



## **SUNCEP RESEARCH REPORT**

Enhancing the practice of Intermediate, Senior and Further Education and Training phase mathematics teachers in the Limpopo, Northern and Western Cape Province, South Africa, via an Advanced Diploma in Education (ADE) programme.

Level 1: Perceptions of participating in an ADE: Mathematics Teacher training programme.

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# 1. ABBREVIATIONS

ACE	Advanced Certificate In Education
ADE	Advanced Diploma in Education
ANA	Annual National Assessments
CPL	Continuous Professional Learning
CTLI	Cape Teaching and Leadership Institute
FET	Further Education and Training Phase
INSET	In-service training
IP	Intermediate Phase
ISPFTEDSA	Integrated Strategic Planning Framework for Teacher Education and Development in South Africa
ITE	Initial teacher education
LDoE	Limpopo Department of Education
NCED	Northern Cape Education Department
NEEDU	National Education Evaluation Development Unit
NGO	Non-governmental organization
NQF	National Qualifications Framework
NSC	National Senior Certificate
PD	Professional development
SACE	South African Council of Educators
SAQA	South African Qualifications Authority
SP	Senior Phase
SU	Stellenbosch University
SUNCEP	Stellenbosch University Centre for Pedagogy
WCED	Western Cape Education Department

## 2. EXECUTIVE SUMMARY

The ADE is an NQF level 7 qualification designed and developed by SUNCEP in accordance with the Minimum Requirements for Teacher Education Qualifications (MRTEQ) policy and aligned to Integrated Strategic Planning Framework for Teacher Education and Development in South Africa (ISPFTEDSA). The aim is to fulfil the recognized need of providing a well-rounded, broad education that equips currently serving teachers with the subject content knowledge base, pedagogical theory and methodology that will enable them to demonstrate competence and responsibility as academics and professionals.

The ADE qualification is also intended to create opportunities for capacity enhancement for currently serving teachers in a specific learning area/subject, by demonstrating focused knowledge and pedagogy in any teaching context. This qualification is designed to develop, mentor- and lead teachers, which are the target categories stipulated in the Integrated Strategic Planning Framework for Teacher Education and Development in South Africa.

Utilising and adapting Guskey's (2002) framework for evaluating professional development, the purpose of this study is to determine the influence the ADE in Mathematics teacher training has on currently serving mathematics teachers in the IP, SP and FET phase, in the Limpopo, Western Cape and Northern Cape provinces, utilising a practice based teacher professional learning approach.

The findings indicate that the respondents perceived their experiences on the ADE programme as positive. The programme is addressing most of the respondent's content and pedagogical needs. There are also indications of the respondents growing in confidence to deliver the curriculum in their teaching. Overall, the respondents appreciated the efforts made by all role players to ensure that the programme was delivered with integrity and that the academic quality was not compromised.

### 3. BACKGROUND TO STUDY

The National Education Evaluation Development Unit (NEEDU, 2012) report states that the problem of a generally low educator capacity has been recognised for some time, and efforts to address it through in-service training (INSET) by both the public and NGO sectors, with support from international and local corporate donors, have a long history. In any profession, continuous professional development remains an important mechanism for keeping professionals up to date with the latest developments as is the case in teaching.

According to Van der Berg, Spaul, Wills, Gustafsson, & Kotze (2016) there is a range of research that suggests that in-service teacher development is most likely to be effective when it builds on and strengthens what teachers already do in the classroom, rather than introducing sudden and fundamental changes in teaching practice from outside sources. In-service courses that lack relevance to the day-to-day work of teachers in schools (decontextualized) make it less likely that training will be reflected in improved classroom practices. The effectiveness of approaches to in-service teacher development will be significantly influenced by factors such as the knowledge and skills of participating teachers (content and pedagogy), the characteristics of their teaching environments (teaching context) and the expectations of the school curriculum (what I need to know).

Currently, the Integrated Strategic Planning Framework for Teacher Education and Development in South Africa (ISPFTEDSA), 2011–2025, (Department of Higher Education and Training and Department of Basic Education, 2011) is government's plan for inset training of teachers. It places teachers at the centre of efforts to improve their capacity, encouraging them to take responsibility for their own development. The main intended outcome is to improve the quality of teacher education and development in order to improve the quality of teachers and teaching and learning.

Aligning to ISPFTEDSA mandate, SUNCEP has recently developed new Continuing Professional Learning (CPL) programmes called the Advanced Diploma in Education (ADE), accredited by the South African Qualifications Authority (SAQA). Contained in these CPL programmes are short courses aligned to the ADE in Mathematics, Natural-, Life- and Physical Sciences, and endorsed by the South African Council of Educators (SACE). The ADE is a NQF level 7 qualification designed and developed to fulfil the recognized need of providing a well-rounded, broad education that equips currently serving teachers with the subject content knowledge base, pedagogical theory and methodology that will enable them to demonstrate competence and responsibility as academics and professionals.

The ADE qualification is intended to create opportunities for capacity enhancement for currently serving teachers in a specific learning area/subject, by demonstrating focused knowledge and pedagogy in any teaching context. This qualification is designed to develop, mentor- and lead teachers, which are the target categories stipulated in the Integrated Strategic Planning Framework for Teacher Education and Development in South Africa.

This longitudinal research study will focus on the influence that an Advanced Diploma in Education in Mathematics Teaching will have on the practices of currently serving (INSET) mathematics teachers, in the Intermediate (IP), Senior (SP) and Further Education and Training (FET) phase, in the Limpopo (Thabazimbi district), Western Cape and Northern Cape province of South Africa.

## **4. LITERATURE REVIEW**

### 4.1 Teacher perceptions of professional development

According to Avidov-Ungar (2016) professional development (PD) takes place throughout the professional life of the teacher and it is governed by personal perceptions (cognitive), personal commitment (affective) but at the same time also influenced by regulations and policy within a system that manages PD from the top down. However, the need for the teacher to be part of any professional development programme is ultimately linked to their worldview and how it can contribute to this worldview. It is also vital to the development of curriculum change and teacher professional knowledge (Ha, Lee, Chan, & Sum, 2004). At any given moment, teachers locate themselves at various stages on the professional development continuum, informed by various needs whilst reflecting on their personal motivations and aspirations. For some teachers, perceptions on PD are linked to their personal values, beliefs and ideologies. Teachers' perceptions on PD are also linked to intrinsic motivation, that is, sense of self-satisfaction by embracing the challenges that come with learning and applying new knowledge and skills, and extrinsic motivations, that is, the seeking appreciation for the work they have done from others and the associated expectations others have for or of their work (Avidov-Ungar, 2016; McMillan, McConnell, & O'Sullivan, 2016). This led Avidov-Ungar (2016) to note that when teachers are involved in any kind of PD, the perception is that some want to develop laterally, that is, becoming an expert in a certain area of teaching, and some do it to develop horizontally, that is, to acquire skills and knowledge to occupy more senior positions.

However, it must be noted that PD must be viewed as a process and not as an event; implying that PD should not be a once off event, but a continuous and sustained process, if it is to address a personal, professional and institutional need. It also requires that the leader of the school/educational institution, plays an active role in initiating and supporting collaboration amongst teachers, government, parents and educational experts to maintain and nurture a healthy learning environment within the school or institution. Successful reforms, via PD, requires the commitment of all stakeholders, especially the teachers.

Further highlighting the challenges around teacher training in South Africa, another report entitled *Identifying binding constraints in education* by Van der Berg, Spaul, Wills, Gustafsson, & Kotze (2016, 8) indicates that

A large body of local research has shown that many teachers lack basic levels of content knowledge and pedagogical skills. The Southern Africa Consortium for Monitoring Educational Quality (SACMEQ) 2007 study assessed Grade 6 Mathematics teachers as well as their learners. This study showed that only 32% of Grade 6 Mathematics teachers in South Africa had desirable subject knowledge in Mathematics, compared with considerably higher proportions in other countries such as Kenya (90%), Zimbabwe (76%) and Swaziland (55%).

