A 360 degree learning environment for university online teaching

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The paper is a sequence of methods to inform competent online video conferencing (webinar) teaching resources for universities rushing to meet learning effective provision in the current Covid crisis.

The authors consider Moore's Theory of Transactional Distance (1970), with the focus of the theory on developing autonomy in the learner, may still be relevant as a theoretical guide to a rapid growth in demand for online learning, despite originally being applied to traditional paper based distance learning.

Ensuring autonomy of learning in the theory's application, might need a WHAT, HOW, WHY, analysis to encourage the self-managed focus of webinar Presenters, Facilitators, Participants and stakeholders to be informed and aware from small PowerPoint projects to large-scale conferences.

The home-distance learning environment of the autonomous learner is now quite different to that envisaged in Moore's theory. Participants now have a broadcast studio in their home. The authors suggest a base level of hard skills of technical nature and soft skills of performance and engagement are required.

Managing complex online events are also not a feature of Moore's concept of the autonomous learner. Therefore a 'Fishbone' analysis is proposed to show the process of identifying key issues and quickly resolving solutions that may arise.

Looking to the future, the authors see the potential for a virtual online 360 Classroom. The Webinar could quickly evolve to use 3D Virtual Reality technology. One application might be to realise the traditional Socratic Method of higher level thinking accessible to many in a virtual online 3D environment. The conflation of technology and educational objectives are complex, but may now be managed with the methods suggested in the paper.*

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Finally, a Transactional Distance Toolkit, is explored as a quick and easy method of planning the structure and organisation of a webinar and a with its inbuilt visualisations are away to assess the effectiveness learner autonomy.

Keywords: online learning, webinar, learning theory, virtual environments.

Introduction

Teamwork, we take the view, is the essential component in a crisis. Stakeholders quickly recognise the nature and degree of being self-directed in these situations. But, goodwill must be maintained and nurtured and at a distance. The methods in the paper provide a clear plan of research and development of webinar interaction guidelines based on a theoretical foundation tailored for an eLearning team working to these situations.

Transactional Distance

What is 'transactional'? Dewey (1949) explains 'transaction' in an education context, as the individual's pattern of behaviour in an environment. According to Moore (1997), the separation between these [stakeholders] is sufficiently significant that special [engagement] strategies and techniques are needed.

These theories were proposed in the context of analog technologies of radio and TV of the correspondence distance learning models of the time. However, they are very relevant to the virtual 2D space of the digital transactional webinar of the present: particularly the concept of learner autonomy, responsibility for owning the processes and of their knowledge acquisition.

WHAT elements comprise a successful event

The section begins with technical components and moves to examine the stakeholder's profiles. For example, is there a clear model of the expectations of the Participants? Is there an inherent expectation for the interactions to be identical to a face-to-face discussion, classroom lecture, seminar debate, role-play enactment, or unstructured brainstorming? These

expectation need to be explicit. They become the criteria and a benchmark in 'transactional webinar design'.

WHAT Webinar Components Affect Learning

General technical elements of most webinar systems includes sound, video, live text discussion, screen share, recording, and feedback or participation surveys.

Audio: The audio component is the most important part of a webinar communication. Without clear sound, Participants stop the software and revert to a phone call. The solution is to ensure they use the 'audio set-up wizard' microphone test to confirm the sound levels. The essential check must be done well before the live event to avoid the 'can-you-hear-me' problems. A headset with earphones and microphone may be a way to avoid audio feedback or echo.

Video: Video takes up bandwidth. Frequently it is not essential to see the speaker or the audience to add value to the event. Alternatives include facilities to only show visuals of Participants that speak, limiting views of Participants to two or four in a large group. A still image of the speaker in the corner of the PowerPoint slides as an alternative to the live 'talking-head' may suffice. Technically only one channel of audio can be transmitted at a time. It may be recommended that the audience is set on mute audio and video at the start of the session.

But what is the psychological effect go these controls. Because the Participants are not necessarily in control. A long meeting is extremely tiring. It is possible that individuals are exposed to scrutiny as never before.

Text: Text chat may be a safer, disciplined method. Certainly some Participants are disconcerted by break-out sessions if they are not familiar with the protocols.

