CHAPTER 12:

DOES NEO REALLY EXPERIENCE EXPERIENTIAL LEARNING IN THE MATRIX?

Mark Childs and Mike Collins

The Zillas have explored the twin towns of Active Learning and Problem-Based Learning in the Land of Constructivism. While Beckzilla explores further possibilities there, the others spot another town on the horizon, the signs beckoning them towards Experiential Learning ('You've seen it all, now do it all!'). 'Ooh, something shiny!' shouts Markzilla, and soon he and Mike are off track and headed towards a blindingly modern-looking house called Virtual Experience.

They're suddenly surrounded by a crowd of Cyber-Elves. Donning their wraparound shades to blend in, they continue towards the house. The road is a bit rougher and more populated by Elves than they anticipated, because they not only have to explore Experiential Learning but they also have to understand it while pondering the existential nature of reality. Have they made a huge mistake? If they have (and can admit it), will they reflect and learn from it?

Constructivism is a broad category, which includes many pedagogies. Learners can build new knowledge on existing foundations in multiple different situations. Educators often try to support this knowledge building by making learning opportunities as 'authentic' as possible. Interpretations of authenticity vary, but they typically include activities in 'real-world' situations that are relevant to the learners. In this chapter, we'll tackle two concepts head on. The first is experiential learning, a constructivist approach that we'll examine with the help of *The Matrix* movie and its central character, Neo. The second is the concept of authenticity and reality in a virtual environment. Can we have an authentic, real-world experience in a world that has no physical existence? We need to consider both experiential learning and the nature of reality in order to answer our question: **Does Neo really experience experiential learning in *The Matrix*?**

The Matrix

The Matrix franchise is a series of films, a couple of really good comic book collections and also a series of animated shorts; the imaginatively named Animatrix. Within *The Matrix* (the franchise) is the Matrix that *The Matrix* franchise is named after[1]; a computer-generated world that all humans are wired into, although the vast majority of them don't realise that's the case. Most humans think the Matrix is reality. The story follows one character, Neo (played by Keanu Reeves), who discovers the truth. Like Neo, the audience only discovers this deception part-way through the movie. We initially think that what's portrayed on the screen is a real world and then, suddenly, our perspective shifts and we realise that what was going on before that moment

1*Editor throws up hands in defeat*

was virtual. It's only after the point of the revelation that we see actual reality. And this reality is much bleaker than the simulation that most humans in the movie perceive, because robots have taken over the world and they're using humans as batteries.

Once humans realise that they're in a computer program, they can manipulate reality, and essentially attain superhuman powers. We see Neo make that shift. However, there are also independent artificial intelligences – agents – within the Matrix who try to stop the reality-aware humans.

Morpheus and Trinity are key characters. Morpheus is Neo's mentor throughout the learning process. Trinity, who has already been inducted into the nature of reality, teaches Neo about some of the steps involved. Rounding out the main cast of the first film are the crew of the airship Nebuchadnezzar, who battle the robots in the real world but also help Morpheus enter the computer-generated world.

In this chapter, we focus mainly on the first movie, partly because it's the best one, but also because it's the only one in the trilogy in which Neo does any learning or, rather, any well-structured learning. We note here that the movie franchise as of 2024 is now a tetralogy, although when we recorded the podcast, the fourth movie hadn't been released.

Experiential learning

Experiential learning is another facet of the approaches we saw in the previous two chapters, in that being active, or solving problems, provides us with experiences that we can draw upon for our learning. This approach considers learning to be 'the process whereby knowledge is created through the transformation of experience' (Kolb, 1984). The additional

element that experiential learning brings to the mix is its emphasis on *reflection* as an essential component. This provides a framework that makes the learning more highly focussed and a lot more structured. The approach stresses that 'learning is best conceived as a process, not in terms of outcomes' (Kolb, 1984). Concepts come from our experience and are modified by that experience – they're not fixed and immutable. The role of a teacher isn't simply to introduce new ideas; it's also to modify or dispose of old ideas (which links this approach to the transformative learning covered in Chapter 2).