Offering further evidence of the above, Van der Berg et al. (2016), states that as a consequence of these finite workshops with no practical implementing component, teacher training had not produced the quality of teachers South Africa needed – a testament to this is the poor results of our systemic (WCED, ANA and NSC) examinations. They also revealed that the methods of teacher training in South Africa are still unsuitable as the training does not address the challenges of transforming content knowledge into practice. Van der Berg et al. (2016) indicates that a range of research suggests that in-service teacher development is most likely to be effective when it builds on and strengthens what teachers already do in the classroom, rather than introducing sudden and fundamental changes in teaching practice from outside sources. In-service courses that lack relevance to the day-to-day work of teachers in schools (decontextualized) make it less likely that training will be reflected in improved classroom practices. Studies done by Badri, Alnuaimi, Mohaidat, Yang, & Al Rashedi (2016), Hustler, McNamara, Jarvis, Londra, & Campbell (2003) and McMillan et al. (2016), the authors purport that the availability of collaboration, time, long-term commitment and resources are important for the successful implementation of PD.

They also noted that:

- Teachers found PD meaningful when the impact was transferable in the classroom and guided their practice.
- Professional development programmes had the most impact on teaching if it focused on knowledge of curriculum, content knowledge, student evaluation and assessment.
- Within PD, policy makers should consider including professional learning spaces to address the medium- and long-term needs of teachers, whereby teachers are involved and take ownership of their own PD.
- Most notable barriers to PD for teachers are linked to conflicts with their personal and professional work schedules, financial costs of courses, travelling vast distances to attend PD and the lack of incentives associated with PD.
- Teachers find PD most meaningful if it could be customized to their personal, professional lives and linked to their institutional needs.
- Teachers noted that some of the most formative learning experiences occur when there is any form of peer-to-peer interactions with colleagues. This could be done via mentoring, establishing professional learning communities, etc. or any opportunity that could create a platform to share and exchange knowledge of content, contexts, skills and resources.
- Sometimes, institutional needs take preference over professional needs. Professional development programmes should strike a balance between the two.
- Older teachers (especially male teachers) tended to have a more negative attitude towards PD. They linked their involvement in PD to institutional and national policy interests. Younger teachers (irrespective of gender), were more positive in attitude towards PD. They perceived PD as being of professional interest to them.
- Mentoring was viewed as adding value to their professional learning. The notion of having an objective voice to guide you and who is privy to outside experiences and the opinions of others while exchanging ideas with others are appreciated.

The effectiveness of approaches to in-service teacher development will be significantly influenced by factors such as the knowledge and skills of participating teachers (content and pedagogy), the characteristics of their teaching environments (teaching context) and the expectations of the school curriculum (what I need to know). Teachers still lack the basic content and pedagogical skills required to adapt their practices to ever-changing contexts in order to teach effectively.



This aligned to the NEEDU (2012) report that stated that after evaluating teacher education programmes, and while acknowledging the successes of some of these programmes, much still needs to be done to bridge the gap between theory and practice.

To bridge the theory-practice divide, researchers such as Webster-Wright (2009) and Boud & Rooney (2011) suggest that we make the paradigm shift from viewing professional development to professional learning. We should reframe professional development as continuous professional learning and thus move away from the notion of development being once off, to learning being a lifelong concept; embedding the notion of continuous professional learning into the reality of what we do and not outside of where teachers practice.

#### 4.2 SUNCEP approach to teacher training

Considering the challenges mentioned above, SUNCEP initiated an in-depth study on literature exploring, analysing and critically evaluating theories, approaches and practices related to professional learning, teacher education and teaching practice. Through this analysis, the literature indicates that practice-based professional learning is increasingly being touted as an alternative means of teacher education to address the impediments linked to teacher training that is too focussed on theory and not linked to the context in which teachers deliver their teaching practice.

This led SUNCEP to adopt a very broad philosophical positioning that learning should be an embodied, continuous and lifelong process; focussing on the professional learning of teachers within an epistemological framework linked to knowledge acquisition as a human activity related practice. This philosophical and epistemological positioning led SUNCEP to shift towards a practice-based approach to teacher professional learning, using practice theory as a theoretical framework. Using this philosophical positioning and epistemological approach led SUNCEP to conceptualise components of its practice-based teacher professional learning approach within its Advanced Diploma in Education (ADE) Mathematics and Science teacher training courses for the Intermediate Phase (IP), Senior Phase (SP) and Further Education and Training Phase (FET). These components include contact sessions for learning new knowledge or strengthening and transforming existing knowledge; mentoring to offer support for the teacher to bridge the theory-practice divide in teaching; practice-based assignments to implement new strategies and ideas in their teaching, and e-resources to offer teachers ideas on e-learning in the classroom.

Utilising and adapting Guskey's (2002) framework for evaluating professional development, the purpose of this study is to determine the influence the ADE in Mathematics teacher training has on currently serving mathematics teachers in the IP, SP and FET phase, in the Limpopo, Western Cape and Northern Cape provinces, utilising a practice based teacher professional learning approach.

## **5. THE ADVANCED DIPLOMA IN EDUCATION**

### **5.1 Western Cape**

The ADE IP mathematics teacher training programme in the Western Cape had all the components of the SUNCEP practice-based teacher professional learning approach. The funding granted to SUNCEP, in 2018, by the Western Cape Education Department made provision for 25 IP mathematics teachers to register and complete an ADE in IP Mathematics teacher training at Stellenbosch University. Recruitment of the course participants were done by the Western Cape Education Department (WCED) in late 2018. The teachers were to be recruited from all major education districts in the Western Cape of South Africa. The course currently has 25 participants.

The contact sessions were held at the Cape Teaching and Leadership Institute (CTLI) in Kuilsriver in the Western Cape. This is the official in-service teacher training institute of the WCED. The contact sessions were held during the school holidays, which meant that the teachers from the various education districts in the Western Cape had to travel to the CTLI. Those who came from rural areas were housed in the hostels at the training facility for the duration of the contact sessions. The duration of these ADE programmes is two-years (24 months) part time. For this cohort of teachers in this research report, 2020 is the second year of the programme and this report is linked to their experiences of the course during their first year. The successful candidates are expected to graduate with their diplomas in December 2020.

### **5.2 Northern Cape**

The three programmes in the Northern Cape had all the components of the SUNCEP practice-based teacher professional learning approach. The funding granted to SUNCEP from the SIOC Community Trust made provision for 85 mathematics teachers to register and complete an ADE in Mathematics teaching at Stellenbosch University. Recruitment of the course participants were done in conjunction with the Northern Cape Education Department, in particular the John Taolo Gaetsewe (Mothibistad) and ZF Mgcawu (Upington) education district officials, as stipulated by the funder.

Thirty mathematics teachers per district were to be recruited. In addition, 25 mathematics teachers from the Thabazimbi education district of the Limpopo Province were also supposed to be recruited. The teachers from Thabazimbi municipal district were geographically located within a region served by the Godisang Trust, a subsidiary trust of the SIOC Community Trust.

Initially the 85 teachers were to be registered for an ADE in SP and FET mathematics teaching only. However, due to the limitations of the area from where the teachers were to be recruited regarding suitable candidates, this limited the number of mathematics teachers that was initially recruited. After consulting with the relevant liaison person from the SIOC Community Trust, it was agreed that we could include natural science teachers and thus deliver a course in ADE Natural Science teaching. This was a crucial decision as SUNCEP did not want the opportunity of offering 85 teachers a professional learning opportunity to improve their pedagogical skills and content knowledge to go astray: albeit it only for natural science and mathematics teachers. SUNCEP is currently administering three practice-based teacher professional learning ADE programmes in the Northern Cape. These are:

- ADE in SP Mathematics teaching
- ADE in SP Natural Science Teaching
- ADE in FET Mathematics teaching.

