

# The use of augmented reality in the teaching and learning of isiXhosa poetry

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## Abstract

Teaching and learning isiXhosa poetry continues to pose challenges for both teachers and learners in South African basic education. The abstract nature of poetry makes it difficult for both groups to grasp the figurative meanings embedded in each line of the poems. Teachers who rely on rote learning and learners who master cramming find teaching and learning poetry difficult, as these skills offer little or no results in the teaching and learning of poetry. It is against such a backdrop that this paper seeks to investigate the use of augmented reality (AR) in education and how it can assist in the teaching and learning of isiXhosa poetry.

The use of AR in language learning has been extensively studied by several scholars. AR is found to enhance learning and decrease learners' cognitive load. In contrast, some scholars argue that it is not ready for total integration into language classes. Despite strides that have been made in the study of augmented reality in language learning and teaching, there is a paucity of extended research on the use of augmented reality in teaching and learning isiXhosa poetry. In this paper, I will review existing data and examine augmented reality activities and technologies that can be used in the teaching and learning of IsiXhosa poetry. This paper will contribute towards improving the teaching and learning of isiXhosa poetry in basic education and assist literature educators in integrating modern technologies in their teaching.

**Keywords:** *Augmented Reality, isiXhosa poetry, teaching and learning, AR technologies, AR activities*

## 1 Introduction

My interest in the use of Augmented Reality (AR) in teaching and learning isiXhosa poetry was sparked by a paragraph in Nicky Verd's book, *Disrupt Yourself or Be Disrupted*. She succinctly said, "Augmented Reality technology allows you to point an AR powered device like a smartphone at an object and find out detailed information about that object" (Verd 2019:33). When she spoke of its use in education with its interactive models, I was interested in investigating its use in education, and how it can be used in the teaching and learning of isiXhosa poetry. The abstract and complex nature of isiXhosa poetry, its use of middle and high-order thinking skills, and its use of figurative language are proving to be burdensome for educators and learners in the teaching and learning of isiXhosa poetry in basic education, in South Africa. Teachers find it difficult to analyse isiXhosa poetry and instruct their learners, subsequently, learners lose interest in isiXhosa poetry and their performance in poetry sections is below average. It is in this light that I investigate the use of AR in the teaching and learning of isiXhosa poetry.

Furthermore, research shows that AR has been widely used and its benefits continue to improve the lives of users in "architecture, sports events and tourism" (Marrahí-Gómez & Belda-Medina 2022:7). Although it has been proven effective in other areas, the focus of researchers lately is its use in education, more specifically in language teaching and learning. Nevertheless, there is a paucity of extended research on the use of AR in teaching and learning isiXhosa poetry. Therefore, this paper aims to investigate the use of AR in education and how it can assist in teaching and learning isiXhosa poetry in basic education.

Research has proven that AR is among the technologies that provide "better support for teaching and learning processes" (Garzon, Bacca-Acosta, Kinshuk, Duarte, & Betancourt 2021:1). Radu and MacIntyre (2012) agree with the scholars mentioned



above in stating that AR plays a key role in enhancing the experience of learners in the classroom through the implementation of kinaesthetic learning. The argument of these scholars is based on the use of AR in subjects such as technology, life orientation, sciences, and arts. As scholarship proves the importance of AR in education, it is paramount to examine what it can offer in the teaching and learning of isiXhosa poetry.

Therefore, this paper will answer the following questions:

- How has AR been used in education and language teaching and learning?
- How can AR assist in the teaching and learning of isiXhosa poetry?
- Which AR technologies and activities can be used in the teaching and learning of isiXhosa poetry?

## 2 Methodology

In answering the three stated questions, I used a qualitative research approach. This approach assisted in investigating how AR has been used in education, especially in language teaching in order to determine how it can benefit teachers and learners in teaching and learning isiXhosa poetry. Furthermore, I have used a systematic literature review as a research design. This design has allowed me to review scholarly research done on the use of AR in education, the use of AR in language teaching and learning, as well as the advantages and disadvantages of using AR. In this review, I focused more on scholarly work that sheds light on AR technologies and activities that offer possibilities in the teaching and learning of isiXhosa poetry.

## 3 Systematic Literature review

Literature offers a vast body of reviews on the use of AR in education. A large chunk of these reviews focuses on the use of AR in science subjects. Although there are reviews done on the use of AR in language teaching

and learning, there are notable silences on the use of AR in teaching and learning poetry, especially isiXhosa poetry. This review is divided into three subsections – AR in education, AR in language teaching and learning, advantages, and disadvantages of using AR in education. I selected literature for review from 2019 to 2023 on the abovementioned sections.

