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how to webcast



Webcast training methodology

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The Methodology was prepared in the consortium of four partners:

Management Observatory Foundation (FOZ)

Adam Smith College (ASC)

Czech Efficient Learning Node (CELN)

Institute of Mobile Technologies for Education and Culture (IMOTEC)

Authors:

Calum Thomson (ASC)

Jaroslav Čech (CELN)

Krzysztof Zieliński (FOZ)

Vilma Butkute (IMOTEC)

Review:

Joanna Opoka

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1. Introduction to webcasting

The term “webcast” first appears in Daniel Keys Moran’s mid-80s science-fiction novel *The Armageddon Blues* where he describes a news company called DataWeb “webcasting” a news bulletin. However, at this time webcasting was still only an idea.

At a conference called “IterTainment ’89” held in New York, Brian Raila of GTE Laboratories first described the streaming media technology which would make webcasting a reality. He called it “buffered media” where rather than as had previously been practice, downloading entire pieces of media, media is downloaded progressively in portions or “streamed” to the clients computer. After collaboration with his colleague James Paschetto who developed the first working prototype of streaming media, Raila first publicly presented and demonstrated the technology.

During the early 90s this led to the first experimental broadcasts of radio and video streamed over the internet using similar streaming technology. Popularity of webcasting for entertainment and news purposes grew rapidly coinciding with growth of capacity for web traffic both commercially and physically.

1.1. What is webcasting

The term “webcasting” holds a number of different meanings within modern communications. In its most basic form, the term webcasting simply refers to audio or video which is broadcast over the World Wide Web using a single content source to distribute to a wide trainees. This can be delivered either live, or “on demand” where the viewer has the flexibility to view whenever they wish. However, rather than requiring a download like a podcast or video podcast, a webcast uses a progressive video stream onto the users computer so there is no need for hard drive space or leftover media files.

Due to its generally accepted use, webcasting is most broadly used by the media to broadcast non-interactive entertainment and news over the web. The main benefit of this is the flexibility provided to the viewer who is not constrained by time schedules like those of more traditional broadcasting. Within the UK, major television networks such as the BBC, ITV and Channel 4 all webcast their content over the web, both as a live stream and as an “on demand/watch again” service where all content is available for one week after its live broadcast.

Although these webcasts are generally non-interactive, an interactive element is delivered through forums and chat rooms linked to the page supporting the webcast. This either allows viewers to discuss the content as an online community or, in some cases of live discussion and panel shows, contribute to the show directly by asking questions or making statements which can be relayed directly to the panel.

As these webcasts become more interactive they become more similar to an e-learning webcast, where

a linear broadcast of a lecture or educational piece of video is made available and trainees are asked to discuss the piece or can submit questions and opinions. As the trainees are given an increased level of interactivity through allowing them to submit information to the discussion be it text, graphic, audio or video, the experience will become more engaging for them and make for better learning.

1.2. Differences between webcasting & web-conferencing

The definition of webcasting which is used here could be considered a form of web-conferencing, a technology used throughout the business world to conduct meetings “in person” between groups of people over a network / the internet. Within these meetings, software with similar functions to those we are developing methodology for are used to create a similar environment. However this uses “many to many” communication where, although one person may chair a web conference meeting, all members have equal access to deliver content to each other simultaneously. Also, as with a traditional meeting environment there will be an agenda, but not a rigorous structure as would be required with an e-learning webcast.

1.3. Webcasting in education

Use of this technology for learning is still considered to be in its infancy, however as with news and entertainment, growth of use within teaching practice is expanding rapidly alongside the capacity of trainers and learners to support the technology. The potential which webcasting holds within education, particularly for adult education and continuing professional development within small and medium businesses opens up a huge market for in house up skilling of staff where traditionally staff would have to be sent on training days, often at great cost to the company. Also, the option for webcasting to either be live and interactive, allowing a simulated classroom experience, or “on demand” for trainees to watch when they want as many times as they want makes training of this type very flexible and therefore efficient, particularly for small businesses.

As the use of technology in post-compulsory education has become more widespread, educators have begun to use these technologies both in courses based around training in subjects such as IT as well as an additional core skill in more traditional areas. This has led to a culture shift in education towards what we call “blended learning”. Initially the term blended learning referred to educators using new and innovative technologies in conjunction with more traditional teaching methods practiced in the classroom to deliver their lessons. However, as technologies have become more developed and generally available this innovative approach to learning has shifted to “blended e-learning” which refers more to the virtual environment in which the lessons are delivered. In blended e-learning, the use of multiple digital medias to deliver learning, such as incorporating audio, video, graphics, text and interactivity within one delivery allows the educator to create engaging and subversive virtual learning environments.

In webcasting for learning, the structure of content and the level of control over interactivity made available creates more of a “broadcast” environment, with one person (namely the lecturer) delivering content to a group. While an e-learning webcast with a small number (2 or 3 trainees) may have a high level of interactivity similar to that of a web conference, where the lecturer has control over the heightened interactivity, as the volume of trainees taking part in the webcast increases, less interactivity should be made available in order to control the webcast. Therefore large groups will lead to webcasts similar to a traditional broadcast format.

Although these new technologies support learning, many still use them with the traditional teaching styles they have adopted for the classroom. However, while many underlying methodologies common to all teaching practice are allowed to function using new technologies such as webcasting, the effect of these technologies can be maximized by developing new processes and teaching styles specific to the new technologies and this document sets out to address how you can maximize the effectiveness of teaching and learning through webcasting.

1.4. Advantages and challenges of webcasting for training

Rapid development of infrastructure and technology used for distant communication makes the technology itself cheaper and more available. As prices decrease every month, the user's experience is enriched. In such circumstances, a fast internet connection is a standard in every educational institution or enterprise. As a result, distant education is becoming a far cheaper and better alternative to traditional training.

The price is undoubtedly one of the advantages of webcasting training especially when the costs of travel and accommodation of trainees are high. The cost savings of webcasting training appears in such areas as:

- Time of trainees
- Travel and accommodation
- Training materials
- Evaluation of trainings
- Post training materials preparation

Webcasting allows for a training experience with an expert which would otherwise be unavailable because of the associated distance and time limitations. It also allows the trainer to record such sessions easily for other trainees (and to make available “on demand” on the website). Moreover, webcasting is a possibility for people to get trained in new areas – especially when they wish to retrain in order to change or get a new job. In such situations, the most important factor is the initiative of trainees who have to browse the Internet and to find free of charge webcasting sessions. Apart from that, webcasting sessions provide a good option for people that do not know in what area they wish to specialize. Due to the webcast, they can attend many webcasting training sessions to check themes and topics before choosing expensive traditional trainings or post-graduate studies.

The distance learning and webcast training experience unfortunately have also disadvantages. Trainees participating in traditional training are more concentrated on the training than those participating in the webcasting session. During the webcasting session trainees can at the same time browse the Internet, work, read and do many other things that might distract them and make the training unproductive.

Secondly, with webcasting tools it is fairly easy to conduct ad hoc meetings but only in the groups of up to 5 or 6 trainees. Webcasts with larger groups of trainees have to be prepared earlier. Also, traditional meetings allow participants to be more flexible and interact more than during webcasting sessions. Consequently, during the webcasting training it is difficult to moderate the large group of participants especially when the non verbal communication between participants is limited to an absolute minimum.