The contact sessions were held in Kathu during the school holidays, which meant that the teachers from the Thabazimbi municipal district had to be bussed in. All teachers on the ADE programme were accommodated at guesthouses in Kathu and all meals were catered for. The travel costs were also covered by the funder and managed by SUNCEP. The duration of these ADE programme is two-years part time. The first year of the programme took place in 2019 and the programme is expected to be completed in December 2020, with the graduation of successful candidates taking place in December 2020 or March 2021. This report excludes the Natural Science teachers as SUNCEP is still awaiting ethical clearance in order to conduct research with the Natural Science cohort.

## 6. THEORETICAL FRAMEWORK

The theoretical framework used for this research report is based on an adaptation of the Guskey (2002) framework for evaluating teacher training programmes, and will focus on the following levels, namely, (1) Participants perceptions, (2) Participants learning, (3) Organisational support and change, (4) Participants use of new knowledge and skills. **As this is a longitudinal study this report focusses only on evidence linked to level 1 of the research study. Data for this report, linked to level 1, was obtained via an online questionnaire completed by each respondent after being on the ADE programme for 12 months (1 year). To complete this study, further interviews and questionnaires will be conducted to collect data focusing on levels 2, 3 and 4, with a subsequent report(s) to follow.**

This research report will thus focus on:

### 6.1 Level 1: Participants perceptions

This level focusses on the reactions/perceptions or the experiences of the participants whilst being part of a practice-based professional learning programme, such as the Advanced Diploma in Education (ADE): Mathematics Teaching. The information required to look at the course participants reactions whilst being on an ADE, will be gathered via a questionnaire and/or open-ended interview type question. The aim of this part of the study is to determine the participants' satisfaction with the programme, and how the data gathered could be used to improve programme delivery on future ADE's.

## 7. RESEARCH QUESTIONS

### 7.1 Main research Question

What influence does an Advanced Diploma in Education: Mathematics Teaching have on enhancing the teaching practices of currently serving mathematics teachers, in the Intermediate, Senior and/or Further Education Training phase, in the Limpopo, Western Cape and Northern Cape Provinces of South Africa?

### 7.2 Sub-question

- What are the course participants' (or respondents) perceptions about attending an Advanced Diploma in Education: Mathematics Teaching programme?

## 8. METHODOLOGY

### 8.1 Research design

This research study will adopt a mixed methods approach in that both quantitative and qualitative data will be collected. For this research report, as part of the broader research study, a survey design was utilized.

### 8.2 Population and sampling

Participants were drawn from teachers enrolled for the ADE Mathematics teacher training programme in the IP, SP and/or FET phase. All students enrolled will be invited to participate in the study. Those who agree to be research participants will be asked to complete and sign a research consent form, as prescribed by the ethics committee at Stellenbosch university.

### 8.3 Methods of data collection and analysis

An online questionnaire (see Appendix A) was administered to gather the respondents' perceptions about their experiences whilst on the course (see Appendix A). The questionnaire was administered using the SUNSurvey platform at Stellenbosch University. The research participants were given two weeks to complete the questionnaire with reminders sent by the principal investigator at regular intervals. Using basic Excel, a statistical analysis of the data from the questionnaires were done.

## 9. ETHICAL CONSIDERATIONS

### 9.1 Validity and reliability of instruments

- Piloting of instruments to ascertain validity and reliability
- Proposal to be submitted to REC for ethical clearance after instruments have been finalized
- Institutional permission to be obtained from SU, Limpopo Department of Education (LDoE), Northern Cape Education Department (NCED), Western Cape Education Department (WCED) and principals of participating schools
- Consent forms to be completed by facilitators and participating teachers

## 9.2 Risks and Benefits

We do not foresee any appreciable risk or discomfort that will arise from participating in this study. Questions will be posed in general terms. This is a minimal risk and participants will not be asked to divulge personal information. There will be no direct benefit to learners participating in this study.

## 9.3 Consent

Written informed consent will be obtained from all ADE mathematics training teachers who volunteer to be research participants or respondents. Consent scripts will be in English.

## 9.4 Voluntary participation

Participants will be informed of their right to withdraw from the study at any point without facing any negative repercussions.

## 9.5 Coercion and perverse incentives

There will be no undue incentives to those who will consent to form part of the study where asked and participants will neither be intimidated nor compelled to take part in the study. Any kind of coercion and issuing of perverse incentives is seen as a breach of ethical conduct and is deemed to be unethical.

## 9.6 Confidentiality

SUNCEP will treat information collected via interviews and/or questionnaires in a confidential manner. Information collected will only be made accessible to people authorised to assist with data capturing and investigators involved in the analysis and write-up of study results. Data collected electronically will be stored on password-protected computers and network drives. Hard copies of interview and questionnaire data will be stored in locked cupboards, offices or store rooms at the researcher's office when not in use for data entry or analysis. No names or personal identifiers will be recorded in any of the data collection tools.

## 10. DATA ANALYSIS AND FINDINGS

### 10.1 Level 1: Participants perceptions

A survey, via a questionnaire, was done with all research respondents, in the Western Cape, Northern Cape and Limpopo (Thabazimbi), after year 1 of attending the course. As indicated in the theoretical framework above, the purpose of this survey was to obtain their initial perceptions of the course after year one. As indicated in the literature review, teachers' perceptions of teacher training initiatives are linked to their personal values, beliefs and ideologies. It is also linked to their levels of intrinsic motivation, where fulfilling a personal need is highlighted and extrinsic motivation, seeking appreciation from others for what they have achieved. It is thus worth noting that their current perceptions could be influenced by their personal beliefs, values and ideologies. Levels of intrinsic or extrinsic motivation will also influence their responses on how they perceived the course after year one.

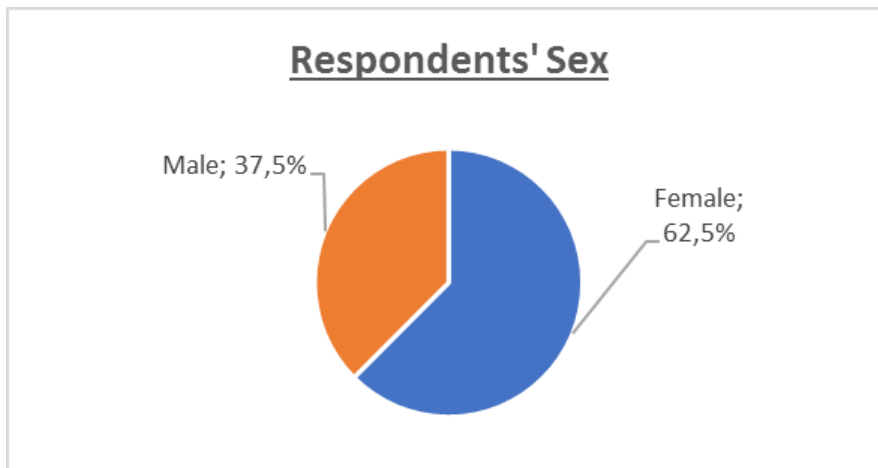
The questionnaire (see appendix A) required the research respondents to either complete items on a Likert type scale or provide qualitative comments on certain aspects of the course. The items in the survey were divided into the following sections:

