# Using COVID-19 as a vehicle for enabling geographical thinking in teacher education

**Di Wilmot**

Rhodes University

d.wilmot@ru.ac.za

*https://orcid.org/0000-0001-8184-4624*

## Abstract

*This article describes a curriculum innovation conceptualised in the March/April 2020 COVID-19 lockdown and implemented over six months (April to September 2020). Written from a position of hindsight, the article responds to the question: how can the geography of the COVID-19 pandemic enable teachers' geographical thinking? More specifically, it addresses the need for practical 'how to' examples of responsive geography education curriculum-making processes and active learning pedagogical approaches employed in teacher education in the context of the COVID-19 pandemic.*

*The article begins by describing how, despite the many challenges faced across education sectors, COVID-19 was able to be used as a 'teachable moment' in the geography module of the Understanding the Social and Physical World course— offered in the BEd (Foundation Phase Teaching) qualification at a South African university.*

*The article describes the curriculum design and conceptual framing. It reveals how the constructivist, learner-centred epistemology used was employed to elicit, build on, and expand the student's knowledge of the pandemic from a geographical perspective. Written from a position of hindsight, this article critically reflects on how I used COVID-19 content to conceptualise and implement an enquiry-based curriculum responsive to the context in which we found ourselves while maintaining disciplinary integrity. In showcasing examples of how this was achieved, the paper offers insights into the lessons learned, which may stimulate curriculum innovation and pedagogical responsiveness in other geography teacher education programmes.*

**Keywords:** curriculum innovation; constructivist; learner-centred epistemology; geographical thinking; active learning; teacher education; COVID-19 pandemic; enquiry-based approach

## 1. Introduction

From the start of the lockdown on 27 March 2020 until the beginning of 2022, we lived in an extraordinary time of uncertainty, rapid change, risk, and vulnerability as South Africa, like many other countries, responded to and sought to overcome a crisis caused by the COVID-19 pandemic. Globally, COVID-19 caught the education sector by surprise, triggering what was described as "the world's biggest educational technology (ed-tech) implementation in history almost overnight" (Gual Soler & Dadlani 2020, in Ydo, 2021: 1).

It brought about many challenges and complications at all levels of education, including the closure and ongoing disruption of schooling and higher education, the technological logistics of moving to teach and learn online, and the implementation of educational technology. It also highlighted a digital divide and unequal access to an online connection, support, and quality education (Day et al., 2021; Ydo, 2021; Donita-Schmidt & Ramot, 2020; Van Nuland et al., 2020).

In a South African context, du Preez and le Grange (2020) describe how COVID-19 laid bare the acute digital divide. They argue that online teaching/learning in a context of unequal access to technology and online connection threatens the potential for 'epistemological access' to forms of knowledge offered in a university (Morrow, 2007), particularly for students from disadvantaged educational backgrounds used to face-to-face teaching/learning. At the university where the curriculum innovation that this article discusses took place, pragmatic steps were taken to mitigate the issue of technological access. The university purchased laptops and data packages and couriered them to students during the lockdown. Course materials were printed and sent to students while connectivity issues were being resolved. Despite these efforts and the sudden (and mostly successful) pivot to online learning, du Preez and le Grange caution that access to technology does not guarantee epistemological access. It requires additional "pedagogical/ epistemological labour" being performed by both lecturer and student" (du Preez & le Grange, 2020: 91). This, they explain, includes lecturers understanding the contexts in which students are learning and having technological and pedagogical competence. It also requires an expanded notion of emergency online teaching/learning and the use of alternate strategies, including, for

example, interactive print materials and expository texts (du Preez & le Grange, 2020: 100). Furthermore, they assert that students should be actively involved in the teaching/learning process, giving regular feedback on their learning experiences.

Crisis education took place in a context of vulnerability, precarity and heightened stress levels. The shift to online teaching/learning and working remotely from home had advantages and disadvantages. On the one hand, there was arguably more flexibility, and many people viewed the suspension of commuting to lectures or work as an advantage. On the other hand, there was more congestion at home, often resulting in no quiet spaces to work, a lack of routine and structure, and work being interrupted by domestic chores and supervising children who would typically have been at school. There were also feelings of isolation, a lack of motivation, despondency, and anxiety (Day et al., 2021).

Increased anxiety and fear were also triggered by misinformation, that is, false information (Kidman & Chang, 2020a). During the COVID-19 pandemic, people were bombarded with information and misinformation circulated on social media and other digital news platforms. Kidman and Chang (2020a) stress the need for

educating people about the "full story" (emphasis in the original) by exploring the interrelationship of four elements of the pandemic, namely "(a) the pathogen itself; (b) the immune system of humans and other animals; (c) the role of the physical environment; or (d) the role of the social environment and social media". (Kidman & Chang, 2020a: 108). In their view, education needs to focus on the interrelationship of these four dimensions to mitigate fear and avoidance. They remind us that COVID-19 is a social and epidemiological phenomenon that requires teaching about social processes and the need for empathy *and* natural processes. This suggests a heightened need for education to address both the cognitive and affective domains of learning.

Reflecting on the emergency online learning during the pandemic, Ydo notes "huge fissures" in the way curricula responded to the crisis and asks: "are our educational systems preparing students for a world driven by sudden, unforeseen, and disruptive change?" (2021: 1). He argues for curriculum preparedness and response. Similarly, Murillo (2021: 70) asserts that "tragic events create a demand for quick action" and proposes three guiding principles for emergency curriculum decision-

making relevant to this innovation. First, flexibility or a willingness to use one's professional autonomy to select content, pedagogical and assessment methods appropriate to the context. Second, prioritisation of core concepts and skills. This requires making decisions about what knowledge is of the most worth and what can be trimmed or excluded so that whatever time is available is used for learning core/essential elements of a discipline. Third, integrity, which Murillo explains as teaching in a way that treats one's topic of study with integrity concerning the discipline as a whole (Murillo, 2021: 71).

