

4. Theme, sub-themes and comments: Acquiring knowledge

The thematic analysis of the theme, sub-themes and comments of acquiring knowledge 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 acquiring knowledge, 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 6 below.

Table 1: Indicates the theme and sub-themes number of comments and participants which refer to learners' acquiring knowledge

Theme	Subthemes	Participants	Comments
Acquiring knowledge	Total	8	62
	Learner engagement	8	22
	Build content knowledge	8	20
	Meaningful lesson content	6	13
	Reinforce knowledge	4	4
	Learner communication and sharing	2	3

Table 2: Indicates the sub-theme 'Learner engagement', under the theme: 'Acquiring knowledge'

All eight participants, with twenty-two comments identified.

	Learner Engagement
Participant pseudonym	Comment
Bhavna	When saying, "we're 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.."
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 are actually in that specific place.

Dhriti	Dhritis learners' discussion they had about the Khoisan people after viewing the VR information was engaging, learners were asking unusual questions compared to other years. They seem to show a greater understanding and depth of awareness and questions.
Dhriti	<p>Absolutely. The learners were so involved and interested. They used it individually, but it reinforced what they were doing in the other activities.</p> <p>Yeah. I suppose we could get through more contents as well then, Because I mean, if the VR and the other things are used in the lesson the learners are involved, I suppose if they're doing similar content in many different ways, you are almost reinforcing their knowledge in different ways, building their knowledge</p>
Dhriti	<p>But thank you for the lesson today. I really appreciate it.</p> <p>Thank you for assisting with the setting up, and helping the technology to work. The children really loved it, I see great value in using it, and want to incorporate it into my lessons.</p>
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>
Kgomotso	<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>One child was restless and easily distracted,</p> <p>Others were very focused and spoke a lot about the content after the lesson</p>
Kgomotso	<p>Looking at our learners, because most of them are so used to technology these days, and they can operate phones. So, I think it is a great tool to try and use in schools, because it's linked to their everyday life. In their everyday life, it's not about the teacher narrating every time like they know it, and remember what I explained and if it is explained from another point of view. Certain learners may understand the other person better than they understand you, because it is now bringing variety. I would say it is a great tool for teachers to try and use, of course, I would like to use something like that. Because they're certain and learners who learn, if they're excited, number one. Number one, they're excited. Number two, they're in their own environment, there are no disturbances, they learn even better. So I think it's something that given a chance, I would like to try it.</p>
Kgomotso	Learners were impacted positively and wanted to know when they could do it again

Kgomotso	<p>How did you feel the inclusion of VR content impacted your learner's participation in the lesson, and 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> <p>Speaker 1:</p> <p>Did you find that learners were more engaged, or more easily distracted using the technology?</p> <p>Speaker:</p> <p>They were more engaged. It is something that they were using for the first time, so because of the excitement, they were more engaged. Though, when they finished the video, they needed to move on to the next one. They wanted to continue.</p>
Mary	<p>And he insisted he wanted to do it anyway, he absolutely loved it because this was like a real thing for him, you know, he could relate to it. He said, So I just want to go into space again</p>
Mary	<p>So they get excited, they engage and participate.</p>
Mary	<p>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</p>
Saira	<p>How well did the learners engage with the VR content being included in the lesson?</p> <p>They loved it, were very excited to be using VR</p> <p>Participated and focused on the task</p>
Sarah	<p>They loved it. They absolutely loved it.</p>
Tammy	<p>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</p>
Tammy	<p>But thank you for the lesson today. I really appreciate it.</p> <p>Thank you for assisting with the setting up, and helping the technology to work. The children really loved it, I see great value in using it, and want to incorporate it into my lessons.</p>
Tammy	<p>I do, I think this technology can be used in lessons for kids to interact. And I think sometimes it's finding the time to include the technology, the school is talking about getting headsets but nothing as yet. Today the children really enjoyed viewing the VR, and it tied in well with the lesson's revision.</p>
Tammy	<p>Received 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 it.</p>