2. Organization of the live webcasting training

As was suggested during the introduction, webcasting has a variety of uses in entertainment, business and learning. Nevertheless the main focus of interest in this paper will be only one form of webcasting which is live broadcast for educational purposes. Many aspects of live webcasting, such as technology or learners' motivation, can impact the effectiveness of training. The institution that organizes a webcast training session has the most important role to play, which is the responsibility to provide a successful session.

2.1. The aim of the webcasting session

An institution that wants to organize webcast training has to answer the fundamental question: why do I need this? The given answer will determine how the webcasting session will be organized. The most common reason for choosing an audio-video broadcast is due to the geographical dispersion of course trainees, both learners and trainers. The technology of webcasting gives an opportunity to avoid travel, which in turn reduces costs and saves time. It also allows an enriched course program by inviting guest lectures. Finally, webcasting is an alternative for learners who cannot attend the training in person because they are unable to travel or are ill. Regardless of the reason we decide to organize a webcasting session, the aim of the webcasting for learning is to increase access to education.

2.2. Types of trainees

The training organizer is responsible for providing information about their remote trainees to trainers who have to know what kind of learners they are going to be working with (adults/children, professionals/laymen etc.) and how many of them will participate in the training.

If we consider types of trainees, first of all the trainer has to know who will attend in the training, and this depends on nature of the webcast:

- Closed, limited audience (invitation required, known identity of the particular people);
- Power users (advanced users of computer programs);
- Anonymous users.

All of the types mentioned above require a specific approach (e.g. power users (usually) do not need an "opening ceremony", "Do you hear me? I do not hear you...", "How do I set up my camera?") this part takes up extremely large amounts of time for inexperienced users. Anonymous users have their own specific habits (see most open internet discussions) and the administrator has to control such a user using available tools for the whole session.

Another factor that determines a webcasting session is the location of trainees. There are a number of possibilities:

- Trainer and local trainees in the same class + remote trainees;
- Local trainees in the same class + remote trainer;
- Local trainer + remote trainees;
- Remote trainer + remote trainees.

Each of these situations requires different ways of preparing webcast training. The trainer has to know how to plan structure the of the lesson, what types of activities and interaction might be used, and whether they will be supported by technical staff.

Also the number of trainees in the group is very significant for organizing a successful training. There is one general rule for webcasting: the more users—the less interactivity. This rule of thumb has to be considered when planning the structure of the webcast session. But there has to be some interaction. if it is missing we do not perform webcasting training but one way streaming which is definitely less effective. The following tables demonstrate how a webcast alters depending on the number of session attendees.

Level of interactivity and webcast structure

Number of trainees	Interactivity level	Structure of the webcast
Up to 6	High level of interactivity—the session can be led as a dialogue. The trainees can interrupt the lecturer spontaneously. There are allowed interactions between particular trainees e.g. via chat. If there is a local trainees, polls, voting and similar tools do not play such a big role – everything can be addressed face to face.	Structure of the session can be changed if necessary according to the feedback and interaction.
7-20	Limited audio/video responses (lecturer can select who will talk). There has to be tool to express particular status by the trainee (e.g. “raising hand” button available in webcasting software). Polls, voting and similar tools are important.	Structure should be set “semi firmly”. There has to be space for extending/shortening some parts of the session if it is interactively required. There should be space for Q/A after each logical block or at the end.
20-50	Limited feedback via chat or interactive tools like poll and questionnaires.	The structure should be firm, there should be some space for FAQ via chat
50+	The level of interactivity depends on size of the webcasting team. If the size is small (or none)—only polls and similar tools can be used. If the team is more robust, chat can be allowed and pre-sorted.	The structure should be firm. There will be anonymous users and the fact that some attendees come later, some leave earlier.

Required attendees identification

Number of trainees

Up to 6
7-20
20-50
50+

Trainee identity

Full – Name/Surname/Email
Full Name/Surname
Limited (Name/Nick)
Anonymous – identification for chatters
only required

2.3. Trainer's role in webcasting training

The organizer of the webcasting session has to enable the trainer to concentrate on teaching. Which means that trainer must be given all the important information about trainees and learning outcomes. The organizer must be ready to answer following questions:

What is the aim of the particular webcast?

- What we want the learner to be able to do?
- What we want the learner to know?

What type of trainees will participate in training?

- Is the webcast for a closed or open community?
- What is the number of trainees?
- Do the trainees use this kind of software frequently?
- Will there only be one session or do we expect more consecutive sessions? If consecutive sessions—will there be the same attendance?

What technical conditions are ensured during the training?

- Everyone is sitting by their own computers?
- Is the broadcast made for single or multiple “classes”?
- Is there provided a technical support for learners and trainer?

The trainer's job is to choose the right methods to accomplish their teaching goals. However, the organizer must provide the trainer's guidance in the field of technology and the use of webcasting in education. If the trainer is well trained and informed, they should be ready to prepare a good lesson plan.

Before live webcast training the trainer should be able to answer the questions below:

What type of interactivity is desired?

- Full audio/video interactivity on both sides
- Switched trainees response (the administrator can choose who will speak)
- Chat response only
- Response through some interactive tools (e.g. voting, questionnaire)
- No response at all

What output of the session is expected?

- Certain knowledge and understating of presented problems
- Practical application of the knowledge
- Analysis/problem solving skills
- Evaluation skills

What is the structure of the webcast?

- Lecture
- Interactive training
- Network collaboration

What kind of external materials will be used?

- Presentations
- Documents
- Films

What software will be used during the session and what are the other technical conditions?

- Is it possible to use these materials “interactively” (e.g. using whiteboard tools)?
- If we are using media requiring high bandwidth (e.g, HD video)—do we know the bottleneck of the connection (are all trainees well connected)?

2.4. Moderator and technical support

During a webcast, the trainer will find themselves having to multitask. They have to deliver a presentation fluently while at the same time pay attention to questions from the trainees and text-based comments from the remote attendees. The moderator is the person who helps the trainer to deal with the high volume of trainee interaction. The moderator can focus on the organization of the class discussion. They can easily follow comments and questions, categorize them into topics and present them to the trainer in the time reserved for discussion.

Conducting a webcast requires a certain degree of technical know-how. It is important to assure that the person conducting the training session knows how to use a computer and the software used for the webcast. It is not uncommon for technical problems to occur and if they do, the trainer should be prepared. The software, hardware and lesson plan should all be tested before the training session to minimize the chance of potential problems. Also, the trainer should have enough knowledge on the subject to help course trainees if they encounter any difficulties.

3. Webcasting technology

3.1. Webcasting software

Many pieces of webcasting software are web based applications and do not require installation. This is due to issues regarding the learners' willingness and ability to install new software on their computer and the inevitable time delays which will result as users join a webcast, but realize they are required to install software. Many pieces of webcast software are built within the Adobe Flash platform which is installed on 99% of machines. This also aids the software as it allows it to work on multiple platforms and operating systems. Using web based software however can result in high bandwidth use and many pieces of software developed to be web based are renowned for being bandwidth intensive. This can result in problems running the software on computers connected to the internet through smaller networks.

