remote attendees to control in-class computers so that they may complete the technical hands-on exercise labs. As is done for the classroom attendees, student machines are set up in the classroom for remote users. As a result, hands-on exercises work exactly as in the classroom, allowing the instructor to observe the remote attendees' work as s/he would as that of in-class attendees.

All publications, scientific, patent or otherwise discussed in this application are hereby incorporated by reference in their entirety for all purposes, including U.S. Patent Numbers 7,058,891; 7,131,068; 7,134,079; and 7,454,708, and U.S. Patent Application Publication Number 2002/0103882.

SUMMARY OF THE INVENTION

The invention relates to systems and methods related to providing an electronic presentation to both in-class attendees and remotely located out-of-class attendees, in which video and audio associated with the presentation is provided to the remote attendees, and out-of-class programmable systems are programmed to execute an educational exercise associated with the presentation and be remotely operated by the remote attendees.

According to a first aspect of the invention, there is provided a system providing an electronic presentation, the system comprising: a console interface of a console programmable computer configured to provide a presentation control interface for directing visual content to a presentation display for viewing by a plurality of in-class participants in a classroom; a camera configured to capture video data of the presenter; a microphone configured to capture audio data of the presenter; one or more programmable computers programmed to receive image data from the camera, audio data from the microphone, and the visual content displayed on the presentation display, encode the image data, audio data, and visual content as outgoing data, and transmit the outgoing data to a plurality of remote attendee systems located external to the classroom via the network; wherein the programmable computers are further configured to receive incoming data from the plurality of remote computers via the network, and in response to the incoming data output audio via a speaker, and interact with the console programmable computer; a plurality of in-class programmable systems located in the classroom, each

programmed to execute an educational exercise, and each provided with a display and input device for operation by one or more of the plurality of in-class participants; and

a plurality of out-of-class programmable systems, located in the classroom, each programmed to execute the educational exercise in the same software environment provided by the in-class programmable systems and to be operated by a respective one of the plurality of remote attendee systems via the network.

According to a second aspect of the invention, there is provided a system for participating in a remote electronic presentation, the system comprising a programmable computer located in a classroom with a display, audio output device, and input device for operation of the programmable computer; wherein the programmable computer is programmed to receive incoming data from a remote computer located external to the classroom via a network, and in response to the incoming data (a) display a first live video feed of a presenter in the classroom, (b) output a live audio feed of the remote presenter, and (c) display in a window visual content selected by the presenter; wherein the programmable computer is further programmed to operate via the network an educational exercise on a remote demonstration computer; wherein the remote demonstration computer is located in the classroom; and wherein the remote computer is configured to display content from the remote demonstration computer in a window of an interface located on the remote computer.

According to a third aspect of the invention, there is provided a method for providing an electronic presentation in a presentation room accommodating a presenter and a plurality of in-class participants, the method comprising: a console interface of a console programmable computer providing a presentation control interface to direct visual content to a presentation display for viewing by the plurality of in-class participants in a classroom; a camera capturing video data and a microphone capturing audio data of the presenter; one or more programmable computers encoding the video data, audio data, and visual content displayed on the presentation display as outgoing data; the one or more programmable computers transmitting the outgoing data to a plurality of remote attendee programmable computers located external to the classroom via a network; in the presentation room, a plurality of in-class programmable systems located in the classroom, each executing an educational exercise, and each provided with

a display and input device for operation by one or more of the plurality of in-class participants; a plurality of out-of-class programmable systems, located in the classroom, each executing the educational exercise in the same software environment provided by the in-class programmable systems and each being operated by a respective one of the plurality of remote attendee programmable computers via the network; and the one or more programmable computers providing a plurality of instructions via the network to the plurality remote attendee programmable computers, said instructions causing each of the plurality of remote attendee programmable computers to perform the steps of: receiving the outgoing data; displaying the visual content and the video data components of the outgoing data on a visual display included in the remote attendee programmable computer; outputting the audio data component of the outgoing data via a speaker included in the remote attendee programmable computer; operating, via the network, one of the plurality of out-of-class programmable systems.

Additional advantages of the present invention will become readily apparent to those skilled in this art from the following detailed description, wherein only the preferred embodiment of the invention is shown and described, simply by way of illustration of the best mode contemplated of carrying out the invention. As will be realized, the invention is capable of other and different embodiments, and its several details are capable of modifications in various obvious respects, all without departing from the invention. The present invention may be practiced without some or all of these specific details. In other instances, well known process operations have not been described in detail, in order not to unnecessarily obscure the present invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates an embodiment of the disclosed subject matter, in which a plurality of remote attendees 141 are able to actively participate in an educational session delivered at presentation center 110 by use of remote attendee systems 140.

