

Metaverse Adoption in Built Environment Education: A Kirkpatrick Model-Based Evaluation of Educator Training Outcomes

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INTRODUCTION & AIM

- ❖ The ongoing digital transformation within the construction and built environment sector necessitates that higher education institutions implement innovative pedagogical strategies.
- ❖ Metaverse technologies provide immersive, interactive, and experiential learning environments that have the potential to improve student engagement and digital competence.
- ❖ Although interest in metaverse applications is increasing, there is limited empirical evidence concerning the effectiveness of educator training programmes intended to facilitate their adoption in built environment education.
- ❖ This study aims to evaluate the effectiveness of an educator training workshop focused on the use of the EON-XR metaverse platform, employing the four levels of the Kirkpatrick Evaluation Model.

- ❖ The **SMART** evaluation statement for the study follows:

Specific: The workshop aimed to train participants (built environment educators) in the use of metaverse (EON-XR) applications for teaching first-year modules.

Measurable: The workshop was evaluated using the following metrics: the number of participants who completed the workshop, the participants' satisfaction with the workshop content, and the participants' ability to apply the skills learned in the workshop to the modules they teach.

Attainable: The workshop was designed to be accessible to participants with a variety of skills (subject specialisation) and experience levels (qualification and years of teaching experience) in the built environment.

Relevant: aligns with the institutional and industry clamour for construction digitalisation.

Time-related: The workshop was held over three months.

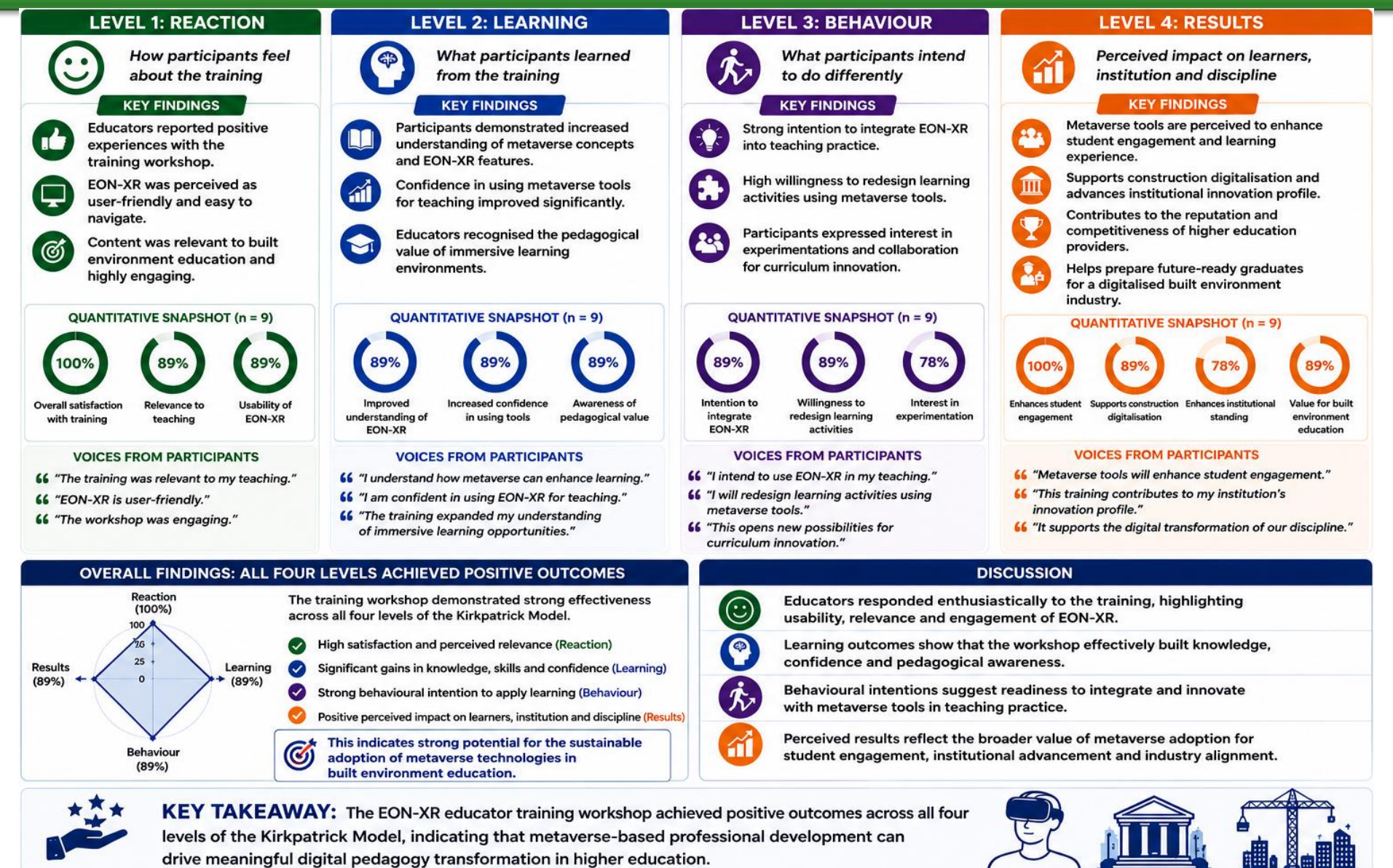
METHOD



EVALUATION FRAMEWORK: KIRKPATRICK MODEL ALIGNMENT			
LEVEL	EVALUATION FOCUS	SURVEY DIMENSIONS	EXAMPLES OF ITEMS
1 REACTION	Satisfaction and perceived relevance of the training.	<ul style="list-style-type: none"> Overall satisfaction Relevance to teaching Usability of EON-XR Engagement of content 	<ul style="list-style-type: none"> "The training was relevant to my teaching." "EON-XR is user-friendly." "The workshop was engaging."
2 LEARNING	Knowledge and skill acquisition.	<ul style="list-style-type: none"> Understanding of metaverse concepts Knowledge of EON-XR features Confidence in using tools Pedagogical applications 	<ul style="list-style-type: none"> "I understand how metaverse can enhance learning." "I am confident in using EON-XR for teaching."
3 BEHAVIOUR	Intention to apply acquired skills in teaching practice.	<ul style="list-style-type: none"> Intention to integrate EON-XR Likelihood of redesigning activities Willingness to experiment Support to colleagues 	<ul style="list-style-type: none"> "I intend to use EON-XR in my teaching." "I will redesign learning activities using metaverse tools."
4 RESULTS	Perceived impact on teaching, learners, institution and discipline.	<ul style="list-style-type: none"> Student engagement Contribution to digitalisation Institutional reputation Value for built environment education 	<ul style="list-style-type: none"> "Metaverse tools will enhance student engagement." "This training contributes to my institution's innovation profile."

The survey instrument was explicitly aligned with Kirkpatrick's four levels to capture educators' perceptions, learning, behavioural intentions, and the broader outcomes of metaverse adoption in built environment education.

RESULTS & DISCUSSION



CONCLUSION

- ❑ Educators responded positively to metaverse-based training.
- ❑ Training enhanced knowledge, confidence, and digital teaching competence.
- ❑ Participants demonstrated strong intentions to adopt metaverse applications in their teaching.
- ❑ Metaverse integration is perceived to improve student engagement and support digital transformation within built environment education.

FUTURE WORK / REFERENCES

✓ Measure student learning outcomes arising from metaverse-enabled teaching, expand training programmes across additional built environment disciplines, and investigate hindrances to long-term adoption.

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