The protocols for meetings might not be as casual and informal as the technologies suggest. For these reasons prudent 'Before the event' planning on the invitation webinar registration or email invitation the Q&A (Question & Answer) protocols. Will questions be addressed during the session or only at the end? The text chat discussion can be copied and pasted in-

to the event FAQ frequently asked questions resource page. Built-in caution such as silencing mic and hiding visual before sessions start are available.

Screen Sharing: Screen sharing is a powerful 'show and tell' tool. Unfortunately, the feature demands bandwidth, so action can slow or stall. A pre-recorded video may be a better. Also, an audience might be given an option to download the video prior to the event.

Recording Webinars: Event recording is an expected service for anyone wanting to review a session or who missed the live webcast. In a business meeting, a summary of the action points can be recorded for the next agenda.

Recordings can be edited to create a lasting training resource, tell a story, create marketing and publicity. Using more than one camera beside the screen capture allows the teaching resource to give a different perspective on the subject matter. The Presenter may do an 'over the shoulder' point of view (POW) recording of the webinar. The resource can take on a more engaging tone. New technology such as the Black magic ATEM Mini Pro (2020), makes live multi-camera conferencing while recording multi-camera.

Towards Autonomy: Awareness of Hard and Soft Skills

The discussion so far identifies the variety of media and potential for creative opportunities. Next are some suggested solutions for essential hard technical and awareness of soft personal skills for protocols from a simple online room set up and for expectations of Presenters, Facilitators or Participants.

Organising the home-distance learning environment

There are a series of hard skills, tricks of the trade, which help bring the webinar model alive. The organisation and layout of the home room needs thinking about carefully.

Figure 1 *Presenter set up - legend below*

Red: Visuals

1 Laptop at eye level, screen vertical, recording screen

2 Box or books on hand for raising the laptop during online sessions

3 Camera used for to-camera introductions which highlight key teaching points and for end of session summary.

Blue: Lighting Control

1 Curtain

2 Blind

Both create a slit of light onto the Presenter's face controlling available daylight

3 LitePanel backlight to lighten up background behind Presenter.

4 Main light for recording video at the big screen.

Green: Scripting

You may prefer to prepare in the form of scriptwriting using tables in Pages or Word to structure your message (2). The scripting process is very rewarding: reflective, an exercise turning written concepts into spoken English using visualised, graphic, language through several script iterations (3) ending in a bullet point list on a small card. But to maintain eye contact in your personal conversation with individuals, the card is under the laptop camera (1). Unless the screen is shared, use it as an autocue.

The spoken style of writing comes with practice. Most talk on radio and certainly TV is scripted in some form and flipping from writing formal to informal spoken English and back again is a very valuable skill. The ability of the Apple pen in Pages on an iPad Pro (2020) is to record video in a variety of situations such as creating figure 1 above. Adding audio commentary and annotations on top of text is now a possibility.

Black: Video production

Creating a simple video is now technically easier to achieve using Media Video Player and Quicktime. A lecturer can either speak to camera or use screen capture to record a PowerPoint with an audio sound track. But, to do both at the same time needs special software.
1) Note the thin green rectangle on the screen. This is the boundary of the recording area of the screen that can be defined of iShowU Instant Mac software (2020) used mainly in gaming. In education, the potential is much more exciting: inside the green area, the Presenter can record themselves full-frame, part frame, or switch to grab the screen view during recording. By setting a (16:9 aspect ratio) the output video will be in the right format for online transmission. But, significantly, a PowerPoint, a pre-prepared video or live extra visuals from an iPhone for example of close-up detail, can be dragged into the green area - all on the fly!
2) The video editing software is Final Cut Pro but any simple package will do to tidy up the components recorded in iShowU Instant.
3) A slope is for scripts. Narrations can be recorded to the computer camera and sound using the script on screen as an autocue. An alternative is reading the script into a smart phone. The iPhone using VoiceMemos, outputs a very good quality close up sound because of the microphones. The sound file can be imported into the video.

Figure 2 *Selfies become serious*

Soft Skills Screen presence is a subtle art. The assumption that giving a lecture online is a doddle compared to the college theatre needs careful assessment - unless you are really good at it: time disappears, cogent argument becomes endless waffling, your favourite edifying story may well become an in-your-face full colour flop, largely because soft skills that work in the confines of a small screen, are ignored.

