

Research Article

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An Empirical Analysis of Correctional Centre Mathematics Educationists' Disposition Towards Translingual Instructions

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Abstract

Background/purpose. Despite the findings on the value of using multilingual pedagogies, the role of translingual instruction in adult correctional centre mathematics classrooms remains unrecognised. In this paper, we present an empirical analysis of the dispositions of correctional centre mathematics educationists towards translingual instruction.

Materials/methods. Scaccia's (2014) Readiness Theory served as a lens for the study. The study was framed within the QUANT-QUAL explanatory sequential research design. We utilised both qualitative and quantitative data drawn from questionnaires and semi-structured interviews. Qualitative data were analysed thematically. *SPSS* was used to analyse quantitative data using a t-test to assess the mean difference between negative and positive questionnaires.

Results. Quantitative findings showed that positive questionnaire scores were higher than negative questionnaire scores. To determine whether this difference was statistically significant, the t-value of 3,472 (which exceeds the critical value of 2,045) was used to conclude that educationists have positive dispositions towards translingual instruction. From the qualitative findings, three themes emerged: (i) educationists' synonymous conceptualization of translingual and code-switching instructional approaches; (ii) the translingual instructional approach as a resource for actualizing concept-based curriculum; and (iii) educationists' perception of translingual strategies as scaffolds for decolonizing offender education. Based on the themes, we identified the misapprehension of differences between code-switching and translingual instruction. The themes further surfaced educationists' positive dispositions towards translingual instruction.

Conclusion. We conclude by underscoring the critical role that fostering supportive educationists' dispositions to translingual instruction can play in improving adult offenders' mathematics performance. We subsequently recommend the need for the transfiguration of Languages of Learning and Teaching within adult offender mathematics classrooms, thus challenging the adult education policy framework to a deliberate multilingualism in adult mathematics learning situations.



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1. Introduction

Offender mathematics education has been identified as an integral rehabilitation strategy, which promotes offender behaviour transformation and successful societal reintegration. International scholars such as Roessger et al. (2021) and Wang et al. (2024) assert that learning mathematics in correctional facilities has enduring impacts on offenders' lives during and after incarceration, including the development of emotional, cognitive, and practical skills. The combination of these skills supports a smooth transition from incarceration to community life (Fazel & Baillargeon, 2011; Higgins, 2021). South African scholarly studies further associate offender mathematics education with reductions in recidivism, the development of critical thinking and problem-solving skills, and improved employability prospects prior to incarceration (Mbatha & Khohliso, 2025). Other scholars have identified that offender mathematics education fosters civic responsibility, equipping offenders with the skills and values to contribute meaningfully to their communities upon release (Esperian, 2010; Khan & Ali, 2020). While the body of scholarship underscores the critical need for offender education, the language used in the teaching and learning of mathematics in adult correctional centre classrooms, and its impact on the performance of adult offenders, remains obscure. Mathematics and language are conceptually inseparable (Kapadia, 2021); therefore, studies whose focus is on offender mathematics education cannot seclude language issues, particularly given the preponderance of multilingualism in both "normal" and "protected spaces.

In this paper, we sought to evaluate the dispositions of correctional centre educationists towards the use of translingual instruction. The following research question was used as the guideline for this research endeavour:

-What are educationists' dispositions towards translingual instruction in adult correctional centre mathematics classrooms?

This study was informed by the problem of mathematics underperformance in adults and children, which is arguably influenced by linguistic factors (even though not ostensibly so). The problem was calibrated using findings from large-scale international studies, such as the Trends in Mathematics and Science Study of 2023. The latter findings align with those focusing on adult offenders' underperformance in mathematics (Mbatha, 2024a, 2024b; Mbatha et al., 2024). In this study, we sought to probe beneath adult offenders' substandard performance in mathematics by investigating the role of andragogic translanguaging repertoires among mathematics educationists. Underpinning the study was the hypothesis drawn from the scholarly works of Guzula and Abdulatief (2024), which underscored the establishment of translanguaging spaces as a means towards making translanguaging a "norm" rather than a "problem".

What distinguishes the study from the preceding bodies of scholarship is its concentration on adult offender mathematics teaching, which is debatably an under-researched terrain, particularly since the advent of the humanistic approach to imprisonment. Furthermore, the present study investigates educators' andragogical practices through a translingual lens, particularly in the context of the designation of language barriers in adult offenders' mathematics classrooms.

2. Literature Review

The literature review, in this paper, was arranged as follows:

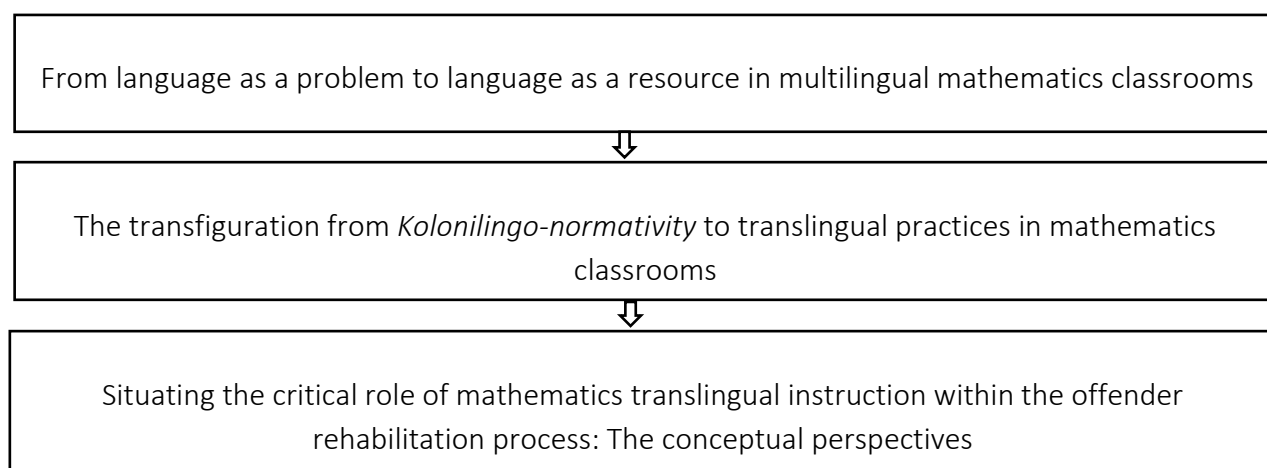


Figure 1. Architecture of the literature review of the study

2.1. From Language as a Problem to Language as a Resource in Multilingual Mathematics Classrooms

Several contemporary South African scholarly literatures, which are the progeny of Setati (2008) and Adler's (2000) work, argue for drawing learners' languages as resources for learning in mathematics classrooms (Marshall et al., 2023; Sapire & Essien, 2021; Tyler, 2016). However, literature from the late 1960's to the early 1970's identified language as a problem in multilingual teaching and teaching situations. In fact, the perception of language as a resource only surfaced as Ruiz's (1984) attempt to challenge the initial orientation to multilingualism that viewed language as a problem. While Ruiz (1984) outlined the generic notion of language as a resource, Phakeng et al. (2018), Planas and Setati-Phakeng (2014), and Barwell et al. (2016) situated the resourcefulness of language within the context of multilingual mathematics classrooms (although the central focus of the latter scholarly works was predominantly on code-switching).

2.2. Shifting from the Use of Code-Switching to the Deployment of Learners' Full Linguistic Repertoires

After the use of code-switching was criticized for causing linguistic setbacks in mathematics classrooms, numerous scholars framed the notion of language as a resource upon translanguaging (Claasen, 2024; Ndhlovana & Charamba, 2023; Robertson & Graven, 2024), thereby arguing for the use of learners' full linguistic repertoires for meaning-making and mathematics conceptual development. Furthermore, several scholars have argued that it [translanguaging] liberates multilingual learners (particularly those whose English is not their home Language) who are often silenced in classrooms where teachers insist on English proficiency (Guzula & Abdulatief, 2024).

2.3. Conflicting Perspectives on Translingual Pedagogies

Even though translanguaging has been perceived as the contemporary resource towards the development of cognition and learner-engagement in multilingual mathematics classrooms, two conflicting perspectives on translingual pedagogies [i.e. with that which argues that teachers disregard their translanguaging practices as legitimate on one hand, (Probyn, 2009), and that which identifies teachers' translingual instructions as resourceful for meaning making on the other (Makonye, 2019; Probyn, 2021)] have divulged the need for studies whose focus is on probing into teachers' dispositions towards translingual instruction. Furthermore, the scantiness of studies whose focus is on mathematics adult offenders' educationists' translingual practices and their (educationists') dispositions towards translanguaging andragogical practices underscores the critical need for studies focusing on translanguaging, particularly since multilingualism has become ubiquitous in correctional centre classrooms.

2.4. The Transfiguration from Kolonilingo-Normativity to Translingual Practices in Mathematics Classrooms

The latter section of the literature review revealed the role of multilingualism in children's learning and teaching of mathematics, while also accentuating the need to explore the role of translingual strategies in adult offender mathematics education. In this section, we utilize literature to construct the argument for the decolonial approach to language use in adult correctional centre mathematics classrooms. By drawing on Quijano (2007), Maldonado-Torres (2007), and Mignolo's (2007) argument that colonial language ideologies are the reason for the misrecognition of the role of multilingualism in meaning-making in mathematics classrooms, we hypothetically intersect monolingual practices with the repudiation of the use of multilingual pedagogies (particularly translingual strategies) in mathematics correctional centre classrooms. According to Maldonado-Torres (2007), despite the termination of colonialism, colonial thinking that privileges Western knowledge, language, and culture persists in the minds of both former colonisers and the formerly colonised (Ndhlovu & Makalela, 2021). Building on this scholarly postulation, we argue that the persistence of colonial thinking leads to the erasure and marginalisation of the languages of the colonised. To illustrate the ongoing coloniality, particularly in the context of mathematics teaching and learning, we draw on the concept of "Kolonilingo-normativity," coined by Guzula et al. (2016). The concept is the combination of isiXhosa's word "Koloni" and "lingo" (which signifies the language), and it [the concept of *Kolonilingo-normativity*] is used by the latter scholars to describe the normalised expectation that indigenous people must be proficient in colonial languages in the former colonies in the global South (see Guzula & Abdulatief, 2024). We used this concept to underscore, analyse, and determine the rationale for the continued use of monolingual pedagogy in adult mathematics correctional centre classrooms. We further intersected the *Kolonilingo-normativity* concept with Maldonado-Torre's (2007) argument that teacher education, pedagogy, and curriculum policies in South Africa breathe coloniality every day. This point of intersection underscores both the critical need to explore educationists' dispositions towards translingual instruction and the need to promote multilingualism in adult offender mathematics classrooms. Again, while the South African Language in Education Policy endorses additive bilingualism and multilingualism (Dorambari, 2021), we argue that the lack of government support for the implementation of the Language in Education Policy, which promotes multilingualism (particularly in adult offenders' mathematics classrooms), is manifested through the prescription of English as the Language of Learning, Teaching, and Assessment. As a matter of fact, the Adult Basic Education and Training Act of 2000 and the Manual for Educationists of 2016 (which are policy documents that aligned with the Curriculum and Assessment Policy Statement) legitimize the use of English as the sole medium through which offenders learn, are taught, and assessed (Mbatha, Khohliso, Zondi, et al., 2025). This monolingual learning and instructional ideology arguably minimizes meaning-making and mathematics conceptual understanding, particularly since several neuroscience studies have shown that multilingual instructional and learning approaches parallel mathematics conceptual understanding (Janssen et al., 2021; Susac & Braeutigam, 2014).