Tammy	The VR lessons are enjoyable for the children, not always just take out your book and do that activity. Asking questions about the content. You make them think out of the box, which is quite nice. And again, those VR things provide another opportunity and they are nice for NS, getting them to think, linking it to the thinking hats, I think that's nice getting them to think.
Thandiwe	<p>What did you learn about bullying or what, whatever kind of bullying? So although I wanted them to come or narrow it down to cyberbullying and what, cause they were talking about the boy bleeding or the boy having an eye or so red eye or sore arm.</p> <p>So yeah, most of them were kind of criticizing the video saying he didn't really understand. He didn't even know who was fitting the boy. Why, why was the boy bleeding? But I was, I was saying, I was telling them, you know what, the main message there was actually this, you see what cyberbullying was about. So this Speaker 1 (02:52):</p> <p>Is, and I suppose the interesting thing there with the little boy getting hurt, even though it's cyber, which is virtual or digital, that's quite a big, um, I suppose mental thinking in terms of understanding that the boy wasn't really hurt it was makeup. And it's, it's just to show you that cyberbullying can hurt.</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 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
Dhriti	Learners' discussion they had about the Khoisan people after viewing the VR information was engaging, learners were asking unusual questions compared to other years. They seem to show a greater understanding and depth of awareness and questions.
Sarah	I mean some of the questions or the answers that they gave to your questions around what they observed was also really interesting. Um, like noticing no drivers noticing. So I suppose that was also fun and the way, um, some of them got so very engaged. Yeah.
Kgomotso	<p>Uh, I think it's something that when you, I will say when I try to use it, but I think it's something that we can adapt to because most of the time learners are fascinated with new ideas. If it's something that they haven't done before. Definitely they'll be fascinated by that. And because it looks like they are inside it, they are part of it.</p> <p>They're experiencing something that is different from watching a video. Cause it looks like they're engaged in it themselves. So I think they would love that. I think it's something that we can try and use.</p>

Table 3: Indicates the sub-theme Build content knowledge, under the theme: 'Acquiring knowledge'

All eight participants, with thirteen comments identified.

	Build content knowledge
Participant pseudonym	Comment
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.</p> <p>I think it was very enjoyable, very nice. I think it is very important and nice for them to see that type of things they 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>
Dhriti	<p>surprised at how the learners had reacted. Built VR into lesson plan.</p> <p>Learners' discussion about the Khoisan people after viewing the VR information was engaging, learners were asking unusual questions compared to other years. They seem to show a greater understanding and depth of awareness and questions.</p>
Mary	<p>Um, so for our children or, um, we've got a lot of kids with dyslexia, not all, but the VR, that's a video now I've gone blank on the actual one, but it's it's, there are YouTube videos that are 3d and they go places and move around. Uh, I have found it easier than the ones with the, um, gosh, the explore expeditions. I found that part difficult for the kids to use or to understand. So I think they enjoy being surrounded by the experience immediately and sort of in a live way.</p>
Sarah	<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>
Tammy	<p>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</p>
Dhriti	<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.</p>
Tammy	<p>Teacher describing when using a VR scenario in a lesson - " I think it's important that we actually watch it and see it and understand, and find out how it works"</p>
Mary	<p>And he insisted 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,</p>
Kgomotso	<p>When teaching when information is within the lesson content, helps children to understand</p>
Bhavna	<p>Yes, it really helps the learning. So it was nice in that sense where kids who were totally new to VR were experiencing something new. And like I said, again, I saw it in the answers in the exam where some of them even wrote in our VR lesson, I remembered, this about the moon or this about saturn or whatever it was. So it was, it was nice to know that this little thing as a VR headset actually made the world of difference to their learning.</p>

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>
Dhriti	<p>How did it relate to what you are teaching now?</p> <p>Speaker 1: Perfectly, absolutely related perfectly because it's, uh, aligned [00:00:30] with the san and the whole reason that we said we, um, actually teach them about the san. I feel it is to show them how um, how they should learn about respecting the environment, and 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, loved it.</p>
Thandiwe	<p>How, how would you add it into the prep?</p> <p>I think it's a good question. How to incorporate it. The one that we did today I did to do, uh, listening and speaking and maybe writing instead of them reading the test themselves. Cause maybe I had a challenge of now copying the story and having to print it when I have it here. So I just said, let me read it to them and then, then do the task later. But um, I think maybe it'll work more on the reading and, and, and speaking, when you read, when I'm sorry, not reading when listening and speaking. Yeah. They actually watch and then answer questions. We could answer orally and then maybe that will also help learn my comprehension instead of just them text all the time they read them, read them. They said maybe just to forget it, then they would have to just watch this and then maybe sometimes we'll speak about it and then maybe answer questions, um, or return questions afterwards. Um, yeah, I think that would be a different kind of comprehension that we'll be doing instead of doing this reading or watching the story and then having a text again, to read, I think maybe the text would be, could be done on a different day or something or a different story altogether result should be just based on what they have seen. And yeah, that's what I think for now. I am doing that For the English, For the English and for life skills or For life skills.</p> <p>I think, well, I'm not sure when to put it, would it be a good thing to start by watching the video first on, on any topic given that, that time we did, uh, bullying, I would watch the video of bullying before I teach was this time. They kind of watched it after I had done the lesson and it was kind of hard to clear some of the things that we had already spoken about or watched before. And then we introduced the lesson or something. I think it's something that I have to do, to figure out it went well here now, because when I talk about cyberbullying, I thought they understood me. But now when they watch this, they say, oh, Uhha, this is what cyberbullying is. Yeah. This is what it is. So now it makes me wonder, when is the right time to do it before you introduce a topic or do it after a topic, then like starting up that lesson and saying, this is what we are talking about. So this is what we see.</p> <p>Maybe it's having something different, putting it in at different times, depending on the content of the video, the topic of, or the content of the lesson. And maybe it's also nice to vary it from the children's point of view too, To see what they want.</p>

Table 4: Indicates the sub-theme Meaningful lesson content, under the theme: 'Acquiring knowledge'

Six participants, with thirteen comments identified.