It is easier to describe than perform, the five factors of height, distance from, horizontal position and angle of screen and your background all have a significant effect of the audience and illustrated in *Figure 2*. These are described in a series of embodied metaphors, the short hand language of the camera crew: headroom, falling out of the screen, having depth, being in the frame, the open door is the metaphor 'future opportunity'. Thinking space is the area to the side of the speakers when a more informal conversational level of engagement is required. This area, where 'minds meet', is space filled during the discussion of ideas in a restful visual scene. The example in *Figure 2* might be too busy. The lamp and bunch of flowers are standard 'props'. Your background is more important than you think. A warning, bed furniture is a big no-no.

These soft skills for lecturers as an actor or performer working online may appear irrelevant. There are many reasons why academics dislike anything to do with this approach. But Michael Caine's famous TV master class (1987), may provide insights for anyone contemplation a teaching career on the small screen.

Webinar Stakeholders: Key Actors in Transactional Distance

Who are the key actors in a webinar? Web video conferencing events may include: Host, Presenter, live text Facilitators, Participants as individuals small or large groups. We argue that the metaphor 'actor' is taken seriously.

The webinar Host owns the account on the software cloud platform. This may be in any of the current popular systems such as Microsoft Skype in Teams, Zoom, WebEx, Adobe Connect, Google Hangouts, GoToMeeting, Amazon Chime, etc. Two-way communication frees up the limitations of one-way live webcast seen in YouTube or live streaming services. The webinar Host has the flexibility to control the webinar space by setting access permissions,

and to unmute microphones and video. Some systems, such as Adobe Connect, have screen layouts that can be adapted for location of the Presenter's video slides or text chat inside the framework of the software window. In a lecture-style webinar, the Presenter speaks while showing PowerPoint slides. Experienced webinar Presenters can engage the audience by pacing the delivery of text and graphic content with opportunities to respond to questions via text chat or poling tools. The webinar Facilitator is perhaps the most important role by linking the Presenter and audience. The Learning and Skills Group (LSG 2019) of London, UK facilitated by Don Taylor demonstrates a good balance of content delivery with audience contribution.

It helps to consider the Facilitator and Presenter as Key webinar 'players' and treat them as 'actors' even in a remote location and no longer facing the lecture hall. Even though the audience falls into three categories: a) individuals b) small groups on location c) large groups on location, every participant actually experiences the event as a personal face-to-face encounter with the webinar players. Treat the audience as individuals, personally recognise their very first login with a greeting and include another identifier such as the business or organisation or location. A Facilitator working with the Presenter is helpful for following reasons.

1 The 'actors' at the keyboard suddenly have a heavy responsibility, the audience experiences the Presenter and the Facilitator talking personally to them in full screen reality a foot or two away. Any small movement expression glance is magnified.

2 We identify the Facilitator's role to include that of moderator or spokesperson for the group. The role then specifies a function that helps manage events such as a Presenter naturally glancing out of the screen window that can create concern for every participant.

3 Questions for the Presenter to be directed to the Facilitator, to ensure the emotional load of the Presenter is minimised. Questions might be handled by a still image or a voice or just text appear on the webinar screen.

4 The Facilitator should be fluent in the language of the Presenter.

HOW: Designing learning with transactional distance in mind?

The technology should not drive the pedagogy, Thorp (1989) reminds us. Our research frames webinar instructional design in a matrix linked to the level of transactional distance (range of structure and dialogue) towards the learner becoming more autonomous.