2.5. Situating the Critical Role of Mathematics Translingual Instruction Within the Offender Rehabilitation Process: Conceptual Perspective

Although multilingualism has been identified as a resource for and towards the advancement of understanding within the context of mathematics classrooms (Planas & Setati-Phakeng, 2014), several scholars still acknowledge the complexity of teaching and learning in contexts of language multiplicity, thus problematising the language-as-resource metaphor (Essien & Moleko, 2025; Essien, 2018). In fact, Planas and Setati-Phakeng (2014) point out that, due to the complexity of teaching and learning in linguistically diverse contexts, a monolingual orientation that privileges one language over others is still preferred to the adoption of multilingual pedagogies. While the rationale behind the prevalence

of (Planas & Setati-Phakeng, 2014) monolingual orientation within multilingual mathematics contexts is still obscure, the contemporary scholarly postulation that minority language speakers often claim the right to education in their home language, thus deprecating language plurality in mathematics classrooms (Barwell et al., 2019) can be used to hypothesise the continuing complexity of language use within multilingual mathematics classrooms. In fact, the South African Curriculum and Assessment Policy Statement of 2012 designates English as the only Language of Learning and Teaching in mathematics classrooms, while non-native speakers of English contest the instruction and learning of mathematics solely through their home language. Again, qualitative and quantitative studies have recognized translanguaging as an effective instructional method, particularly for teaching mathematics to learners whose home language is not English. Nhongo and Tshotsho (2019), for example, argue for the fluid use of English and African indigenous languages within the South African mathematics context, thereby opposing the total abandonment of English as the sole language of instruction. In fact, several studies, particularly those contextualised within South African mathematics teaching and learning settings, advocate for the fluid use of English alongside African indigenous languages to make meaning in mathematics classrooms (also see Ndhlovana & Charamba, 2023).

From the latter review of literature, we draw two conflicting views (the one for monolingual practices on one side and the one for multilingual pedagogies on the other). We then argue that they (conflicting views) create what can be theorised as the "contemporary antithetical perspectives on language use within mathematics multilingual contexts." These perspectives, we argue, have the potential to intersect, particularly if English is integrated and used fluidly alongside learners' home language to advance meaning-making in mathematics classrooms (see the illustration in Figure 2 below).

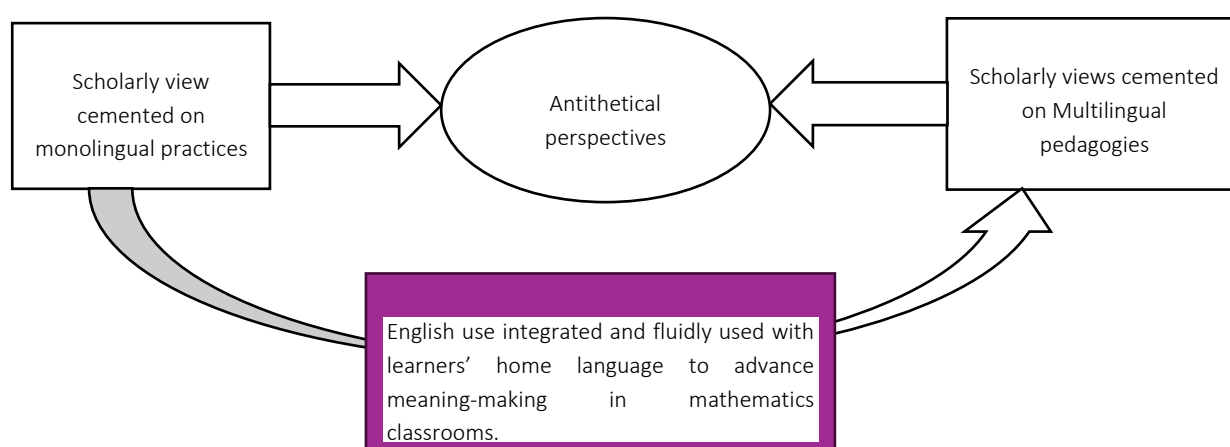


Figure 2. Contemporary Antithetical Perspectives on Language Use Within Mathematics Multilingual Contexts

While scholars have presented polarized views on the role of language(s) of instruction in mathematics classrooms (i.e., monolingual practices versus multilingual pedagogies), it is worth noting that children's mathematics learning contexts have been the central focus in this regard. Even large-scale studies on international assessments and performance in mathematics focus on children's mathematical performance and its intersection with language proficiency (see the Trends in International Mathematics and Science Study of 2023 and the Program for International Student Assessment of 2023, for example). The question of whether and how the polarization of these debates translates to adult mathematics learning contexts has been bedeviling scholars for some time. Even though Mbatha (2024) attempted to explore the role of translanguaging in adult offender

mathematics learning, the central focus of the study was adult offenders' perspectives on its use. While the study inferred findings that gesture towards the positive correlation and the statistically significant impact of translanguaging to mathematics within adult correctional centre classrooms, there is still a need to explore educationists' dispositions towards translanguaging instruction, particularly since most of them presumably were trained to use monolingual instruction and develop learners' English proficiency in the process of teaching and assessing mathematical knowledge (Cardimona, 2018; Lee & Desjardins, 2019; Lee & Lee, 2019; Moschkovich, 2012; Moschkovich, 2013). The findings from this research endeavour will, hypothetically, aid in situating the critical role of translanguaging instruction across the entire offender rehabilitation cycle. As a matter of fact, the role(s) of language(s) of instruction were overlooked in Cracknell's (2022) attempt to investigate factors that catalyse the perfection of and the completion of the offender rehabilitation cycle.