3.1.1. Functionalities

Within this paper we have identified that there are a number of functionalities which are beneficial to webcasting software. Some of these functionalities are essential to delivering the webcast, while others simply enhance the learning experience. As with all software, the number of functionalities available to the user is dependant on the development of the software and this is reflected in the cost. We have evaluated a variety of pieces of software ranging from freeware / shareware software available to commercial options.

The following functionalities are found in most if not all webcasting software suitable for education:

- Voice transmission (VoIP)
- Video transmission
- Chat
- Real time whiteboard
- File sharing
- Note sharing
- Screen sharing (ability to view of the monitor screen of the presenter / lecturer).

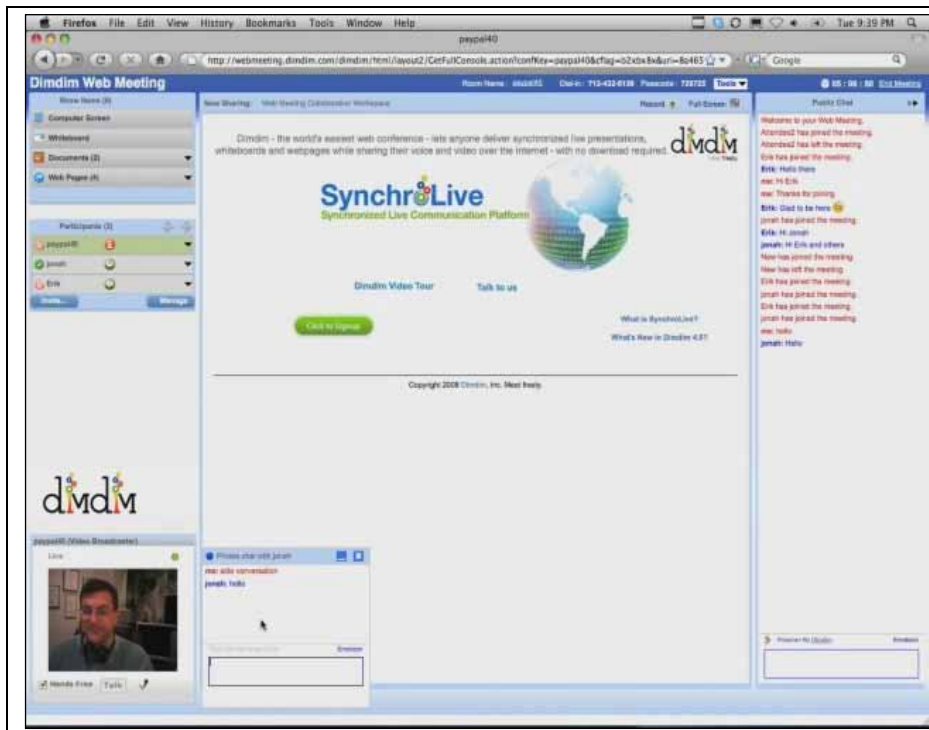
Further options which may be useful and are available in some of the more advanced software options are:

- The option to change moderator/trainer during the session—this can be helpful for webcasts to smaller groups as it allows trainees and trainers to work collaboratively and swap who is sharing their screen etc;
- The ability to view a downloaded file through the software—this is helpful for discussion

purposes;

- The ability to record a webcast through the software—this can be very helpful as it not only allows trainees who have not attended the webcast to view the content, but also works as a form of digital note taking meaning trainees can devote their full attention to the webcast at the time of live deliver;
- The ability to carry out teleconferencing style webcasts—this can be very helpful if the lecturer wishes to allow the trainees to take control of their own lesson in order to hold a discussion or collaborative work;
- A questionnaire creator—this can be an excellent way to carry out assessment;
- The ability to publish this questionnaire—this can be an excellent way to give feedback to trainees on this assessment quickly and easily.

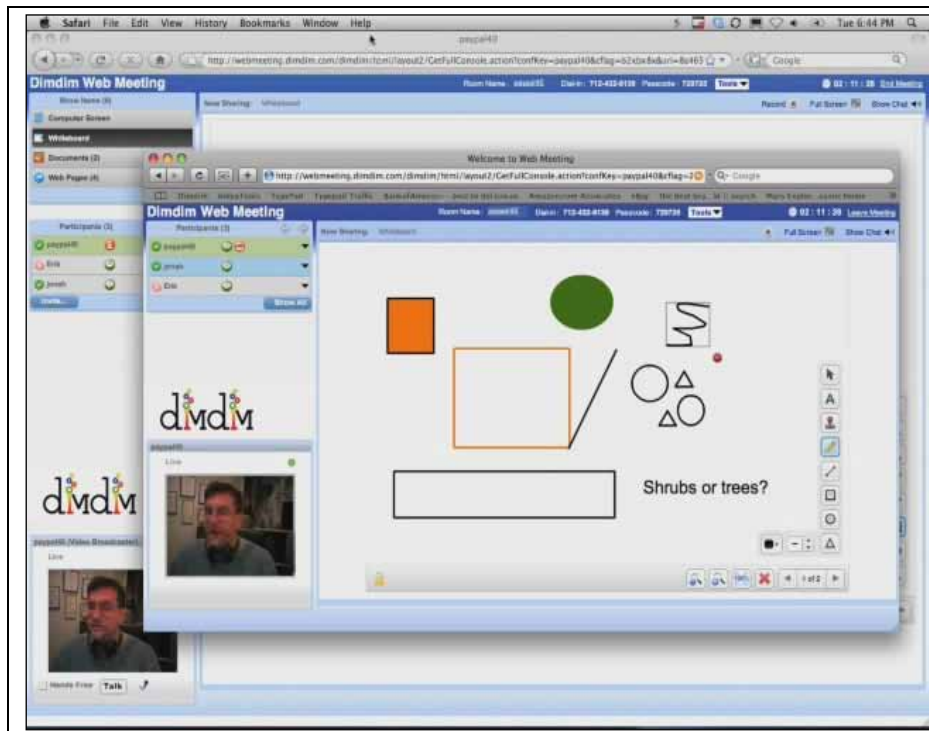
Screenshots below show examples of webcast software functionalities:



