

BIOLOGICAL SCIENCES PRE-SERVICE TEACHERS' EXPERIENCES OF COVID-19 AS AN ENABLER FOR THEIR SERVICE-LEARNING PROJECTS

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Abstract

The newspaper headlines in July 2020, reflected the context of COVID-19 and the challenges in the education sector in South Africa. Pre-service teachers completing a Biological Sciences for Educations Research and Service-Learning module conducted their Service-Learning in their home contexts, which under normal times, they would do so in the neighbouring university contexts. The research question: Why did the Biological Sciences pre-service teachers' experience COVID-19 as an enabler for their Service-Learning projects. An interpretive, qualitative case study was adopted to explore the pre-service teacher's experiences of their projects undertaken. The data gathering methods included document analysis (pre-service teacher's reflective diaries); observation of module reflective sessions and seminar presentations and visual methodology (pre-service teachers made videos). The data analysis using descriptive content analysis. The research rigour of credibility and dependability were worked with, and the research ethics were considered. The results indicated that during the learning about the project, the pre-service teachers had emotional experiences of fear, excitement and even confusion. During the planning for the project, they had concerns about Covid-19 restrictions and access to placement sites, what to do, who to work with and the nature of the projects planned. The action of the Service-Learning indicated the collaboration and teamwork, imagination and creativity, including the contextually relevant problem-solving actions that were undertaken. Pre-service teachers were in their own communities where they excelled and built relationships and valued their community members. Service-Learning should be completed in the pre-service teacher's home contexts for greater relevance, value and connectedness with their community.

Keywords: biological sciences, case study, COVID-19 pandemic, pre-service-teacher education, service-learning

Introduction

COVID-19 - Excess deaths point to hidden toll in South Africa; The primary goal of the South African COVID-19 response is to slow the spread of infections; South Africa has the world's fifth-worst Epidemic, with 471,123 cases; South Africa's R350 coronavirus grants will be made available to more people; South Africa crosses 400,000 mark; Schools closed amid virus. These newspaper headlines depict the context of South Africa during the pandemic. Reading these headlines and the articles linked to them is different to actually experiencing it directly, and being challenged by feelings of fear,



anxiety, hopelessness, including hope with growth for what can we do to influence the lives of communities in sustainable ways, and still expecting to be living a “normal” life as a teacher educator and working with pre-service teachers.

In the School of Education, Community Engagement embraces the University of KwaZulu-Natal Strategic Plan 2017 – 2021, Goal 3 (Strategic Plan, University of KwaZulu-Natal, 2017). This goal is concerned with Community Engagement which should be high impact societal and stakeholder community engagement that has meaningful interactions for mutual benefit. In the Southern African Higher Education sector, the strategic outcome of Community Engagement is in regard to social responsiveness and to contribute to the development of students, communities and Higher Education Institutions. This was in response to the call of the White Paper on the Transformation of Higher Education (Department of Education, 1997). The principals identified in this policy document are social responsibility, humaneness and social justice, and they are viewed as pivotal to engaging with communities.

In the context of South Africa and Higher Education, including Basic Education (schooling levels) the intensity of the pandemic was indicated by the newspaper headlines. Many issues experienced were linked to the extensive lockdown that was implemented by the government in March 2020. Since there was restricted movement of citizens and the closure of the universities and schools, students and learners experienced many challenges - access to the internet as online learning was implemented by the institutions that could afford it, lack of education resources and general attendance and access to learning, safety measures and the prevention of contracting the virus. Many learners (schooling level) and students (post schooling levels) were dealing with added trauma, including economic dislocation, hunger, and mental health challenges, all of which clearly affect learning, regardless of how it takes place.

Pre-service teachers completing a Biological Sciences for Educators Research and Service-Learning module were challenged with deciding what to do and how to complete their projects in the context of the pandemic. This was particularly important for the service with communities to be recognised and the pre-service teachers to achieve credits for the work that they had completed. Service-Learning may be defined as experiential learning that integrates practical experiences into the academic curriculum (Furco, 2001), with the life purpose aspect (Opazo, et al., 2018). As a teacher education institution integrating community engagement in a module gave credence to the Scholarship of Teaching and Learning (SoTL) (Shulman, 2000) focusing on the expectations, planning, and the actions for the completion of the Service-Learning. The Biological Sciences module was taught virtually to third-and fourth-year pre-service teachers in 2020 and focused on Service-Learning, both were engaged with. The 16-credit module comprises three 90-minute lectures per week for 5 weeks and one 90-minute lecture and Service-Learning placement site work for three to four hours per week, for seven weeks. During COVID-19, many issues regarding students working in communities were raised: a focus on service-Learning (more on the learning and less on the service) and minimal contact with communities (Morton & Rosenveld, 2021); the new digital face of Service-Learning where academic efforts were aligned with community priorities (Brooks, 2020). In the case of the pre-service teachers, due to COVID-19, they conducted their Service-Learning projects in their home communities, not in the areas around campus, in a mask to mask nature. So, a completely different contextual setting was to be engaged