3. Methodology

3.1. Contextualizing the Study

The study was contextualised within one of the correctional centres in the province of KwaZulu-Natal. While one of the researchers was conducting a study on adult offenders' use of translanguaging in the learning of mathematics, it was noted that translanguaging (by adult offenders) is informed by the attitudes, understandings, and dispositions held by educationists towards translanguaging instruction. We subsequently endeavoured to investigate educationists' dispositions towards translanguaging instruction. We were further drawn to the fact that the adult offenders converse through translanguaging, while they are expected to learn mathematical concepts solely through the medium of English. We therefore probed beneath educationists' dispositions towards translanguaging and translanguaging instruction, because we had established the hypothesis that their (educationists') adherence to monolingual pedagogies emanates from their dispositions towards translanguaging instruction. In this regard, we endeavoured not only to observe language use within adult correctional centre mathematics classrooms, but also to define it in accordance with the attitudes and dispositions of educationists, particularly towards translanguaging instructions.

3.2. Research Method

In this study, we adopted a pragmatic epistemological stance, acknowledging both quantitative and qualitative data as pertinent to the inquiry into the dispositions of educationists towards translanguaging instruction. Ten mathematics educationists were purposively sampled from the total population of 25 (n=25) educationists rendering formal education services within the selected correctional centre. The educationists sampled taught mathematics across AET levels in both medium and maximum sub-correctional centres within the selected correctional centre.

Participants were informed of anonymity and confidentiality. We also informed the participants that their participation was purely voluntary and that they were not deprived of the right to withdraw at any time should they wish to do so. Likewise, all participants signed forms indicating their consent to participate in the study. We sought and acquired the gatekeepers' permission from the South African National Commissioner of the Department of Correctional Services. We further applied for and acquired ethical clearance to conduct the study. The validity of the data was ensured by the triangulation of two data collection tools (questionnaires and semi-structured interviews). Prior to collecting qualitative data, we requested that the proceedings be recorded using a tape recorder. To ensure the accuracy of the data translation (from isiZulu to English), we used the expertise of a language expert, who evaluated the appropriateness, tone, and style of the translated text. Permission to record semi-structured interview proceedings and questionnaire results was obtained from participants.

3.3. Research Design

We framed the study within the QUANT-QUAL explanatory sequential mixed methods research design, which uses quantitative data to explain qualitative findings. This research design was suitable for this study, which used both quantitative and qualitative methods. We used qualitative data inferred through semi-structured interviews to provide an in-depth explanation, interpretation, and understanding of quantitative data. We further intersected the two research methods to provide a better understanding of the complex reality of educationists' dispositions towards translingual instruction.

3.4. Research Participants or Population and Sample

Ten mathematics educationists were purposively sampled from the total population of 25 ($n=25$) educationists rendering formal education services within the selected correctional centre. The educationists sampled taught mathematics across AET levels in both medium and maximum sub-correctional centres within the selected correctional centre. Participants were informed of anonymity and confidentiality. We also informed the participants that their participation was purely voluntary and that they were not deprived of the right to withdraw at any time should they wish to do so. Likewise, all participants signed forms indicating their consent to participate in the study. We sought and acquired the gatekeepers' permission from the South African National Commissioner of the Department of Correctional Services. We further applied for and acquired ethical clearance to conduct the study. The validity of the data was ensured by the triangulation of two data collection tools (questionnaires and semi-structured interviews). Prior to collecting qualitative data, we requested that the proceedings be recorded using a tape recorder. To ensure the accuracy of the data translation (from isiZulu to English), we consulted a language expert, who evaluated the appropriateness, tone, and style of the translation. Permission to record semi-structured interview proceedings and questionnaire results was obtained from participants.

3.5. Instruments

In this study, we utilized two data collection instruments. The quantitative strand of data was collected through structured questionnaires, both positive and negative. The qualitative data were collected through semi-structured interviews.

3.6. Data Analysis

We analysed quantitative data using SPSS with a paired-samples *t*-test. Using the paired samples *t*-test on quantitative data, we sought to assess the mean difference between the negated and positive questionnaires. Qualitative data, on the other hand, were analysed using the thematic approach, which involved coding the data, observing patterns within the codes, and subsequently identifying emerging themes.

4. Quantitative Results

4.1. Test of Normality

Scholars have noted that when normality assumptions do not hold, drawing accurate and reliable conclusions from data becomes infeasible (Ghasemi & Zahediasl, 2012; Hinton et al., 2014). In this study, we used the Shapiro-Wilk test to assess whether the questionnaire data were normally distributed. The Shapiro-Wilk test was further conducted to determine whether comparisons should be made using a parametric or non-parametric test. For the Shapiro-Wilk test, the criterion for normality is an alpha value greater than .05 ($p > .05$). The Shapiro-Wilk test indicated that the questionnaire data were normally distributed. Furthermore, the Shapiro-Wilk test results indicated that the null hypothesis should be accepted (see the normality table below).

Table 1. Normality test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Negated questionnaires	,125	10	,200*	,089	10	,090
Positive questionnaires	,125	10	,200	,089	10	,090

According to the normality test table, for both positive and negative questionnaires, there were no statistically significant differences between the data and normality; in other words, the data were normally distributed (p -value = 0.090, which is greater than 0.05).