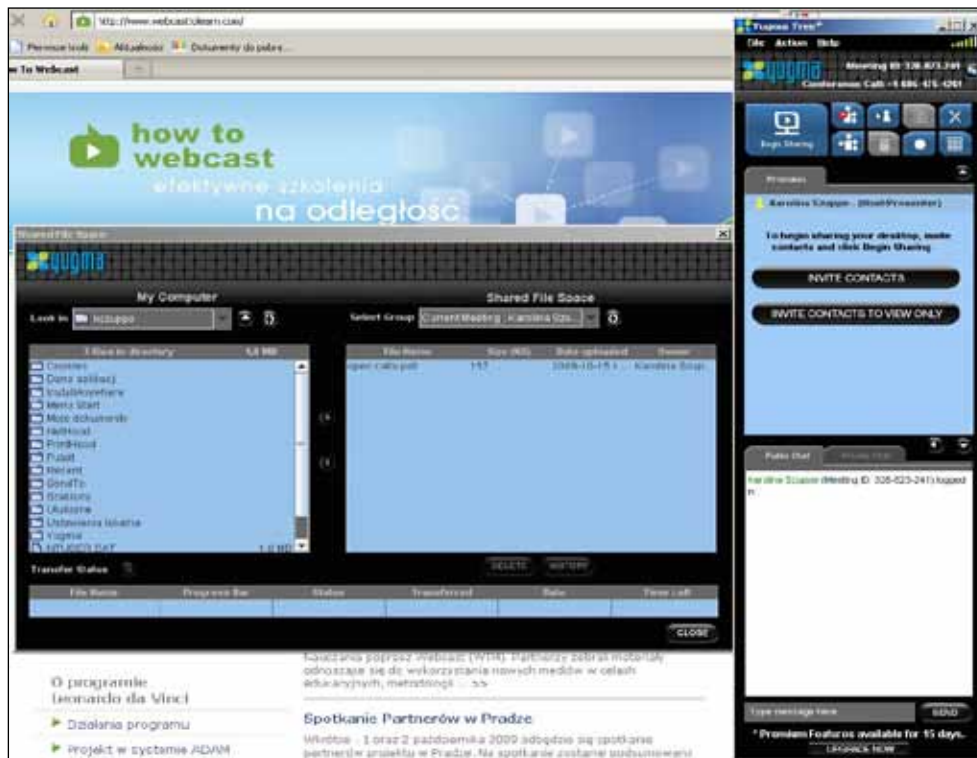
Public and private chat in DimDim free webcast software



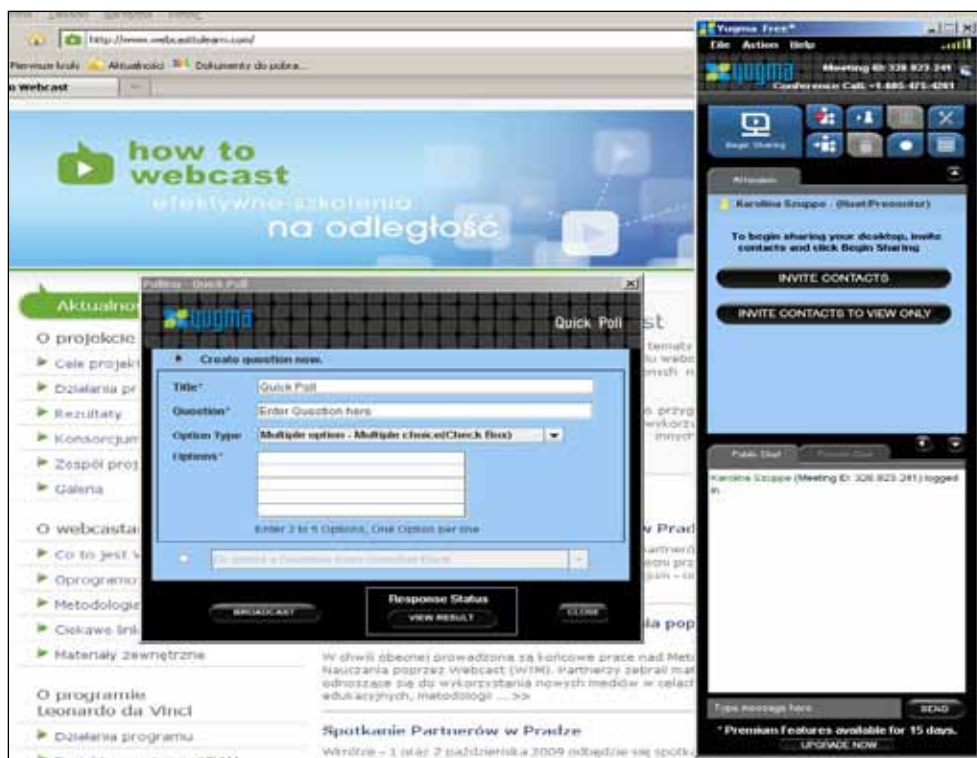
Documents sharing in DimDim free webcast software



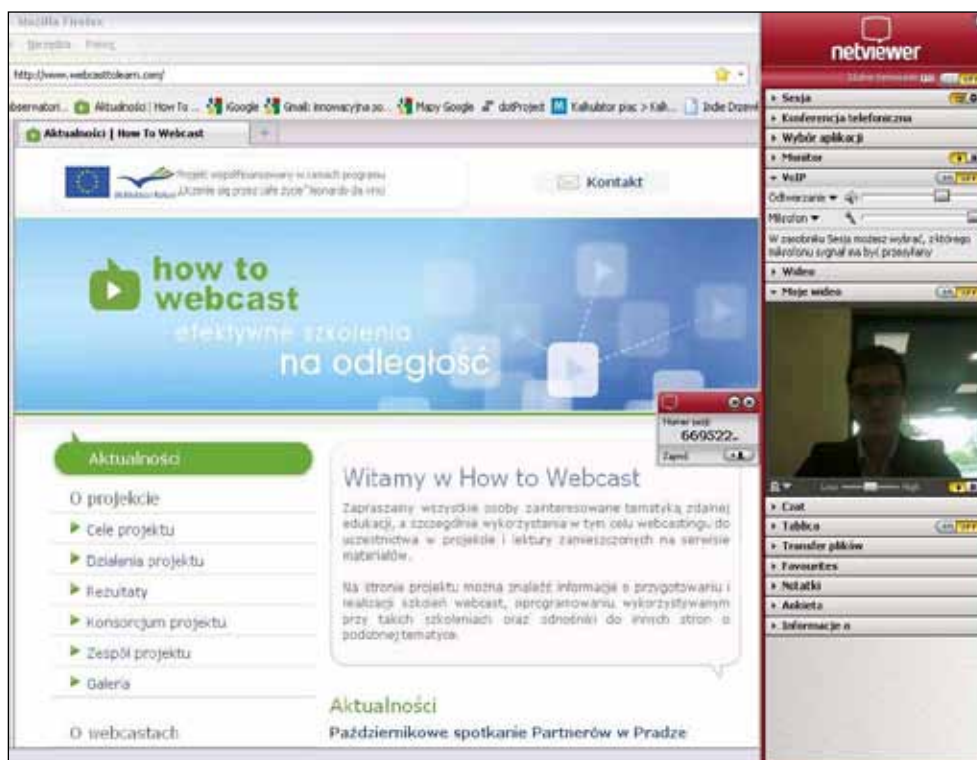
Whiteboard sharing in DimDim free webcast software



File sharing in Yugma Free version software



Creating questionnaires in Yugma Free version software



Video Transmission in Netviewer software

Questions which can be asked of software in order to define its effectiveness are issues such as; is it web based or does it require software file downloading; does it require software installation; what is the maximum number of users at the same time; is it freeware.

3.1.2. Resources

There's a number of software, both free and commercial, which can be used for educational purposes.