Amid this educational crisis—which necessitated additional "pedagogical/epistemological labour" when working online—I saw the opportunity not only to facilitate this access through carefully designed resources and activities but also to use it as an opportunity to enable geographical thinking in a foundation-phase teacher education module. This article, written from a position of hindsight, critically reflects on how I used COVID-19 content to conceptualise and implement a curriculum responsive to the context in which we found ourselves while maintaining disciplinary integrity. In showcasing fine examples of how this was achieved, the paper offers insights into the lessons learned, which may stimulate curriculum innovation and pedagogical responsiveness in other geography teacher education programmes.

## Geography in the foundation phase

There can be no doubt about the worthwhileness of geographical knowledge. The International Geographical Union (IGU) Commission on Geographical Education (CGE), arguably the most powerful collective voice in the field, asserts that

> *Geographical knowledge helps us to understand the world in which we live and how people, economies and environments in different places fit together, affect each other and are changing with time. School geography has an important role to play in helping young people understand the challenges people face in different places of the world. It should, inter alia, enable young people to acquire knowledge and understanding of the 'human-earth ecosystem' and a 'systems thinking approach',*

*that is, an ability to think ecologically and holistically to understand how nature, society and individuals are interconnected; develop skills and capacities in learners, including critical thinking, an ability to communicate and argue effectively; focus on major issues in the contemporary world, identifying and evaluating solutions and alternatives and taking action, and promote values and attitudes including empathy, respect for diversity, and a sense of identity, the belief that people can make a difference (agency), commitment to social justice (fairness), equity, and stewardship (adapted from IGU-CGE, Charter on Geographical Education, 2016).*

The core concepts in geography, place, space, scale, and environment are summarised in Table 1.

Roberts explains how geography has specific questions that frame how we view the world. Core questions that should guide an enquiry are:

- What and where?
- How and why?
- What might?
- What could?
- With what impact?
- What decisions?
- With what impact?
- What do you think?
- What next? (Roberts, 2013: 38).

The South African Geography (Further Education and Training) curriculum lists geography's four big ideas, which can be used as a conceptual framework for any geographical topic.

**Table 1: Geography's core concepts**

**PLACE** is a part of the earth's surface, or a location, given a unique character by human and natural phenomena.

**SPACE** is the three-dimensional uninterrupted surface of the earth on which everything is located and across which people, goods and information move.

**SCALE** is a way of looking at geographical phenomena and problems at different spatial levels, such as local and global scales.

**ENVIRONMENT,** in the broad sense, is the result of the interaction of physical and human features creating conditions and resources on which life on earth depends.

Source: UNESCO. Mahatma Gandhi Institute of Education for Peace and Sustainable Development (MGIEP), 2017.

These are place, spatial processes, spatial distribution patterns and human and environment interaction (Department of Basic Education (DBE), 2011a: 8). Geography is not offered as a subject in the foundation phase, but geographical understanding is embedded in the specific aims of the life skills curriculum ("understanding the relationship between people and the environment" (DBE, 2011b: 8). Unfortunately, this curriculum statement does not elaborate on what geographical understanding is or how it may be enabled in foundation phase learners so there is little guidance for teachers whom themselves may not understand geography's conceptual framework. Geographical topics—for example, the weather, seasons, and water—and content are listed together with the recommended time allocated.

The national curriculum advocates an enquiry-based approach, using key questions to frame learning about phenomena and processes. These are:

- What is it?
- What is it like?
- Who or what is affected?
- Where does it occur?
- Why there?
- What is happening?
- Why did it happen?
- What is likely to happen?
- Who benefits?
- How should it be managed?
- What is my position, and what action can I take? (DBE, 2011a: 10).

From a primary education perspective in the UK, Halocha identifies and explains the crucial elements of geographical understanding (2001: 173–175). These are summarised in Table 2.

A course called, Understanding the Social and Physical World (USPW) was developed to deepen and expand BEd (Foundation Phase Teaching) (BEd (FP)) students' disciplinary knowledge.

The following goals of USPW are

**Table 2: What counts as understanding in primary geography (adapted from Halocha, 2001: 173–175)**

| Geographical enquiry | This includes opportunities to ask geographical questions, learn various ways of observing the world, record and interpret one's findings, and the ability to communicate them effectively. |
|---|---|
| A sense of scale | The 'local-global dialectic' involves understanding one's immediate surroundings but gradually being able to see how it fits into broader global patterns. |

| | |
|---|---|
| The importance of cause and effect at a range of scales and understanding geographical patterns and relationships | For example, the cause and effects of COVID-19 at a local, national and global level |
| Distinguishing between geographical patterns and processes | Understanding that patterns exist in many forms, for instance, in provincial variations in the spread of COVID-19<br>Understanding processes as a series of events which cause changes in an environment, for example, the rapid spread of COVID-19 causing the closure of schools and businesses and increased level of unemployment |
| Integration of the time dimension and timescales | The rapid spread of COVID-19 and its impact on people's health and mortality rates compared to the long-term effects on the economy and work |
| An understanding of the important effects of time | Thinking about the future at different scales – at a community, national and global level |
| The effects of distance | Understanding distance in a lateral sense of space separating two objects (how long it takes for COVID-19 take to travel from A to B) and in a vertical sense (globalisation and the internet, which allows us to see and read about people and events we never experience at first hand) |
| Environmental change and sustainable development | Draws together the concepts of cause and effect, patterns and processes, decision-making and thinking. A sense of environmental stewardship lies at the heart of geography, and it includes developing one's views, hopes and concerns for the world |

for students to understand

- different domains of knowledge (mathematics, science, social sciences, technology, environmental education)
- how experts in these disciplines view the world
- how to identify and approach problems
- the history of the disciplines
- the conceptual tools used

These international and national perspectives on geography education informed the design and conceptualisation of the USPW Geography module in which the COVID-19 curriculum innovation took place.

## Using COVID-19 as a vehicle for enabling geographical thinking

The BEd (FP) qualification at the university where curriculum innovation took place is offered as a full-time, initial teacher education programme for first-time entry students and part-time for in-service foundation phase teachers who are

professionalising their initial teacher education qualification with a BEd degree qualification. The full-time and part-time programmes are offered face-to-face, with the latter group converging onto campus for five week-long teaching blocks a year. These take place in the school holidays. The curriculum innovation reflected on in this article was the part-time programme.

