

### 3. Theme, sub-themes and comments: Challenges teachers expressed when integrating Virtual Reality (VR) in primary school lessons

The thematic analysis of the theme, sub-themes and comments ‘Challenges teachers expressed’ when integrating Virtual Reality (VR) in primary school lessons, during the study of the influence of Virtual Reality as an educational tool on teachers' pedagogy.

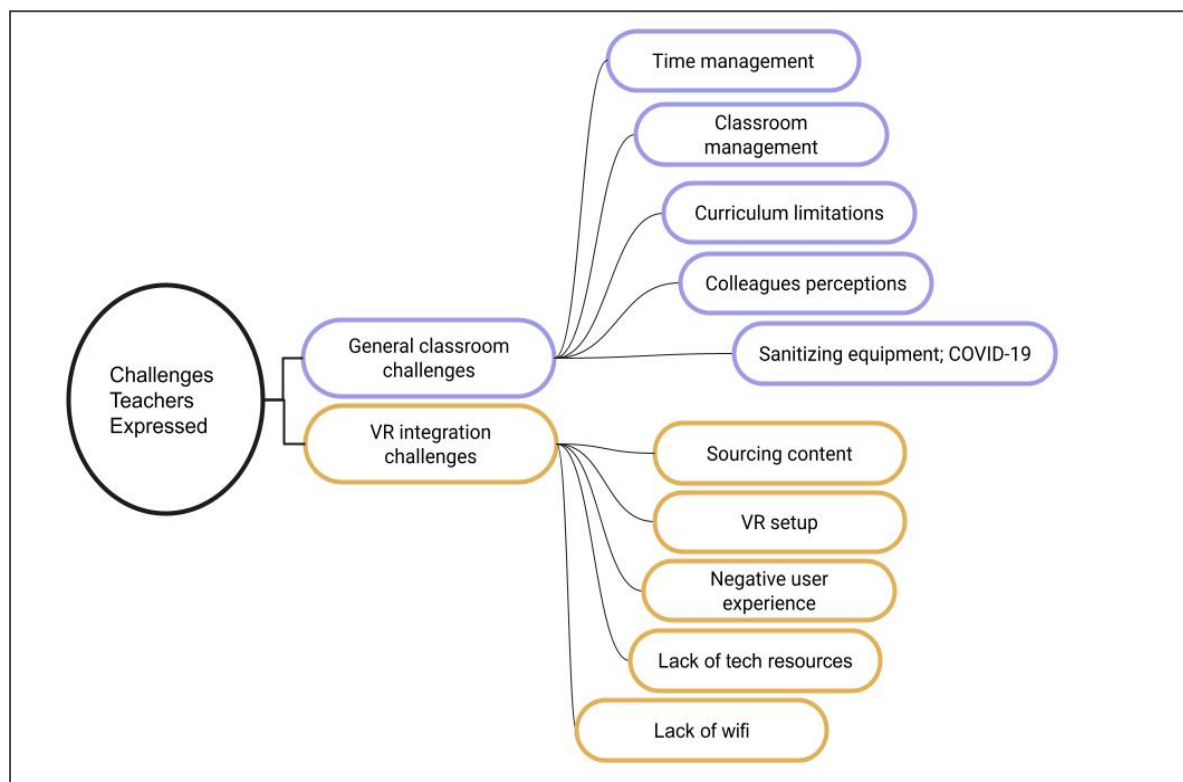
Pseudonyms were used instead of participants' names

The comments reflected in Table 1's summary, are demonstrated in Tables 2 and 3 below.

**Table 1: Indicating the theme “Challenges teachers experienced” and it’s sub-themes**

Theme	Sub Themes	Participants	Comments
Challenges teachers expressed	Total	6	25
	General teaching challenges	5	12
	VR integration challenges	6	13

Figure 1: Mindmap of challenges teachers expressed indicating sub-themes, and descriptors of challenges identified.



**Table 2: Indicating the issues raised, under the sub-theme: General classroom challenges, under the theme ‘Challenges teachers expressed’**

Five participants, with twelve comments identified.