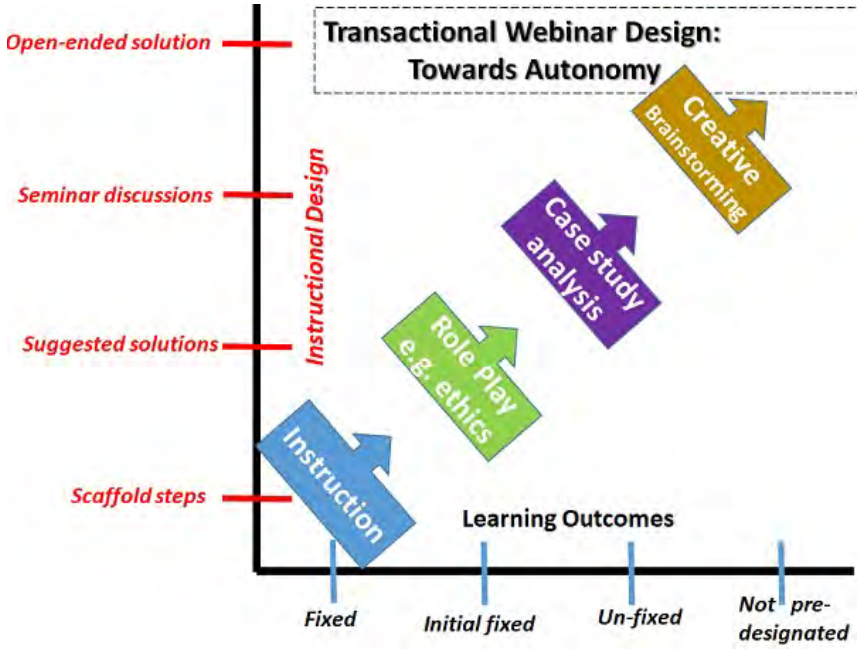

Figure 3 *Webinar Design Spectrum*

An Example: applying Toolkit guidelines for instructional design

A 'talking head' PowerPoint presentation with Q&A at the end, followed by an online quiz is a traditional design model. For example to train staff on using a fire extinguisher correctly there are detailed steps to follow and short-term recall is required for a specified conclusion.

The same task in a role-play webinar, with the Presenter and Facilitator providing audience members with a script to read, can act out a real-world situation.

A video of the task may portray errors or good practice with students discussing possible alternatives as a follow-up activity. Suggested solutions can also be given by the Tutor.

In small group discussions, the Presenter and Facilitator can create virtual breakout rooms to send Participants to analyse a case study. Each group may reach different or creative conclusions based upon their tacit and prior knowledge between the team members. Re-

cordings of meeting summaries can be available for review after hearing all of the solutions. The case study resource may have a sample resolution, but a multiple choice question with answer a combination (c) a + b) could address the factors under consideration. Negotiating with the team members and presenting recommendations supported by evidence in the webinar summary develops communication skills needed for virtual teams.

Finally, a key potential in webinar design is to promote autonomous learning. For example, using scenarios with no fixed outcome but a series of options requiring a creative approach. The webinar format provides a setting where team members may gain an understanding or each other's perspective. Each contribution to the argument leads to an innovative recipe of ideas and actions. Klaxon (2020), a French webinar software company, has an interaction model to foster smart teamwork. The sequence starts with a vote by team members on the project problem or research question. Through this first stage exchange, profiles of the group are established to identify any skill or knowledge gaps. Next, an ideas session provides opportunities for generating a resolution. Finally, a survey is done to gather evidence to assess the learning outputs of the webinar. All of these webinar models use a 2D interface to communicate real-life 3D audio/video data.

The next section is an exploration of a 3D environment as an immersive 360* 3D experience.

A Theoretical Underpinning for 360* Immersive Fishbowl Webinar Design

A Socratic discussion or 'fishbowl' model is proposed by the authors (Basiel et al. 2020) for the next-generation of webinar design.

Immersive webinars using a blend of 360* web video in conjunction with mobile smartphones create a virtual learning environment for the Socratic Method. The 360* software facilitates the Socratic method of cooperative argumentative dialogue between individuals, based on asking and answering questions to stimulate critical thinking and to draw out ideas and underlying presuppositions. The 'Socratic Effect' of the 'fishbowl' webinar design encourages the participant to rethink an idea after having their previously existing understanding discarded on the basis of their own answers to questions. The organisation is outlined in figure 4.

The 360* Immersive Fishbowl Webinar Design

The immersive blended learning model knits together: 360* video, mobile smartphone video conferencing, a local digital video camera, voice-to-text software for auto-transcription and a webinar Host platform.