### 3.1 AR in education

Mardasari, Susilowati, Luciandika, Nagari, and Yanhua (2021) argue that technology has always been part of education. Nevertheless, Mardasari et al. (Ibid.) state that "Augmented Reality technology is an alternative to accompany learning materials or teaching media, which is currently a trend in education and learning research, both in elementary and secondary schools or higher education." Özçelik, Ekşi and Baturay (2022) add that AR is magical technology that allows learners to interact with the real world. These scholars note the integration of the use of video, sound, photographs, text, and 3D models in education to augment student experience in learning different subjects at diverse levels of education.

According to Garzon et al. (2021:18), AR is widely used in medical education and surgery, and this is due to "the new opportunities that AR is creating for the visualisation and simulation of medical procedures." Students in medicine have now an opportunity to experience the surgeries they will perform at a different level, allowing them to provide best practices for their patients and save more lives.

In the study conducted in Turkey on Grade 7 science learners, results showed that AR improved the performance levels of learners when compared to learners who were using traditional ways of learning (Talan, Yilmaz and Badti 2022). They noted improvements in "fields such as health, mathematics, geography, history, foreign languages, engineering, architecture and science courses" (Ibid.:341). Learners corroborated this when they were interviewed. They found AR applications to be "providing effective



learning and rich visual environment, providing efficient realistic and multidimensional learning opportunities, providing understandable learning, activating visual intelligence, activating affective skills, arousing curiosity” (Ibid.:339). These learners “learned 3D content and videos on smartphones, tablets, and smartboards” (Ibid.:336). Therefore, AR provides an environment that ministers to the cognitive, affective and kinaesthetic domains of learners, resulting into better learner experience in education.

The challenges in the teaching and learning of Mathematics, especially geometry, can be paralleled with the challenges in the teaching and learning of isiXhosa poetry. Cevikbas, Bulut and Kaiser (2023) found evidence of potential socio-emotional, cognitive/meta-cognitive, and pedagogical development in mathematics teaching and learning through the use of AR and Virtual Reality (VR) and the benefits of using AR and VR in the study of geometry in Mathematics. According to Cevikbas et al. (Ibid.), offerings of visual stimulation from AR and VR corresponded well with the teaching of geometry, which requires the visualisation of geometry objects. Other scholars (Lai & Cheong 2022) criticised the use of AR and VR across the board in Mathematics, as the benefits of visualisation are not the same across the Mathematics spectrum. However, Cevikbas et al. (2023:7) discovered that “visualization plays a significant role in the learning of different mathematics subjects and has the potential to enhance students’ understanding across multiple mathematical fields.” Therefore, there is a need to investigate the aspect of visualisation offered by AR in the teaching and learning of isiXhosa poetry.

Cevikbas et al. (2023:9) discovered mobile devices as the most used AR hardware tool in Mathematics classrooms and this is due to its “cost-effective advantages and suitability for use in classroom settings, as well as their accessibility, affordability, and portability compared to many stationary gadgets.” Scholars such as Parmaxi and Demetriou (2020), and Frazier, Asquith and Worden

(2019) agree with this notion, and this coincides with the socio-economic status of most learners who study isiXhosa. AR software tools that were used in Mathematics classrooms were 3D modelling programs such as Unity, Vuforia, HP Reveal/Aurasma, and GeoGebra (Cevikbas et al, 2023). Although these border on the expensive side, they are worth exploring in the teaching and learning of isiXhosa poetry.

### 3.2 AR in language teaching and learning

Frazier et al. (2019:2) state that AR “has the potential to change how learning is achieved in the classroom, especially in language learning”. To prove their statement, they constructed five activities that focus on different language skills - reading, writing, listening, and speaking - at different cognitive levels of Bloom’s taxonomy. All these language skills are used in the teaching and learning of isiXhosa poetry. Observing learners during the activities, researchers noted a change in attitude, motivation to learn, improvements in creativity, as well as improvements in attentiveness during lessons. Özçelik et al. (2022) corroborate the findings of these researchers, although they state that most research on the use of AR in language education focuses on vocabulary and little on language skills. The studies done by Frazier et al. (Op Cit.) and Mardasari et al. (2021) earlier prove otherwise. The use of AR in a language classroom caters for all language skills, making it a useful resource for teaching and learning isiXhosa poetry.

The five AR activities constructed by Frazier et al. (2019) were Self-Assessed Learning Centre, AR Tours, Minimal Pairs, Vocabulary Tasks, Poster Adaptation and Choose Your Own Adventure. Videos, card games, YouTube, Google Docs, Google Slides, and HP Reveal, were used to augment reality for students in language classrooms. Although most of these activities focused on language and only Choose Your Own Adventure focused on literature, they can be easily adapted for teaching isiXhosa poetry. They can be adapted to teach and learn aspects of poetry such as diction, sound patterns,



internal and external structures as well as imagery.