	Sub-Theme: General classroom challenges	
Participant pseudonym	Comments	Descriptors related to sub-theme
Sarah	Difficulties in using the technology, and managing the learners (Sarah)	classroom management
Delisile	<p>As the teachers, we were excited about it, but then when it got to the principal, she said something else like, no, I don't think we are ready for this.</p> <p>I don't think we have enough security to keep things safe. And so, but did you show how the children responded in the comprehension? Did that, was that different or did you have better answers? Did you have interesting answers? Unfortunately, what I'm hoping for was one of the teachers at my school. She was also one of the teachers we're working with. So I'm hoping she's got better power to influence our principal. She understands, she likes it, but I dunno what, what holds her back. I'm not sure, but we we'll see, but you don't give up because you make that little difference</p>	colleagues
Sarah	<p>teaching a grade with a team that doesn't want to buy into new technologies (Sarah)</p> <p>And if you're teaching a grade with a team for the team to buy into that, so you can, I could run with it on my own, but because of the way the school is managed or whatever I have to include everybody.</p>	colleagues
Mary	<p>Uh, I'm just bringing in the teachers. The teachers have to come to the party, we got them on because we had to, because they had to go onto Google and then they got complacent. And then I put their names, because I did the timetable, and I put their name there with mine, but no they don't come near the classroom. It's just me. So anyway, if we can do something like that, that would be nice. That'd be good if we got the teachers involved. Y</p>	colleagues
Sarah	<p>I tried natural science, um, it was natural science. I used, um, one of those guided VR tours. Yes. Um, but it is never, so, so the way we prepare is you create a booklet and I kind of tried to insert the technology into the booklets and our booklets need to be checked obviously. And they told me to put all the experiential learning at the back as an extension where, for me, it was part of the process and part of the changing of thinking. So yeah, there, there are lots of possibilities for it. (Sarah)</p>	colleagues
Sarah	<p>bound by the curriculum. And the difficulty is to innovate within the curriculum. (Sarah)</p> <p>The difficulty though, as a teacher is you are bound by the curriculum. And the difficulty is to innovate within the curriculum.</p>	curriculum limitations

Kgomotso	<p>So, you've explained the practicalities around classroom management, what would be difficulties within your school in implementing this type of technology?</p> <p>Speaker 2:</p> <p>Okay. The resources would be a challenge, because I know my children are in a poor community, and they cannot afford the funds. And my school, it's a donor funded school and we do not have the resources, so the resources would be a challenge.</p>	lack of access
Mary	I just spent my whole time sanitizing the goggles, you know, I had to breathe and charge the battery. Then wash and clean the goggles, and the phones. And so those little things sort of got in the way.	sanitizing equipment during covid
Tammy	finding the time to include the technology (Tammy)	time
Kgomotso	<p>So if we look at introducing this technology, did it make you think about your teaching strategies and how you might use this type of technology in the future?</p> <p>Speaker 2:</p> <p>Yes, I thought about it. The only challenges I actually thought, if I can have phones that I can occupy half the class at one moment, then the other half will be doing something, then I just swap. I also look at the time factor. Yes, because I have got limited time. If my lesson is one hour and I've got something that I want to cover, then I have to strategically think about how my lesson is going to work. So, I think it would be better for me if I can have after class, I can divide them into two groups instead of splitting them into five.</p>	time and number of devices, classroom management planning

**Table 3: Indicating the issues raised, under the sub-theme: Virtual Reality integration challenges, which is under the theme: 'Challenges teachers expressed'**

Six participants, with thirteen comments identified.

	<b>VR integration challenges comments</b>	
<b>Participant pseudonym</b>	<b>Comments</b>	<b>Descriptors related to sub-theme</b>
Tammy	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 really wanted to .	difficulty with the user experience of the technology
Mary	It's finicky sometimes. So you know, it doesn't start when you want it to (Mary)	difficulty with the user experience of the technology
Sarah	Difficulties in using the technology, and managing the learners (Sarah)	difficulty with the user experience of the technology

Kgomotso	<p>Kgomotso "So if we look at introducing this technology, did it make you think about your teaching strategies and how you might use this type of technology in the future?</p> <p>Speaker 2:</p> <p>Yes, I thought about it. The only challenges I actually thought of, if I can have phones that I can occupy half the class at one moment, then the other half will be doing something, then I just swap. I also look at the time factor. Yes, because I have got limited time. If my lesson is one hour and I've got something that I want to cover, then I have to strategically think about how my lesson is going to work. So, I think it would be better for me if I can have after class, I can divide them into two groups instead of splitting them into five.</p> <p>"</p>	lack of resources
	Lack of VR goggles and mobile within schools of participants (n=5). Since they did not have devices, they used the researcher's devices.	lack of resources
Thandiwe	we don't really have this gadget of them having individual goggles and, and things like that. (Thandiwe)	lack of resources
	Ensure devices are charged	device charging
Kgomotso	Lack of wifi problem if content is not downloaded (Kgomotso)	lack of wifi
Mary	, the explore expeditions. I found that part difficult for the kids to use or to understand. So I haven't been sold on the following you showed us in the course with you. I've never been able to get five kids with me in the same expedition, because they are all so different. Um, they'll nod their head or, you know, get distracted waiting for others. Opening the apps to view experience (Mary)	difficulty with the user experience of the technology
Dhriti	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.	set-up
Kgomotso	Yes. Also, at the moment, my classroom down there does not have access to wifi.	lack of wifi
Kgomotso	What I see as the success, is that given a scenario where my classes are, they are all engaged in it, they are using it at the same time. I think the management part of it is not difficult. All you do is, you have to make sure that they are not moving onto the next video.	user experience
Tammy	I think it's important that we actually watch it and see it and understand, and find out how it works	set-up