The experiential learning model was popularised in the 1970s and 1980s by David Kolb and his co-authors, but its roots go even further back. As with most pedagogy models, it's not necessarily the work of a lone individual, but it has come to be associated with the person who described it and identified its different elements. One particular inspiration was Kurt Lewin and his field theory of social psychology, which has its basis in the idea of feedback in engineering. The idea of reflection as a learning tool has a lot of parallels with control engineering (Abdulwahed et al, 2008). There's also the storytelling cycle by Heidi Dahlsveen which involves audience feedback and revising your story. If you rewrite this as a loop, it looks identical to the learning cycle (Childs et al, 2015). So there are lots of models that only need very slight tweaks to become the experiential learning cycle.

The central elements of Kolb's experiential learning model are:

- concrete experience
- reflective observation
- abstract conceptualisation
- active experimentation (Kolb, 1984, Fig 2.4).

Although Kolb's visualisation of these elements followed Lewin by arranging them in a circle (thus giving rise to the idea of a cycle), he also drew on the model of learning and cognitive development proposed by influential psychologist Jean Piaget, which made connections across that circle. Kolb sees the learning process as having two dimensions: the first running from concrete experience to abstract conceptualisation, and the other from active experimentation to reflective observation (Kolb, 1984, 31).

To break those elements down a little bit

Concrete experience, that's straightforward, it's your hands-on experience of doing something; trying, doing things, getting your hands dirty. This is followed by reflective observation; which at a basic level is pretty straightforward, it's simply looking back at what has just happened, either to yourself or to someone else. Kolb views this as a process of integrating ideas, combining experience with memories to create meaning.

To take an example from when we recorded the *Pedagodzilla* episode on *The Matrix* and experiential learning – Mikezilla couldn't get his microphone to work in a way that Markzilla could hear what he was saying. After spending a while struggling with various settings and checking the equipment, Markzilla realised his headphones were turned way down. Turning up the volume meant everything worked perfectly.

So that was the concrete experience. We discussed it, drew on our memories of past recording experiences and decided that focusing on the sound transmission technology but paying no attention to the sound reception technology (and its operator) was a really, really stupid thing to do. That was the reflective observation stage.

The **abstract conceptualisation** stage involves looking at what you've done and deciding what general principles can be

taken from it. What does this tell us about what works and what doesn't? In many cases, this requires going to the literature, asking colleagues, looking for parallels elsewhere and building that information into the decision-making process.

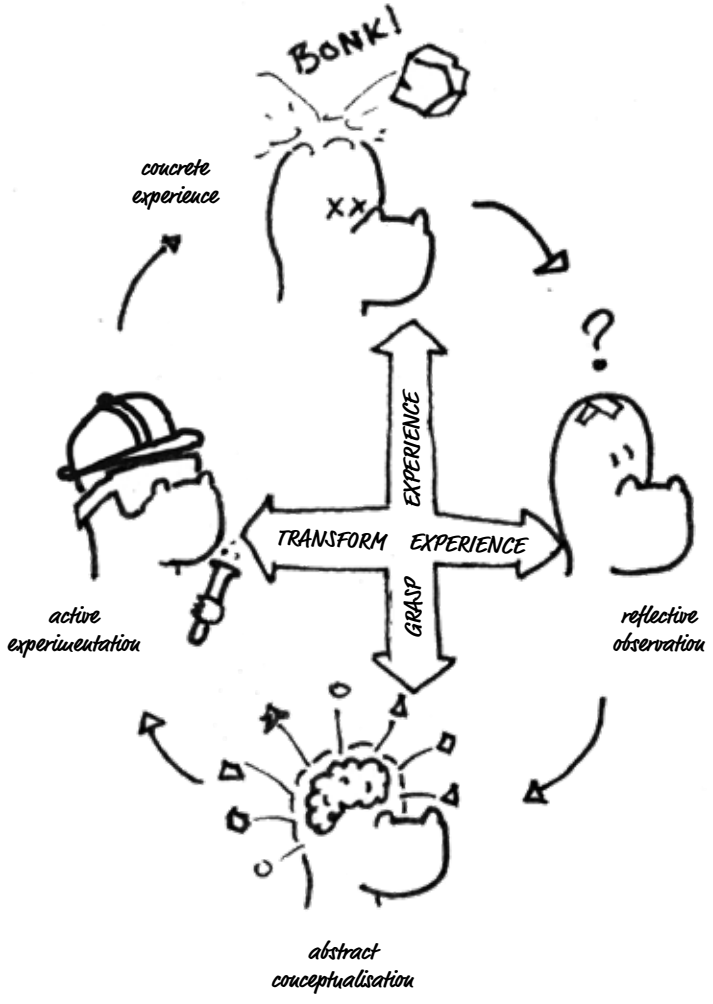
A confounding variable in this particular example was that this was the Zillas' first use of Lavalier microphones, so the assumption was that the problem would lie with them. However, subsequent reflection led to the general principle that we should always start by assuming Markzilla is the problem, before we shift our attention to the technology.