The face-to-face model of provision in the BEd (FP) programme changed overnight in March 2020 when the campus was vacated, and preparations began for "emergency teaching" (Moorhouse, 2020; Richmond et al., 2020) and the rapid transition to online teaching and learning using the university's online learning management system (LMS). Many of the in-service teachers registered for the USPW course did not own laptops, and they were dispersed, with almost all living in remote areas where connectivity was poor. The teaching week scheduled to take place in the April school holidays was postponed while laptops and dongles were purchased and couriered to them with printed course materials developed to support those who struggled to access materials posted on the university's LMS. This helped to make the transition to online learning less daunting for the participants.

The ensuing lockdown was a frenetically busy and anxious time in which faculty was thrust into new roles for which many lacked knowledge and skills for online teaching. At the same time, we were bombarded on social media with information on the virus's rapid spread. Amidst the chaos and uncertainty, quick decisions had to be made about adapting and reimagining existing curricula and pedagogy used for face-to-face teaching for online teaching and learning.

The conceptualisation of the innovation was thus spontaneous and sudden. It responded to the need to make teaching/learning contextually relevant and responsive to the unfolding crisis. It started with questioning what knowledge would be of the most worth in a crisis and recognising that the COVID-19 pandemic allowed reimagining a curriculum that was contextually relevant and responsive and had disciplinary integrity. Similar questions were asked in other national contexts (for example, Courtland, 2022), with innovation taking place in many spheres (see, for example, the work on the assessment done by Knight, 2021).

The curriculum innovation sought to understand how the geography of the COVID-19 pandemic could help us

understand the pandemic's causes and effects on people, the economy and the environment in our place and different places in the world. The reference to 'us' was deliberate, signifying that the teachers and I were co-learners trying to make sense of and navigate our way through new, uncharted territory. The goal was to develop and implement a curriculum using an engaging and active learning pedagogical approach appropriate for online learning

## The USPW geography module

### *Theoretical perspectives informing the design and teaching of the module*

A constructivist, learner-centred epistemology (Roberts, 2013; Wilmot, 2017; Rieckman, 2018) underpinned the module. This perspective views students as autonomous learners actively involved in knowledge construction and meaning-making as opposed to being passive recipients of knowledge about a phenomenon. It is also underpinned by the notion of the teacher as a co-learner in teaching and learning.

The module was located within a situated learning framework that recognises the importance of the "… social, cultural and socio-material 'figure worlds in which individuals act as members of social groups" (Lotz-Sisitka & Lupele, 2017: 7). From this perspective, COVID-19 was seen as being located at the interface of poverty, health conditions and environmental degradation (Lotz-Sisitka & Lupele, 2017: 8). Students' prior knowledge and experiences were used as the starting point for engaged learning processes in which they constructed and reflected critically on their knowledge. Following Lotz-Sisitka and Lupele (2017), the aim was for students to use local knowledge in learning processes to enable epistemological access to abstract forms of knowledge in the discipline.

In addition to the situated learning framework, Cox, Elen and Steegen (2019: 1) argue for an "integrative framework" (for example, a diagram) that can be used at different scales (local to global) to understand relationships and interconnections between elements of a complex system. O'Donoghue's (2001) socio-ecological model of the environment (see Figure 1) was used as a framework through which to view and make meaning of new (COVID-19) content and geographical concepts (interrelationships etc.). It was introduced to the teachers and used to frame their investigations of their place at the beginning of the

*Figure 1:  Environment: A web of socio-ecological interactions (O'Donoghue, 2001)*
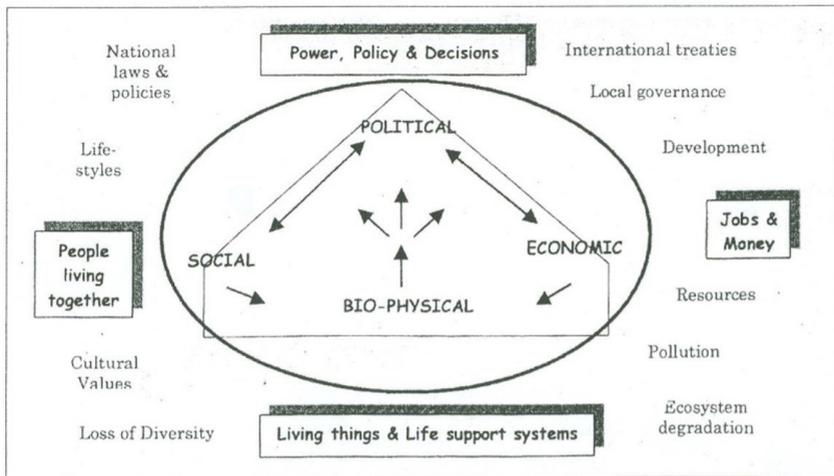


module. This helped them to see the bigger picture of how the different dimensions of the social and physical world are interconnected.

The module was contextually relevant to the lived experiences of the teachers. It drew on and worked with the teachers' authentic practices and experiences. Constructivist epistemology affirms the importance of elicitation, that is, finding out and making visible what students know and bring to the classroom (Wilmot, 2005). Elicitation was achieved by drawing on the teachers' geography of their place by including a survey, observations, and critical reflections on the teachers'

place when viewed through the socio-ecological lens illustrated in Figure 1. These activities helped them become more aware of their local environment and the issues and challenges, and make connections and reflect on the interrelationships between their place's different social, economic and physical aspects. Importantly the curriculum elicited everyday knowledge, which helped create a bridge to more abstract conceptual learning at different scales (national and global).

The pedagogical challenge was adapting participatory teaching/ learning strategies usually used for face-to-face teaching to enable

epistemological access to geographical knowledge and facilitate the teacher's understanding of the COVID-19 pandemic. Stated differently, I needed to find a way to use COVID-19 content as a vehicle for facilitating teachers' understanding of spatial relationships and patterns, cause and effect, changes taking place over time and at different scales—local, national and global— and the interconnections between these scales of human experience, and the interrelationship between the social and physical worlds. This challenge was tackled in two ways: first, the teaching/ learning approach was enquiry-based (question-led), based on the geographical questions described in the literature and the national curriculum (Roberts, 2013; DBE, 2011a). This perspective recognises that "knowledge is not something 'out there' waiting to be learned but is generated in the process of asking questions" (Roberts, 2013: 39). Using geographical questions helped to ensure conceptual coherence and disciplinary integrity in the module.

