

## 5. Theme, sub-themes and comments: Reaction to learning

The thematic analysis of the theme, sub-themes and comments of 'reaction to learning' by learners, from teachers' viewpoints, when addressing the question 'how does the integration of virtual reality simulations influence primary school teachers' classroom practices', during the study of the influence of VR as an educational tool on teachers' pedagogy.

Pseudonyms were used instead of participants' names

Table 1 is a summary of the theme, the reaction to learning, indicating the sub-themes, the number of participants who commented and the number of comments identified for each of the sub-themes, which are demonstrated in Tables 2 to 5 below.

**Table 1: Indicates the theme and sub-themes number of comments and participants which refer to reaction to learning**

Theme	Subthemes	Participants	Comments
Reaction to learning - feeling real		8	61
	Bringing reality into the classroom	8	12
	Learner reaction	8	11
	Contextual learning through experience	7	29
	Real world context	6	6
	Apply to real world	3	3

**Table 2: Indicates the sub-theme 'Bringing reality into the classroom', under the theme: 'Reaction to learning - feeling real'**

All eight participants, with twelve comments identified.

	<b>Bringing reality into the classroom</b>
<b>Participant pseudonym</b>	<b>Comment</b>
Bhavna	it can create or help to create the reality or an understanding of the reality
Bhavna	. . .it was an out of body experience because they could look down.
Mary	explore natural science and social science issues further and apply to the real world, using the UN sustainable goals, development goals

Mary	<p>and then I had one child which I was very worried about him using VR, he's got, uh, a brain cancer and he had just come back from the states, he went to have his op and I was very anxious about him doing it. And he insisted he wanted to, and he absolutely loved it because this was like a real thing for him, you know, he could relate to it. So I just want to go into space again, let you go to space again. Can I have another turn? So no, no, no. I don't think we should really have any more visual stimulation right now.</p>
Tammy	<p>Okay. But I think from, uh, like little Jeremy, the one child in grade six, he said to me afterwards, he said, I know how to use his virtual reality glasses. And I got to see all of the different places, u, he went from the beach, he went to, to the forest or the jungle. He went here and he went there he saw everything and it was so interesting.</p> <p>So I think children that you lose in a classroom, those that I don;t know, they drift off or they perhaps get bored, those are the sorts of children that you really get with this. I think it was very enjoyable, very nice. I think it is very important and nice for them to see that type of things the way they did, and that those are the sorts of children that you really want them to engage.</p> <p>Back to your point, there is another little boy who is very quiet in the classroom. He had a lot to say after putting on the goggles. and seeing the different things, which is nice. especially. to see something which is beneficial</p>
Kgomotso	<p>It is a beneficial resource, because what my learners were saying, they actually felt like they were part of the video themselves. So it means they were part of the learning and teaching that was happening there.</p>
Kgomotso	<p>How well do you think the VR scenario linked with the content topic of your lesson? Speaker 2:</p> <p>I think it's played a very important role, because from the experience I got from my learners, the feedback was great. Though I gave them return work as well, so the feedback was great. And they actually said they felt as if they were part of what was happening. So it was like part of them. So, they really were engaged in the learning.</p>
Siara	<p>How do you feel about how the lesson played out with the inclusion of VR in the lesson?</p> <p>Children related positively where engaged Children very excited.</p> <p>Keen to go through the content, learners were in groups but view VR individually Many children spoke about how the VR made them feel as if they were in the place, in Borneo, spoke about how beautiful it looked - helped them understand ecosystems One child was restless and easily distracted, Others very focused and spoke a lot about the content after the lesson</p>
Dhriti	<p>I think the kids thoroughly enjoyed it.</p> <p>They definitely, obviously it has to be a briefing at the beginning, let them watch it and definitely a debriefing just to help them understand what exactly it is what they saw. So, um, but they loved it. And I think it was very immersive and they were able to come up with questions, you know, make comments about it. So it was brilliant, it got them thinking at least.,</p> <p>Speaker:</p> <p>How did it relate to what you are teaching now?</p> <p>Speaker:</p> <p>Perfectly, absolutely relates it perfectly because it's, uh, aligned with the San and the whole reason that we said we, um, actually teach them about the san I feel it is to show up, you know, learn about respecting the environment of being grateful for what we have, things like that. So it definitely is very much aligned with not just their knowledge, but also the skills and values that we'd like to teach them as well. So,</p>