Shareware/freeware webcasting software examples:

- DimDim - <http://www.dimdim.com/>
- Yugma - <https://www.yugma.com/>
- WiZiQ - <http://www.wiziq.com/>

Commercial webcasting software examples:

- Adobe Connect - <http://www.adobe.com/products/acrobatconnectpro/>
- Netviewer - <http://www.netviewer.com/>
- Onif - <http://www.onif.cz/>
- Wimba - <http://www.wimba.com/>
- Polycom pvx - http://www.polycom.com/products/telepresence_video/video_conference_systems/personal_systems/pvx.html
- ViPS - <http://emtc.ktu.lt/cms/emtc/app>

- Tandberg See&Share - <http://www.tandberg.com/products/webconferencing.jsp>

3.2. Hardware requirements

As with education in the classroom, webcasting should be available to all and therefore webcasting software should be compatible with reasonably low specification computers. The physical hardware required varies depending on the level of engagement the user wishes. To view a webcast, the bare minimum required is a computer with a broadband internet connection, a keyboard, mouse and screen. This will allow a minimal level of interaction. However, as the level of interaction is raised the more engaging the experience will be for the user. The addition of speakers to the computer set up will create a fuller experience for the user.

This hardware will allow the user to interact at a basic level with the webcast, allowing them to see and hear the content being webcast, typing notes and perhaps writing to forums or chat rooms regarding the webcast. The introduction of a microphone and/or a webcam raises this level of interactivity as it gives the viewer the ability to broadcast themselves through the webcast. The addition of a audio/visual representation of the user being broadcast back brings a more flowing interaction with the webcast and will more clearly express the persona of the user.

3.3. Bandwidth/network requirements

The factors affecting bandwidth are [1]:

- The quality rating selected for the uploaded video and audio (a typical combined setting would be 300kbps);
- The length of the live webcast in minutes;
- The number of trainees of the webcast session;
- The length of time each of those visitors remain logged in for in minutes.

For example, a 1 hour video webcast at the quality rating indicated above would generate the following amount of bandwidth if 100 people logged in and each of them watched the whole 1 hour:

- Quality rating: 300kbps;
- 1 hour of the webcast at this quality: 1,080,000 kbits, 1,080 Mbits or 1.08Gbits;
- 100 people watching for 1 hour each = 100 hours;
- Total bandwidth = $100 * 1.08\text{Gbits} = 1080\text{Gbits}$, or 13.5GB (GigaBytes).

There are a substantial number of Internet users who connect to the web using high speed alternatives such as ISDN modems, DSL, dedicated T-1 access and cable modems. The growth of these high-speed connection alternatives has already eclipsed standard 28.8 and 56K modem connections. Viewers with faster and more consistent connections will have a better viewing experience. The best configuration is

ADSL or better. At the time of the publication wireless connections such as Wi-Fi or GPRS cause high delays in transfer (signal latencies) of audio and video, however constant advancements in both webcasting and wireless network technology mean that these high delays are being addressed and in the future will become less of an issue.

3.4. Webcasting production techniques

A solid lesson plan, a good trainer and an avid group of trainees. These are certainly the basic elements needed to successfully conduct any training course. Nonetheless, even if these requirements are met, a webcast training session may prove inefficient due to a number of factors related to the webcast medium. Here are some basic instructions for conducting a successful webcast.

3.4.1. Camera angle

The best camera angle would be if the trainer could set the camera at his own eye level, like in a TV news broadcast. With many camera models, especially those built into notebooks, this may prove difficult. The general rule is the higher the better (but not higher than the trainers head). Also, it is best if the camera is a few degrees either to the left or right of the speaker, so the trainer is not in the middle of the frame, but a bit closer to side he is looking away from. If the trainer gesticulates while speaking, they should set up the camera in way that allows trainees to see your arms and hands. Before broadcasting the trainer has to make sure that the web camera is connected to the computer and that it is operational.

Although a video webcast is far from a Hollywood movie, the same rules and principles of visual composition apply to the moving pictures. Although the video camera stream will not be the most crucial element in most training courses, it has a strong role in supporting the transfer of knowledge from trainer to learner.

3.4.2. Lighting

Another key element in film and video is the lighting of the set. It is said that photography is the art of painting with light, and the same goes for video, webcasts included. Lighting video subjects is a very broad subject and will only be addressed here in a simplified approach.

The trainer's face should be lit either by a indoor lamp (or lamps) or sunlight from a window. The face should be the most lit part of the frame, i.e. there are no windows or lamps facing the camera from behind the trainer. It is best if the trainer is evenly lit. A general rule to follow is that there shouldn't be a strong light source behind the object being filmed.

3.4.3. Audio

The audio broadcast part of the webcast training sessions is without a doubt the most important element as the majority of information will be transferred by voice. For this reason, it is necessary to ensure that the audio broadcast is of a high quality. If course trainees are forced to listen to a crackling, noisy voice broadcast they will quickly grow tired and lose interest in the lesson.

Before conducting a webcast, the trainer has to make sure that the microphone is properly configured in his personal computer. A wireless microphone and earphones headset is the best solution, as it allows free use of the hands. Although most notebooks have a built in microphone, it is best to procure a microphone headset. Using loudspeakers may caused a feedback effect which will distort the sound. The best configuration is USB connected earphones with integrated microphone. If you are using speaker boxes the uncomfortable echo occurs probably on other side of the wire. USB earphones require zero installation on PS and bypasses the sound card allowing to avoid common driver problems.

When conducting an audio/video broadcast, the trainer should try to minimize background noise. Background noise can be generated by electric and electronic appliances, such as computers, air conditioning, printers, etc. If possible, try to turn off as many appliances in the vicinity of the microphone as possible. Also, try to ensure that there are as little (or none if possible) people working, talking, in the same room that the broadcast is being conducted.

Before conducting the webcast session the trainer should check following software/hardware settings:

- Check the audio/video functionality—this is the most problematic point—the audio-path from computer to the ear leads through several bottlenecks;
- Check the audio-card is not disabled/muted;
- Check the earphones/microphone are properly plugged in, have fresh batteries and the volume-control is not switched off;
- Check if you are using proper input device (Your computer may have more input devices—e.g. camera microphone, regular microphone and line-in microphone);
- Check if your audio is properly set in the webcasting software— most of the webcasting software have tools enabling you to set audio/video devices;
- Check the volume control is everywhere properly set;
- Check your camera is not in conflict with other devices;
- Check you have properly set audio/video system support software—e.g. all audio effects are switched off;
- Check there is not an echo if someone is listening to you.

4. Educational impact

4.1. Training program and preparation

Both teaching and on camera presentation require a certain skill set. Trainers vary in teaching styles, strategies, and experience. Even highly skilled educators tend to have problems acting on camera—they lose their charisma and self-confidence. That is the reason why accurate preparation is key to a successful webcast. In this case the usual curriculum consisting of aims, goals, objectives and list of content areas is definitely not enough. The trainer should prepare a document which is more scripted than a regular curriculum or syllabus. Scripts differ from written text. An effective presentation including graphics, pictures, or animation can eliminate the need for detailed description. A script isn't simply a spoken textbook—text which is planned to be spoken has to be different from written language [3]. A lesson script should contain a plan of trainer—trainee and trainee—trainee interactions, detailed learning activities and evaluation procedures.