Second, a participatory, co-engaged learning approach enabled epistemological access to geographical knowledge. A flipped classroom (Mok, 2014), with various strategies, was employed to enable the geographical learning described above. It included case-study analysis, surveys, text analysis, and formal expository teaching. In the USPW module, teachers received mediated texts and activities to work with in preparation for an online teaching session. Constructivism acknowledges and values direct instruction as it recognises the centrality of the teacher as a learning mediator, scaffolder and guide (Roberts, 2013). The teacher's authority as a more experienced, knowledgeable partner in the learning interaction was essential for orientating and helping students to 'tune in', explaining new concepts, and introducing complex, controversial subject matter. Zoom sessions, carefully mediated texts and an integrative theoretical framework were used for this purpose.

The module addressed the need for education to focus on the intellectual and socio-affective domains (for example, promoting empathy, a sense of identity, care, and stewardship) of learning (IGU-CGE, 2016), both of which were important given the uncertainty and heightened levels of stress and anxiety experienced during the crisis.

## Using COVID-19 to enable geographical thinking

Figure 2 illustrates the module design and structure. It was tightly structured conceptually, with flexibility in the content. This ensured disciplinary integrity while simultaneously recognising the nature of the COVID-19 context as rapid, multifaceted, and often involving controversial change. Learning resources were selected, and activities were developed parallel to implementing four different but interconnected work units.

The module design and structure shown in Figure 2 also demonstrate the enquiry-based learning approach used to develop the four units of work, each of which had a different but interconnected focus. The overarching inquiry question for the module was: how can the geography of the COVID-19 pandemic help us understand the pandemic's causes and effects on people, the economy and the environment in our place and different places in the world?

The design and structure of the module were conceptualised with the intended learning outcomes closely in mind. Table 3 shows the learning outcomes and goals of the module.

Table 4 provides an overview of the four units developed to

*Figure 2:  The structure of the module*
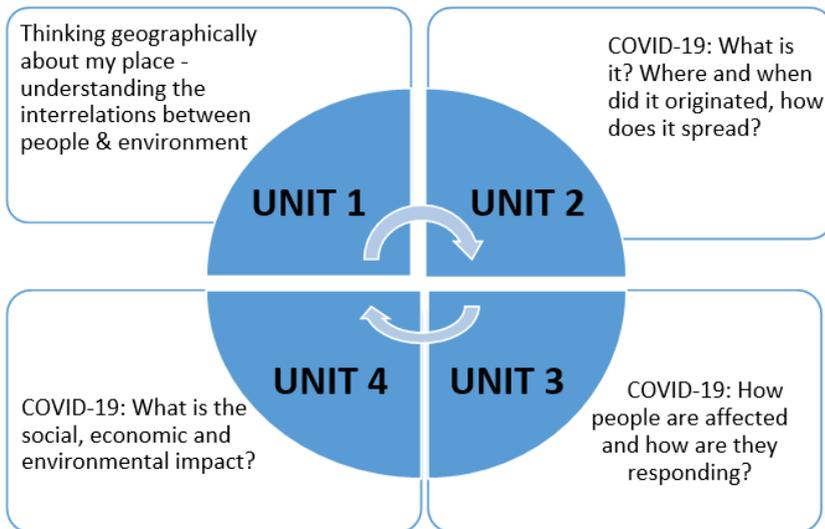
promote the teachers' geographical understanding using COVID-19 as the vehicle. It shows the focus and framing questions of each of the four units and the different pedagogical activities and resources used. Each unit contained an expository text that introduced and mediated the different activities for the teachers. Table 4 also shows how activities utilised written and graphic information from different sources, including the media, government and other websites, The Conversation, National Geographic, and The Economist magazines. Graphic representations included graphs, photographs, maps, cartoons and population pyramids, and different genres of written material (for example, extracts from journal articles, government reports, Mail and Guardian and Daily Maverick news reports, speeches, letters, National Geographic and The Economist magazine, and a children's story). There were purposively selected to demonstrate the different sources of information available to the public and to strengthen the teachers' literacy and graphicacy skills. Given the data constraints and difficulties teachers experienced downloading material from the internet, extracts from source materials were cut and pasted into text boxes.

The following extracts from the units reveal the theory underpinning the innovation in practical terms. More importantly, the extracts show how COVID-19 facilitated and enabled the teachers' geographical thinking.

*Table 3: Geography module goals and learning outcomes*

| |
|---|
| **This module seeks to** |
| <ul><li>elicit, broaden and deepen your knowledge and understanding of the social and physical worlds and the interactions and processes taking place in and between them</li><li>provide you with opportunities to look at your own social and physical world with fresh, critical eyes</li><li>expand your knowledge of the social and physical world beyond your everyday experiences</li><li>stimulate your curiosity about the world in which you live</li><li>develop your critical awareness of the socio-ecological challenges, in particular COVID-19, we face globally, in our country and place where we live</li><li>develop your curriculum (what to teach), pedagogical content knowledge (how to teach), and why you should teach foundation phase children about key issues humankind faces, focusing on the COVID-19 pandemic</li></ul> |
| **Intended learning outcomes** |
| By the end of this module, you should demonstrate knowledge and understanding of<ul><li>What a pandemic is, what caused the COVID-19 pandemic, where it occurs, how it is transmitted from one person/place to another, how it affects people, the economy and the environment, and how we respond to the pandemic, and how the world will change post-COVID-19</li><li>How the physical world and social worlds are interconnected, and how events and processes taking place in one affect other places</li><li>How geographical thinking helps us to understand spatial relationships and patterns, cause and effect, and changes taking place over time and at different scales (global, national and local)</li><li>The importance of being able to read and interpret spatial information communicated through pictures, photographs, sketches, maps, graphs and diagrams</li><li>The importance of mitigation and adaptation in a time of global crisis</li><li>The need to develop resilience, show compassion and care, and a commitment to creating a more socially just, healthy, sustainable world for all</li></ul> |