- Demographics of respondents
- Programme experience linked to course logistics
- The perceptions of the course facilitators and facilitation skills
- The course material and its links to addressing the respondent's content and pedagogical needs.
- Overall perceptions/impressions of the course thus far

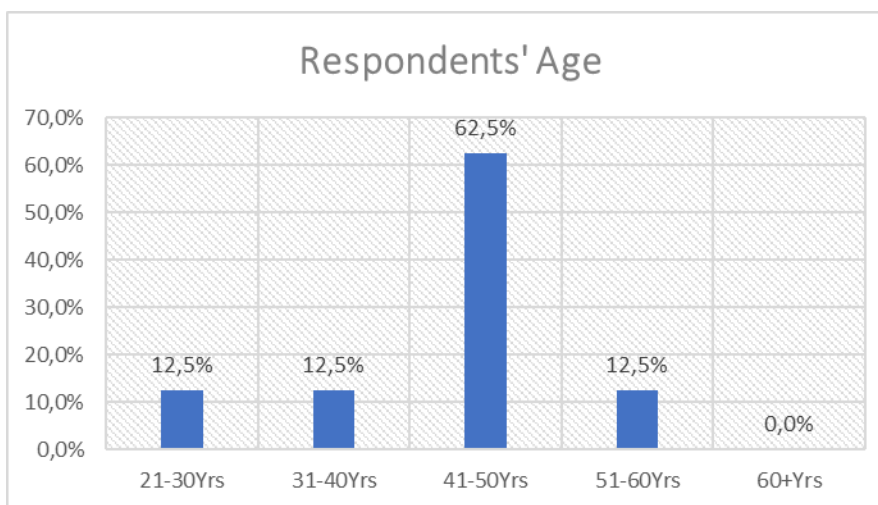
#### 10.1.1 Western Cape ADE

The respondents were all course participants on the ADE IP mathematics teaching course, recruited from various education districts across the Western Cape. The perceptions of the course respondents about the ADE after year one, will be reported under the headings listed above. In terms of the reliability and validity of the survey instrument, namely, the questionnaire, the researchers calculated the **Cronbach's alpha ( $\alpha$ ) coefficient**, which measures reliability, or internal consistency. "Reliability" is how well a questionnaire measures what it should. For this questionnaire, the **Cronbach's alpha ( $\alpha$ ) coefficient** was 0.79, which is regarded as good, and an indication that the survey instrument is reliable and consistent in terms of what the researcher wants it to measure. The respondent rate was also 32%, which, in terms of quantitative studies, is considered an acceptable response rate.

(a) Demographics of research respondents

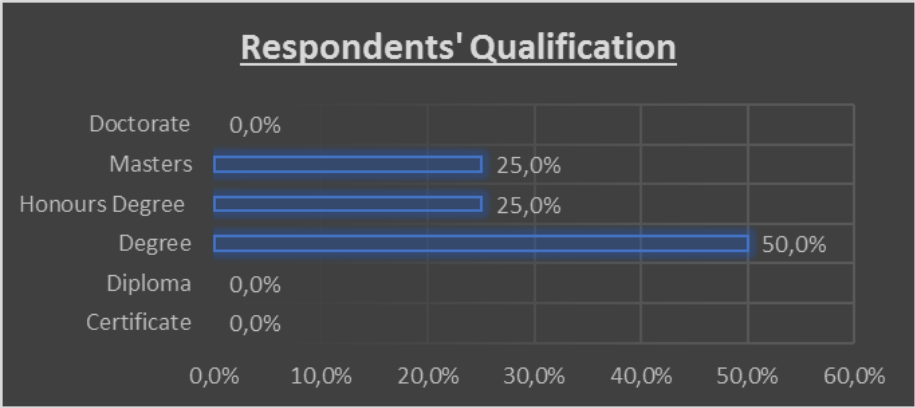


Majority of the respondents were female, which is in line with the gender distribution of the course participants on the IP ADE mathematics teacher training course, where most of the ADE IP mathematics teaching course participants are female. This is also in line with provincial and national trends of having more female teachers than male teachers teaching intermediate phase.

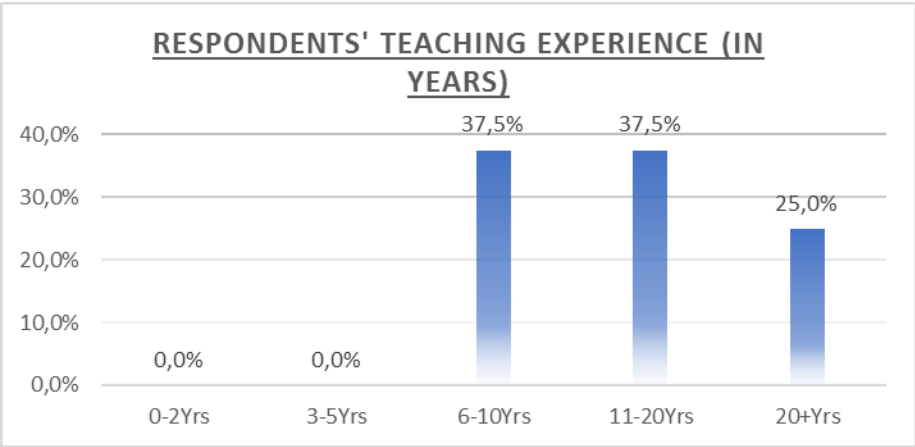


Majority of the respondents were middle aged, implying that a more experienced perception could be given of the ADE course in relation to other courses that they may have attended.

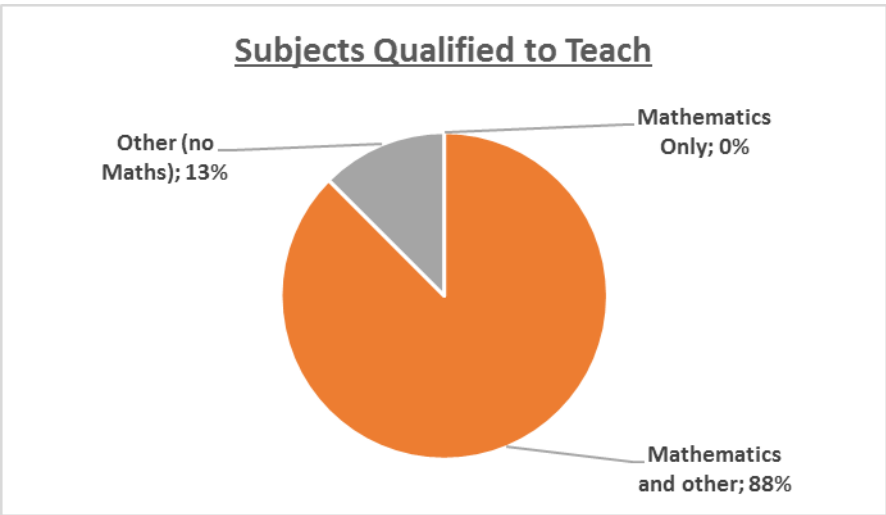




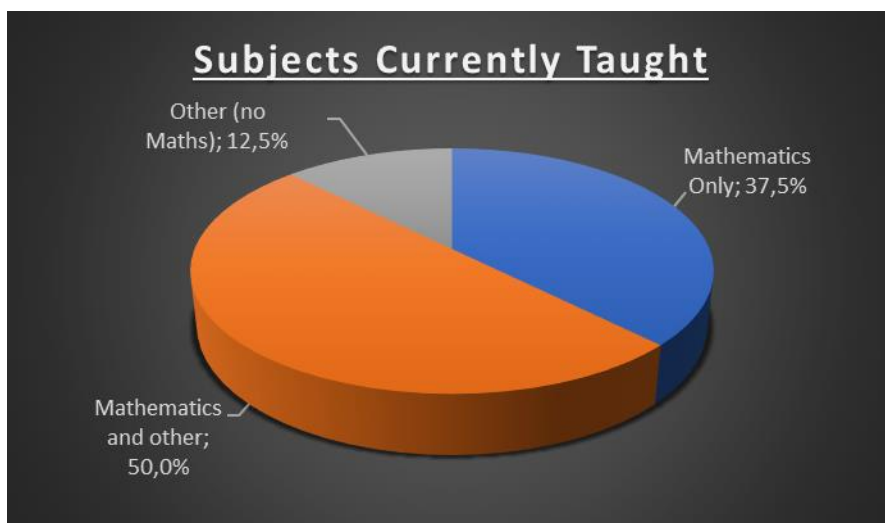
All respondents have a degree and higher qualification.