What is claimed is:

1. A system providing an electronic presentation, the system comprising:

a console interface programmed to provide a presentation control interface for directing visual content to a presentation display for viewing by a plurality of in-class participants;

a camera configured to capture video data of the presenter;

a microphone configured to capture audio data of the presenter;

one or more programmable computers programmed to receive image data from the camera, audio data from the microphone, and the visual content displayed on the presentation display, encode the image data, audio data, and visual content as outgoing data, and transmit the outgoing data to a plurality of remote attendee systems via the network;

wherein the programmable computers are further configured to receive incoming data from the plurality of remote computers via the network, and in response to the incoming data output audio via a speaker, and interact with the console programmable computer; and

a plurality of in-class programmable systems, each programmed to execute an educational exercise, and each provided with a display and input device for operation by one or more of the plurality of in-class participants;

a plurality of out-of-class programmable systems programmed to execute the educational exercise and to be operated by a respective one of the plurality of remote attendee systems via the network.

2. The system of claim 1, wherein:

the programmable computers and out-of-class programmable systems are each programmed to exchange data with a remote connection server to exchange data with the remote attendee systems.

3. The system of claim 1, wherein

the presentation control interface is programmed to direct visual content to a plurality of presentation displays for viewing by the plurality of in-class participants;

the one or more display encoding systems are programmed to transmit the visual content presented on the plurality of presentation displays to the plurality of remote attendee systems via the network.

4. The system of claim 1, further comprising:

a plurality of breakout programmable computer systems each comprising

a breakout display,

a breakout camera,

a breakout microphone,

a breakout speaker, and

a breakout input device;

wherein each breakout programmable computer is programmed to

provide a virtual whiteboard on the breakout display for modifying a diagram in response to the breakout input device,

receive image data from the breakout camera and audio data from the breakout microphone,

encode the image data and audio data outgoing breakout data, and transmit the outgoing breakout data to a subset of the plurality of remote attendee systems via the network,

transmit modifications to the diagram made in response to the breakout input device to the subset of the plurality of remote attendee systems, and

receive encoded audio data from a remote attendee system included in the subset of the plurality of remote attendee systems, and output the received audio data via the breakout speaker.

5. A system for participating in a remote electronic presentation, the system comprising

a programmable computer with a display, audio output device, and input device for operation of the programmable computer;

wherein the programmable computer is programmed to receive incoming data from a remote computer via a network, and in response to the incoming data (a)

display a first live video feed of a remote presenter, (b) output a live audio feed of the remote presenter, and (c) display in a window visual content selected by the presenter; and

wherein the programmable computer is further programmed to operate via the network an educational exercise on a remote demonstration computer.

6. The system of claim 5, further comprising:

a microphone which provides audio input to the programmable computer;

wherein the programmable computer is further programmed to encode and transmit audio received from the microphone to the remote computer via the network; and in response to operation of the input device send a notification to the presenter.

7. A method for providing an electronic presentation, the method comprising:

providing a presentation room accommodating a presenter and a plurality of in-class participants;

utilizing a console interface programmed to provide a presentation control interface to direct visual content to a presentation display for viewing by the plurality of in-class participants;

capturing video data and audio data of the presenter;

encoding the video data, audio data, and visual content displayed on the presentation display as outgoing data;

transmitting the outgoing data to a plurality of remote attendee programmable computers via a network;

providing, in the presentation room, a plurality of in-class programmable systems, each programmed to execute an educational exercise, and each provided with a display and input device for operation by one or more of the plurality of in-class participants;

providing a plurality of out-of-class programmable systems programmed to execute the educational exercise and to be operated by a respective one of the plurality of remote attendee programmable computers via the network; and

providing a plurality of instructions via the network to the plurality remote attendee programmable computers, said instructions causing each of the plurality of remote attendee programmable computers to perform the steps of:

receiving the outgoing data;

displaying the visual content and the video data components of the outgoing data on a visual display included in the remote attendee programmable computer;

outputting the audio data component of the outgoing data via a speaker included in the remote attendee programmable computer;

operating, via the network, one of the plurality of out-of-class programmable systems.

8. The method of claim 7, wherein

the plurality of instructions further causes each of the plurality of remote attendee programmable computers to perform the steps of:

capturing audio data of a remote attendee at the remote attendee programmable computer;

encoding the audio data of the remote attendee and transmitting the encoded audio data via the network for use in the presentation room;

9. The method of claim 7, wherein

the presentation control interface is programmed to direct visual content to a plurality of presentation displays for viewing by the plurality of in-class participants;

the one or more display encoding systems are programmed to transmit the visual content presented on the plurality of presentation displays to the plurality of remote attendee systems via the network.