with the for project completion. So, a question raised is, Why did the pre-service teachers experience COVID-19 as an enabler/enhancer for how they planned and implemented their Service-Learning?

Research Methodology

General Background

An interpretive, qualitative, case study was undertaken to provide meaning and an in-depth understanding of the pre-service teachers' experiences of conducting their Service-Learning during COVID-19. They were expected to be of service in a mask to mask setting with the community and the learning was in discussions and reflections during the virtual sessions. The pre-service teachers provided service activities that did not entail teaching Life Sciences at a school, it could be working with any community organisation, which is referred to as a placement site. So, they had to find suitable placement sites in their home communities. These sites included farming areas, local primary schools, Early Childhood centres, Children's homes, police stations, old age homes, any organisation in their community that would accept them to be of service with the organisation. The nature of the service was decided in negotiation with the placement manager, taking the needs of the organisation and the competences of the pre-service teacher into account.

Sample and Procedures

The sampling method adopted was purposive, in that all the one hundred and seventy pre-service teachers, working in groups of two or three, with a total of 71 projects, were included. All these projects were sampled to provide a descriptive account of the nature of the service that was undertaken, in the engagement with communities. For an in-depth analysis only two projects that were based in rural, primary education sectors were purposively selected.

Since the module was presented in phases, the data gathering was also conducted within these: phase one was concerned with the expectations, informative and exploratory sessions at the beginning; phase two with the planning of the interventions, and phase three with the time spent working with the placement site managers. In each of the phases the pre-service teachers reflected on their thinking and feelings linked to the incidents that they experienced, document analysis of the pre-service teacher's reflective diaries. The module, reflective sessions were integrated in the three phases as well and it was during these times that the class shared their experiences – what they found out, their challenges, frustrations and successes, including their plans for action. The seminar presentation was in phase three where they shared the PowerPoint, video and photographs, including posters describing the service that they had completed in the placement site. The data analysis using descriptive content analysis and the SoTL framework indicated the data sets to be presented and discussed. The research rigour of credibility and dependability were worked with, and the research ethics were considered and acted on.

Research Results

Phase One

Phase one is concerned with the expectations, informative and exploratory sessions at the beginning of the module and the project initiation that the pre-service teachers experienced. The comments written and the statements made by the pre-service teachers were:

“Many things were said by other students about what we could expect in the module, the module is stressful, and it can be confusing etc.”

“There is a lot of excitement and also new challenges in the module, as well.”

“Year 2020 became so stressful, and this was due to lockdown and what is expected of me”

“I have experienced much anxiety and stress, and this is due to how I will be able to do this work, now with COVID-19”

“Confusion as to what and how I will be of service with the communities”.

These statements indicate the emotional experiences that the pre-service teachers underwent. This is not surprising as Service-Learning as a concept and the pedagogy used to facilitate their development of understanding of the knowledge and practices is different to that for facilitating a Life Sciences module. Community persons, past pre-service teachers who had completed the module and the challenges of being expected to write reflections, share them, and use them for constructing and revising the thinking and feelings that each person experiences, is far removed from the focus on just the cognitive development of each person. This year with the added pressure of being at home, in their own communities, many rural and very far from urban areas, the search for appropriate placement sites was increased.

Phase Two

Phase two is concerned with the pre-service teacher groups' planning for the interventions and the actual interventions planned. The comments made and statements written during the planning for the intervention included the following:

“In planning for the groups, we struggled to find partners, especially ones that we would be able to work well together.”

“I wanted to work with a partner who was not living close to me, and this gave me many sleepless nights”

“Finding placement sites was very difficult and added to that when one was found the issue of access due to COVID-19 was a real one”

“We spent weeks looking for placement sites”

“We needed enough data and money to be able to contact placement sites using our phones and then to work out the distances for travel to the site. We will require money for transport”

“What – how will I and my group be able to work for 25 hours in the placement site. This is too much to ask”

These comments and statements were also shared during the class reflection sessions that we had once a week. The really purposeful and growing nature of these

sessions was the collective suggestions and comments shared in a safe space about the emotional, physical and logistical experiences that the pre-service students shared. A problem for one group was a solution, motivator or an idea of the possibilities that the groups could work with. The sharing of frustrations and problems service as a release and comfort in knowing that each group is not the only one having a particular experience.