Interesting statistic here is that all the respondents have more than 6 years of teaching experience. This implies that these respondents could have been involved in more than one teacher professional learning experience and thus could make reasonable comparisons regarding their current experiences with others which they may have attended.

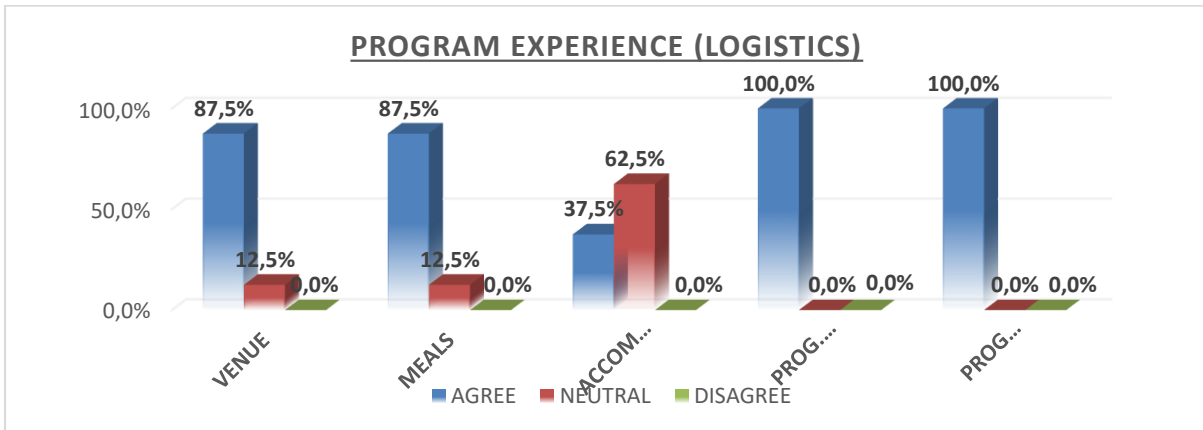


Except for one respondent who is not a qualified mathematics teacher, the rest are qualified to teach mathematics with one other subject. As schools are rationalized due to learner numbers dropping, many teachers are now beginning to change their teaching specialization in order to avoid being declared redundant and thus in excess. Hence many teachers, via the Advanced Certificate in Education (ACE) course in mathematics teaching, learn new content and pedagogical skills within a new subject and attend the ADE course to strengthen that new content and pedagogical skills, to become specialists in that subject. Other teachers have entered the ADE course with an Advanced Certificate in Education (ACE) in mathematics, not necessarily starting out with a mathematics teaching qualification when they first qualified as teachers.



It must be noted that teachers do not always teach the subject they have majored/specialised in during their initial teacher education (ITE) programme. In schools teachers are placed in accordance with the needs and requirements of the school. With our respondents, most are either teaching mathematics only or mathematics and another subject. However, there are cases where a teacher could start the course teaching mathematics, but due to timetable reshuffling based on the school's staffing requirements, may not be teaching mathematics for that year. This can be quite challenging for this particular teacher as a course participant as the course assessments require applications of pedagogies and critical reflections thereof in the teaching of the mathematics.

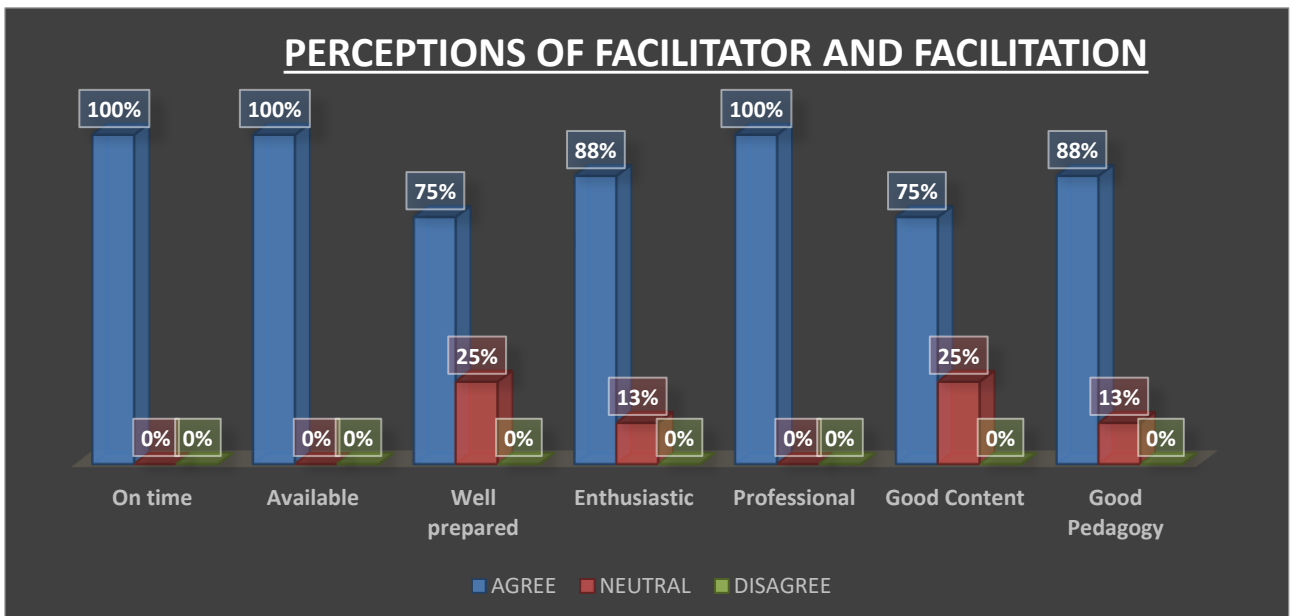
(b) Programme experience linked to course logistics



Generally, the respondents are pleased with how the programme was managed and administered. The programme manager, programme administrator and CTLI staff were visible throughout the contact sessions and accessible during and after each contact session via telephone, email and WhatsApp to address any student concerns.

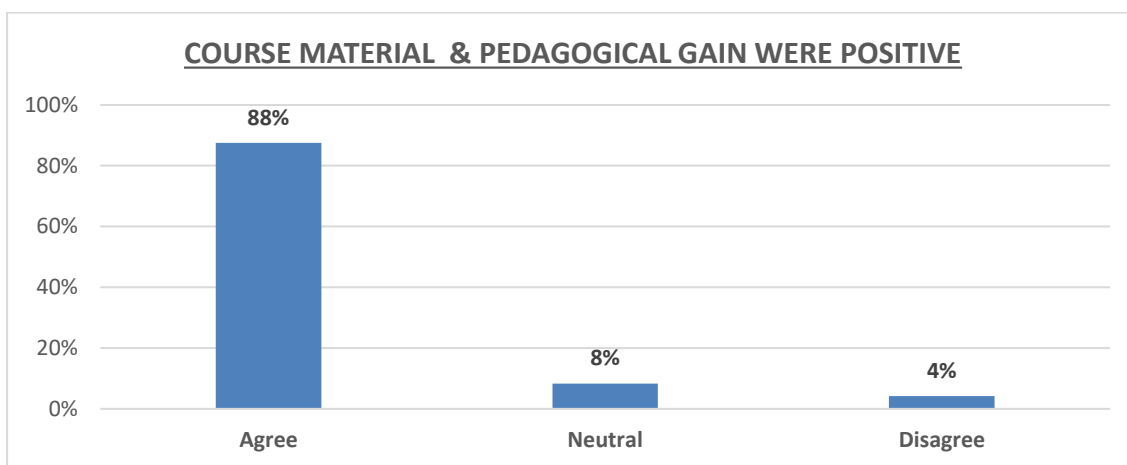
Despite initial teething problems with the course delivery, venue, accommodation and catering, these were addressed timeously as the programme progressed, and solutions were collectively sought and acted upon by all role players.