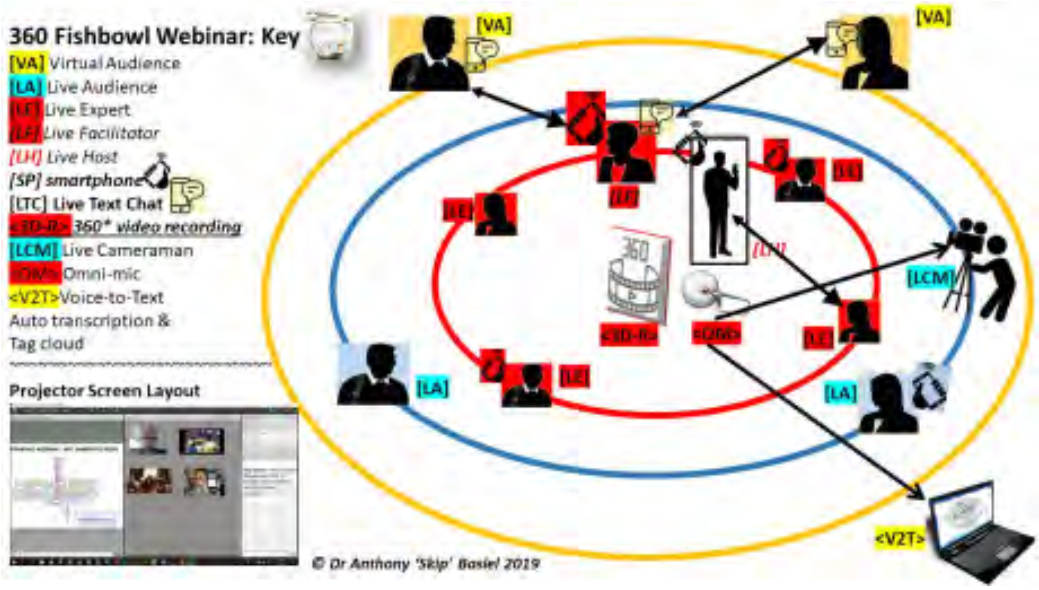

Figure 4 *the 360* Immersive Fishbowl Webinar Design*

The face-to-face 'fishbowl discussion' is a small central group of Local Experts [LE] sitting in an inner (red) circle with a Live Host [LH] using their mobile phone as a video camera and microphone to interview the Experts. The Host swaps the video camera from viewing themselves, when acting as Master of Ceremony, to showing the Expert speaking.

Webinar Participants using smartphones to record themselves using news journalism methods during the teaching event 2D 'Meta-Film' approach (Basiel & Howarth, 2017), now applied in a 3D situation. It sees the inner-and-outer circle actors [LA] being active Participants in a 360* 'unconference', using their mobile phones to record events from their own perspective. These videos are shared in social media platforms to promote the conference and develop an online community of learners.

In the centre of the circle, there are two capture devices:

1. 360* video camera <3D-R>– A device that first records the introduction before the live event. Then records the fishbowl discussion.
2. Omni mic <OM> – The device creates two outputs. First, the main audio for the Live Camera Man [LCM] who produces the main screen of the event. Second, the audio is fed into a live voice-to-text transcription <V2T>.

Text output creates a tag cloud summary graphic of the transcript. Text can be used as the database for an AI chatterbot dynamic FAQ resource.

The event Live Facilitator [LF] is a key player in the model. They sit in the inner circle and act as moderator for the Host and remote audience virtual [VA] members. This interaction is mediated silently, at first, by live text chat [LTC] discussion. As the Live Facilitator finds questions to add to the discussion, they give the VA member video access and turn off their [LF] self-video.

The projector screen layout diagram in the bottom left corner suggests how the event may look online to the virtual audience [VA]. The live event is projected on a big screen so the face-to-face actors can see the video of the entire group.

The event uses interactive webinar elements previously discussed such as whiteboard mind maps, voting, surveys, and polling. These activities promote evaluation of the event success. Next iterations of the 360* fishbowl model includes use of video drones (2020) and replaces the inner-circle people with a 360* monitors model (2020) when it is not possible to meet in person such as social isolation during the Coronavirus pandemic.

A 360* meeting during the Coronavirus in 2020 is may be a contribution to creative solutions to the situation of self-isolation.

