

Challenges to the Development of a Flipped Classroom in Grade 6 Geography

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Abstract. *This qualitative study explores the challenges facing efforts to develop a flipped classroom in grade 6 geography classes at a school district in North West Province, South Africa. This research was conducted because the current instructional practices in these classes leave much to be desired, encouraging passive learning among students. Data was collected, following purposive sampling, from five grade 6 geography teachers and five department heads through face-to-face interviews and, later, non-participant classroom observations with the teachers. The findings reveal that, although teachers are keen on integrating information and communications technology in their classrooms, they lack the necessary digital tools. This problem is exacerbated by their shallow technology skills, which hinder their efforts to flip the classroom. Even though learners are typically digitally savvy, contextual factors prevent them from learning independently through digital means, leaving them with a passive learning approach. Ultimately, the study recommends, among other proposals, that teachers be trained to use ICT and digital tools so as to facilitate digitally enabled classrooms.*

Keywords: *Flipped classroom, information and communications technology, geography, technological and pedagogical content knowledge*

1. Introduction

This study follows Bergman and Sams's (2016) proposal for the flipped classroom: an emerging instructional design approach by which learners first encounter course content outside the classroom by watching videos or consuming online reading materials as homework. It explores the approach through an assessment of grade 6 geography classrooms seeking to make the learning process easier. Currently, the approach to teaching geography grade 6 at schools in the North West Province of South Africa leaves much to be desired due in large part to teachers' inadequate instructional practices. The instructional practices currently in place foster passivity among learners, as they are not provided with opportunities to engage in

enquiry-based learning, let alone to study ahead through individual research. This is particularly troublesome given that the subject of geography facilitates self-reflection due to its relatively practical nature. In a flipped classroom, the learner is encouraged to actively study at their own pace. When Bergman and Sams's (2016) flipped classroom, approach serves as a classroom's pedagogical method, direct instruction shifts from the group learning space to individual learning spaces. Such an approach is particularly fruitful for the subject of geography given its importance for students in grade 6.

As Van Wyk and Tshelane (2016) argue, the flipped classroom approach is a learner-centered teaching strategy wherein in-class and out-of-class activities are swapped from

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the traditional approach. This study represents an attempt to explore the efficacy of this approach in the specific context of grade 6 geography classes in North West Province, South Africa, where current teaching and learning dynamics are insufficient. Learning about concepts like maps, Earth's natural features, and the human race requires a lot of self-research, which is directly facilitated by the flipped classroom approach. If geography teachers in North West Province were to adopt this classroom approach more broadly, students' ownership of their learning experience would be enhanced, as would the critical 21st-century skills of collaboration, problem-solving, group discussion, and innovation. With this in mind, the following formal research objectives were developed:

Research Objectives

- To determine the components of flipped instructional design that can enhance approaches to teaching grade 6 geography.
- To ascertain teachers' ICT skills for the purposes of flipped classroom instruction in the context of grade 6 geography.

2. Literature Review/ Hypotheses Development

Bishop and Verleger (2018) note that educational institutions, even those at higher levels, have begun employing learner-centered approaches geared toward modernizing instruction and addressing present-day challenges and opportunities. In turn, teachers are being encouraged to leverage teaching pedagogies and methodologies that encourage learners to function as co-creators of their own education. Such new learner-centred pedagogies engage learners about their intended learning outcomes and how they want to achieve them (Bishop & Verleger, 2018).

Information and communications technology (ICT) are growing at an alarming and exponential rate, giving rise to an array of new teaching and learning strategies based on

novel ICTs (Bishop & Verleger, 2018) and, in turn, spreading digital literacy in schools. ICTs constitute a cornerstone of flipped instructional design due to their efficacy in mitigating the frustrations and challenges faced by both teachers and learners in the social sciences. Mattar (2018), in line with Bishop and Verleger (2018), contends that the contemporary global educational landscape has been changed at a fundamental level by emerging ICTs and methodologies. The flipped classroom approach is one such methodology. Mattar (2018) further asserts that technologies are as old as mankind and as such, it is good to integrate it. However, Itsnaini et al. (2024) explain that advancements in digital technology (e.g., accounting digitalization in SMEs) drive broader economic improvements—improvements from which subjects like geography are not immune.