(c) The impressions of the course facilitators and facilitation skills



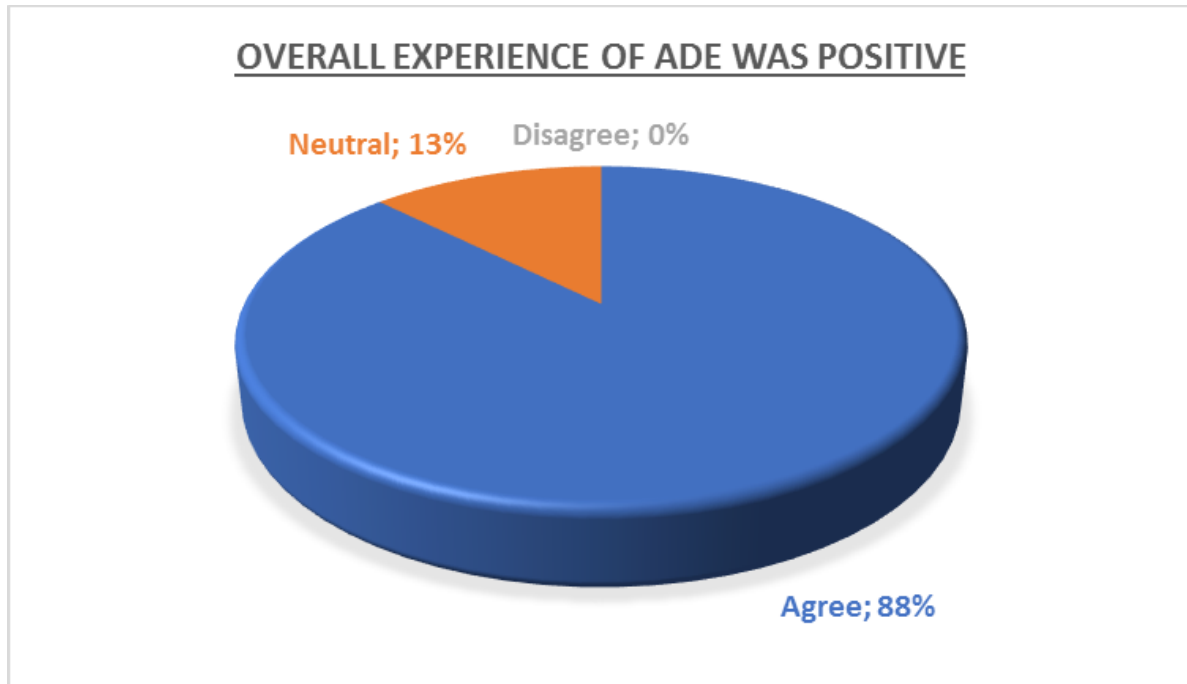
SUNCEP conducts briefing sessions before and after each contact session with all facilitators on all the ADE programmes. These sessions ensure that the academic quality and integrity of the programme is ensured and sustained. All facilitators are evaluated by the Centre for Teaching and Learning at Stellenbosch University. Once the analyses are available, these results are shared and discussed with each facilitator via the programme manager. As we expect all course participants to act in a professional manner, the facilitators were expected to lead by example. After each session, at the end of each day and during and after each contact session, facilitators availed themselves to address any student concerns. The latter is stipulated as one of the facilitator's responsibilities when they are selected to facilitate. Facilitators are also expected to keep pace with the student's ability to grasp important concepts and theories. The aim is to improve the understanding of important concepts and theories and not to leave any student behind. For this reason, the students appreciated the high levels of content and pedagogical knowledge of the facilitators.

- (d) The course material and its links to addressing the respondent's content and pedagogical needs.



This item was included to get a sense of whether the programme was addressing the content and pedagogical needs of the respondents. It would seem that the respondents are positive about how the course is addressing their content and pedagogical needs. However, this aspect will be further investigated with an additional survey to be administered after the March 2020 contact session, which will investigate the second level of this research, namely, what influence the course has had on their professional learning of new knowledge and skills.

(e) Overall perceptions/impressions of the course thus far



This graph should be viewed in conjunction with some of the respondent's comments below:

- This is a meaningful and learning full course for me. I enjoy it very much and love the networks that I have formed with my fellow students and lecturers.
- It's a course with new innovation and helping in avoiding the recipes
- I thank you for having the initiative for this course. It really was a need and a great experience. Thank you.
- I have enjoyed the course and look forward to 2020.
- It's helping me a lot my teaching style and approach has been changed in a positive way.
- I have adopted new strategies in teaching
- My learners results have improved and their interest in mathematics has also improved.

There were initial challenges at the start of the course, but by listening to the teacher's needs, most challenges were addressed. Overall, the respondents appreciated the efforts by all role players to ensure that the course was delivered with integrity and that the academic quality was not compromised.

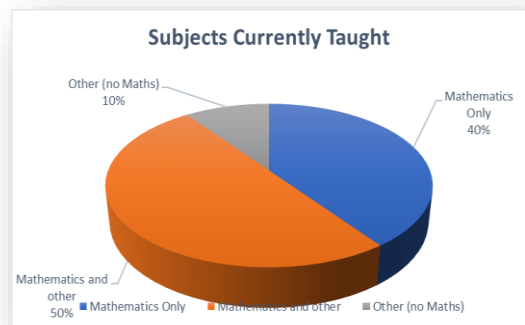
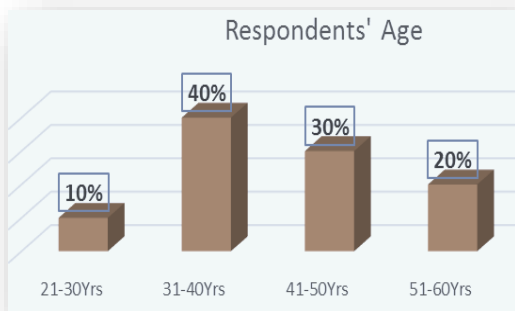
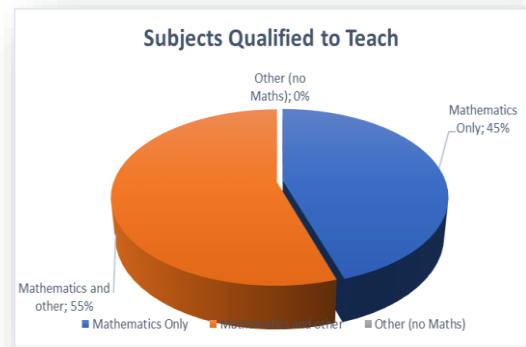
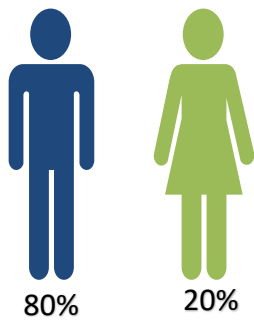
#### 10.1.2 Limpopo and Northern Cape ADE

The respondents were all course participants on the ADE SP and FET mathematics teaching course, recruited from the John Taolo Gaetsewe (JTG) and ZF Mgcawu (ZFM) education districts in the Northern Cape and from the Thabazimbi municipal district in Limpopo. The perceptions of the course respondents about the ADE after year one, will be reported under the headings listed above. In terms of the reliability and validity of the survey instrument, namely the questionnaire, the researchers calculated the **Cronbach's alpha ( $\alpha$ ) coefficient**, which measures reliability, or internal consistency.