A weakness of the open discussion model is that the webinar can become chaotic. The Live Host/Local Facilitator can juggle the flow of the interactions, but the larger the audience the more difficult it is to choreograph the online event. Let a physics principle called *py*[‡]*(2020)* be applied to guide us through the webinar mayhem. Entropy predicts any system will tend towards disorder, rather than develop a systematic structure. For example, if I

[‡] https://www.quora.com/What-is-entropy-4

have a container with 20 game dice that I throw across the table, the grouping patterns will be random, not tidy. The probability of the dice forming a pyramid is very low. Instead, there may be no evident pattern. Some of the dice may cluster together, while others are isolated.

An example of '*Learning entropy*' occurs in the unstructured nature of brainstorming in a webinar. The creative process can be steered by the Host/Presenter through the technical features of the webinar such as limiting participant video and audio transmission. Questions and comments can be redirected into the live text chat, but that can also become chaotic.

Is there a way to funnel the interactions of the webinar without too much control from the event organisers?

A fishbone or Ishikawa diagram (2020) is a way to conduct a *cause and effect analysis* for a brainstorming session. The diagram-based technique combines brainstorming with mind mapping to consider all possible causes of a problem, rather than just the obvious ones. According to Mindtools.com (2020), *'When you have a serious problem, it's important to explore all of the things that could cause it, before you start to think about a solution. Then, you can solve the problem completely, first time round, rather than just addressing part of it and having the problem run on and on.'* A fishbone diagram can:

- ➢ Discover the root cause of a problem,
- ➢ Uncover bottlenecks in your processes,
- ➢ Identify where and why a process is not working.

Step 1: Identify the problem

You can use a Soft Systems Methodology technique (SSM) from Checkland (2012) called CATWOE where the problem is examined from the perspective of Customers, Actors in the process, the Transformation process, the overall World view, the process Owner, and Environmental constraints.

Figure 5 *Fishbone Diagram - Identify the problem Mindtools.com*

Step 2: List the major factors

Next, identify factors that may be part of the problem such as systems, equipment, materials, external forces, people involved with the problem.

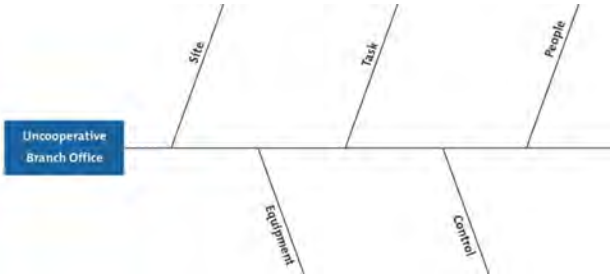

Figure 6 *Step 2 Fishbone diagram - Major Factors*

Step 3: Possible causes

Now, brainstorm the variety causes of the problem for each of the factors you considered in step 2.

Figure 7 *Step 3: Possible causes*

Step 4: Analyse the problem

Analysis involves setting up investigations, carrying out online surveys, and web video conference interviews. These techniques test the causes actually contributing to the problem and provide evidence to inform action. In the context of the Transactional Webinar Design, the same analytical processes take place easily and quickly in a short effective event or a series of webinars.

The manager in the example above may have assumed that people in the branch office were "being difficult". He thinks the best approach is to arrange a meeting with the Branch Manager. The decision allows him to fully brief her on the new strategy, and talk through problems she may be experiencing.

Why Transactional Distance Theory?

The final question, WHY would you want a webinar model that is informed by Moore's Transactional Distance Theory (1997)? Stepping back in time to the 1960s there are two dominant pedagogical traditions. Perhaps most of your webinar experiences have fallen into a Behaviourist webinar model. In this online learning event, the webinar audience is taken through a linear, systematic path of instruction based upon behavioural objectives. There is maximum Tutor/Presenter control of the resources, timing of the content delivery, media types used and opportunities for audience participation. Knowledge in this webinar design is a product metaphor. Mastery of a new skill or ability to recall short-term information may be a learning outcome linked to a standard assessment such as a written essay or presentation. The Behaviourist webinar model focuses on deliverables and not the process.

The Humanistic Tradition, on the other hand, has its roots in counselling and education psychology. Special value is placed in less formal, unstructured learning. The value of interpersonal, open-ended dialogue and creative brainstorming falls into this pedagogy. The creative webinar space may produce a bottom-up, learner-generated content experience with personalised learning outcomes. The Participant ownership of the learning journey is a key element. Moore was concerned with distance learning and responsibility for the learner to manage their learning from manuals radio or TV. Today the same process is live, active and

public in the digital environment with the students and the Presenter and Facilitator being more relevant than ever. They can be creative players on a stage.