In focusing on the intervention, an analysis of these was completed, and the criteria used to categorise them were inductively decided on, it was the focus of each of the projects/programmes. The analysis of the intervention projects/programmes revealed the following:

Table 1
Categories and Number of Each of the Pre-service Teacher’s Projects/Programmes

1 Food security	2 Special Needs	3 COVID -19 Related	4 Environmental	5 Health related
10	5	4	22	30

To provide further clarity on the categorisation of the pre-service teachers’ projects/programmes the examples of the titles are presented below:

Category one has 10 projects, an example, Exploring and enhancing nutrition and food security among grade 3 learners at a primary school;

Category two has five projects, an example, Exploring and enhancing people living with cerebral palsy;

Category three has four projects, an example, Exploring and Enhancing the Cleaner’s understandings of the effect of COVID-19,

Category four has 22 projects, an example, Exploring and enhancing land pollution awareness, and

Category five has 30 projects, an example, Exploring and enhancing healthfulness of Homeless people.

Phase Three

Phase three is concerned with an in-depth analysis of two of the projects. The visuals for each of these projects are also presented as the results:

Project one is concerned with category five – Health related as the basis of the programme was about the healthy state of the child and the healthy eating practices.

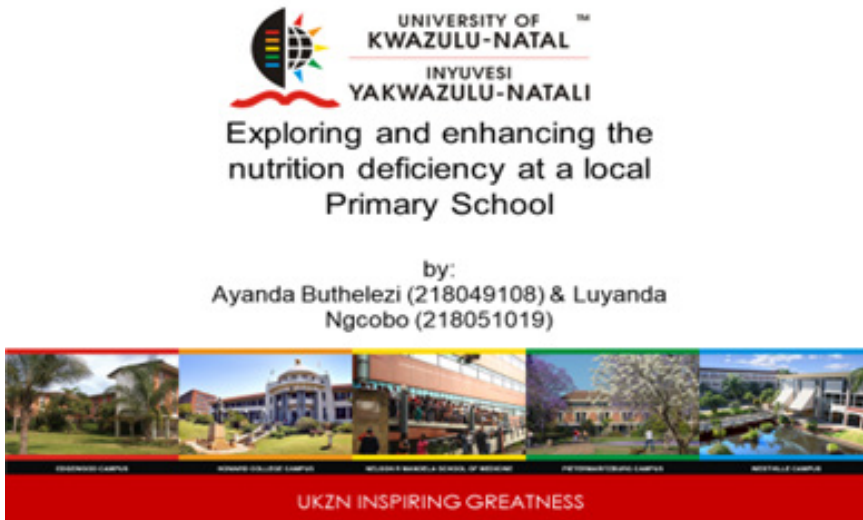
Figure 1*An Example of a Project in the Health Conditions Category*

The group designed the intervention where the underlying principle is – Teach them until they understand the importance of hygiene and living a healthy lifestyle. The programme engaged learners in rhymes, music and movement in the indigenous language – isiZulu focusing on healthy foods and behaviours, demonstrating and acting on the washing of hands and the making and wearing of masks as a fashion and to be applauded. They also included the making and provision of healthy cooked meals (where they provided all the ingredients with their own money) to the children during the lunch break. The class group was also engaged in making and planting food crops in a school garden. Each child planted a plant in the garden and was responsible for taking care of it – watering it. The children were also educated about littering and keeping their environment clean, and they were engaged in a litter clean up around the school. The use of games was an important strategy for the learners to develop appropriate knowledge, skills and attitudes linked to healthy lifestyle.

In reflecting on their experiences, the pre-service teachers presented the following conclusion during their seminar presentation:

Doing Service-Learning was amazing. This gave us an opportunity to engage with different people and to learn and explore how quickly the minds of young children are. From this experience we have learnt that it is within us to do good, we learnt that when we work together, we can achieve a lot of things. During our time at the site, one of our mentors told us that they never had time to teach the learners the importance of hygiene and living healthy. We really appreciated and enjoyed teaching young children about the importance of hygiene and living healthy.