Evidence included in the materials (report, manual) prepared for the “Good NGO Trainer” project shows that addressing issues of trainer competency development, setting up a clear and precise training structure is crucial, especially for less experienced trainers. Having proven live webcast trainings are similar to traditional trainings we can transfer certain good practices and rules directly from the regular trainings onto the webcast training methodology.

Concerning the subject-matter of training structure preparation an educator should know how to:

- Prepare each element of the webcast training in a way allowing it to keep the right apportionment for trainee activity, focusing specially on sustaining trainee energy to avoid drowsiness;
- Select the content concerning materials in a way allowing the trainees to easily find the logic in the training as a whole and in particular elements, that make up for the key conclusions of the training;
- Blend typology of used didactic methods into methods used before training as well as those used afterward, which is referred in the WTM Model as “blended learning” methods;
- Create the training program in a way to find a balance between individual activities and those meant for team work, with recognition to the objectives and terms established before the training;
- Select an adequate structure in case the training is conducted by more than one educator.

The art of putting together a training program structure optimally suitable to the objectives and conditions of a particular training is quite complex, contrary to common belief. The more elements taken into account during the planning process, the easier the program is in the later stages for the educator to conduct, more attractive in reception and more educationally efficient. This is extremely important in

cases when the training is conducted by more than one educator, especially when the trainers are not a co-operating couple or a team.

Program structure must strongly take into consideration the characteristics of the trained group, such as: its predisposition to concentrate in a longer time period, possessed habits towards a certain didactical methodology, to the program conditions resulting from the subject of the training itself. It is desirable if the program structure is transparent and clear, not only for a educator guiding the sequence and timing of particular parts, but also trainees, which usually are paying attention to the training program at the stage of choosing the trainer. A clear program structure makes it easier to verify and modify for the individuals controlling or responsible for approving a given training program and allowing it to be implemented or/and financed.

Considering the functional side of preparing a training program structure the trainer should know how to:

- Plan the whole infrastructure and resources required to conduct a didactically efficient training;
- Provide a complete transfer of appropriate information to all the people supporting the training or co-organizing it, as well as all of the trainees;
- Predict eventual problematic situations, prepare a course of substitute actions and materials, and introduce an elastic form of reaction to all sorts of changes or troubles you might encounter while conducting training.

In order to reliably plan all necessary equipment, infrastructure and materials, it is desirable to use a check list elaborated by yourself. It gives a sense of organizational safety to all of the trainings and it minimizes the chance of forgetting not only about something truly important but also about details, which increase the comfort of work and build a professional image. Regardless of control tools a good practice is to be present at the training an hour before, to make sure all of the equipment is adjusted accordingly and works as it should and presentations are ready. This allows you to find infrastructure glitches that make up for nuances (example: software adjustments of one or more trainees that affect the everyone in the training because of the effect of feedback). Important elements of organizing trainings are clear methods of naming the training session and giving the trainees training schedules before hand (so that trainees could be prepared for the session).

4.1.1. Presentations

A key feature in webcast training is that it allows the use of extra materials and presentations as an integral part. As a visual medium, webcast session depend largely on graphics. The graphic approach and design must be coordinated with other lesson elements to enhance and clarify messages and learning points. Graphics should always have communication and educational value; simple and straightforward graphics are most effective [3]. The most popular presentation tool that can be easily use during a webcasting session is PowerPoint. This format of presenting a series of slides with text, images and simple animations is a great way to illustrate information provided during a lecture. Although PowerPoint is a common and well known presentation tool many users actually keep making the same mistakes. A trainer who presents slides should

avoid legibility problems such as too small fonts or lack of consistency in style. Consequently, start with short webcasts and limited group of people and organize your presentations well in advance. Also, remember that a trainer has to be prepared to every session, even if the topic is the same to previous ones.

These simple recommendations below can be helpful in a successful slides preparation [4]:

- Use a simple PowerPoint template in landscape format
- Use dark print with a plain light background or light print and a plain dark background; a dark blue background is recommended
- Allow for a 1 inch margin on all borders
- Limit the number of words per slide:
 - use no more than 5 bullets of information per slide
 - use brief phrases instead of sentences
- Keep any graphics simple:
 - use simple bold tables like pie charts or bar graphs
 - avoid complex tables and scatter plots
- Use a consistent font size:
 - at least 30-point font for text and 44-point for headings
- Select a simple, clear, and bold font such as: Arial, Tahoma, Verdana
 - avoid italics
 - use lower case for text
- Avoid animation and special effects such as: sounds, fly-ons, fade-ins:
 - use simple slide transition
 - remember about simplicity

There is a difference between a presentation prepared for live presentation only and a presentation for archiving purposes. If trainees can re-use a presentation the trainer should prepare some extra textual materials which will be an equivalent to the talk.

Although PowerPoint presentations are by far the most popular as a lecture element, other materials can be equally useful. The exact way in which extra materials can be used in a training course depends on the lesson plan and the software that is being used. Many of webcasting software tools allow file sharing. A “file access” option makes it possible for the trainer to upload files to course trainee’s computers so they can access them on their own. These might be spreadsheets, text documents, audio or video files—the only limit is the file size, which will probably be around 10 megabytes depending on the internet connection speed of the trainer and course trainees.

Regardless of the potential of a piece of new media, the trainer should consider how to use lesson time in the most effective way. Reading text documents during, e.g. a 45 minute session, could be conceded as a needless waste of time. Live webcasting sessions need a good plan of activities which will be creative and enhancing both for trainees and the trainer.

4.1.2. Activities

For each webcasting event (course, training, lecture) there exist some criteria which influence effectiveness of learning. Probably the most important criterion is the degree of interaction (learning activities). The trainer cannot expect that trainees will be focused on his webcast lecture, if there is only one-way communication. Live lecture broadcast on the web looks like television program. It is a one-way message received by a passive audience. However, television uses numbers, edit points and different images combined with a variety of sounds to communicate its message. Webcasting lectures or trainings usually have lower production values. In fact a webcasting session if viewed as a one-way technology can be seen as very low quality television [5]. This could be one reason why trainees go to sleep in one-way presentations. Definitely, interaction between trainer and learners, communication and activities will change these trainees reactions.

As mentioned earlier, the intended productive utilization of webcast training involves planning a number of activities:

- Interaction with training materials;
- Interaction with trainer;
- Interaction between learners.

The potential of new media presentations has increases enormously in the past few years. The speed of internet connections and hardware/software throughput grows constantly. The richness of new media allows the trainer to plan interesting and varied trainee-content interaction. This is a list of popular Internet sources:

- Number of public video resources/channels (e.g. YouTube, trainer Tube);
- Google Books, Google Academics (proved documents—mostly in English only);
- Number of new publicly accessible Internet services:
 - vocabularies,
 - knowledge basis,
 - digital libraries,
 - free online courses materials;
- Web 2.0 pages (web-based communities e.g.: wikis, blogs, social-networking sites).

