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; a camera configured to capture video data of a presenter; a microphone configured to capture audio data of the presenter; one or more programmable computers configured 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 a network, wherein the programmable computers are further configured to receive incoming data from the plurality of remote attendee systems 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, each programmed to execute an educational exercise, and each provided with a display

and an input device for operation by one or more of the plurality of in-class participants; a plurality of out-of-class programmable systems, each programmed to execute the educational exercise and to be operated by a respective one of the plurality of remote attendee systems via the network; and 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 into outgoing breakout data, transmit the outgoing breakout data to a subset of the plurality of remote attendee systems via the network, transmit to the subset of the plurality of remote attendee systems modifications to the diagram made in response to the breakout input device, 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.

According to a second aspect of the invention, there is provided a method for providing an electronic presentation, the method comprising: providing a presentation room accommodating a presenter of the electronic presentation 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 an 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; exchanging text messages with a computer located in the presentation room and the other remote attendee programmable computers.

According to a third aspect of the invention, there is provided a method for providing an electronic presentation, the method comprising: providing a presentation room accommodating a presenter of the electronic presentation 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 an 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; and providing a control to enable control of a field of view for displaying the video data component of the outgoing data.

According to a fourth aspect of the invention, there is provided a method for providing an electronic presentation, the method comprising: providing a presentation room accommodating a presenter of the electronic presentation 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 an 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, and operating, via the network, one of the plurality of out-of-class programmable systems; and 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.

According to a fifth aspect of the invention, there is provided a system for providing an electronic presentation by a presenter, the system comprising: a presentation center, wherein the presentation center comprises: 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; a camera configured to capture video data; a microphone configured to capture audio data; and one or more programmable computers configured to receive image data from the camera, audio data from the microphone, and the visual content displayed on the presentation display; a plurality of remote attendee systems; and a connection server configured to establish a networking session with the presentation center for exchanging data with the presentation center, and configured to establish a separate networking session with each of the plurality of remote attendee systems for exchanging data with each remote attendee system, wherein: the connection server receives first data from the presentation center and distributes the first data to each of the remote attendee systems, and the connection

server receives second data from each of the remote attendee systems and sends the second data to the presentation center.

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.