4.2. Paired Sample T-Test, which was Run for Negated and Positive Questionnaires

The hypothesis for the paired samples t -test was as follows:

The null hypothesis: The difference between the paired sample means is equal to zero (that is, the positive and the negative mean scores are the same).

$$H_0: \mu_1 - \mu_2 = 0$$

The alternative hypothesis: The difference between the paired sample means is NOT equal to zero (that is, the positive questionnaire score mean differs significantly from the negative questionnaire score mean).

$$H_1: \mu_1 - \mu_2 \neq 0$$

The following paired-samples test was used to determine whether the educationists' questionnaire scores differed significantly.

Table 2. The Paired Samples Test

		Paired Differences					T	Df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	Scores from positive questionnaires – scores from negated questionnaires	5,4000	2,49395	0,67563	2,60376	10,07623	3,472	10	<.001	<.001

According to the paired-samples test results in Table 2, the difference between the positive and negative questionnaire means is positive, indicating that the positive questionnaire scores were higher than the negative questionnaire scores. To determine whether this mean difference is

statistically significant, the t -value must exceed the critical value of 2,045. From the paired samples test, the t -value is 3,472, which is greater than the critical value of 2,045.

$$7,276 > 2,045.$$

5. Presentation and Discussion of Qualitative Data

While we were thematically analysing qualitative data, three prevalent themes emerged. Although the themes appear to be discrete, we discovered overlapping pieces of data, which subsequently caused them [themes] to converge and intertwine (see figure 3 below). Furthermore, we coordinated pieces of data to address the following research question:

-What are educationists' dispositions towards translingual instruction in adult correctional centre mathematics classrooms?

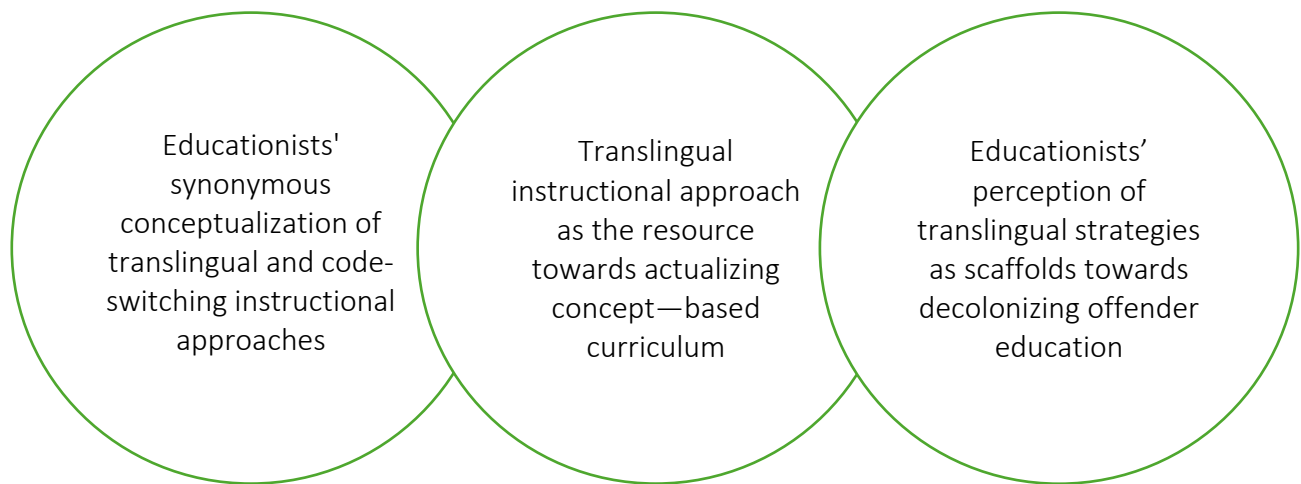


Figure 3. Themes

5.1. Educationists' Synonymous Conceptualization of Translingual and Code-Switching Approaches

The paradigm shift from multilingualism as a problem to multilingualism as a resource yielded the waves of multilingual pedagogies, which include code-switching (Grobler, 2018; Setati et al., 2009), code-mixing (Songxaba, 2011), plurilingualism (Tshuma & Theledi, 2023), and translanguaging (Mbatha, Khohliso, & Nsele, 2025). These waves of multilingual pedagogies, we argue, are connected by “language wavelengths, thus making it difficult to disentangle and dichotomise one multilingual pedagogy from the other. In fact, several scholars have identified similarities between code-switching and translanguaging (Probyn, 2021; Strauss, 2016), thereby leading to a synonymous conceptualisation of the two (as latter multilingual pedagogies). While contemporary scholars disentangle translanguaging from code-switching by drawing on the episteme of fluid language use for meaning-making (García, 2017; Makalela, 2018a, 2018b; Nkadameng & Makalela, 2023), the perspicuous difference between translingual and code-switching instructional approaches has long bedeviled scholars and educators. The synonymous conceptualisation of translanguaging and codeswitching, we argue, has adverse pedagogical implications, particularly in the teaching of mathematics. Probyn's (2021) definition of translanguaging as the deployment of learners' full linguistic repertoires without adhering to defined boundaries of named languages, and Setati et al.'s (2009) conceptualisation of code-switching as the practice of alternating between two (or more) languages, is the matrix within which the synonymous conceptualisation of the two language practices can be drawn. Conceptualising and using the two language practices as though they are synonymous, we argue, might confine the instruction of mathematics within the boundaries of two

languages, thereby prohibiting educationists from drawing on offenders' linguistic repertoires to make mathematical meaning. Furthermore, from a concept-based curriculum perspective, deeper conceptual understanding of mathematics is achieved solely through translingual instruction (Mbatha, Khohliso & Nsele, 2025). In contrast, codeswitching has been shown to cause setbacks in the understanding of the mathematics register (Mbatha, 2024). While, from the latter postulation, we divulge the pedagogical adverse effects of using and conceptualising translanguaging and code-switching as the unitary language practice, studies reveal that the synonymous conceptualisation of translanguaging and code-switching is particularly apparent in mathematics classrooms owing to the multi fold language uses, which include the use of mathematics register (Wilkinson, 2018) and the language through which mathematics is taught, learnt and assessed (Moschkovich, 2015).