Webcasting software functionalities allows trainers to build a collaborative webcast program based on trainee-generated content:

- Document/screen sharing (it allows users to see the content of each others screen and even to take control of it—very useful for document creation/revision etc.);
- Co-browsing (sharing of web pages—everyone sees the same page and content);
- Video sharing (simultaneous broadcasting of video);
- Screen cast (this option allows the trainer, or any of the trainees, to project a video stream of what is happening on their computer desktop. This allows for practically unlimited flexibility, as the trainer

can show, work on and comment on any application or materials that he has on his computer. This can be particularly useful when teaching how to use software);

- Programmable APIs to public internet services is from technical point of view include services like YouTube, Google Maps and many more others as native part of one's software. This technique (known as mash-ups) enables broad usage of publicly accessible resources in one's webcast.

Interaction with a trainer can be provided in the form of questions, comments and answers. Activities defined as a 50 minute presentation and 10 minute questions/answers interaction would not be effective. However there are such educational events where time is limited and the presenter is a special guest who's lecture is highly. In these circumstances limited activities are justifiable. The special guests, such as an expert or celebrity can make an impact on learning and motivate trainees.

The literature of webcasting for education [5] indicates that some preparations need to be carried out to optimize the session:

- Provide information about the trainees and learning objectives;
- Demonstrate webcasting technology, it will reduce their apprehension if they are not familiar with it;
- Agree on a format of webcast session;
- Agree with the guest how and when questions from trainees will be handled;
- If they are not comfortable with giving a speech suggest an interview style;
- Ask if they are happy to answer questions during the speech or if they prefer to take questions in the end;
- Ask if they would prefer the moderator to act as chairperson or will trainees talk directly to the guest;
- Prepare the learners, give them information about guest;
- Ask trainees and guide them to the preparation of questions.

Other activities that are suitable for live webcast training which include interactions between trainees are listed below:

- Debate
- Discussion
- Brainstorming
- Presenting
- Project
- Dramatization
- Create
- Case study
- Exploration
- Role-playing

As we can see, if the communication and cooperation between trainees is not an issue, the trainer can

actively involve trainees in learning. In further part of this chapter will focus on some powerful and efficient teaching methods and techniques.

Brainstorming allows trainees to create new ideas, solve problems, answer questions, introduce a new subject, raise interest, motivate and develop teams. Brainstorming is a great motivation tool because it involves members of a team in bigger management issues, and it gets a team working together. During the random collection of ideas the trainer must record every suggestion on the flipchart or blackboard. In webcasting brainstorming exercises a camera can be pointed at a blackboard or a flipchart can serve the same purpose. Tools available in webcasting software (sharable electronic whiteboard, forums, text chat) can be used to record ideas.

The case method as an educational technique enables arousal of the interest of the trainee by placing him or her in an active role and by making them analyze the real world problems. The case method requires learners to decide which analytical tools and techniques to use in complex situations and then to deal with the practical problems of implementing their decisions [6]. Case studies usually consist of three elements: a scenario, supporting materials, and the problem. The scenario is the story of the real world problem. Case study scenarios can be delivered verbally by the trainer as a introduction to the problem. The supporting materials are often text documents but can be web pages, media files, or tables and data. Advanced webcasting tools allow document/video sharing and co-browsing what makes trainees cooperation easy and effective. The problem should be an open-ended one in which trainee develops a solution as well as a supporting argument. Reporters from each group can then use the video or other webcasting software tools (forum, chat) to share their group's response with the training trainees. While the process of case study is a valuable learning activity it is also a starting point for what can be a rich discussion of a problem and the proposed solution.

The discussion method uses two-way communication between the trainer and the trainees to increase learning opportunities. Discussions allow the trainees to be actively engaged in the content of the webcasting session, which improves recall and use in the future. trainees questions demonstrate the level of understanding about the lesson issue. Trainer questions stimulate thinking about the key learning points. Discussion can be provided via audio-video channel, or/and text chat. The important thing is to manage the discussion by engaging a moderator. With a small group of trainees the trainer can moderate discussion them self or they can ask a trainee to play a role of moderator.

Concerning moderating trainee interaction trainer should be able to:

- Plan an adequate timeframe to complete all of the elements of training, including efficiency assessment in a way that will allow achieving the objectives set up for the training session with the use of available resources, along with time;
- Arrange all the planned breaks to ensure a smooth, dynamic enough and maximally comfortable course of the whole training for trainees;
- Create time elasticity of the training prepared to react to most possible training session situations.

When planning the timeframe for the training session keep in mind that concentration is higher in the

early day time hours which gives a possibility to increase the amount of learning activities in this part of the day. The later the session will be conducted during the day the shorter the length of the learning activity should be. Important elements influencing the general length of each activity carried out in the training session are obviously the types of activities for trainees (lectures and presentations should be short units of time and exercises should be longer units). The time of year also influences the length of a training session, especially in the winter time and summer. It is commonly known that the optimal length of a didactic training unit is between 45 minutes and 90 minutes. This rule is made of course for timeframe planning purposes mainly and regardless of its educators should react to the level of trainee concentration during the training session and adequately adjust the length of each particular unit.

4.2. Engaging and motivation

Some learners are naturally enthusiastic about learning, but many require to be inspired and stimulated by their trainers. There is no simple answer to question about trainees' motivation. Many factors influence learners' motivation, such as: interest in a particular topic, its usefulness, self-confidence, patience and determination. Literature of this subject [5], [7] suggests that instructors use the following strategies to encourage trainees to become self-motivated learners:

- Give frequent, early, positive feedback that support learners' beliefs that they can do well;
- Use teaching strategies that engage and actively involve learners;
- Help trainees find personal meaning and value in material (prepare up-to-date, real world based training content);
- Communicate personal interest in trainees by calling them by name and asking questions;
- Asking questions directed to particular trainees can ensure that even quietest trainee has role in webcast training;
- Help trainees feel that they are valued members of a community of responsible learners.

In a webcasting event contact and communication have a special meaning. It is important both to trainer and learners to enhance the sense of presence. When answering a question there is a trick about how to appear, to give eye contact to the trainees as in classroom. While it is natural to look at the image of the trainees on the screen if trainer looks into the camera it will appear to them that he or she is looking into their eyes [5].

4.2.1. Building a social interaction

Learning is a social process, therefore social aspects of learning such as: communication, collaboration and emotion has a great influence on the effectiveness of learning and teaching. Learner-based teaching focuses on encouraging trainees to express their ideas freely. That is why a webcasting session should be structured with many opportunities for learners to talk formally and informally. For example—if there is a break in the class trainer should leave the webcast link connected and suggest to trainees that they can use it.

As mentioned earlier, the trainer should build a learner friendly environment that encourages trainees and lets them feel valued members of a learning community. The trainer can involve learners in creating webcast session rules and agreements.

In the beginning of the training session the trainer should be able to:

- Plan the beginning of the training in a manner allowing the trainees to be informed of all the important training aspects for the organization or individual;
- Make arrangements with training trainees at the beginning of the session insuring a swift method of carrying out the training and maximizing the comfort of the educator and trainees.

Communication aspects with trainees at the beginning of training should include such matters as:

- The time frame of the session;
- A training program schedule;
- Information concerning the use of didactic materials;
- Information regarding efficiency assessment of trainings and possible requirements to trainings ending with formal examination.