According to Mattar (2018), teachers in traditional classrooms were functionally the only active “protagonists” in the teaching-learning activity; learners merely served as passive participants. Following the advent of the flipped classroom approach, however, traditional teaching and learning activities changed dramatically, giving way to what Mattar (2018) and other authors (e.g., Bishop & Verleger, 2018) dub “an inverted classroom.” As Mattar (2018) puts it, more active methodologies sought to place more value on the students themselves, viewing them as a responsible part of the teaching-learning process and an equally worthy protagonist capable of making decisions. Karabatak (2019) complements Mattar (2018) by arguing that flipped classrooms achieve better results by boosting students' participation, strengthening communication between teachers and students (and communication among students themselves), and helping students to develop a habit of active exploration and learning.

Recent changes in the educational sphere are outlined by Van Wyk (2017), who concurs with the aforementioned researchers that academia at every level is undergoing rapid

changes and significant challenges. The resulting frustration has been driven by a sharp and rapid increase in the degree to which societal institutions are based on technology. Additionally, White Paper 7 on e-Education (DoE, 2004) backs up Van Wyk's (2017) assertion that education departments should commit to the process of digitalization and ongoing development if teachers are to remain relevant and compatible amid the current technocratic era.

ICT tools, including laptops, tablets, projectors, and smartphones, have come to represent demonstrably valuable educational assets worldwide (Van Wyk, 2017). Teachers have found themselves compelled to shift their fundamental educational vision and, in turn, to incorporate ICT tools into their classroom activities. For the purposes of this study, "ICT adoption" refers to the gradual pivot to digitisation in instructional processes. The present Information era demands that teachers embrace the use of various ICT tools (Van Wyk, 2017).

Sharma (2018) adds that the flipped classroom approach is grounded in socio-constructivist theories of education and active learning. Moreover, according to Sharma (2018), it is embedded in four pillars—a flexible environment, a learning-oriented culture, intentional content, and professional educators—which Balci (2017) details as follows:

- *Flexible environment:* Teachers prepare videos and readings to be consumed whenever and wherever they (teachers) want. Learners can access these study materials and videos without any temporal or spatial constraints.
- *Learning-oriented culture:* Students are no longer passive learners. The flipped classroom approach entails a paradigm shift from teacher-centered teaching and learning practices to learner-centered ones.
- *Intentional content:* The teacher is the one responsible for determining video and reading content based on the needs and interests of the learners. This pillar directs

what the teacher should teach and what resources are to be sent to learners.

- *Professional educator:* The role of the teacher in a flipped classroom differs radically from that in a traditional setting. In flipped classrooms, teachers are not only the bearers of information but also facilitators and coaches, while learners are allotted opportunities to accumulate information and construct knowledge on their own (Chang, 2016).

Complementing these outlines, Hayırsever and Orhan (2018) assert that there are two key elements for a flipped classroom to function:

- (i). Students appear in class and actively engage with classroom content.
- (ii). Students prepare the learning materials before class.

Evidently, flipped classrooms allow students to learn at their own pace, encourage students to actively engage with lecture materials, and free up classroom time for creative and engaging learning activities.

Hamdallah (2016) argues that "in a flipped environment the teacher plays an active role in directing, guiding, and managing the learning process to achieve the desired objectives or learning outcomes." This approach is a modern, technology-based strategy that meets learners' 21st-century needs, developing them into young researchers. Learners also become capable of effectively using technology independently, beyond the confines of the classroom. This dynamic promotes their critical thinking skills, self-learning practices, communication skills, and collaboration capabilities.

Eid (2017) explains that the "flipped classroom approach is a strategy that focuses on Bloom's taxonomy [of] lower cognitive levels which refer to remembering and understanding as they watch the video before class time." Through this approach, learners tend to concentrate on Bloom's higher cognitive levels of application, analysis, and assessment during classroom activities, when their active learning strategies are activated.

Teachers, on the other hand, support learners during these activities, who in turn support one another.

Having gone through various authors' descriptions of the approach's benefits, grade 6 geography teachers need to "flip the classroom." This would enable learners to learn and understand critical geographical concepts through independent research. As the flipped classroom is inherently intertwined with modern ICTs, such a shift would necessarily entail teachers who are familiar and (at least somewhat skilled) with technology and its applications in education. Such teachers simply do not exist to any significant degree in the setting for this study.