Thandiwe	<p>The VR video helped them understand what cyberbullying was Cause with that, I had discussed all the different types of bullying, we had discussed cyber bullying, but, uh, I thought they understood, but clearly or apparently, they didn't really quite understand it because I don't know, maybe for us, the social media things and, and phones and things like that.</p> <p>Maybe they're not so used to it, but now it is clear to them</p>
Bhavna	<p>Well, some of them have never had never, ever done a VR experience. So it was, it was so nice and heartwarming to see some of them they're like totally, totally fascinated. Like them, they actually felt that they were on that particular planet. You know, when we are doing that or even the moonwalk when we are doing they're like, this is really, I feel like I'm on the moon of, I guess that is the VR experience. You feel that you are actually in that specific place.</p>
Sarah	<p>And why do you think they don't disengage with VR?</p> <p>Speaker 1 (08:19):</p> <p>Well, I think because it's, it's, it's real, it's reality. It's another reality. It's not, um, it's something that they're using their senses and they're engaging with on, on like on every level, you know, like I with that's the first time I've ever had a headset on. And I mean, you're completely immersed in that and you, and you guiding you looking at your own where you want to look where you want to go, you, you aware of your own body in, in the, in the experience. So it's back to experiential learning as opposed to, um, I don't know, not, it's not even tactile learning when you get a worksheet. Yeah. You know, it's superficial for me. It's yeah.</p> <p>Speaker 2 (09:09):</p>

**Table 3: Indicates the sub-theme 'Learner reaction', under the theme: 'Reaction to learning - feeling real'**

All eight participants, with eleven comments identified.

	<b>Learner reaction</b>
<b>Participant pseudonym</b>	<b>Comment</b>
Dhriti	<p>The learners were so involved and interested. They used it individually, but it reinforced what they were doing in the other activities.</p> <p>I think the kids thoroughly enjoyed it</p> <p>So, um, but they loved it. And I think it was very immersive and they were able to come up with questions and make comments about it. So it was brilliant, it got them thinking, so ja it was good,</p>
Tammy	<p>really nice feedback</p> <p>Well I was pleasantly surprised. I really really was. The children that had difficulty moving from one screen to another were horribly disappointed, so it is something they wanted to do. They wanted to do.</p>
Saira	<p>Helped build understanding of the content,</p>

Thandiwe	Yeah, there was, there was so much excitement. There was so much excitement and, um, because we were doing it in turns. So the others in class were also looking forward to doing it, having their own turns of, of doing that. And I'm glad we, we, we were able to do within that space of time, we were able to kind of rotate all of them and we all had a chance, but there was so much excitement about it. I think maybe it was maybe something that we were doing for the first time. It was exciting other than what we normally do in class, just teaching the normal way. I think more visual was exciting for them. What they saw
Kgomotso	<p>They were excited about it, so they participated even better. And from the feedback, they understood the content, because they were really immersed in it, as they had no other disturbance, because one child was focusing on what they were doing at that particular moment, so they gained a lot of information</p> <p>They were more engaged. Is it is something that they were using for the first time, so because of the excitement, they were more engaged</p> <p>Okay. I noticed that my learners were excited and they were motivated, and they were focused. So I really loved it.</p>
Bhavna	we going to do VR? They get so excited. And uh, so I try to do the work that I need to do with this and get their next focus. And then we have a bit of fun at the end. And so they little kids for me.
Sarah	They loved it. They absolutely loved it.
Mary	Well, they were because they were relaxed and thought they were just having fun and playing a game. When you're in that theta mode, you actually take on more information. So if you're relaxed and happy, you will remember that because you are in, in your amygdala and your central part of your brain. That is, if you are relaxed there, you're gonna remember more things. So it definitely, um, affects the children that way. And I mean, I think that we underestimate the fact that the kids can learn about brains and I really
Bhavna	Well, some of them have never had never, ever done a VR experience. So it was, it was so nice and like heartwarming to see some of them they're like totally, totally fascinated. Like they, they actually felt that they were on that particular planet. You know, when we are doing that or even the moonwalk when we are doing they're like, this is really, I feel like I'm on the moon of, I guess that is the VR experience. You feel that you actually in that specific place.
Tammy	And another little voice, because they're thinking. He's usually quiet in the classroom. He had a lot to say after putting on the goggles and seeing all the different things, he's excited and bubbly at the lesson, which is nice
Mary	And he insisted he wanted to any absolutely loved it because this was like a real thing for him, you know, he could relate to it. So I just want to go into space again,

**Table 4: Indicates the sub-theme 'Contextual learning through experience', under the theme: 'Reaction to learning - feeling real'**

All seven participants, with twenty-nine comments identified.