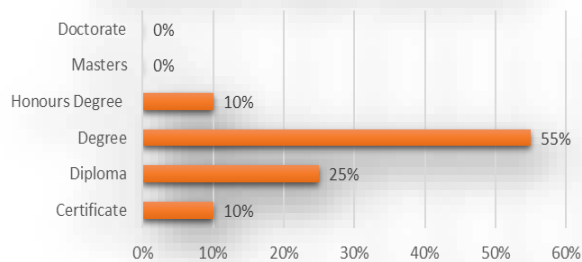
"Reliability" is how well a survey measures what it should measure. For this questionnaire, the **Cronbach's alpha ( $\alpha$ ) coefficient** was 0.79, which is regarded as good, and gives an indication that the survey instrument is reliable and consistent in terms of what the researcher wants it to measure. The respondent rate was also 36%, which is considered an acceptable response rate in terms of quantitative studies.

(a) Demographics of respondents

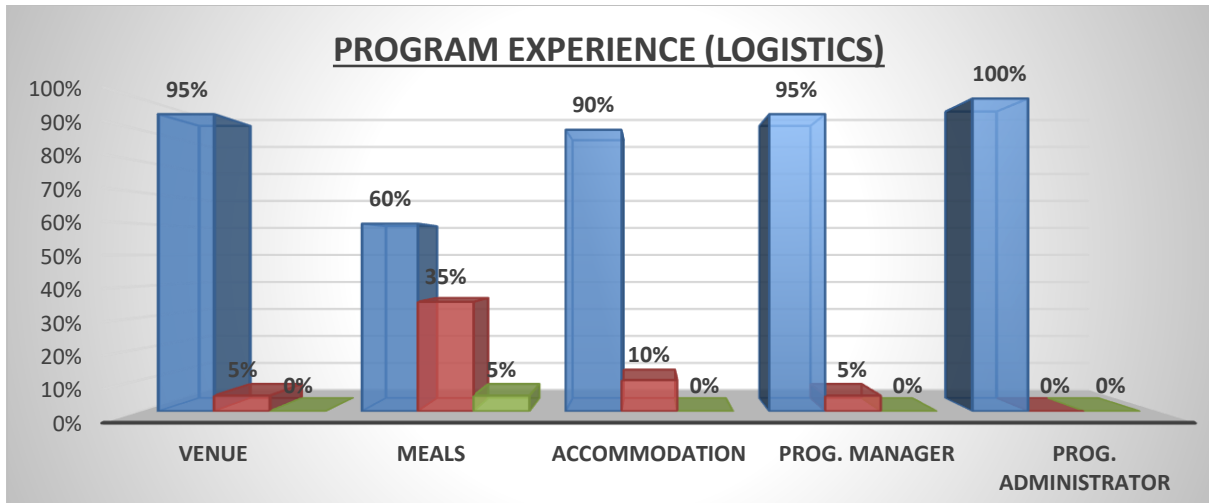
The majority of respondents seem to be experienced teachers. Most have a degree and are qualified to teach mathematics in conjunction with another subject. It would appear that some of them are either teaching mathematics only or mathematics and another subject. However, there are cases where a teacher starts the year teaching mathematics, but due to timetable reshuffling, may not be teaching mathematics afterwards. This can be quite challenging for this teacher as a course participant as the course assessments require applications of pedagogies and critical reflections thereof in the teaching of the mathematics.



Respondents' Highest Qualification

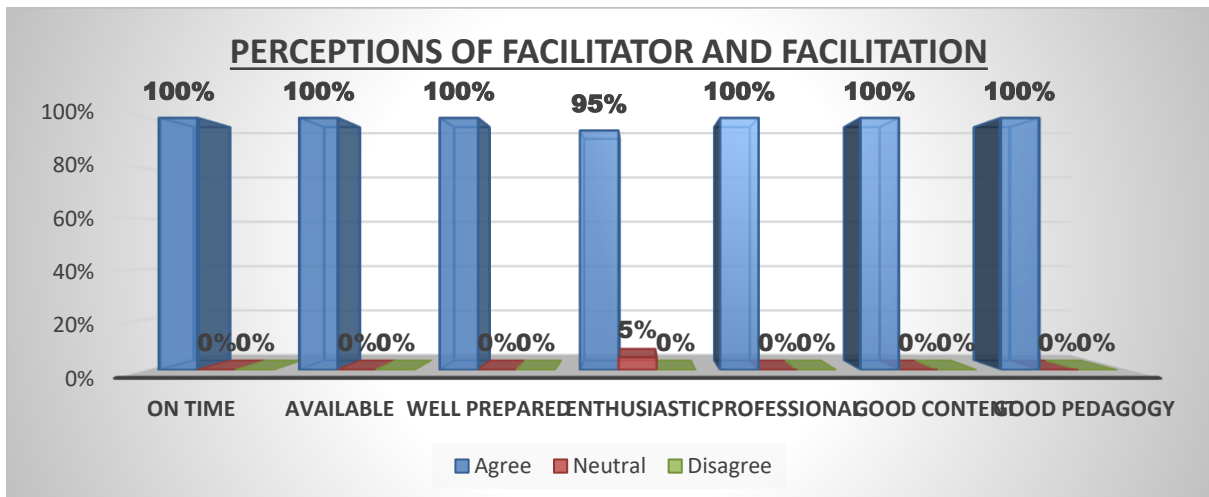


(b) Programme experience linked to course logistics



The respondents were generally pleased with the logistical arrangements of the course. Given the unique context that many had to travel vast distances to the training venue, SUNCEP made every effort to ensure that their meals, accommodation and training venue were of a high standard. There were challenges in the beginning, but due to the accessibility of the programme manager and the administrator as well as the CTLI staff, these challenges were addressed amicably, professionally and timeously.

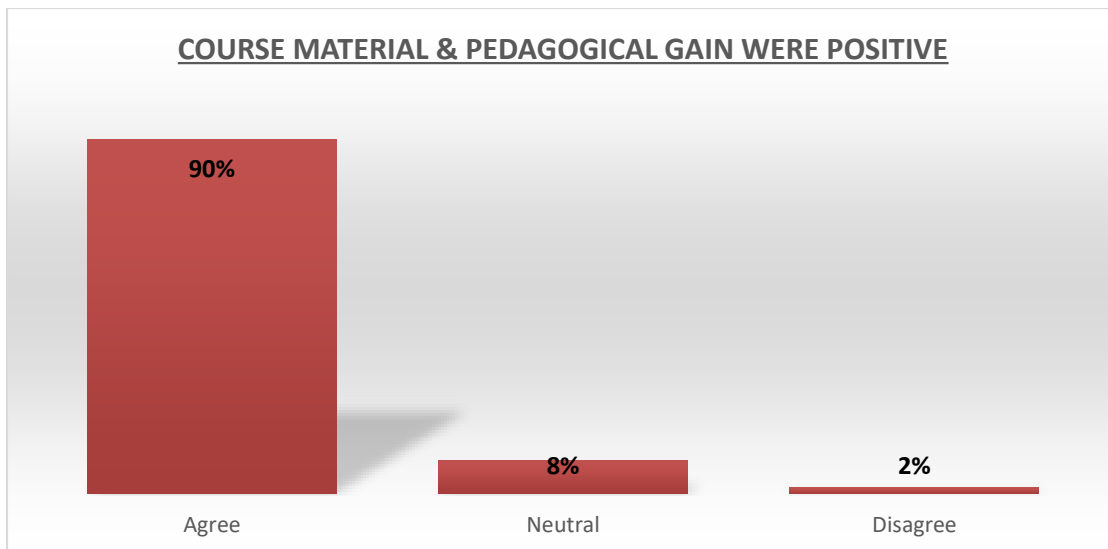
(c) The perceptions of the course facilitators and facilitation skills