This technological pedagogical content knowledge (TPACK) was used as the study's underpinning framework, facilitating the exploration of what challenges grade 6 geography teachers face when it comes to flipping the classroom. Grade 6 classrooms were specifically chosen for this study, as this is where many foundational concepts are introduced. Worth noting here is that grade 6 geography teachers in North West Province, South Africa, often complain about learners' limited understanding of geography as well as their more general unwillingness to complete homework assignments and put effort toward getting a passing grade.

Theoretical Framework

This research considered the TPACK model laid out by Mishra and Koehler (2006) as the lens through which grade 6 geography teachers carry out and develop their instructional practices. Mishra (2019) argues that three major aspects prompt teachers to use the TPACK model in their daily teaching practices: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). Lim and Kim (2014) concur, asserting that the TPACK model enables teachers to anchor their knowledge of and competency in a particular subject matter in a manner that integrates these three aspects and showcases their interdependence. Notably, however, this study

did not investigate the considered teachers' content knowledge in the field of geography; rather, it explored their levels of TK, its application (TPK), and the interactions between the two concepts to ensure proper instructional practices in geography instruction. Although there were some classroom observations that accrued related information, CK was not a priority. The TPACK elements focused on in this research were TK, TPK, TCK (technological content knowledge), and how the elements come together to develop the geography teachers' TPACK practices.

3. Methodology

Research Approach

Anderson (2010) and Creswell (2014) explain that, in qualitative research, the researcher seeks out the real-life experiences of individuals facing problems within their environment. In line with McMillan and Schumacher (2010), who posit that the qualitative researcher should immerse themselves in fieldwork and enter the natural setting with a view that everything is important, this study employed a qualitative research approach.

Research Paradigm

This research employed a constructivist research paradigm. This paradigm is rooted in the assumption that reality is subjective and socially constructed (Kincheloe & McLaren, 2000). In other words, one's reality may only be truly understood through their unique experience, which is shaped by their historical or social perspectives. This study also takes an interpretivist approach, using qualitative research methods with a focus on individuals' beliefs, motivations, and reasoning. Interpretivists value qualitative data collected through unstructured interviews, participant observations, and documents that range from policy documents, lesson plans, teacher preparations etc. Similarly, Reeves and Hedberg (2003) note that the interpretivist ("interpretive") paradigm stresses the need to put analysis in context and is primarily

concerned with understanding the world as seen from the subjective experiences of individuals.

Research Design

This study employs a case-study design to learn more about a little-known and poorly understood situation (Leed & Omrod, 2005). A case study facilitates a focus on a single phenomenon for the purposes of achieving an in-depth understanding regardless of the number of available research sites or participants (McMillan & Schumacher, 2010).

Population and Sampling

The study was conducted at primary schools within a single school district in North West Province, South Africa: the Madibeng Sub-District of the broader Bojanala School District. Martinez et al. (2014) describe the population (in the context of research) as the complete set of people bearing particular characteristics. The accessible population used in this study was ten, comprising five primary school teachers and five departmental heads. The population also served as the study's sample, and participants were purposively selected because they teach geography and work at a primary school in the aforementioned sub-district.

Data-Collection Tools

Data was collected through face-to-face interviews with teachers and department heads (HoDs). Additionally, classroom observations were conducted to see how teachers use technology and create opportunities for students to take charge of their own learning. Each interview lasted no more than 20 minutes, and only one geography lesson was observed, which lasted less than an hour.

Data Analysis

The collected data was analyzed thematically. Pseudonyms were used for all participants; teachers were labeled as T1–5, while HoDs were labeled as HoD1–5.

Research Ethics

All research must follow ethical guidelines to ensure that the rights of participants are respected. Researchers must ensure participants' confidentiality and anonymity (Dooley, Moore, & Vallejo, 2017). Thus, as already mentioned, pseudonyms were used for all participants instead of their real names. From the outset, participants were informed of the study's purpose and that their participation was entirely voluntary, and their informed consent was formally obtained. Participants were also assured that no harm would come of their involvement in the study and that they could change their mind about participating and withdraw at any time without consequence, in line with conventional ethical guidelines (Dooley et al., 2017; Shaw, Howe, Beazer, & Carr, 2020). Notably, all participants who provided their initial consent participated through to the conclusion of the research. To ensure the findings' validity, the interview data was triangulated using data from classroom observations.