Through the Transactional webinar model the participant has acquired a new skill, understood a new concept or mind mapped a path to an innovation or discovery. The next stage of the process provides the opportunity to apply that capability. The webinar or series of online events has the potential to bring a virtual community into action in the real world.

Key Components of the Transactional Webinar Profile Toolkit

Our research provides a software toolkit that guide the programme structure and learning dialogue to create a successful Webinar Profile (2020). A set of ten transactional factors are rated from your perspective as a webinar Host/Presenter or Participant. The next figures provide a summary of the analysis.

Figure 8 *Webinar Profile Toolkit - Structure*

Values are added to the Toolkit and appear as a visual bar charts. The assessment begins with establishing that the webinar has a pre-event resource induction or discussion. Next, is there an introduction of the Host or Presenter and Participants providing context to the webinar event? Are the stakeholders given appropriate resources or opportunities to create their own? Is any formative, self-assessment or reflection built into the webinar? Are the

webinar Participants given the opportunity to analyse, evaluate or create? At the end of the event, is evaluation data collected and analysed?

Figure 9 *Webinar Profile Toolkit – Dialogue*

The overall goal is not just review the webinar design and systems used to match the needs of the stakeholders, but the quality of learner autonomous, self-managed webinar Participants and stakeholders.

Evaluation

Evaluation should not be an afterthought. An online survey built into the webinar design from the start to quantify open-ended feedback and provide 'feedforward' evidence is needed. Each webinar event can use built-in polling tools and external systems to capture participant profile information. Some useful data may include:

1. Demographics e.g. geographic location, occupation, native language, webinar technology expertise
2. Expectations e.g. personal learning outcomes matched against the intended learning objectives
3. Human-Computer Interaction e.g. usability of the system

4. Pre-During-Post event sharing of knowledge and opinion, recorded as a score or tag cloud.

Web video recordings of the events can provide auto-transcriptions, text discussion exchange and whiteboard mind mapping evidence to support any modifications proposed to the webinar design.

Conclusion

The paper outlines practical methods for designing webinars for learning from an effective planning process to a 360* design for immersive learning experience with a simple way to assess participant performance. A theoretical framework is provided by Transactional Distance Theory (Moore 1997) adapted to current online distance technologies.

Training for the modern versions of distance learning is facilitated by asking organisers to assess: WHAT are the key factors of a successful webinar? HOW can webinars be blended with the interactive and transactional design? and WHY should you choose the transactional distance webinar model?

Moore (1997) at the time suggested that teachers need training to extend their traditional skills to embrace telecommunications for distance learning. Our paper provides a structure for that training by requiring stakeholders to assess their profile for technical and pedagogic blending. The spotlight on learner autonomy is a powerful reminder that end-user objectives are included in planning. The spotlight provides a focus towards Humanist creativity rather than the traditional instructional design Behaviourist model of webinar design.

Practical techniques such as the fishbone diagram maintain attention on learning despite the complexity of online events. The Transactional Webinar Profile Toolkit gives participants feedback guidance in aspects of the process from planning software to assessing effectiveness.

A glimpse into the future of a move from 2D technologies to a 3D immersive experience for participants suggests the benefit of shifting the balance from participants looking in to an event where looking out in terms of application of ideas in the world of the user. The So-

cratic Method may be achievable as an online experience using the technology. The result might allow participants to engage in higher levels of thinking.

The future is fast changing and ways to quickly collaborate to evaluate methods which are not platform dependent. The focus on the quality of online life in Higher Education is likely to be the norm not the exception.

The reader is invited to use the Transactional Webinar Profile Toolkit (2020) and test the guidance to choose software that applies Moore's Transactional Distance Theory in real-world webinar events. Test our webinar learning theory in online activity from basic lecture, discussion, large scale webinar or the 360* environment.

Please contact us with case study feedback on the results. The analysis of the case study examples inform the future designs of webinars. The authors predict a paradigm shift to more creative webinars that promote autonomous learners.

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