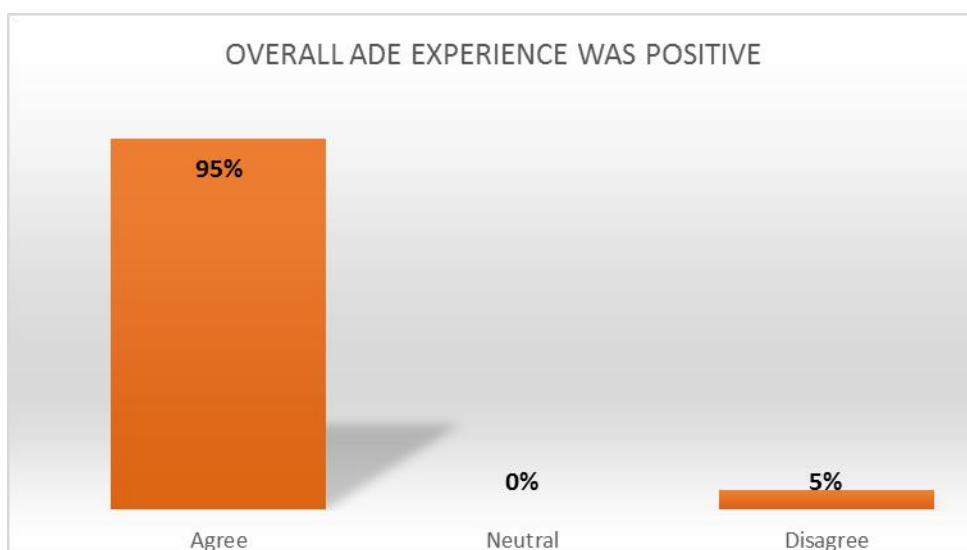
SUNCEP is always aware of the time that teachers spend away from home and the vast distance teachers have to travel to attend teacher training programmes. It is for this reason that SUNCEP must ensure that our facilitators offer meaningful opportunities for learning new content and pedagogies. SUNCEP facilitators are thus obliged to attend training sessions whereby they are orientated to the teaching and learning philosophy of SUNCEP.

(d) The course material and its links to addressing the respondents' content and pedagogical needs.



In line with offering the best opportunities for teaching and learning, SUNCEP also ensured that all course material addressed their content and pedagogical needs positively.

(e) Overall perceptions/impressions of the course thus far



This graph should be viewed in conjunction with the comments from the respondents below:

- Would like to further my studies and do in depth research in trying to find solutions for Africa
- The course has rekindled my interest in mathematics teaching.
- i gained new knowledge from the modules
- I have learn new things as well as refreshed my mind
- The course is helpful in coming up with different approaches to different topics
- It enlightens me with the new content and new approaches to learners with different behaviour and attitude
- i gained much skills in the way I execute my duties as an educator.
- It is really helping me to get back to basics and find different approach that is conducive for my learners.
- I have implemented the knowledge i have gained from the ADE course and have seen great changes in my classrooms.
- ADE courses developed me a lot because it assess on how far was content knowledge and how to teach different techniques during the lesson and to reach the solution.
- I am of the opinion that a person should do the readings before the course is even started. To ensure the context of the course is already as a foundation. Reading material was very overwhelming
- The programme is excellent as it gives opportunity to practising teachers to share their pedagogical knowledge in various mathematics topics. The experience of other teachers and the knowledge of facilitators has help me a lot in reshaping my teaching approaches especially varying the methods. Its been an awesome experience so far.
- It helped me to grow as a teacher and to look for alternative methods to approach teaching. It stimulated me to think about my thinking and know about my knowing.

There were initial challenges at the start of the course, but by listening to the needs of the teachers, most of these challenges were addressed. Overall, the respondents appreciated the efforts made by all role players to ensure that the course was delivered with integrity and that the academic quality was not compromised.

## 11. CONCLUSION

From the data provided it seems apparent that the respondents in the Northern Cape, Limpopo (Thabazimbi district) and the Western Cape are positive about their perceived experiences on the ADE programme thus far. The format of the ADE programme will appear to be addressing the content and pedagogical needs of the respondents. However, this data only reflects the perceptions, which is level 1 of the research project, of the respondents after their first year on the ADE programme. To further validate these perceptions, a follow up survey, using a questionnaire, linked to level 2 of this research project and which looks at the level of the respondents professional learning whilst on the course, will be conducted with each respondent in 2020. Interviews will also be conducted with each respondent in 2020 which will be used to triangulate the level one and two survey data.

## 12. WITH APPRECIATION

- The Northern Cape Education Department, the Western Cape Education Department and the Limpopo Department of Education for granting the researchers permission to conduct this research.
- The funders of the ADE programme which are:
  1. Sishen Iron Ore Company-Community Development Trust (SIOC-CDT) in the Northern Cape and Limpopo province.
  2. The Education, Training and Development Practices Sector Education and Training Authority (ETDP SETA) in the Western Cape.
- The mathematics teachers on the ADE programme who consented to be research participants.
- To SUNCEP for providing the funding for this research study
- To the research assistant who diligently collected and assisted in transcribing and analysing the data.

## 13. APPENDIX A

### **ADE LEVEL 1 SURVEY QUESTIONS**

#### **Demographics of respondents**

1. Are you (Female/Male)
2. How old are you?
3. What is your highest teaching qualification?
4. How many years of teaching experience do you have?
5. What subjects are you qualified to teach?
6. What subjects are you currently teaching at your school?
7. Have you been part of any other diploma or certificate teacher professional course offered at SUNCEP?
8. If you answered YES above: Please state the name of the SUNCEP course you attended before ADE
9. Any other comments about the questions above?

#### **Programme experience linked to course logistics**

10. The venue utilized for the lectures was comfortable and conducive for learning
11. The meals provided were of good quality
12. The accommodation provided was suitable for me
13. The program manager was accessible and available for discussions about the course
14. The program administrator was accessible and available for discussions about the course
15. Any other comments relating to the questions above?

#### **Perception of the facilitator(s) and facilitation**

16. The lecturer/facilitator was always on time
17. The lecturer facilitator was approachable and available for discussions about the course
18. I could keep pace with the lecturer/facilitator
19. The lecturer/facilitator was well prepared for the sessions
20. The lecturer/facilitator's enthusiasm stimulated my interest in the sessions

21. The lecturer/facilitator handled the training session(s) in a professional manner
22. The lecturer/facilitator demonstrated high levels of content knowledge
23. The lecturer/facilitator demonstrated high levels of pedagogical knowledge
24. Any other comments related to the questions above?

**The course material and its links to addressing the respondent's content and pedagogical needs.**

25. The course material/resources were well packaged and easy to use
26. I could keep pace with the course materials and facilitators
27. The course has helped me in addressing my teaching and pedagogical needs
28. Any other comments related to the questions above?

**Overall perceptions/impressions of the course thus far**

29. Overall, the Advanced Diploma in Education course so far has been a positive experience for me
30. Any other comments regarding your experiences on the ADE course thus far?

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