4. Findings and Discussion

This section presents the findings based on the data collected through face-to-face interviews with teachers and HoDs as well as non-participant observations of grade 6 geography classrooms. The data was analyzed thematically for both data types.

Teacher Interviews

When asked about the value provided by technological assistance in grade 6 geography, one prominent theme emerged.

Insufficient Access to ICT Tools

Three of the five participating teachers explained that they often struggle with using ICT tools in their teaching, as they are not sufficiently available to alter classroom dynamics.

T2: "In my school, we do have a computer laboratory which we are expected to use to teach, but the equipment in there is not in working condition."

T3: *"I do want to expose my Grade 6 to technology learning, but I do not have adequate resources to do so".*

T5: *"I work in a rural school and, to start with, [beyond the fact that] we do not have Wi-Fi, I do not own any gadgets and [neither does] my school".*

The challenges facing teachers when it comes to the integration of ICT into the classroom evidently coincide with Angeli and Valanides' assertion (2009) that, despite teachers' efforts, they are generally unable to incorporate ICTs into their classroom practices. Still, Kumiawati and Subeki (2022) show that teachers exhibit keen enthusiasm for the use of ICT to help them become more resourceful, interactive with learners, and competent in their lesson plans despite the many associated challenges.

When the participating teachers were asked about their level of technological proficiency with digital tools for the purposes of their grade 6 geography classrooms, the following theme emerged:

Acceptable Competency In ICT

T1: *"I did a computer course when I was doing my Senior Teachers' Diploma, and I can type very well and plan my lessons on PowerPoint, but in my school, we do not have computers and data projectors to teach with."* T4: *"I did a Word-Perfect course while in tertiary, but the circumstances in my school [do] not [enable] me to apply it."*

T3: *"I do prepare my lessons on PowerPoint, and I also own a laptop which I often use to demonstrate to my learners and allow them to come to watch some clips in their groups".*

Although teachers responded positively when it came to their ICT experience in teaching during the interviews, their responses proved to be shallow and filled with misconceptions, as they only possess a basic level of technological understanding. This finding goes against Esharenana's (2010) assertion that teachers in South Africa have limited experience with ICT use, especially in the context of teaching and learning practices.

This is the case because, when some teachers talk of the Word-Perfect program, the information from that program is extremely outdated by today's standards.

Thus, their efforts fall well below acceptable standards, as some teachers just download videos on their laptops and ask students to come around them and watch, promoting a relatively passive learning experience. Furstenburg (2005) explains that advances in ICTs have given rise to a wealth of opportunities for the education system but also pose many challenges.

When asked about their experience with learners' ICT proficiency, the teachers' responses pointed to one theme:

Learners as Digital Natives

T3: *"I realize that, when I ask my learners to come around my laptop and watch the clips that I would have prepared for them, they often demonstrate eagerness and more knowledge on using a laptop."*

T4: *"My learners often give me more information that I would not have expected from them. They are more into inventing, and they watch a lot of YouTube videos, which makes them come with a lot of questions in class."*

T5: *"Most of my learners own a cell phone with some sometimes using [an] iPad, which, as a school, we have not distributed to them."*

HoDs Interviews

The HoDs participated in the study because they play a role linked to administrative issues that impact the well-being of both teachers and students. When asked about the schools' compliance with ICT integration as a National departmental directive, the following theme emerged:

No Clear ICT Policy For Geography Teaching

The HoDs said that one of the main reasons behind primary schools not enforcing technology integration in geography classrooms (across multiple levels) was that the prevailing policy is not clear about the matter.