*Table 4: Overview of the four units*

| Focus and Framing questions | Pedagogical Activities and Resources used |
|---|---|
| UNIT 1: Focus on geographical thinking<br><br>What is geography? How does geographical thinking help us better understand how the human and physical worlds are interrelated in the place where I live? | Introduction and tuning in to the module and the framework through which to view COVID-19: Expository teaching interspersed with questions and discussion on Zoom.<br><br>Survey: the place where I live. |

| UNIT 2: Focus on COVID-19 | Four activities |
|---|---|
| | 1. COVID-19: a zoonotic, infectious, respiratory. Text analysis. |
| What is COVID-19? | Sources:  https://www.nationalgeographic.com/science/health-and-human-body/human-diseases/coronavirus/ |
| | https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters |
| Where and how did it originate? | https://jivemedia.co.za/category/media/comics/ |
| | |
| How did it spread, and where did it spread? | 2. How and where did COVID-19 originate? Text and photo analysis. |
| | Sources:                https://www.nationalgeographic.com/animals/2020/04/coronavirus-linked-to-chinese-wet-markets/ |
| What is the COVID-19 situation in South Africa? | https://www.the-sun.com/news/621553/coronavirus-wet-markets-animals-lindsey-graham/ |
| | https://www.change.org/p/us-congress-china-s-wet-markets-have-reopened-ban-travel-to-and-from-china-until-they-are-closed |
| | https://www.nytimes.com/2020/03/05/opinion/coronavirus-china-pangolins.html |
| | |
| | 3. The controversy of wildlife trade: text analysis of different views. |
| | Source:        https://theconversation.com/what-is-the-wildlife-trade-and-what-are-the-answers-to-managing-it-136337? |
| | https://theconversation.com/the-new-coronavirus-emerged-from-the-global-wildlife-trade-and-may-be-devastating-enough-to-end-it-133333 |
| | |
| | 3. The spread of COVID-16 – Text and graph analysis. |
| | Sources:     https://www.worldometers.info/coronavirus/countries-where-coronavirus-has-spread/ |
| | https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/ |
| | |
| | 4. The COVID-19 situation in South Africa – Map analysis. |
| | Sources:  https://www.nicd.ac.za/first-case-of-covid-19-coronavirus-reported-in-sa/ |
| | https://www.nicd.ac.za/covid-19-update-47/ |
| | https://www.worldometers.info/coronavirus/country/south-africa/ |

| UNIT 3: Focus on people<br><br>What is meant by population structure, and how does it help us to understand Covid-19 better?<br><br>Who is at high risk of getting Covid-19? Why?<br><br>What can be done to slow down the spread of Covid-19?<br><br>What are some of the challenges and issues associated with responding to Covid-19?<br><br>What can we learn from people working at the frontline? | Four activities<br>1. COVID-19: a zoonotic, infectious, respiratory. Text analysis. Sources: https://www.nationalgeographic.com/science/health-and-human-body/human-diseases/coronavirus/ https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters https://jivemedia.co.za/category/media/comics/<br><br>2. How and where did COVID-19 originate? Text and photo analysis.<br>Sources: https://www.nationalgeographic.com/animals/2020/04/coronavirus-linked-to-chinese-wet-markets/ https://www.the-sun.com/news/621553/coronavirus-wet-markets-animals-lindsey-graham/ https://www.change.org/p/us-congress-china-s-wet-markets-have-reopened-ban-travel-to-and-from-china-until-they-are-closed https://www.nytimes.com/2020/03/05/opinion/coronavirus-china-pangolins.html<br><br>3. The controversy of wildlife trade: text analysis of different views.<br>Source: https://theconversation.com/what-is-the-wildlife-trade-and-what-are-the-answers-to-managing-it-136337? https://theconversation.com/the-new-coronavirus-emerged-from-the-global-wildlife-trade-and-may-be-devastating-enough-to-end-it-133333<br><br>3. The spread of COVID-16 – Text and graph analysis.<br>Sources: https://www.worldometers.info/coronavirus/countries-where-coronavirus-has-spread/ https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/<br><br>4. The COVID-19 situation in South Africa – Map analysis.<br>Sources: https://www.nicd.ac.za/first-case-of-covid-19-coronavirus-reported-in-sa/ https://www.nicd.ac.za/covid-19-update-47/ https://www.worldometers.info/coronavirus/country/south-africa/ |

| UNIT 4: Focus on Impact, the future and Teaching Practice<br>What is the social and economic impact of the lockdown?<br>How is the lockdown impacting your life and the lives of people in your home?<br>What will the world be like post-COVID-19?<br>What and how should we teach young children about the COVID-19 pandemic? | Four activities<br>1. The controversy of Lockdown: Humanitarian vs Economic crisis? Text analysis.<br>Source: https://www.dailymaverick.co.za/article/2020-05-05-actuaries-warn-ramaphosa-of-a-humanitarian-disaster-to-dwarf-covid-19-if-restrictive-lockdown-is-not-lifted<br><br>2. How is the lockdown impacting your life and the lives of people in your home? Household survey.<br><br>3. What will the world be like post-COVID-19? Text analysis.<br>Source: https://www.biznews.com/briefs/2020/05/11/cyril-desk-beating-covid-19-lockdown-rules?mc_cid=92d3b-30c28&mc_eid=ddbcf429dd<br>https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-65-responses-to-the-covid-19-catastrophe-could-turn-the-tide-on-inequality/<br><br>4. How can we teach COVID-19 in the foundation phase? Text analysis.<br>Source: https://theconversation.com/comics-and-cartoons-are-a-powerful-way-to-teach-kids-about-covid-19-137910 |
| --- | --- |

Text Box 1 shows how an activity based on text and photo analysis was mediated by short explanations and linking sentences connecting the different resources. They also alerted the teachers to controversial issues and different, conflicting views. This helped to develop an understanding of the controversy surrounding wet markets and animal trade from a Chinese and global perspective. Including this diversity promoted an understanding of multi-perspectivity and helped the teachers connect and critically reflect on the role of wildlife trade and bush slaughtering in South Africa (the latter was done in a Zoom session). The activity also developed graphic literacy skills. Geographical thinking promoted by this activity included:

- a critical awareness of another distant place with similar and different challenges compared to those experienced in the teachers' localities
- world-mindedness and an appreciation that what happens in one part of the world has consequences in other parts (for example, the wildlife trade)
- understanding human-environment interactions
- cost and benefit (of trading wildlife)

**Text Box 1: Extract from Unit 2- How and where did COVID-19 originate?**

The first cases of Covid-19 were reported in Wuhan, a manufacturing city in China, in December 2019. Most of the earliest Covid-19 cases have been traced back to a 'wet market' site in the city. Read the extract of an article published on the National Geographic website on 20 April, which explains what 'wet markets' are, what they sell and why they are controversial.