The findings inferred from this study revealed that while educationists have positive dispositions towards translingual instructional approaches, they (educationists) conceptualise translanguaging as code-switching, thus making it difficult to establish whether they employ these two multilingual pedagogies concurrently in their mathematics teaching practices. For example, Educationist A indicated that for the past seven years, he has been switching between English and isiZulu (even though his idea of switching was contextualised within translingual strategies).

Educationist A

I have taught mathematics for seven years in this correctional centre. I have found switching between English and isiZulu resourceful. I use both isiZulu and English to explain mathematical concepts, while I attempt to translate mathematical terminology to isiZulu.

The verbatim words of educationist A revealed that he conceptualises translanguaging and code-switching as similar multilingual pedagogies. In fact, his mention of translating mathematical terminology into isiZulu further reveals that, in his view, code-switching, translanguaging, and translation are tantamount. This conceptual overlap among the three multilingual pedagogies complicated his understanding of his dispositions towards translingual instructional approaches, particularly because he also displayed a positive disposition towards code-switching, which has been criticized for causing linguistic setbacks in multilingual mathematics classrooms (Faloye & Olaniyan, 2020). Furthermore, in his verbatim words, there was no clear linguistic status of the adult offenders in terms of monolingualism, bilingualism, and multilingualism, thus raising the question of whether translation is a pertinent pedagogical strategy in correctional centre mathematics contexts.

Educationist B exhibited that she does not understand what translanguaging is, thus she conceptualises it as code-switching. Worth noting, however, was that her illustration of how she teaches equations revealed the use of translingual instruction (see Verbatim words below):

Educationist B

I do not really know what translanguaging is; I just assume it is the same as code-switching, because during our university time, code-switching was the only pedagogical strategy recommended for teaching mathematics to multilingual learners. I am going to give you an example from one of my lessons. I hope it will help you understand how I use code-switching to teach equations:

$$2x+7=9$$

Ngiyabatshela ukuthi they should eliminate seven ngokufaka i-additive inverse yakhe. After that, kusala u-2x, bese ngithi abahlukanise u-x no-2 ngokudivayida ngo-2.

$$\frac{2x}{2} = (9 - 7) \div 2$$

$$X=2 \div 2$$

$$X=1$$

Lokhu kuchaza ukuthi you multiply 2 by one and add the answer by seven to get 9

While educationist B revealed that she conceptualises translinguaging as code-switching, the example she used to illustrate her mathematics instructional strategy resonates with the translingual approach. For example, she used isiZulu and English fluidly, by demolishing language barriers (Makalela, 2022) to help adult offenders make meaning of solving linear equations.

From the verbatim words of the two educationists, we conclude that code-switching and translinguaging are still conceptualised as synonyms. However, we identified that, aside from understanding translinguaging within the context of code-switching, educators have positive attitudes towards the use of translingual instructional approaches. We argue that the use of translingual instructional approaches instead of monolingual instructional approaches signifies educationists' divergence from monolingual ideologies, which promotes the development of understanding through the elevation of learners' proficiency in the language of English (Alisaari, Heikkola, et al., 2019; Alisaari, Vigren, et al., 2019).

5.2. Translingual instructional approach as a resource towards actualising concept-based curriculum

According to Erickson and Lanning (2013), the concept-based approach refers to the method of developing learners' factual knowledge, skills application, and deeper conceptual understanding concurrently. Language, according to Mbatha, Khohliso, Zondi, et al. (2025), is the scaffolding resource in the process of developing the three dimensions of mathematics (i.e., skills, facts, and concepts). This study found that educationists believe that translingual instruction is resourceful in developing the three dimensions of mathematics across the AET levels in correctional centre classrooms. Educationist C, for example, indicated that he uses translingual instructional approaches to intersect the development of procedural fluency with factual knowledge and conceptual understanding in the teaching of the Theorem of Pythagoras (see Verbatim words below).

Educationist C

Translinguaging is the best approach, especially when you want offenders to understand the mathematics content and apply it in real-life situations. Using different languages is always better than using English, especially since most offenders are not Home Language speakers of English. I am going to provide an example of how I use translinguaging to help (offenders) understand the know-how of mathematics, the fundamental knowledge, and its application in real-life problems.

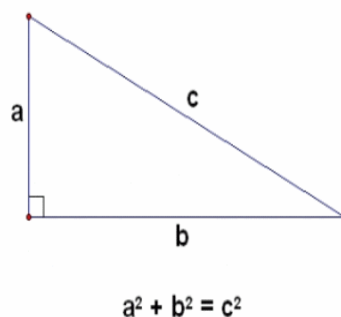


Figure 4. Illustration of the Theorem of Pythagoras in a right-angled triangle

The theorem: The square of the hypotenuse equals the sum of the squares on the other two sides (factual knowledge). It becomes easier for offenders to determine the length of the unknown side when two sides are known (application of skills). Kodwa, it becomes difficult ukubenza ba-applaye le theorem in real life. That is why I use the analogy of a ladder, thus giving them (offenders) the idea that the ladder represents the hypotenuse side, the wall the opposite side, and the ground the adjacent side (this is a deeper conceptual understanding).