	<b>Contextual learning through experience</b>
<b>Participant pseudonym</b>	<b>Comment</b>

Bhavna	I give them more, um, yeah, visual aids, no, on the projector. And then we use the VR quite extensively where we spoke about planet earth and I'm like, right, go onto this link. And we're going to now explore planet earth. And we did that. We explored satin, we explored the asteroid belt and I found in my exam, uh, it was last year and the year. No, not the year before the previous year. Uh, where, when I did that, I saw in the answers what they remembered from the VR experience and, you know, they, which is so nice to see and they actually remembered it more. Um, so the VR really helped in that sense with, I find personally, if kids can see something and then they, so I give them information, they see that physically, they actually gels. Well, they meant they still remember it.
Bhavna	I think it does have, because if you had to take, so you doing geography and you're doing rock formations and you find an example, to explain to the children would make much more sense.
Bhavna	it can create or help to create the reality or an understanding of the reality
Bhavna	Not so much special needs, but we have learning with difficulties with grasping concepts. , but we have a few learners, um, who have some learning needs. But with VR it really helps, as it is visual, and it is practical So some of them, I have to take a little bit more time, going throughout the unit to explain to them [inaudible] [00:11:00] such as the science stuff, they would talk about it or create a drawing as opposed to writing down things. So if we do have kids with learning needs, because we do so much of discussion in terms of school and exposing them to outside experience it benefits these kids. So I have these kids, I haven't had to adjust my teaching style drastically as I consider them when I am planning.
Bhavna	we use the VR quite extensively when we spoke about planet earth
Bhavna	Well, some of them have never had never, ever done a VR experience. So it was, it was so nice and like heartwarming to see some of them they're like totally, totally fascinated. Like they, they actually felt that they were on that particular planet. You know, when we are doing that or even the moonwalk when we are doing they're like, this is really, I feel like I'm on the moon of, I guess that is the VR experience. You feel that you actually in that specific place.
Dhriti	aligned with the san and the whole reason that we said we, um, actually teach them about the san
Dhriti	it was very immersive
Kgomotso	How did you feel the inclusion of VR content impacted your learner's participation in the lesson, their understanding of the content? Speaker 2: They were excited about it, so they participated even better. And from the feedback, they understood the content, because they were really immersed in it, as they had no other disturbance, because one child was focusing on what they were doing at that particular moment, so they gained a lot of information.
Kgomotso	How well do you think the VR scenario linked with the content topic of your lesson? Speaker 2: I think it's played a very important role, because from the experience I got from my learners, the feedback was great. Though I gave them return work as well, so the feedback was great. And they actually said they felt as if they were part of what was happening. So it was like part of them. So, they really were engaged in the learning.