Project two was concerned with food security, where the focus was on nutrient deficiency.

Figure 2*An Example of a Project in the Food Security Category*

The pre-service teachers in this group discussed the nutrient deficiency with the teachers and principal at the school. They identified that the children's diet lacked proteins. The group then decided that in the time that they spend at the school, 25 hours, they will provide meals that are rich in proteins. They purchased food items to be cooked, lentils, beans that are also cooked with samp, an African traditional food consisting of dried corn kernels. Chicken was also added to some of the cooked meals. This group also taught the children to plant and played games focusing on food security.

They reflected on their experiences:

Working with others, enabled us to develop our communication and listening skills. Working in groups on the sites made the experience more enjoyable. The motivation & encouragement we provided to each other was invaluable. We learnt a lot from Caitlin and Mrs Deca (the tutors) as well, sharing ideas and thoughts about their experiences in biology and seeing different perspectives and encouraging us to develop our own thinking skills and research skills.

Conclusions and Implications

The pre-service teacher's experiences were varied and expansive. The understanding and their attitude to the module in the initial part was acceptable, as they had no previous experiences of research, more especially Service-Learning and working with a community, as part of a module expectation. Furthermore, the work with communities is loaded with so many aspects linked to COVID-19 safety protocols, and the protection of self against infection, so health, emotional, physiological and psychological aspects need to be considered in the work with communities for the greater good. During the working with communities, this experience of learning in and with their

community was certainly a different one for all concerned with the development of the mutually beneficial relationships. Mutually beneficial learning/engagement is significant in the emotional learning where statements made were, “working in the community is very amazing,” with the social learning evident from “experience was so amazing; I learnt the importance of spending time with other people,” and the respect “promises to be kept when working with a community” and attitudes of “amazing module with focus and honesty” and “work hard with honesty” were expressed. Some groups experienced much frustration when, “it did not end well” for them because they did not keep their promise of time and attendance at a placement site, and they were asked to leave.

Service-Learning during COVID-19 was a renewed way of working and even with the challenges experienced by the pre-service teachers of access, finding placement sites or even possible ideas for interventions taking the safety and security issues into account. Statements like, “through this module I have learnt a lot of things, I have grown as a life sciences teacher, and I would also advice those who think this module is difficult to drop the attitude.”

So, the enhancers are evident in the collaboration and teamwork that the pre-service students were engaged within and across their groups, and also with the placement of site persons. Working with a community for 25 hours, completing service that is mutually agreed upon, does entail the acceptance and role of the pre-service student in the place, to the achievement of the purposes identified. Since there are no pre-planned and clearly defined plans of actions that should be undertaken during the service periods, it is imperative that the pre-service teachers use their creativity and imagination to work with the opportunities and possibilities to design and implement a Service-Learning programme that is purposeful, practical, and sustainable. This entails the use of problem-solving strategies, which invariably are developed in that time with great support from the partners, lecturer, tutors, and groups for contextually relevant solutions to be implemented.

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References

- Corporate Relations. (2017). *Strategic Plan*. University of KwaZulu-Natal.
- Department of Education. (1997, August 15). *Education White paper 3: A programme for higher education transformation* (Government Gazette no. 18207). Government Printers.
- Furco, A. (2001). Advancing service-learning at research universities. *New Directions for Higher Education*, 114, 67-78. <https://eric.ed.gov/?id=EJ632892>
- Brooks, L. (2020 September 23). Reimagining service learning in the digital age. *Inside Higher Ed*. <https://www.insidehighered.com/advice/2020/09/23/how-adapt-service-learning-hybrid-or-online-classes-opinion>
- Morton, P., & Rosenveld, D. (2021). Reconceptualizing service-learning during the COVID-19 pandemic: Reflections and recommendations. In: Tosone, C. (Eds), *Shared trauma, shared resilience during a pandemic. Essential Clinical Social Work Series* (pp. 331-339). Springer. https://doi.org/10.1007/978-3-030-61442-3_34

- Opazo, H., Aramburuzabala, P., & Ramirez, C. (2018). Emotions related to Spanish student-teachers' changes in life purposes following service-learning participation. *Journal of Moral Education*, 47(2), 217-230. <https://doi.org/10.1080/03057240.2018.1438992>
- Shulman, L. (2012). From Minsk to Pinsk: Why a scholarship of teaching and learning? *Journal of the Scholarship of Teaching and Learning*, 1(1), 48-52. <https://scholarworks.iu.edu/journals/index.php/josotl/article/view/1582>

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