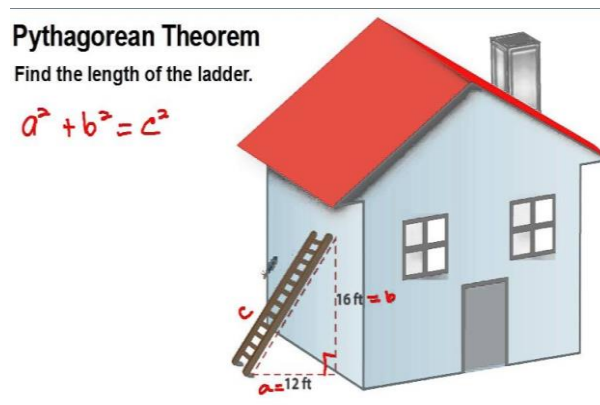


Figure 5. Illustration of the real-world application of the Theorem of Pythagoras

They get to see the applicability of the Yale theorem in real life, while I foster the advancement of the three dimensions of numeracy.

In my view, translanguaging practices are instrumental and important, particularly because we want our offenders to apply mathematical knowledge to solve real-life problems.

Educationist C revealed the positive disposition towards translanguaging instructional practices, thereby underscoring its relevance in actualising the concept-based approach. While the concept-based approach is advocated across children's and adults' mathematics learning situations (Chien, 2025; Giddens et al., 2012; Medwell & Wray, 2020), the body of scholarship focused on its relevance in the teaching of mathematics to adult offenders is minimal. Furthermore, the humanistic approach to imprisonment, as posited by Terrill et al. (2019), aims to prepare adult offenders for the world of skilled trade, and we argue that this preparation is actualised through the use of the concept-based approach. Of paramount importance is the perception of translanguaging instructional practices as resources for and towards realizing the development of the three dimensions of mathematics, which lead towards the preparation of adult offenders for the world of skilled trade.

To strengthen Educationist C's positive disposition towards translanguaging instructional approaches, we further draw on Mbatha and Khohliso's (2025) research findings, which underscore the central role of these approaches in constructing adult offenders' language identities, thereby centralising translanguaging as a resource for developing the three dimensions of mathematics. These findings identified that educators use translanguaging and the Sabela language to advance adult offenders' conceptual understanding of mathematics. Furthermore, the data from which Mbatha and Khohliso's (2025) were drawn indicated that educationists have positive attitudes towards translanguaging instructional approaches, owing to their positive correlation with adult offenders' mathematics performance.

In our attempt to analyse the latter findings through the lens of the Scaccia's (2014) Readiness theory, we argue that educationists' willingness, attitudes and dispositions towards translanguaging instruction determines the implementation of innovative teaching approaches particularly for the teaching of the curriculum aspect of the theorem of Pythagoras, thereby ensuring the understanding

of the skills application, factual knowledge and conceptual understanding (of the Theorem of Pythagoras) in adult correctional centre classrooms.

5.3. Educationists' Perception of Translingual Strategies as Scaffolds Towards Decolonizing Offender Education

The decolonisation of education and/or curriculum is defined by Makokotlela and Gumbo (2025) as a self-determination pedagogical strategy that seeks to counteract colonialised educational activities grounded in monolingual teaching approaches. While some scholars identify the integration of indigenous knowledge in higher education as a fundamental component of decolonised education practices (Le Grange, 2020), contemporary research underscores the use of multilingual pedagogies as an attempt to decolonise the curriculum. For example, Phakeng (2018) identifies the embracement of multilingualism as a decolonising strategy for the mathematics curriculum. While multilingualism (and multilingual pedagogies) has been advocated in contemporary Basic Education and Higher Education curriculum frameworks, research findings on how, and to what extent, multilingual pedagogies (translanguaging in particular) contribute to the decolonization of correctional education are arguably limited. In this study, we discovered that educators' perception of translanguaging as a decolonising pedagogical strategy leads to positive dispositions towards translingual instructional approaches. Educationist D, for example, highlighted that his impression of translingual instructional approaches is underpinned by the perception that it decolonises correctional education, which was initially presented in a Western format (see verbatim words below):

The idea of using translanguaging in the teaching of mathematics in this context (a correctional centre mathematics classroom) is very exciting to me. The content enshrined in our textbook aligns with the Western way of teaching mathematics, which is not relevant to the South African context. Ever since I started using translanguaging, I have always used Africanised examples, and that, for me, is very important because it helps offenders understand that solving mathematical problems is an "immediate" activity, which aids them in real-life situations. Think of addition and subtraction, for example. I think it is good practice to use immediate examples, such as cattle in the context of this farm correctional centre, to help offenders understand that addition is accumulation, whereas subtraction is elimination. I once used an example of cattle breeding and the death of calves due to the virus to illustrate addition and subtraction.

Educationist E supplemented the latter idea by indicating that adult offenders ought to be taught mathematics in a way that uses all their languages to illuminate mathematical conceptualisation.

Educationist E

I really love translingual instruction because you get to infuse adult offenders' language varieties into explanations of mathematical concepts and to foster understanding of procedural fluency. At some point, I use the *sabela* to explain critical mathematical concepts that I believe are not clearly understood when taught in English. I cannot think of any example right now, but I assure you that translanguaging and the use of offenders' *Sabela language* foster inclusivity while leading towards meaning-making.