Kgomotso	<p>How did you feel the inclusion of VR content impacted your learner's participation in the lesson, their understanding of the content?</p> <p>Speaker:</p> <p>They were excited about it, so they participated even better. And from the feedback, they understood the content, because they were really immersed in it, as they had no other disturbance because one child was focusing on what they were doing at that particular moment, so they gained a lot of information."</p>
Mary	<p>do you think it's still interesting to grade seven?</p> <p>Speaker 2 :</p> <p>Actually, I was amazed because it did, but they sort of, um, maybe they were just tired and they enjoy,</p>
Mary	<p>And that experience means that they safe, that it isn't expensive, but at the same time, they get that feeling that they are traveling and moving and exploring new places. So the get excited, they engage and participate.</p>
Mary	<p>the virtual experience in this day and age actually can assist or can supplement when you can't go out.</p>
Mary	<p>. . it was an out of body experience because they could look down.</p>
Mary	<p>And he insisted he wanted to any absolutely loved it because this was like a real thing for him, you know, he could relate to it. So I just want to go into space again,</p>
Mary	<p>but I was surprised because they enjoyed the experience even though they've flown in airplanes and have some knowledge.</p>
Mary	<p>I know I use the, when we did Egypt, then we went into the caves, you know, I said, we're going to Egypt,</p>
Mary	<p>I used the VR headset predominantly with space</p>
Mary	<p>the children learn through the through experience, whatever the experience might be. So actually that's how, that's why I liked the VR,</p>
Siara	<p>How do you feel about how the lesson played out with the inclusion of VR in the lesson?</p> <p>Children related positively where engaged</p> <p>Children very excited.</p> <p>Keen to go through the content, learners were in groups but view VR individually</p> <p>Many children spoke about how the VR made them feel as if they were in the place, in Borneo, spoke about how beautiful it looked - helped them understand ecosystems</p> <p>One child was restless and easily distracted,</p> <p>Others very focused and spoke a lot about the content after the lesson</p>
Sarah	<p>And why do you think they don't disengage with VR?</p> <p>Well, I think because it's, it's, it's real, it's reality. It's another reality. It's not, um, it's something that they're using their senses and they're engaging with on, on like on every level, you know, like I with that's the first time I've ever had a headset on. And I mean, you're completely immersed in that and you, and you are guiding you looking at your own where you want to look, where you want to go, you, you are aware of your own body in, in the, in the experience. So it's back to experiential learning as opposed to, um, I don't know, not, it's not even tactile learning when you get a worksheet. Yeah. You know, it's superficial for me.</p>
Sarah	<p>I think whenever things are put within a context, there's always much more effective learning that takes</p>
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	learning that takes
Sarah	So I think they enjoy being surrounded by the experience immediately and sort of it a live way.
Sarah	the VR really helped in that sense with, I find personally, if kids can see something and then they understand it more, so I give them information such as VR
Tammy	And I think, um, they don't have enough hands-on experience and things, and I think that's a nice substitute for actually being able to see things. I don't know how it could be incorporated in all the subjects . So do this effectively I think we need training, specifically of how we could incorporate it into lessons,
Tammy	How well do you think the VR scenario linked with the content topic of your lesson? Speaker 2: I think it's played a very important role, because from the experience I got from my learners, the feedback was great. Though I gave them return work as well, so the feedback was great. And they actually said they felt as if they were part of what was happening. So it was like part of them. So, they really were engaged in the learning.
Thandiwe	"I think we as teachers, maybe I'm looking for myself, maybe this kind of school that I, I, I teach at, we are kind of slow into going into that direction. We are very, very slow. I know even that, that the first one was what that revolution, the computer revolution or the third revolution we using in industrial. So we were still slow. We were still slow. We're not catching up with, um, with technology. Speaker 2 (05:17): And, but I think also with COVID, it kind of helped us to, to be now open towards it, going, learning more to life. We need to do more. I, I, I believe you to do more and yeah, I think it can help solve a lot of problems in education. If you can, we can do this. I think going, I want to really bring it in. Cause there are a lot of things that we could do using the visuals and what, and it can help a lot because I see so many gaps, so many gaps and I don't know whether I would attribute that to, to, to COVID because the group I'm teaching now is grade 4s. Yeah. I think they are the worst I've taught in, in my whole teaching career of eight, eight to nine teaching careers are the worst I've seen, their comprehension, whatever. "
Thandiwe	Cause with that, I had discussed all the different types of bullying, we had discussed cyber bullying, but, uh, I thought they understood, but clearly or apparently, they didn't really quite understand it because I don't know, maybe for us, the social media things and, and phones and things like that.  Maybe they're not so used to it, but now it is clear to them. This is, oh, so this is what side of the things about it's about text and sending a message to someone could be someone you know or someone anonymously or what. Speaker 2 (01:23): So it was, it was interesting to see that actually, when I taught it in class, I thought they understood it. But now when they were now reflecting on the, on the, on the vr I had seen, then they were telling me, you know, try, remember this is when I now realized that, oh, the actual type of bullying was when you are sending some or someone sent something by us. So yeah, I think it, it, it helped, although I think from them when we were reflecting again, they were, they were focusing mostly on the VR video itself. Some of them were saying they didn't really see, or they were saying it's different types of abuse in one or what or what, but I was interested and I tried to bring the discussion back into what did you learn, what did you learn? What lesson did you learn from that?

Thandiwe	<p>Do you remember the kind of reactions you got from the children went up to watch?</p> <p>Speaker:</p> <p>Yeah, there was, there was so much excitement. There was so much excitement and, um, because we were doing it in turns. So the others in class were also looking forward to doing it, having their own turns of, of doing that. And I'm glad we, we, we were able to do within that space of time, we were able to kind of rotate all of them and we all had a chance, but there was so much excitement about it. I think maybe it was maybe something that we were doing for the first time. It was exciting other than what we normally do in class, just teaching the normal way. I think more visual was exciting for them. What they saw</p>
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**Table 5: Indicates the sub-theme 'Real world context', under the theme: 'Reaction to learning - feeling real'**

All six participants, with six reflections identified.

	Real world context
Participant pseudonym	Comments and reflections
Siara	Many children spoke about how the VR made them feel as if they were in the place, in Borneo, spoke about how beautiful it looked - helped them understand ecosystems
Dhriti	... aligned with the San and the whole reason ...teach them about the San.
Tammy	And I got to see all the different places, went from the beach to the forest, and jungle
Thandiwe	Assisted learners to understand and discuss cyberbullying
	, I think that you need something to motivate children to excite them, and it will, the virtual experience in this day and age actually can assist or can supplement when you can't go out. If I just take COVID for example, does that mean we can
Mary	"take them on a journey without leaving the classroom" such as into space, on a weather balloon
Bhavna	Exposed learners to the planets, by traveling around them in VR

**Table 6: Indicates the sub-theme 'Apply to real world', under the theme: 'Reaction to learning - feeling real'**

All three participants, with three comments identified.

	Apply to real world
Participant pseudonym	Comment
Mary	. . . explore natural science and social science issues further and apply to the real world, using the UN sustainable goals, developmental goals
Thandiwe	The VR video helped them understand what cyberbullying is.
Bhavna	It can create or help to create the reality or an understanding of the reality