This took us on to **active experimentation**, or incorporating the general principle we've just identified when planning the next activity. The Zillas built a new step into the recording process – if something fails, begin by checking Markzilla hasn't made an obvious mistake. If, for example, his microphone is back-to-front, then this concrete experience leads to further reflective observation, such as, 'He really is an idiot, isn't he?' The experiential learning cycle goes round and round, with our understanding gradually improving.

When Mikezilla accidentally spent ten minutes recording an episode in which everyone spoke about *The Lord of the Rings* while using monster voices, more reflection and abstract conceptualisation were needed, and it was time to add a new step to the recording process.

The experiential learning model describes the process we go through when we learn from what we do. We try something out. If it goes right, we do it again. If it goes wrong, we think about why that has happened (ideally drawing on what other people have experienced) and do something different next time. The model simply formalises these stages. If at first you don't succeed, try, try, try again but, if you want to learn from your experience, incorporate some reflection and rethinking into that process. As the quote misattributed to Einstein says: 'The

definition of insanity is doing the same thing over and over again and expecting a different result.'



(highly accurate experiential learning diagram)

The answer(s)

The question of whether Neo uses experiential learning in *The Matrix* ought to be prefaced by more existential questions. Does what happens in a virtual space count as experience? Is it authentic? Is there a spoon? But we won't do it in that order, because the existential questions are more difficult.

Breaking down the learning moments for Neo, we see there's a scene in which he's sitting in the Nebuchadnezzar wired into a teaching machine by one of the crew members, Tank (who, incidentally, isn't fitted with the technology that enables him to enter the Matrix). Tank has a set of cassettes with different skills recorded on them, from which he chooses combat training ('Ju-jitsu, I'm going to learn ju-jitsu?'). The programs are directly loaded into Neo's brain. It's a good example of something that is clearly not experiential learning. Neo just sits there and receives the training with no active participation on his part. The experiential part of learning these skills occurs later when he has the chance to exhibit them to Morpheus in a virtual dojo that is a pared down version of the Matrix.

As a training space, this mini-Matrix is different from the construct the machines have created because it can be slowed down and paused for demonstration purposes. Morpheus could just have told Neo this, but placing Neo within the context of the situation Morpheus is preparing him for provides the concrete (or is it?) experience that makes the reflection more meaningful.

When Neo enters the virtual dojo, his brain and body contain the muscle memory skills he's acquired from Tank's download, but he also has to learn from Morpheus about the malleability of reality in order to make full use of his potential.

Here is the Warchowskis' script for part of this scene.