Mardasari et al. (2021:254) posit that “Through Augmented Reality, a teacher becomes easier in transferring knowledge to students.” They discovered that through examining teachers using AR in teaching listening, speaking, reading and grammar competencies. In their teaching, educators asked students to download AR applications to display audio learning to assist in listening competencies, and video learning to assist in speaking competencies. The teaching and learning of isiXhosa poetry offers opportunities to develop listening and speaking competencies and as isiXhosa poetry is performed and available in digital space, these applications can be used by educators in teaching and learning isiXhosa poetry.

In their systematic literature review of the use of AR in language teaching and learning, Parmaxi and Demetriou (2020), discovered that mobile-based AR is mostly used in language teaching and learning. This is due to its affordability, as most students have smartphones and, in some schools, the government provides learners with tablets. They further discovered that this is due to educators’ low technical skills, as mobile-based applications do not require high technical skills. The mobile-based AR that has been used frequently in language teaching and learning are “Vuforia, HP Reveal, Augmented Reality and Interactive Storytelling (ARIS), Wikitude SDK and Android SDK, ChronoOps, Layar (part of Blippar), Pokemon Go, Xcode, Facebook SDK 3.0, ARtoolkit” (Parmaxi & Demetriou 2020:5). These AR technologies cultivated skills such as vocabulary, reading, speaking, listening, writing, spelling, comprehension, and creativity. As stated before, these skills are also taught through the teaching of isiXhosa poetry.

Similarly, Karacan and Akoglu (2021) discovered that through the use of an AR learning environment, HELLO, learners improved their listening and speaking skills.

Citing Wang, Karacan and Akoglu (2021:72) further discovered that “students employing AR in writing had better results in content control, article structure and wording.” In lower grades, learners are expected to compose their own poetry and such AR technologies offer opportunities for learners.

### **3.3 Advantages and disadvantages of using AR**

Research shows that AR in education offers more advantages than disadvantages. Talan et al. (Op Cit.) found the use of AR to be learner-centred in nature, an aspect encouraged by various learning theories, such as cognitivism, social constructivism, and discovery learning. Cevikbas et al. (2023) add that “both AR and VR technologies positively impacted students’ mathematics learning” (p.10). Alzarhani (2020:1), citing Alkhatabi, corroborates this by stating that AR “generates positive teaching and learning outcomes”. According to these scholars, the positive impact was mostly evident in socio-emotional outcomes, which included learner interest, curiosity, motivation, enthusiasm, enjoyment, interaction, satisfaction, confidence, and cognitive/metacognitive outcomes, which included learner performance, active learning, understanding, visual thinking, problem-solving, critical thinking, reasoning, creativity, cognitive load, inquiry. The lack of these outcomes in the teaching and learning of isiXhosa poetry impacts learner experience negatively in isiXhosa poetry class and the use of AR has been proven to address such issues.

Nevertheless, research shows that the use of AR can be costly, denying access to other learners coming from poor socio-economic backgrounds. As it is the case in provinces such as Gauteng, where learners are provided with tablets, other provinces can follow suit. Some of the learners who were interviewed by Talan et al. (Op Cit.) found the use of AR in the classroom to be confusing and time-consuming. It was also noted that educators are lagging, due to their lack of technical skills needed to use AR. Therefore, the training of educators and learners on the use of basic AR





technologies can minimise the confusion of learners and cut the time wasted trying to get around the device used.

#### **4 Results and discussions: AR in the teaching and learning of isiXhosa poetry**

In this section, I have organised the synthesis of results and discussion into three sub-sections – AR in the classroom, AR technologies, and AR activities.

##### **4.1 AR in the classroom**

Results show that AR creates visual stimulation that results in activating visual intelligence. In isiXhosa poetry, poets paint images in words, using the imagination of their audience. As some of the poetry was produced long before some learners were born, the imagery used by poets is hard to decode for some learners, especially those who are not visual learners. The visualisation aspect of AR will allow learners to visualise these images using pictures and videos in real time.

Similarly, AR offers opportunities for auditory learners as it has been proven to enhance audio learning. The sound effect plays a key role in the learning of isiXhosa poetry, as isiXhosa poets use ideophones often in their poetry, as well as sound devices such as alliteration, assonance, and rhyme. The use of AR hardware and software tools will draw the attention of learners to key areas in the poem while picking up on the rhythm of the poem and its effect on meaning. Teachers will have opportunities to stop and repeat for effect while explaining relations to learners.