To address potentially important domains that need to be discussed with training trainees before are:

- Agreements concerning forms of addressing each other or a preferred tone, atmosphere of the training;
- Rules concerning breaks during the training;
- Terms of asking questions and leading discussions in the training;
- Principles of comfort and concentration during training (examples: turning off all communicators, leaving the training outside the given breaks, non subject related chats and communication during the training);
- Content-related trainee expectations.

After presenting all of the above mentioned rules, regulations and terms it is good practice to leave some time for questions from training trainees in case of confusion and putting them down in a visible place (example: whiteboard, chat etc.). Before the trainer starts to present a subject they can involve trainees in an ice-breaking activity. This can serve to create the feeling of inclusion, particular for a remote audience. If the number of remote trainees is not too great ask the trainees to introduce themselves. While they do this draw a simple map of each endpoint, including the trainees' names. The resulting *mud map* can be used later in the class to direct questions and seek comments from particular trainees. An alternative is to use nametags [5].

4.3. Learners' evaluation

Once the trainer has defined the learning purpose, they would then select the assessment or series of assessments that measure the trainees' progress (knowledge, skills etc.). Good assessment starts with a pre-assessment of what trainees already know about the subject. For example, educator might choose to assess the learners' creation of materials that learners will use during the webcast. As a result, the trainer will evaluate if the trainees have communicated their ideas clearly, succinctly, and visually. The other way to pre-assess trainees' knowledge and skills is a quick pretest.

Trainers assess trainees during the learning process as well. The issue is not how many notes are taken during the training, but what trainees are learning. The trainer can embed assessment throughout the interactive session. The trainer can watch and evaluate the activities that learners are involved in. They can observe how well the trainees cooperate and do the tasks they were given. The trainer can ask trainees for clarification and further explanation, or additional arguments. The educator can also ask trainees to assess each others achievements, presentations or problem solution (peer-assessment). Many trainers use a discussion as a way of assessing trainee learning [8].

The final evaluation of webcast training can be provided by open or close question post-test.

4.3.1. Assessment methods and tools

For assessment of webcast training direct measurable of learning outcomes are appropriate. Direct measures of learning outcomes are objective assessments of knowledge, skills and perspectives demonstrated by the trainee at the time of measurement. These include things like assessment of specific learning objectives as grades for class assignments, or evaluation of observed behaviors, or a count of the number of times a particular perspective is recognized in an examination. This type of data is obtained from an assessment of trainee output (e.g. trainee assignments, presentations, examinations) and can be completed by the instructor or by an independent examiner [9].

The trainer can prepare computer-based tests, quizzes or any other exercises using free assessment software available on the World Wide Web resources, for instance:

- Easy Test Maker (<http://www.easytestmaker.com/default.aspx>)—free online test generator;
- Hot Potatoes (<http://hotpot.uvic.ca/>)—the Hot Potatoes suite includes six applications, enabling users to create interactive multiple-choice, short-answer, jumbled-sentence, crossword, matching/ordering and gap-fill exercises for the World Wide Web;
- QuizMaker JavaScript Wizard (<http://www.edict.com.hk/quizmaker/>)—tests and quiz tool;
- Personal Educational Press (<http://www.educationalpress.org/>)— allows to create free educational worksheets such as flashcards, game boards, and quizzes to print directly from your browser as well as make tracing sheets, quizzes, study sheets, word lists, bingo cards, word scrambles, word searches and more.

4.4. Good practices, tips and tricks

Always have a plan “B”.

- During the creation of the training session pay special attention to the connection between the educational process and the group process
- Adjust your language, metaphors, and materials to each target group
- Check the location of your training
- Check the equipment and materials
- At the beginning of the session ask trainees about their expectations
- Pay attention to the amount of time spent on each exercise
- Prepare alternative training session scenarios
- Assess and research trainee expectations and needs and define the crucial concentrated moments of the training—do it before the session
- Keep in mind that some trainees might be “forced” to take part of the training session and that you might need more time to fully commence the educational stage
- Describe each training scenario—the objectives, modules, exercises, time, resources, the content of exercises, material and tools
- Plan realistically—the effective time of the training session, not the number of hours
- Set the rules and conditions of the training before it starts
- Get to know the people you are working with
- Stick to your training scenario
- Don't be late

The “golden” rule, especially for inexperienced trainers/educators/lecturers is: “prepare yourself, prepare yourself and once again prepare yourself”.

- Join processes
- Analyze the target group
- Planning is important but elasticity is even more important
- The quality of the “catering” might influence the training effect
- There are no stupid questions or points of view—do not try to “fix” training trainees, treat them the way they are and adjust to them also on the program level
- Always have with you your “trainer suitcase” full of presentations, necessary software, back up files, printed materials, laptop and a webcam
- Someone else might organize the training session but you should be in direct contact with that person

5. Evaluation of the webcasting training

Evaluation of training whether it be before (needs assessments and trainees polling for training design), during (evaluating learning of key concepts) or after the training (feedback on delivery methods and other aspects of the training experience), can be obtained using qualitative and/or quantitative methods. Evaluation can be formative, summative and impact. These types may be conducted in the following ways:

- Formative evaluation, e.g. by discussion or interview. This is useful early on in a training to get the trainees' feedback on the course up until that time. This can be either formal or informal;
- Summative—end-of-session questionnaires or interviews;
- Impact evaluation—after the session has finished—this can be an interview or questionnaire with trainees [10].

5.1. Feedback after the training

Feedback is very useful to trainers, organizers and learners even if it is not always complimentary. trainees evaluate the trainer's expertise, evaluate how they increased their knowledge and skills, anticipate practice changes, strengths and weaknesses of the presentation, and ideas for course improvements.

To get a full picture of a webcasting session the trainer or organizer should collect information like:

- Who was connected?
- What was his connectivity?
- How many trainees arrived late and left early?
- If there were any questionnaires, polls etc. Do we have the results?
- Was there any contact with the trainees after the lesson (mail, telephone call etc.)?

After answering all of these questions we can plan the next webcast. All of the mentioned facts above should have significant influence on the planned webcast content, duration and session length so the impact of the lesson should be optimal.

5.2. Survey

Quantitative methods involve gathering information that can be tabulated in the form of statistics. A common quantitative method is surveying using a rating scale. Here statements are rated along a three or five point scale. Three or five points are needed to ensure that the data you collect is meaningful and meets research protocols i.e. you need to have end extremes and a neutral middle rating to give trainees enough options to choose accurately.

Examples of three point scales and five point scales

3 point scale	5 point scale
good, average, poor	excellent, good, average, below average, poor
agree, neutral, disagree	strongly agree, agree, neutral, disagree, strongly disagree

Other examples of qualitative measurements are: multiple choice questions, true or false statements or yes or no questions. The advantage of using quantitative measurements is that you can provide statistics to stakeholders e.g. 89% percent of trainees strongly agreed that the material covered will help them improve their productivity.

Whereas quantitative research is closed, qualitative research involves asking open-ended questions to gather thoughts, opinions and suggestions. This level of detail can help the trainer understand exactly why certain elements need improvement and if suggestions are made, how they can be improved.

Some examples of open-ended questions are:

- What exercise or activity did you enjoy the most? Why?
- What would you like to receive additional training on?

An example of training course feedback on-line:

<http://www.bre.com/training/courses/training-feedback.aspx>

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