	Meaningful lesson content
Participant pseudonym	Comment
Bharva	I do think integrating VR into lessons is useful. I used VR headsets last year. I haven't used them much now due to COVID, we were online. I used VR headsets a lot, especially in the fourth term every other lesson, when we explored space, which was great.
Bharva	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
Bhavna	if they're doing similar content in different ways
Dhriti	aligned with the san and the whole reason that we said we, um, actually teach them about the san
Mary	Because they make the lesson content meaningful to themselves.
Kgomotso	reinforcing their knowledge in a different manner
Mary	And he insisted 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
Mary	Yes. I think also the children have no experience. Have they learned so much as they are looking up and asking so why are they going there? I'm saying to them, why is that balloon expanding? Oh, because, the pressure is less or, you know, and, and, and then they sort of make, uh, connections themselves.
Sarah	So how did your class react? Speaker: They loved it. They absolutely loved it. In fact, I started them off on plants. If I remember correctly, adaptations of plants. So virtual reality of a plant and they saw the different plants and they did the activities. And then they went on and did their own.
Tammy	Okay. But I think, 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.
Tammy	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 different things, which is nice. especially. to see something which is beneficial
Tammy	The VR lessons are enjoyable for the children, not always just take out your book and do that activity. Asking questions about the content. You make them think out of the box, which is quite nice. And again, those VR things provide another opportunity and they are nice for NS, getting them to think, linking it to the thinking hats, I think that's nice getting them to think.
Tammy	Yes we do, it is actually quite nice we have done DeBono training, and thinking hats training. So now with this in the calendar Speaker 2: Now, we are focusing on these skills, focusing on those skills and then in our lessons we have to incorporate those skills. [00:07:30] So using VR to assist with the skills and the lesson content is useful, another resource.

Table 5: Indicates the sub-theme ‘Reinforce knowledge’, under the theme: ‘Acquiring knowledge’

Four participants, with four comments identified.

	Reinforce knowledge
Participant pseudonym	Comment
Mary	actually can assist or can supplement[learning] when you can't go out
Bhavna	It's reinforcing that, that it helps with memory retention and all those kinds of things, which is really great.
Thandiwe	<p>What kind of reaction did you get from the cyberbullying video, when you were teaching about bullying last week?</p> <p>I know that, I remember that we were doing cyberbullying and I had watched the video myself before. So I wanted to know, find out how, and I had taught, uh, bullying before I had taught them about cyberbullying, but it was interesting for me to learn that most of them said it was much more like, so, and I often now they could not understand what really cyberbullying was about. The VR video helped them understand what cyberbullying was Cause with that, I had discussed all the different types of bullying, we had discussed cyberbullying, 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, um knowingly or what.</p>
Sarah	<p>Would you consider using VR in your lessons?</p> <p>Absolutely. The learners were so involved and interested. They used it individually, but it reinforced what they were doing in the other activities.</p>

Table 6: Indicates the sub-theme ‘Learner communication and sharing’, under the theme: ‘Acquiring knowledge’

Two participants, with three comments identified.

	Learner communication and sharing
Participant pseudonym	Comment
Mary	<p>Today. I had two boys that I told about VR, because one boy knew all about the transformers, but he, it was as if he was an adult giving a lecture, he explained the Edwards, stood on the little dock and he just had pictures of a few of the transformers. And then he talked about each one and then he said, and this is the main tour, and this is the, this, he knew everything. And then he stalled down and then there were 12 badges. And he said, now we can, you know, all the star signs, well, we've got these. And then he said, this is this. What meant were you born? And he engaged us. I was like, w that we all connect for him. Cause he was so brilliant with it. And then, the other little boy had made up a game and cause I told them, cause I'm not fresh out of ideas. I said, I want you to share with me your interest. So the one little girl sang a song, wrote a song and everybody's cringing and whatever. But anyways, she wrote a song and then this boy did his transformers and the other one made his own game. But it wasn't Minecraft. It was a proper game going, jumping up and everything and going around and oh, wow. It's so nice to see that. And I just thought that made me think of VR again.</p>

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,