HoD1: *“There is no clear policy on what and how technology can be integrated.”*

HoD3: *“As primary schools, we have not been directed by any of the policies to start the process of applying and distributing gadgets like tablets to grade 6, so how we teach now is what the department is comfortable [with].”*

HoD4: *“We do not have a policy that [forces] us to integrate technology in the [teaching of geography ... especially in grade 6.”*

When the HoDs were asked about their perspectives on ICT integration in geography classrooms specifically—especially at the grade 6 level—one notable theme emerged:

ICT Integration Aids Both Teaching and Learning

HoD1: *“I know that infusing technology in any lesson is a good idea, but not all of the learners have gadgets, and our computer laboratory is not functional.”*

HoD3: *“We can infuse technology in our grade 6 geography teaching, but we will have to get buy-in first from the School Governing Body, which will demand a clear policy as evidence.”*

HoD5: *“Our kids were born with and within the technological era, so I believe that we need to think along the lines of technology integration.”*

Sargeant and Casey (2020) use ICT to refer to all relevant contemporary technologies, including computers, the Internet, and smartphone applications. Casey, Goodyear, and Armour (2016) note that advancements in ICT have identified a need for educational institutions to devise means of integrating ICT tools in an optimal manner to mitigate obstacles to educational goals.

Classroom Observation

Non-participant observations were conducted to verify data collected through interviews. With the help of the TPACK model, the teachers’ TK, their TPK, and the ways in which these two concepts collectively enhanced teachers’ TPACK were observed. Regarding the teachers’ TK, one theme emerged:

Lack of Sufficient Technological Knowledge (TK) among Teachers

In T1’s class, technology was not used at all in the delivery of the lesson despite the teacher having a laptop visible on his desk. This was likely attributable to the fact that the classroom did not have a projector. The same is true of the class led by T3, who used a chalkboard to write information from his laptop. T5’s class featured a lot of perfectly designed charts (e.g., a map, an illustration of clouds). The class was exciting and inviting; during the lesson, the teacher consistently made use of the maps, and there was a sense of excitement among the learners. One of the many challenges that still needs to be addressed, however, is the frightening gap between the information “haves” and information “have-nots,” commonly known as the “digital divide,” which is particularly problematic in the teaching of geography. This divide was exacerbated by the classroom observations in which no technology was employed at all due to resource constraints. Maphalala and Adigun (2021) note that technology-based teaching instruments at all levels of education have turned into a worldwide requirement. As a result, the importance of ICT integration in teaching and learning activities for the effectiveness of teachers simply cannot be understated.

Regarding the manner in which teachers make use of technology in the classroom, one prominent theme emerged:

Disconnect Between Teachers and Instructional Technology Strategies

Despite teachers stating that they are competent with technology, none of those observed made use of it in teaching geography concepts. In T1’s class, a textbook served as the only teaching resource. In T2’s class, the chalkboard functioned as the primary instructional tool. While T3 had a lesson saved on their laptop, the information was simply copied to the board. Evidently, their assertions that they possess computer skills in the interviews were borne of misconceptions, at least to some extent.

Clearly, teachers should be provided with adequate ICT facilities if they are to engage in efficient and effective teaching, research, and community development. Moreover, ICT tools have come to constitute a curriculum-creation and delivery system for educators (Maphalala & Adigun, 2021). On a complementary note, Szymbkowiak, Melodic, Dabić, Jeganathan, and Kunidi (2021) argue that, nowadays, life without ICT is inconceivable—that it is functionally impossible to envision 21st-century life without contemporary technology.

5. Conclusion

The potential for flipped classrooms in grade 6 geography is severely hampered in the North West Province of South Africa by a lack of digital tools and limited technological knowledge among teachers. Given these dynamics, the South African Department of Education should provide accessible courses and programmes for teachers, enabling them to develop technological competence. This would need to be coupled with improved digital access, including through refurbished computer labs or the widespread availability of ICT tools. The generally positive attitudes among teachers amid ICT integration are explained by Dewi et al. (2024) as follows: Teachers have a strong desire to integrate ICT into their classroom activities despite facing various barriers in their efforts. They also delineate several factors of which teachers must be conscious when devising technology-driven lessons, including setting objectives, examining students' needs, organizing lessons, selecting ICT tools, and, above all, being trained to use said tools. Therefore, to develop a flipped classroom for grade 6 geography, teachers must be up to date on emerging ICT tools and skills, and those tools must be made available to students. Only then can the approach help students to more easily grasp content independently and at their own pace by leveraging their strengths as digital natives.

Declarations

Author contribution

All authors contributed equally as the main contributors of this paper. All authors read and approved the final paper.

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Competing interest

The authors declare that they have no conflicts of interest to report regarding the present study.

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