10. The method of claim 7, wherein

the plurality of instructions further causes each of the plurality of remote attendee programmable computers to perform the step of:

exchange text messages with a computer located in the presentation room and the other remote attendee programmable computers.

11. The method of claim 7, wherein

the plurality of instructions further causes each of the plurality of remote attendee programmable computers to perform the step of:

provide a control to enable control of the field of view for the displaying the video data component of the outgoing data.

12. The method of claim 7, further comprising:

using a plurality of breakout programmable computer systems, wherein each breakout programmable computer system comprises a breakout display, a breakout camera, a breakout microphone, a breakout speaker, and a breakout input device, to perform the steps of:

modifying a diagram displayed on the breakout display in response to the breakout input device;

encoding video data captured via the breakout camera and audio data captured via the breakout microphone as outgoing breakout data;

transmitting the outgoing breakout data to a subset of the plurality of remote attendee programmable computers via the network;

transmitting modifications to the diagram made in response to the breakout input device to the subset of the plurality of remote attendee programmable computers; and

modifying the diagram displayed on the breakout display in response to data received via the network from one of the subset of the remote attendee programmable computers included in the plurality of remote attendee programmable computers;

wherein the plurality of instructions further causes each of the remote attendee programmable computers included in the subset of the plurality of remote attendee programmable computers to perform the steps of:

receiving the outgoing breakout data;

displaying the video data component of the outgoing breakout data on the visual display;

outputting the audio data component of the outgoing breakout data via the speaker;

modifying a diagram displayed on a visual display included in the remote attendee programmable computer in response to modifications to the diagram received via the network;

modifying the diagram on the visual display in response to an input device included in the remote attendee programmable computer;

transmitting modifications to the diagram on the visual display in response to the input device included in the remote attendee programmable computer to the breakout programmable computer system;

capturing audio data of a remote attendee at the remote attendee programmable computer; and

encoding the audio data of the remote attendee and transmitting the encoded audio data via the network to the breakout programmable computer system.

What is claimed is:

1. A system providing an electronic presentation, the system comprising:

a console interface of a console programmable computer configured to provide a presentation control interface for directing visual content to a presentation display for viewing by a plurality of in-class participants in a classroom;

a camera configured to capture video data of the presenter;

a microphone configured to capture audio data of the presenter;

one or more programmable computers programmed to receive image data from the camera, audio data from the microphone, and the visual content displayed on the presentation display, encode the image data, audio data, and visual content as outgoing data, and transmit the outgoing data to a plurality of remote attendee systems located external to the classroom via the network;

wherein the programmable computers are further configured to receive incoming data from the plurality of remote computers via the network, and in response to the incoming data output audio via a speaker, and interact with the console programmable computer;

a plurality of in-class programmable systems located in the classroom, each programmed to execute an educational exercise, and each provided with a display and input device for operation by one or more of the plurality of in-class participants; and

a plurality of out-of-class programmable systems, located in the classroom, each programmed to execute the educational exercise in the same software environment provided by the in-class programmable systems and to be operated by a respective one of the plurality of remote attendee systems via the network.

2. The system of claim 1, wherein:

the programmable computers and out-of-class programmable systems are each programmed to exchange data with a remote connection server to exchange data with the remote attendee systems.

3. The system of claim 1, wherein

the presentation control interface is programmed to direct visual content to a plurality of presentation displays for viewing by the plurality of in-class participants; and

the system of claim 1 further comprises one or more display encoding systems programmed to transmit the visual content presented on the plurality of presentation displays to the plurality of remote attendee systems via the network.

4. The system of claim 1, further comprising:

a plurality of breakout programmable computer systems each comprising

a breakout display,

a breakout camera,

a breakout microphone,

a breakout speaker, and

a breakout input device;

wherein each breakout programmable computer is programmed to

provide a virtual whiteboard on the breakout display for modifying a diagram in response to the breakout input device,

receive image data from the breakout camera and audio data from the breakout microphone,

encode the image data and audio data outgoing breakout data, and transmit the outgoing breakout data to a subset of the plurality of remote attendee systems via the network,

transmit modifications to the diagram made in response to the breakout input device to the subset of the plurality of remote attendee systems, and

receive encoded audio data from a remote attendee system included in the subset of the plurality of remote attendee systems, and output the received audio data via the breakout speaker.

