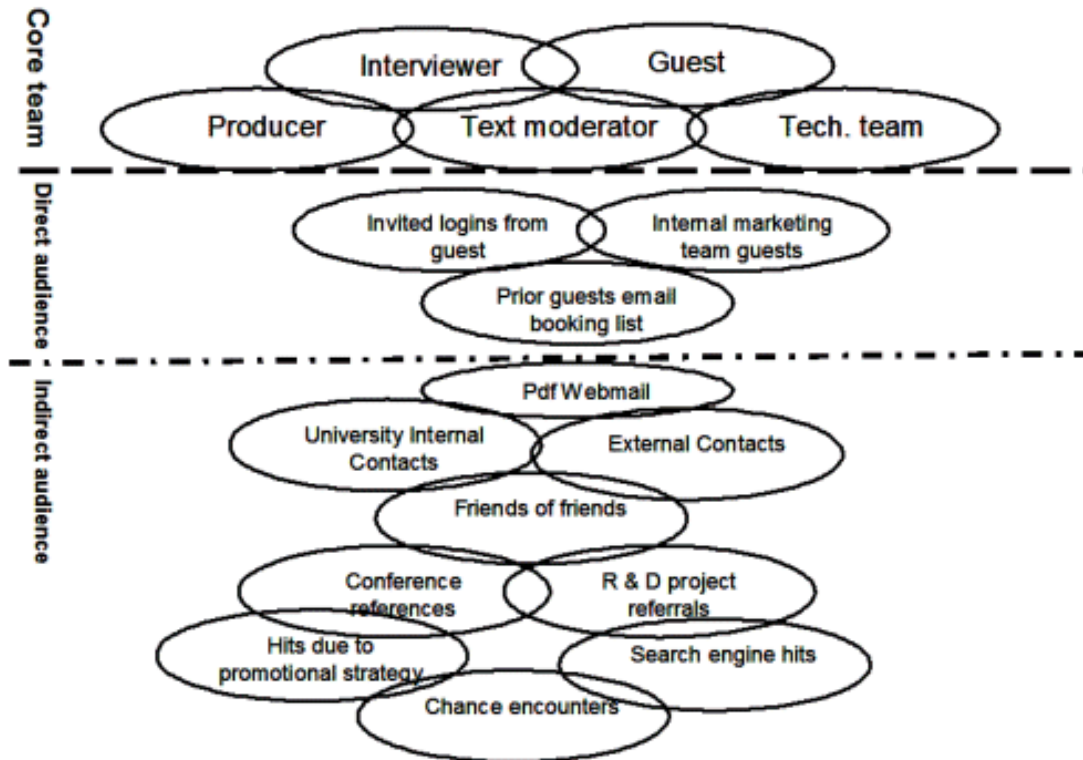Evolutionary Graph Theory to map Interactive New-media Webcast model

Figure 4: Evolutionary graph theory mapped to the webcast model (source: authors)

We can see in Figure 5 a visualisation of the connections between the various network layers of stakeholders, audience participants and so on through to a summary form of the data or webcast. The process can also be illustrated in a familiar software example of a set of Excel spreadsheets that each contain data (or a collection of networked knowledge). By using the copy and paste feature the data can be passed on through the various worksheets to a final summary worksheet.

We can also synthesise Metcalfe's law of computer networks into our e-learning webcast framework. Hendler (2007) sees the power of the web enhanced through the network effect produced as resources linked to each other with the value determined by Metcalfe's law which states the value of a telecommunications network is proportional to the square of the number of connected users of the system.
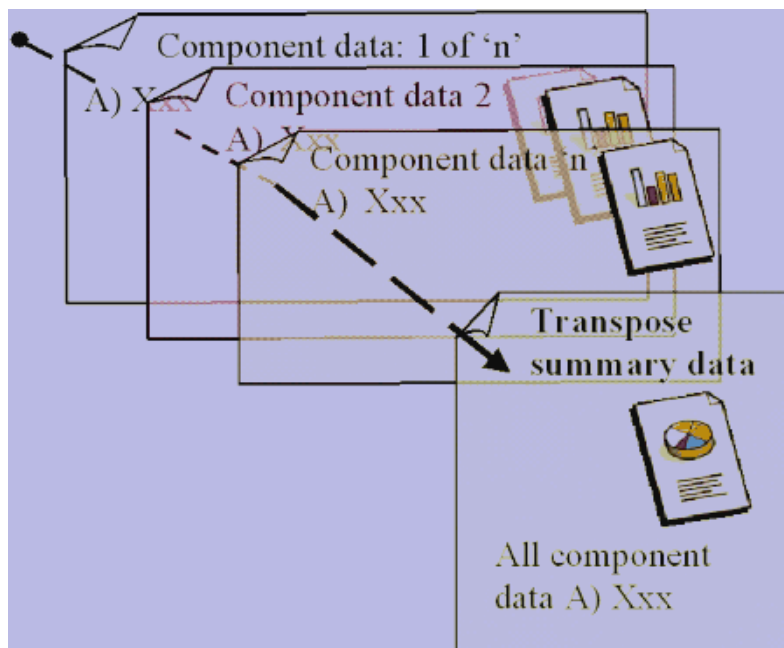
Figure 5: Connecting the network layers

In Web 2.0 applications, much of that effect is delivered through social linkages realised via social networks online. Unfortunately, the associated semantics for Web 2.0 applications, delivered through tagging, is generally minimally hierarchical and sparsely linked. The Semantic Web suffers from the opposite problem. Semantic Web information, delivered through ontologies of varying amounts of expressivity, is linked to other terms (within or between resources) creating a link space in the semantic realm (Hendler, 2007).

Summary

In summary we have provided context for models of webcasts and webinars from the perspective of the Institute for Work Based Learning (IWBL) at Middlesex University. We suggest innovative technical and pedagogic elements of these e-learning and marketing models synthesised in the Interactive New-media Webcast design (INWeb).

Moore's (1993, 1996) Transactional Distance Theory (TDT) was critically reviewed to its application to the pedagogic design for the INWeb model. Dialogue and structured were analysed to illustrate the impact on the autonomous learner as a webcast participant. The transactional distance between the webcast presenter and the online viewers/ callers was explored in the context of the webcast 'content' being a 'learner-generated' Web 2.0 dynamic resource for learning and marketing.

Three webcast models were compared with respect to moderated text discussion, the presenter's capacity and the type of content engagement for the online event. These e-learning webcast models were triangulated with Garrison's (2004) distance learning historical timeline and Pincas' (2007) collection of 3Ps pedagogic designs.

Several mini-case studies were then critiqued as a way to ground the e-learning theory in some real-world examples of use. These case studies were then reviewed from a business and academic perspective.

Our concluding reflections discussed how the current webcast models may be extended if we provide further framework towards a case-law. The Evolutionary Graph Theory and Metcalfe's Law were suggested as possible theoretical positions to tie together the professional social network and Web 2.0 elements to future Interactive New-media Webcast designs.

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