[Extracts from the National Geographic article were inserted here]. https://www.nationalgeographic.com/animals/2020/04/coronavirus-linked-to-chinese-wet-markets/ downloaded 17 April 2020

Look closely at the photographs of the wet market on the next page.

[Three photographs of wet markets were inserted here]

Another article by Ross Harvey, an academic at the University of Johannesburg, published in The Conversation, explains the dilemma about wildlife trade from an ecological and economic perspective.
Extracts from https://theconversation.com/what-is-the-wildlife-trade-and-what-are-the-answers-to-managing-it-136337? Downloaded on 29 April 2020

The following article, written by George Wittemyer and published in The Conversation on 31 March 2020, explains the risks of wildlife trade from a conservationist perspective.
Extracts from https://theconversation.com/the-new-coronavirus-emerged-from-the-global-wildlife-trade-and-may-be-devastating-enough-to-end-it-133333

**UNIT 2: ACTIVITY 2**
Complete the following:

1. Describe a wet market.
2. Explain why wet markets are controversial. (look carefully at what you have read about their economic value and the ecological and conservation concerns people have about them)
3. Explain why people want to regulate trade in wildlife and plants.
4. Why are wet markets important in China?
5. Find out more about pangolins. Write a paragraph describing where they are found in the wild. Why are they in such high demand in China?
6. Name two other animals from which coronavirus diseases have originated and the disease that has resulted in each case.

- human dependence on the natural world
- and global development and sustainability challenges, such as food security and conservation

The learning about COVID-19 in South Africa sought to develop map reading and interpretation skills and spatial concepts, including location, where COVID-19 was recorded in South Africa at a particular time and change taking place over

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**Text Box 2: Extract from Unit 2 - What is the COVID-19 situation in South Africa?**

The first confirmed case reported in South Africa was on 5 March 2020. Here is the report:

This morning, Thursday, 5 March, the National Institute for Communicable Diseases confirmed that a suspected case of COVID-19 has tested positive. The patient is a 38-year-old male who travelled to Italy with his wife. They were part of a group of ten people, and they arrived back in South Africa on 1 March 2020. The patient consulted a private general practitioner on 3 March with symptoms of fever, headache, malaise, a sore throat and a cough. The practice nurse took swabs and delivered them to the lab. The patient has been self-isolating since 3 March. The couple also has two children.
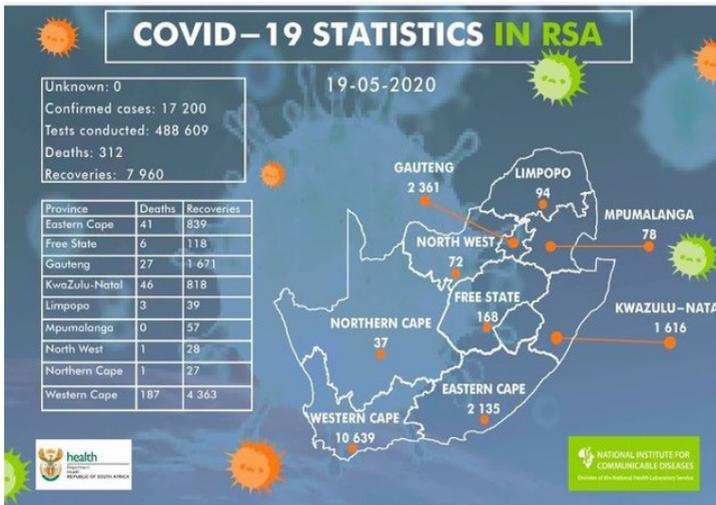Source: https://www.nicd.ac.za/first-case-of-covid-19-coronavirus-reported-in-sa/

The map below shows the distribution and number of confirmed cases in South Africa on 28 April 2020.

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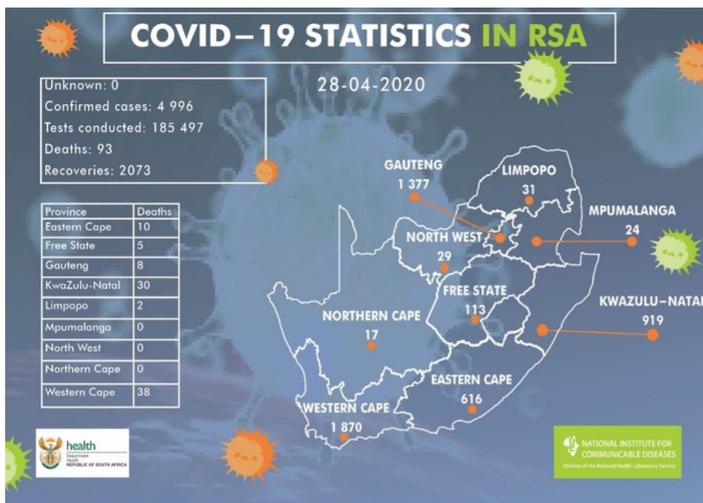


Source: www.nicd.ac.za Downloaded on 29 April 2020

By 19 May 2020, the Covid-19 situation in South Africa had changed as follows:



Source: www.nicd.ac.za Downloaded on 19 May 2020

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**UNIT 2: ACTIVITY 4**

Answer the following questions:

1. What does the map tell us about the distribution and magnitude of Covid-19 cases in South Africa on 28 April 2020?
2. Where are the 'hotspots' of Covid-19 on 28 April in South Africa?
3. Which provinces in South Africa had the lowest number of confirmed cases on 28 April?
4. Write a paragraph explaining how the distribution of confirmed cases in the different provinces changed from 28 April to 19 May (compare the provinces with the most and least confirmed cases).
5. On 19 May, the number of confirmed cases had risen to 17 200, with 230 deaths. By what percentage did the confirmed cases increase from 28 April to 19 May?
6. Compare the changes that took place from 28 April to 19 May and write a paragraph explaining how the distribution and intensity of reported cases of Covid-19 changed in the three-week period.
7. Write down the date on which you are doing this activity. Look up the map for this day and write a paragraph explaining what has happened to the distribution and magnitude of reported cases in South Africa since 19 May.

time (comparing the maps drawn at different times); distribution, such as how it was occurring, the frequency and magnitude thereof of different provinces; relationships and interconnections, including for example, between the number of cases occurring in Gauteng and the Western Cape both of which have busy international airports; and between the physical and social environment (the physical size of a province and climate and population distribution and density). The activity was intended as a springboard to a rich conceptual discussion in the Zoom sessions. Unfortunately, this was constrained by connectivity challenges.

Mediation played an important role in enabling epistemological access to abstract geographical concepts. Text Box 3 shows what the mediation looked like in practice when learning about the interface between COVID-19 and population structure in South Africa, Italy, and the USA, where COVID-19 mortality was high in May/June 2020. The activity started with an expository text explaining the geographical concept of population structure and provided information that helped the students to read and interpret population pyramids.

This activity promoted an awareness and understanding of how a population is organised and structured according to age groups and sex, what is meant by a birth rate and death rate (and how these affect a population), the implications of population growth

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**Text Box 3: Extract from Unit 3 - Population**

How does studying the population help us to understand COVID-19?

The population structure is the make-up of a population in terms of the distribution of age and sex (male/female). Demographers, who study population structure, use population pyramids to show graphically how a population is structured. A population pyramid can be drawn to illustrate the population of 1) the world, 2) a continent (Africa), 3) a country, for example, South Africa), 4) a province like the EC, 5) a city, town or village 6) a specific group of people (for example the workforce of a university or the student population). The population pyramid of South Africa shows what the population structure looks like.

**South Africa - 2019**
Population: 58,558,267

PopulationPyramid.net
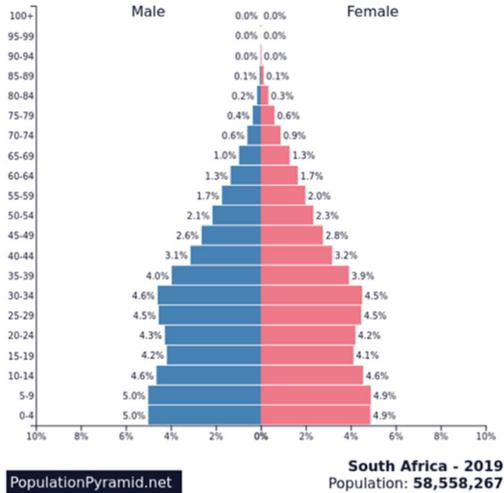
The population pyramid shows how the population is divided into five-year age groups, with males shown on the left and females on the right. Horizontal bars show the percentage of the population in each case.

Population pyramids are used to identify trends in
- birth rates (the number of babies born each year per 1000 people per year)
- death rates (the number of deaths per 1000 people per year)
- infant mortality rates (the number of babies who die each year before reaching the age of 2 years), and
- life expectancy (the average age a population is expected to live)

South Africa's population pyramid is A-shaped with a narrow peak (which tells us that the life expectancy is short in South Africa) and steep concave sides (which means that South Africa has a high infant mortality and death rate), and a broad base (which means that South Africa has a high birth rate and a large percentage of children). The pyramid illustrates a youthful population.

The structure of the population varies from one country to another. An 'A-shaped' population structure is typical in less economically developed countries (LEDCs). More economically developed countries (MEDCs) have differently shaped pyramids. This is because economically developed countries (like the US and Italy) have different population structures from those of economically developing countries (like South Africa).

The population pyramids for the US and Italy are described as being bell-shaped because they have a narrower base and bulge in the middle. The narrow base means their birth rate is low and falling, and they have fewer children. The vertical sides (not concave like South Africa's sides) mean that they have low infant mortality and death rates. The broad peak at the top of the pyramid means they have a long life expectancy and a higher proportion of older people (over 65 years of age) than South Africa.

United States of America - 2019
Population: 329,064,916



Italy - 2019
Population: 60,550,092

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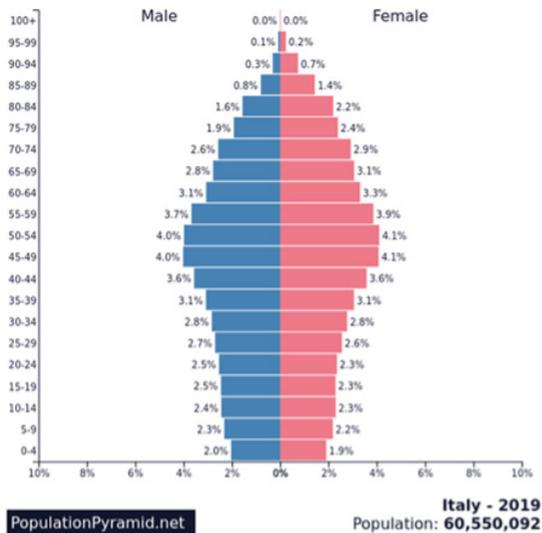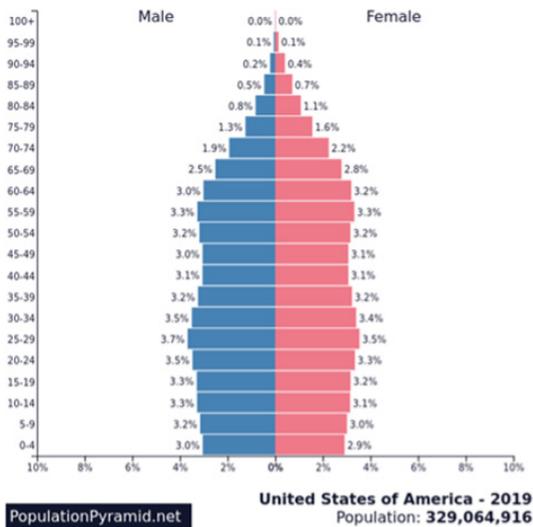
**UNIT 3: ACTIVITY 1**

Study the population pyramid for South Africa, the US and Italy and answer the following questions:
1.          9, 9% of South Africa's population is between 0-4 years of age: true or false? What is the percentage of 0-4 years of age in the US and Italy?
2.          Which country has the highest percentage of women over 65?
3.          Which has the smallest percentage of people over 65?
4.          Which country has to provide the most medical care for people over 80?
5.          Which country has the largest proportion of young people under 25?
6.          Which country is likely to have the most homes for the aged? (for people over 65)?
7.          If COVID-19 transmission spread to schools, which country would be at greatest risk? Give a reason for your answer.