5. A system for participating in a remote electronic presentation, the system comprising

a programmable computer located in a classroom with a display, audio output device, and input device for operation of the programmable computer;

wherein the programmable computer is programmed to receive incoming data from a remote computer located external to the classroom via a network, and in response to the incoming data (a) display a first live video feed of a presenter in the classroom, (b) output a live audio feed of the remote presenter, and (c) display in a window visual content selected by the presenter;

wherein the programmable computer is further programmed to operate via the network an educational exercise on a remote demonstration computer;

wherein the remote demonstration computer is located in the classroom; and

wherein the remote computer is configured to display content from the remote demonstration computer in a window of an interface located on the remote computer.

6. The system of claim 5, further comprising: a microphone which provides audio input to the programmable computer; wherein the programmable computer is further programmed to encode and transmit audio received from the microphone to the remote computer via the network; and in response to operation of the input device send a notification to the presenter.

7. A method for providing an electronic presentation in a presentation room accommodating a presenter and a plurality of in-class participants, the method comprising:

a console interface of a console programmable computer providing a presentation control interface to direct visual content to a presentation display for viewing by the plurality of in-class participants in a classroom;

a camera capturing video data and a microphone capturing audio data of the presenter;

one or more programmable computers encoding the video data, audio data, and visual content displayed on the presentation display as outgoing data;

the one or more programmable computers transmitting the outgoing data to a plurality of remote attendee programmable computers located external to the classroom via a network;

in the presentation room, a plurality of in-class programmable systems located in the classroom, each executing an educational exercise, and each provided with a display and input device for operation by one or more of the plurality of in-class participants;

a plurality of out-of-class programmable systems, located in the classroom, each executing the educational exercise in the same software environment provided by the in-class programmable systems and each being operated by a respective one of the plurality of remote attendee programmable computers via the network; and

the one or more programmable computers providing a plurality of instructions via the network to the plurality remote attendee programmable computers, said instructions causing each of the plurality of remote attendee programmable computers to perform the steps of:

receiving the outgoing data;

displaying the visual content and the video data components of the outgoing data on a visual display included in the remote attendee programmable computer;

outputting the audio data component of the outgoing data via a speaker included in the remote attendee programmable computer;

operating, via the network, one of the plurality of out-of-class programmable systems.

8. The method of claim 7, wherein

the plurality of instructions further causes each of the plurality of remote attendee programmable computers to perform the steps of:

capturing audio data of a remote attendee at the remote attendee programmable computer;

encoding the audio data of the remote attendee and transmitting the encoded audio data via the network for use in the presentation room.

9. The method of claim 7, wherein

the presentation control interface is programmed to direct visual content to a plurality of presentation displays for viewing by the plurality of in-class participants;

the method of claim 7 further comprises one or more display encoding systems transmitting the visual content presented on the plurality of presentation displays to the plurality of remote attendee systems via the network.

10. The method of claim 7, wherein

the plurality of instructions further causes each of the plurality of remote attendee programmable computers to perform the step of:

exchanging text messages with a computer located in the presentation room and the other remote attendee programmable computers.

11. The method of claim 7, wherein

the plurality of instructions further causes each of the plurality of remote attendee programmable computers to perform the step of:

providing a control to enable control of a field of view for displaying the video data component of the outgoing data.

12. The method of claim 7, further comprising:

a plurality of breakout programmable computer systems, wherein each breakout programmable computer system comprises a breakout programmable computer, a breakout display, a breakout camera, a breakout microphone, a breakout speaker, and a breakout input device, performing the steps of:

the breakout programmable computer modifying a diagram displayed on the breakout display in response to the breakout input device;

the breakout programmable computer encoding video data captured via the breakout camera and audio data captured via the breakout microphone as outgoing breakout data;

the breakout programmable computer transmitting the outgoing breakout data to a subset of the plurality of remote attendee programmable computers via the network;

the breakout programmable computer transmitting modifications to the diagram made in response to the breakout input device to the subset of the plurality of remote attendee programmable computers; and

the breakout programmable computer modifying the diagram displayed on the breakout display in response to data received via the network from one of the subset of the remote attendee programmable computers included in the plurality of remote attendee programmable computers;

wherein the plurality of instructions further causes each of the remote attendee programmable computers included in the subset of the plurality of remote attendee programmable computers to perform the steps of:

receiving the outgoing breakout data;

displaying the video data component of the outgoing breakout data on the visual display;

outputting the audio data component of the outgoing breakout data via the speaker;

modifying a diagram displayed on a visual display included in the remote attendee programmable computer in response to modifications to the diagram received via the network;

modifying the diagram on the visual display in response to an input device included in the remote attendee programmable computer;

transmitting modifications to the diagram on the visual display in response to the input device included in the remote attendee programmable computer to the breakout programmable computer system;

capturing audio data of a remote attendee at the remote attendee programmable computer; and

encoding the audio data of the remote attendee and transmitting the encoded audio data via the network to the breakout programmable computer system.