Morpheus attacks him and it is like nothing we have seen. His feet and fists are everywhere taking Neo apart. For every blow Neo blocks, five more hit their marks until – Neo falls. Panting, on his hands and knees, blood spits from his mouth, speckling the white floor of the Dojo.
MORPHEUS: How did I beat you?
NEO: You – You're too fast.
MORPHEUS: Do you think my being faster, stronger has anything to do with my muscles in this place?
Neo is frustrated, still unable to catch his breath.
MORPHEUS: Do you believe that's air you are breathing now?
Neo squints at him.
MORPHEUS: If you can free your mind, the body will follow.
Neo stands, nodding.
MORPHEUS: Again.

(Warchowski and Warchowski, 1996)

Morpheus takes Neo through an entire cycle of experiential learning in that short sequence:

- There's a concrete experience: 'Morpheus attacks him and it is like nothing we have seen. His feet and fists are everywhere taking Neo apart. For every blow Neo blocks, five more hit their marks until – Neo falls.'
- There's a reflective observation: 'How did I beat you?' 'You – You're too fast.'
- There's abstract conceptualisation: 'Do you think my being faster, stronger has anything to do with my muscles in this place?'
- Finally, there's the last part of this first loop. When Neo fights again, he attempts to apply active experimentation

(by freeing his mind, his body will follow), which results in a new set of concrete experiences as the cycle enters its second loop.

The most important part of the cycle as far as Neo's learning is concerned is the abstract conceptualisation – his actual muscles and speed have no effect on his performance within the space. As he learns that he can manipulate the reality within the space with his mind, he becomes better at fighting and, with each cycle, he develops not his muscle memory skills for combat but his skills at this manipulation.

Neo uses this cycle several times in the film in non-formal learning situations. The final point is when he's shot by several agents who have cornered him in a corridor. On that occasion, he realises that even bullets aren't subject to the normal rules of physics in a virtual space.

The evidence for the experiential learning cycle being employed by Morpheus in the training situations is pretty conclusive. What's more conjectural, because it is employed within a simulation, is whether these count as 'actual experiences', or whether they should simply be considered 'experiences'.

When this was being discussed in the podcast, Mike and Mark had different perspectives.

The answer: Mikezilla's perspective

'I play a lot of video games. I'd like to play more. I'm one of those people who on their deathbed will be saying, 'Man, I wish I'd played more video games.' I use the experiential learning model a lot in the games I play, but I'm learning how to do that in a virtual world. In that regard, my experience is perfectly legitimate. I think Neo's experience, all the relevance

of his experience, is couched in this virtual world in the first film. It's a perfectly legitimate piece of experiential learning because he's learning how to interact in a virtual environment. Therefore, it matches and is appropriate. Everything you learn, experience-wise, is appropriate to a particular scenario. For example, I don't think Euro Truck Simulator*, which is the inexplicably popular computer game in which you drive a truck, would actually give you what you needed as a learning experience to drive a truck.' ~Mikezilla*

The answer: Markzilla's perspective

'Though the stuff you learn in a virtual world won't necessarily be applicable to the physical world, that's true of moving from any one scenario to any other scenario. Some of it can translate into the physical world. A good example of an experiential learning project in a virtual world was the SWIFT (Second World Immersive Future Teaching) project at Leicester University (Childs and Kuksa, 2014, 153-154). Paul Rudman was the researcher on the project, David Burden at Daden Ltd built it, and they and others set up a genetics lab in the virtual world Second Life™. The problem they were addressing was that whenever the students were in the physical lab they could carry out the steps for genetic sequencing, but they didn't match that conceptually with what they'd learnt about the science of what was actually going on with the genes.

'And so, what Paul and David and the others set up was a space where the learner's avatar enters the lab and there are certain basic safety things the learner has to remember to do, otherwise they receive error warnings and alerts. The project didn't replicate the physical nature of turning the machines

on and flicking particular buttons on and off, but what it did do was take the learner step by step through the operation of the equipment. As the student was doing a step, a little animation appeared above the equipment to show what was happening conceptually.

'And that is experiential learning. It's not exactly applicable to the physical world because the student hasn't learnt how to operate the apparatus, but they have learnt the order of the steps that have to take place, as well as what's happening conceptually at that step. All of that applies in the physical world when the student's in the physical lab.