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on resources, the similarities and differences between the population in a developing and developed world context, as well as the impact of COVID-19 on the population and economy.

## Critical reflection

Using select excerpts from the module, I have provided a sense of the time and effort it took to conceptualise and plan the module, develop activities, find appropriate resources to support learning and keep abreast with the COVID-19 crisis. Critically reflecting on the experience, I have asked myself, to what extent did the curriculum innovation achieve its goal of enabling non-specialist foundation phase teacher's geographical thinking? In doing so, I have reflected on what worked well and where the limitations lay, including how sustainable the approach is going forward as we return to face-to-face teaching.

In terms of the positive aspects, all the teachers completed all the activities. They provided evidence that showed that all could, to a greater and lesser degree, identify and explain spatial relationships and patterns, interrelationships, and interconnections between the social and physical world, causes and effects and changes taking place over time and at different scales (global, national and local). They also demonstrated that they could apply their knowledge of COVID-19 to make informed personal and professional decisions. This is important given teachers' central role in educating young people for a more socially just and sustainable future.

Adopting a low-tech approach with mostly asynchronous learning taking place worked well. It meant the teachers could work at their own pace using the mediated work units to support their learning without worrying too much about connectivity issues. The flipped classroom also worked well because it meant that teachers attended Zoom meetings having engaged with the topic at hand. They were thus more informed and better placed to ask questions. Zoom sessions were short and mainly used for introducing or synthesising units. Unfortunately, the discussion was limited and not as rich as it should have been. Good communication channels (WhatsApp and email) went a long way in alleviating anxiety and confusion. The teachers knew they could get hold of me if any issue arose.

Searching for, selecting, appropriating and recontextualising various sources of information about COVID-19 to use as learning support materials to accompany the activities I developed was time-consuming. However, it was also educationally sound because it ensured that I was building my knowledge of COVID-19 and staying up to date with the rapidly changing context in which we found ourselves in 2020. Responsive, conceptually robust curriculum development requires disciplinary expertise and pedagogical imagination. It raises the question of whether sufficient expertise is available in foundation-phase teacher education programmes. Not all come with geographical expertise, and by sharing ideas and experiences such as these, the practice may be strengthened, as may be the scholarship of teaching and learning. It also requires curiosity and humility, recognising that one does not have all the facts in a crisis of the COVID-19 pandemic. This was done by positioning myself as a co-learner alongside the teachers and showing my vulnerabilities in a time of crisis (for example, having to drive to the top of a nearby hill to get connectivity when my Wi-Fi connectivity at home let me down during a synchronous Zoom session).

The use of different resources was novel and exciting. It required the teachers to read more expansively and engage with different genres. Given that English was not the first language for almost all the teachers, this also helped to strengthen their capacity to engage with English language articles and media. Using different graphic representations helped promote graphicacy and spatial understanding (distribution, patterns, scale, spatial processes, and changes over time).

Regarding sustainability, I argue that the COVID-19 pandemic presented a particularly unique context to develop a curriculum for teaching and learning about the crisis from a geographical perspective. After two years of crisis education, I believe we have reached a COVID-19 saturation point. The topic, while necessary, is arguably no longer topical. Keeping the curriculum responsive will require the incorporation of new crises, events, and happenings in the world. However, while the content may be transient, the novel enquiry teaching and learning approach that informed the innovation is something that I will continue to use in my teaching.

## Conclusion

This article has considered a teacher education curriculum innovation in 2020, an unprecedented year for humanity and education. It has described how COVID-19 provided the impetus for a spontaneous and sudden process of curriculum design and pedagogical reimagining, the purpose of which was to develop geography non-specialist foundation teachers' understanding of the COVID-19 pandemic from a geographical perspective.

The article sheds light on the pedagogical and epistemological 'labour' required to enable epistemological access. Undoubtedly, this activity-based approach to teaching/learning, underpinned by a constructivist epistemology (while time-consuming, resource-dependent and involving a lot of careful conceptualisation and planning), was a successful learning experience. Anecdotal evidence from the teachers suggests that they found the approach and content interesting and stimulating, albeit time-consuming. Perhaps the most exciting outcome for me was how the module enabled connections between what was happening locally and globally, ultimately helping the teachers understand COVID-19 as a problem of humanity.

At the time of writing, the research is still ongoing. The 2022 USPW curriculum developed and implemented this year has once again been reimagined. The COVID-19 pandemic is no longer used to enable geographical thinking. The module content has been re-conceptualised and updated to ensure that it is responsive and relevant to current topical events. The conceptual framing of the curriculum remains the same, as does its underpinning constructivist epistemology. The pedagogical

strategies have been reimagined for face-to-face teaching and learning. The flipped classroom approach is still employed with face-to-face sessions for workshops, extension activities, and discussing controversial issues. This year's additional innovation has been using videos (YouTube and documentaries) to initiate and stimulate discussion, marking a shift towards transformative learning (Lotz-Sisitka et al., 2022).

In providing a snapshot of what crisis education looked like, theoretically and practically, in a specific context, the article provides insights and guidelines which other geography education teacher educators may find useful when designing curricula using a crisis for enabling teachers' geographical thinking.

## Author Bio

Prof. Di Wilmot is an Emeritus Professor of Geography Education at Rhodes University, where she previously served as Dean of the Faculty of Education.

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