The television camera and lens

See Appendix A [1].

The camera converts light images into an electrical signal so that it may be displayed, recorded or transmitted. The camera lens focuses the images onto a light sensitive layer sometimes referred to as a Charge Coupled Device or CCD.

The type of lens determines the angle or field of view. A wide-angle lens can capture a large group, a narrow angle lens a close up. The ubiquitous “Web-Cam” is a very low cost (and low quality) camera with a fixed focus lens designed only to provide an image of the PC operator. Lenses suitable for group conference applications will have a variable field of view these are known as Zoom lenses. Zoom lenses can “zoom out” to a wide-angle shot to include a group or “zoom in” to a close up shot of a single participant.

The sensitivity of the lens is determined by the amount of light entering the lens; most cameras adjust sensitivity automatically but sometimes there is manual adjustment. Both methods move an “iris-diaphragm” in front of the lens to effectively increase or reduce the diameter (or aperture) of the entry pupil of the lens. Most cameras control the iris automatically to optimise image quality for the available light. It is important to realise, however, that in low light conditions, as the iris is opened up to increase the sensitivity there will be less depth of field. The resultant picture overall may not appear sharply focussed.

Television cameras are capable of operating in very low light conditions but they produce much higher quality pictures at higher light levels. At high light levels the lens aperture will also be reduced to give the added advantage of a greater depth of field. In broadcast television this increase in depth of field may not necessarily be seen as an advantage. For artistic effect, directors may require the foreground to be in sharp focus with the background out of focus. This gives separation to the images.

However, in videoconferencing the general rule is the more depth of field the better.

Links
[1] https://community.ja.net/library/janet-services-documentation/appendix-television-camera-lens-sensitivity