Research has found AR to build learner interest, curiosity, motivation, attitude, creativity, attentiveness, enthusiasm, enjoyment, understanding, and satisfaction and to improve learner performance. When learners find it hard to understand a concept, with a teacher who lacks in-depth content knowledge, frustration builds, a negative attitude develops and performance drops. This has proven to be true in many isiXhosa poetry classrooms. The use of AR in teaching

and learning isiXhosa poetry promises to improve learner socio-emotional and cognitive/metacognitive development, as well as educator pedagogy development. With the use of AR, learners will be more involved in the learning of abstract isiXhosa poetry, as all their senses will be impacted using AR technologies and educators will improve their teaching methods.

##### **4.2 AR technologies**

Leading among AR technologies used in education are mobile-based. Although the socio-economic status of many learners who do isiXhosa in basic education is poor, most of them have smartphones, and in some areas of the country, the government provides tablets to learners. Furthermore, some schools have smartboards installed in classrooms to cater for those learners who might not have these mobile devices.

Research revealed that there are AR applications that are downloadable on mobile devices that can be used in the classroom. These applications have been proven to assist learners with all four language skills taught in basic education in South Africa – listening and speaking, reading and viewing, writing and presenting as well as language use and structure. All these skills are used in the teaching and learning of isiXhosa poetry including aspects of comprehension and creativity which have been mentioned in literature to be enhanced by AR.

Videos, card games, images, YouTube, Google Docs, Google Slides, HP Reveal, and Vuforia are among the leading AR technologies used in language classrooms. YouTube is filled with videos of poets performing isiXhosa poetry, creating opportunities for learners to not only read poems but to see them performed. The use of these videos will cater for all three learning styles of learners. These videos are downloadable, meaning learners can watch them anytime, anywhere, as their smartphones are the extension of their hands. Teachers can use Google Slides which allows for editing presentations and saving on the cloud, and learners and educators can have



access to the cloud anytime, anywhere. While the educator is teaching isiXhosa poetry, learners can view the presentation. The educator can edit the presentation using real images or videos where poets use words. This will enhance the learner's understanding of the poem while enhancing the teacher's ability to explain aspects of poetry to learners. Furthermore, the educator can add definitions to difficult words, to help learners understand the diction used by the poet, leading to a deeper understanding of the poem.

### 4.3 AR activities

The results show the use of AR tours, AR card games, vocabulary tasks, poster adaptation and choose your own adventure as activities that can be used in language teaching. Although AR tours have been used in tourism and travel, they offer opportunities for the study of isiXhosa poetry. When left on their own, learners struggle to identify literary devices used by the poet. With the use of AR applications, learners can be directed to specific literary devices used in a poem. An educator can give them a self-assessment task, where they tour the poem, looking for literary devices. After identifying them, the teacher can intervene in helping with the effect on the meaning of the poem, using Google Slides.

AR card games can be used in poetry. The educator can write down imagery used by a poet on an AR card on a device and allow learners to first give the literal meaning of the image. To help learners understand the figurative meaning, the educator then turns the card into a picture with a caption and then into a video. The video will allow them to see distinct functions of the imagery used to find out how poetry can be written down on a card and when learners struggle to identify it, it can turn into a picture with a caption and then a video, which will help learners understand why the poet used a certain image.

In the lower grades, learners are expected to produce their own poetry. Instead of vocabulary tasks suggested by Frazier et al.

(2019), learners can be given diction tasks. In these tasks, they are given words from a poem, where they can find their own literal and figurative meaning. Learners can be encouraged to come up with their verse from the word they were given, create a visual representation of their verse and then a video of their group performing the poem and sharing it with the rest of the class. In this manner, they create their own AR material.

## 5 Conclusion

In this paper, I have shown the opportunities that lie in AR technologies for the teaching and learning of isiXhosa poetry. As many scholars have noted that AR plays a pivotal role in education and language teaching, this research argues that AR possesses multiple potentials for teaching and learning isiXhosa poetry.

Educators who teach isiXhosa poetry in basic education in South Africa can solve some of their problems by incorporating AR technologies in their teaching and AR activities in their assessments. Our learners today are technophiles and assessment tasks must not restrict them to pen and paper. Using AR technologies to teach and assess learners will yield authentic opportunities that will prepare learners for the world of work they are headed to in the future.

Research has proven that for learners to better grasp concepts taught to them today, they need an educator who masters technological pedagogical content knowledge. The Department of Basic Education and teacher-training must train educators in technologies for today and the future.

Training educators on the use of modern techs will enhance learning for learners and pedagogical astuteness for them as educators. More practical research will need to be done on the use of AR in the teaching of isiXhosa poetry, where teachers and learners will be observed



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