'This also exemplifies the difference between simple simulation and replication. It doesn't replicate the physical world; it's a simulation in that it takes some elements of the physical world and maps them to the virtual environment, but also adds things which you couldn't do physically to enhance the learning.' ~Markzilla

The answer: the literature perspective

Due to the nature of the technology we have today, there are evident differences between the physical world and virtual worlds. No-one could mistake one for another. It's quite possible to drive a truck for a living and find the truck simulator so different from this experience you can play it in order to relax (Fesshole, 2022). However, if we're talking about whether there is an *intrinsic* difference between virtual and physical learning due to their essential nature, rather than the practical differences we see today, the literature is pretty consistent.

If you look at the neurological evidence, when you're playing immersive games such as *Minecraft*, the memories are stored in the same way as the memories from physical activities (Stark et al, 2021). The more you feel immersed, the better the recall (Bailey

et al, 2012). In the case of something as technically sophisticated as the Matrix, the virtual reality is indistinguishable from the physical reality. The only way you could know which one you're in is that physical reality is noticeably shittier. Philosophically, you could argue, and in *Reality+*, David Chalmers does this extensively, that if they're indistinguishable, one is just as valid as the other, particularly if you take into account the possibility that we're all living in a simulation anyway or, at least, we can't prove beyond doubt that there is an external world (Chalmers, 2022). Conan the Cimmerian put it far more succinctly while pirating with Bêlit on the Black Coast in Robert E. Howard's Queen of the Black Coast 'If life is illusion, then I am no less an illusion, and being thus, the illusion is real to me' (Howard, 1934; 539).

This position is at odds with arguments such as Robert Nozick's thought experiment of an experience machine. This imaginary device can provide users with whichever desirable or pleasurable experiences they choose, and they cannot distinguish those experiences from the ones they would have apart from the machine. Nozick concludes that 'the connection to actuality is important whether or not we desire it – that is why we desire it – and the experience machine is inadequate because it doesn't give us that' (Bramble, 2016). But when the illusion is indistinguishable to us from actuality then, as Chalmers (and Conan) would argue, it is actually as actual as actuality is actual.

One crew member of the Nebuchadnezzar, Cypher, betrays the others under the promise that he'll be inserted back into the Matrix and not know it's a simulation.

The real world. Ha, what a joke. You know what real is? I'll tell you what real is. Real is just another four-letter word. … You know, I know that this steak doesn't exist. I know when I put it in my mouth, the Matrix is telling my

brain that it is juicy and delicious. After nine years, do you know what I've realized? Ignorance is bliss
(Warchowski and Warchowski, 1996).

Philosophically, Cypher is the most pragmatic of the crew (although also a scheming double-crosser). He acknowledges that the so-called 'real' world is no more nor less illusory than the virtual one, so why not pick the one with better food?

It appears that neurologically, philosophically and therefore, we'd argue, pedagogically, simulation learning is no different from experiential learning. So our conclusion is that, yes, Neo does really experience experiential learning in *The Matrix*.

Tips for practice

As we said near the start, the essential element that makes experiential learning distinctive is the reflection stage. But, the iteration of the cycle is also very important.

The two things that make experiential learning distinctive are the reflection stage and the iteration. And the movement between abstractions and practicality.

The three things that… oh, you see where this is going.

Experiential learning is, as we noted earlier, tied up with how we automatically go about solving problems. This helps the learning process, but also makes it more difficult for students to see what they're doing as learning. As educators, what can help is to:

1. Break the separate stages down for students during the learning process and make each stage explicit.
2. Scaffold each stage. We reflect all the time, but it's difficult to do this well. Provide students with questions to ask

themselves about their experiences. Take them through the process of abstract conceptualisation, pointing out how drawing on literature and generalising from their experiences helps. Give them some examples of the learning cycle (if you use *The Matrix*, we've already done the work for you).
3. Encourage both reflection in action and reflection on action. Reflection in action involves recording experiences as they're happening, maybe writing a short comment on social media, capturing something as a recording or making a note on your phone. Reflection on action is a more considered look back once the activity is complete. Learners might use blog posts to record these thoughts.
4. All the stages in a cycle can be built on when creating a plan to kick off a new cycle, but this new cycle can also be a fresh start. Encourage students to feel liberated by the process. This frees them from the tension associated with pressure to get it right the first time. In fact, the more they screw up the first time round, the more learning is available to draw upon the next time round. At least, that's how we justify to ourselves the fact that we screw up all the time. We're just fast-tracking the learning process.
5. Finally, Mikezilla gets to ring his metacognition bell, because foregrounding the cycle so it's explicit, supporting students in thinking about their thinking, is a very useful tool for them to have in their metacognitive toolkit. Possibly the most versatile of them all. Metacognition – the WD40 of learning – whichever reality you're in.

How about some more (references)? Hell, yes.

Abdulwahed, M. Nagy. Z. and Blanchard, R. (2008) Beyond the engineering pedagogy: engineering the pedagogy, modelling Kolb's learning cycle. In: P*roceedings of The Nineteenth Annual Conference of The Australian Association For Engineering Education (AAEE 2008)*, to Industry and Beyond. Yeppoon, Australia, 7-10 December, M2A3

Bailey, J., Bailenson, J.N., Won, A.S., Flora, J., & Armel, K.C (2012) Presence and memory: Immersive virtual reality effects on cued recall, *Proceedings of the International Society for Presence Research Annual Conference*. 24-26 October, Philadelphia, Pennsylvania, USA.

Bramble, B. (2016) The Experience Machine, *Philosophy Compass*, 11:3, 136–145. Available at: https://doi.org/10.1111/phc3.12303

Chalmers, D. (2022) *Reality+*, Norton Publishing, USA: New York

Chappell, L., Lorig, C. and Williams, A. (2010) Splendid American: a eulogy for Harvey Pekar, *Blog: The Lesser of Two Equals*, 6 August. Available at: https://thelesseroftwoequals.wordpress.com/2010/08/06/splendid-american-a-eulogy-for-harvey-pekar/

Childs, M., Estatiev, V., Hetherington, J., Jugo, G., Richardson, T. and Walton, G. (2015) Connecting to reading: inspiring young children to read through the creation of digital artefacts and use of social media, in A. Jefferies and M. Cubric (eds) *Proceedings of the 14th European Conference on e-Learning ECEL 2015*, University of Hertfordshire, Hatfield, UK, 147-155

Childs. M. and Kuksa, I. (2014) The future of spaces; physical or virtual? in I. Kuksa and M. Childs *Making Sense of Space*, Chandos, UK: Cambridge

Fesshole (2022) I work 50/60 hours a week as a lorry driver. When I come home to relax, I love to play Scania Truck Driving Simulator, Twitter 14 August. Available at: *https://twitter.com/fesshole/status/1558942800888086540*

Howard, R.E. (1934) *'Queen of the Black Coast', Weird Tales* , 23, May 1934. Popular Fiction Publishing Company; USA; Indianapolis, pp 530 - 549

Kolb, D.A. (1984) *Experiential Learning: Experience as the Source of Learning and Development*. Prentice Hall, Englewood Cliffs, NJ.

Kolb, D.A. and Fry R.E. (1975) Towards an applied theory of experiential learning. In C. Cooper (ed.) *Theories of Group Processes*. John Wiley and Sons, New York.

Stark, C.E.L., Clemenson, G.D., Aluru, U., Hatamian, N. and Stark, S.M. (2021) Playing Minecraft improves hippocampal-associated memory for details in middle aged adults, *Frontiers in Sports and Active Living*, 3. Available at: https://www.frontiersin.org/articles/10.3389/fspor.2021.685286

Warchowski, L. and Warchowski, A. (1996) *The Matrix*, https://imsdb.com/scripts/Matrix,-The.html

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