The latter dispositions towards translingual instructional approaches indicate that it (translingual approaches) decolonizes the mathematics curriculum and catalyzes offenders' understanding of mathematical concepts. We argue that these dispositions inform educationists' teaching practices and elevate adult offenders' mathematics performance. In fact, by assembling upon Scaccia's (2014) theoretical ideas, we argue that educationists' perception of translingual instructional approaches as decolonising resources underscores their readiness to embrace multilingualism, and subsequently lead to the expanded use of translanguaging (both as learning and teaching strategies), which, in our

view, is an innovative approach for and towards the teaching of mathematics within correctional centre classrooms (see figure 6 below).

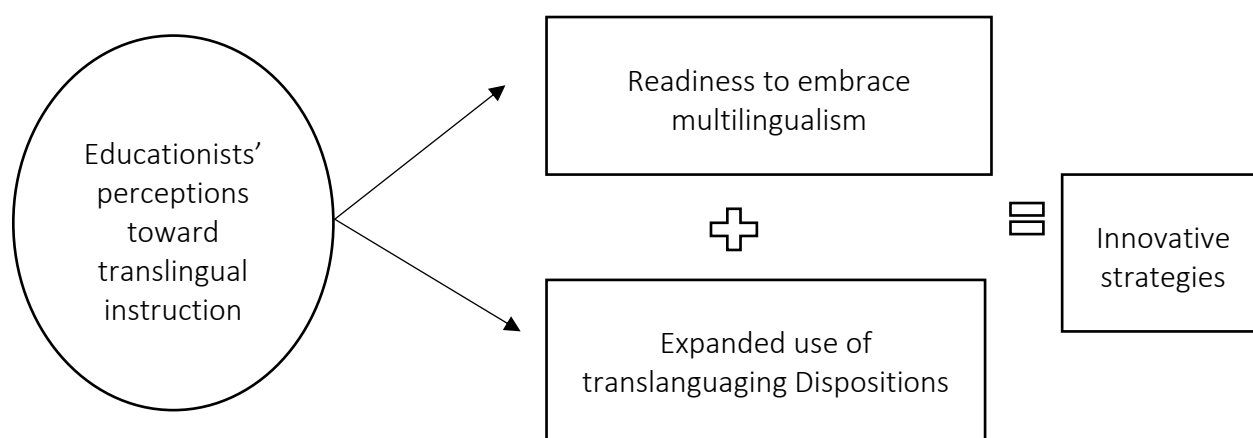


Figure 6. An Innovative Approach for the Teaching of Mathematics in Correctional Centre Classrooms

6. Recommendations and Implications of the Study

Based on the study findings, we underscored educationists' positive dispositions towards translingual strategies. Furthermore, we identified two fundamental outputs that emanate from the translingual strategy input within correctional centre classrooms (i.e., actualisation of the concept-based mathematics curriculum and the decolonisation of the mathematics curriculum). While the preceding scholarships have gestured towards the adverse pedagogical implications of the synonymous conceptualisation of code-switching and translanguaging, we postulate the intersection of the two multilingual pedagogies, particularly since one has proven to be developing procedural fluency (even though it causes setbacks in mathematics register development), while the other has been aligned with the development of mathematics conceptual understanding. The implications of the study's findings for the correctional education policy framework revolve around documenting translanguaging as a compelling pedagogical practice for offender mathematics education. Furthermore, the findings of the study gesture towards translingual-based mathematics teacher-education programs, which seek to prepare pre-service mathematics teachers (of both adults and children) to deploy learners' linguistic repertoires in mathematics classrooms. We, however, challenge the perception that only translingual instructional strategies lead to meaning-making; therefore, we do not discount the use of code-switching, particularly since it is also resourceful in the development of mathematics procedural fluency. Based on the findings of the study, we identified the critical role that fostering supportive dispositions among educationists toward translingual instruction can play in improving adult offenders' mathematics performance. We thus recommend the need for the transfiguration of Languages of Learning and Teaching within adult offender mathematics classrooms, thus challenging the adult education policy framework to deliberate multilingualism in adult mathematics learning situations. We also argue for the reformation of instructional practices by advocating the "intersectionalised multilingual pedagogy approach," which is the concurrent use and coordinated approach to code-switching and translanguaging.

7. Limitations of the Study

The significant limitation of the study lies in its focus on a single classroom in a selected correctional centre. Educationalists' dispositions towards translanguaging may differ in contexts beyond the immediate boundaries of the study. Furthermore, selecting 10 of 25 mathematics educationists reduces generalizability, even within the immediate boundaries of the study.

8. Conclusion

In this paper, we documented the empirical analysis of the dispositions of correctional centre mathematics educationists towards translanguaging instruction. Based on the findings of the study, correctional centre mathematics educators have positive dispositions towards translanguaging instruction but conceptualize it as code-switching. This presents both an opportunity and a challenge for understanding mathematics and developing multilingual pedagogies in correctional center classrooms.

Declarations

Author Contributions. S.M.: Literature review, conceptualization. N.V.S.: Theoretical framework, methodology. S.M.: Data analysis. X.K.: review-editing and writing, original manuscript preparation. All authors have read and approved the published version of the article.

Conflicts of Interest. None.

Funding. None

Ethical Approval. The findings of the study were inferred from the PhD study of Sipehele Mbatha. As such, ethical approval from the University of Zululand (where one of the authors qualified for a PhD), with reference number UZREC 17 1110-030-PGD 2023/3, was obtained.

Data Availability Statement. The data supporting the results reported in this study are not publicly available due to confidentiality agreements with participants and ethical restrictions imposed by the Institutional Review Board. However, de-identified data can be made available from the corresponding author upon reasonable request, subject to approval by the ethics committee.

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