Beyond reality: augmented, virtual, and mixed reality in the library.

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This slim volume is an interesting read. Arranged in nine chapters, it's a sampler of actual and potential applications of the three types of experience listed in the title. Augmented reality might be describes as "reality plus" – an overlay of electronically-generated content on the real world, such as is used in the "heads-up displays" employed by fighter pilots and in some cars.

Mixed reality involves some kind of electronically-delivered content, which is tied in with real-world locations, an example being the recent phenomenon of Pokemon-collecting, in which cartoon characters could be collected, often in proximity to real-world libraries, by use of a smart phone, which overlaid their images on the phone's video display of the user's surroundings. The effort required to communicate that concept in a single sentence is some indication of what a complex process is involved; the fact that it would have made little sense to an average reader of even ten years ago shows how far these concepts have penetrated popular culture.

Virtual reality is an "immersive" experience, often achieved through the use of head-mounted display (HMD) equipment, such as the Oculus Rift, which may permit the user to move around, and interact with "objects" in, an environment which is completely generated by software.

The equipment has fallen in (relative) price to the point where it is now potentially within the reach of libraries, although most of the authors are employed in academia, where resources other than the library budget alone may have been employed. There are also cheaper versions of the hardware, such as the Google Cardboard headset, which employs a cardboard mounting for a suitable mobile phone, to achieve a cut-price version of the top-end experience.

All of this background, scene-setting material is covered in the first couple of chapters, in which the idea of the empowerment of the user through virtual reality also emerges. It seems that education about the medium itself is a popular service offered by libraries, and tuition in the creation of 3D content, perhaps in the context of "makerspaces" is one of the popular applications. There are useful discussions of software and hardware options. It's appropriate, then, that an early chapter expresses concerns about censorship of content, and the need to support open-source technologies.

The digital media specialist of the White Plains public Library explores augmentation to public libraries, using a colouring application to introduce users to AR, and proposes many useful ideas, such as augmented shelf-end displays. This "gentle" introduction is followed by a more technical discussion of VR applications, from the academic sector, and a description of how VR as "play" – its application in gaming – can lead into its use in education, medical and dentistry in this particular case.

H R Jensen uses Ranganathan's Laws as a light-hearted introduction to VR-mediated user engagement in university libraries, through the parallel use of a makerspace and games and educational titles from the SteamVR store.

The possibilities for immersive learning of information literacy and library skills are discussed in an interesting and more speculative chapter by Smith, one of two authors to mention Second Life, though the other mention is merely an acknowledgement of its role as a precursor to VR experiences. Smith has experience in developing Second Life for library instruction, and there is a link to her – rather sad – reflective piece on YouTube, in which she provides a retrospective look at the experiment. Although Smith's plans as expressed in the current volume are stimulating, it would have been interesting to see an acknowledgement somewhere in the volume of the fact that all the

VR environments discussed appear to be single-user (though Smith has a Library Bot), and are stand-alone, rather than networked. Given the large volume of coverage in the popular media which Second Life attracted, somewhat more than a decade ago, and the relatively low profile it has had since (though it still exists), one wonders whether the significant energies which the library community channelled into Second Life projects will be re-directed into the current instantiations of Enhanced Reality. The question of why interest fell away, and whether the causes have been addressed, should perhaps also be considered when contemplating significant new investments in provision of a broadly similar, if considerably higher quality, experience.

The many legal ramifications are considered in a useful final chapter. These range from the consequences of the more obvious health-and safety considerations - users moving around real-worlds paces whilst perceiving something different sounds potentially risky - to the activation of phobias, and the possible inducing of physical ill-effects, from loss of balance to epileptic episodes.

All chapters are supported by notes and references, and most by extensive bibliographies. As is increasingly the case with texts, the large number of references to online resources may lead the less patient reader to wish for the publishers to provide an accompanying website with clickable links. There is a good index.

On the whole, this is an enjoyable and thought-provoking read, and it is to be hoped that it will provide inspiration for the “second wave” of Enhanced Reality practitioners in the library environment. The authors have demonstrated exciting possibilities, at varying points on the investment and technical involvement spectra, and although this is far from being an instructional guide, the information necessary for those keen to get started is supplied.