

Evaluating Educationists' Andragogical Strategies for Teaching Numeracy: A Case Study of the Kwazulu-Natal Adult Correctional Centre Classroom



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ABSTRACT

The paper sought to evaluate correctional centre educationists' numeracy and andragogical practices. From the interpretivist epistemological stance, qualitative data was collected through semi-structured interviews and classroom observations to address the question: What are the andragogical numeracy strategies employed by correctional centre educationists in adult correctional centre classrooms? The qualitative data, which was collected through semi-structured interviews with four purposively sampled educationists from one correctional centre facility in KwaZulu-Natal was analysed thematically, through the Andragogical theoretical lens. The findings revealed that correctional centre educationists use the teacher-centred approach, and balk at taking into cognisance the self-direction of adult offenders in the correctional centre mathematics classroom. Furthermore, the study discovered that the six principles of andragogy are not sufficiently considered in the teaching of basic numeracy in correctional centre classrooms because of contextual delimitations. Again, the language through which basic counting is taught is adult offenders' second language. The researcher subsequently proposed the model for teaching basic counting in correctional centres, which is cemented on the principles of andragogy, inquiry-based numeracy learning and home language instruction. The study arguably contributes to academic scholarship in a three-fold way; firstly by developing numeracy and basic counting skills within the context of correctional centre classrooms; secondly by advocating for the perversion of indigenous languages into the adult learning and teaching spaces and thirdly by developing the teaching strategies pertinent for adult education.

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INTRODUCTION

Correctional education receives inadequate scholarly attention in South Africa. Amongst the different factors that rationale this is the narrowed focus on offender education, and the broadened focus on general offender rehabilitation. The contextualisation of correctional education within the rehabilitation cycle might appear to contradict the latter statement because it conceptualises correctional education as a programme which is coordinated with several other rehabilitation programmes to complete the offender rehabilitation cycle.¹ Nonetheless, even though correctional education is to be coordinated with other programmes offered by the National Department of Correctional Services to complete the “holistic case

¹ Matata Mokoete, “Correctional Sentence Plan: A Pathway to Adult Correctional Education,” *Adult Learning* 27, no. 2 (2016): 87–89.

rehabilitation”, it [correctional education] is to be explored in-depth because of its three-fold advantages, which are, economic, behavioural and survival benefits.² For instance, the study, which was conducted by Chappell revealed not only the positive correlation between offender education and recidivism but also the “beneficial” effects of correctional education on post-release employment and social behavioural change.³ Again, there is an indication that correctional education revives offenders’ humanity and improves their [offenders’] confidence.⁴

Given the plethora of learning areas offered in correctional centres as rehabilitation means, it is safe to assume that each learning area contributes distinctively to the rehabilitation process. Therefore, there is a need to explore how each is taught, learnt, and assessed. The present study explores the andragogical strategies employed by correctional centre educationists in the teaching and assessment of numeracy, particularly basic counting, in correctional centre classrooms. Where the present study differs from the preceding scholarly works is that it focuses on one particular learning area, while the others discuss correctional education by grouping all the learning areas offered. By juxtaposing theoretical ideas of helping adults to learn⁵ with the actual practices of teaching adult offenders basic counting, the researcher derives the epistemologies which can be used by education andragogical practitioners in correctional centre mathematics classrooms. However, prior to that, the researcher collected qualitative data through semi-structured interviews and classroom observations, to address the following research question which animates the study:

- What are the andragogical numeracy strategies employed by correctional centre educationists in adult correctional centre classrooms?

LITERATURE REVIEW

The use of correctional education as the means toward the offender wholistic behaviour rehabilitation emanates from the United Nations Declarations.⁶ The abolishment of the conservative, punishment approach to imprisonment,⁷ and the adaptation of the humanistic approach to offender rehabilitation led to the adaptation of correctional education as one of the strategies for rehabilitating offenders across the world.⁸ To date, a myriad number of countries worldwide give incarcerated persons access to a variety of correctional education programmes as a human right and as preparation for reintegration into communities.⁹ Furthermore, numerous countries worldwide operationalize correctional education as a rehabilitation programme to transform offenders into law-abiding citizens upon release.¹⁰

While there is scholarly evidence on the impact of correctional education on offender behaviour, employment prospects and reduced recidivism (which is what the researcher terms the “three-fold advantages of correctional education,” there is limited scholarship on the role of mathematics teaching and learning in the offender rehabilitation process, the art and science of teaching employed by correctional centre educationists in teaching mathematics, and on the state of adult offender performance in early numeracy and basic counting. While there is literature on mathematics teaching strategies for juvenile offenders with learning disorders and emotional disturbance,¹¹ the question of whether the strategies used to teach juvenile offenders with learning disorders translate satisfactorily to the teaching of adult offenders without learning disorders is worth asking. As a matter of fact, studies on juvenile

² Patricia Van Voorhis and Emily Salisbury, *Correctional Counseling and Rehabilitation* (Routledge, 2016).

³ Cathryn Ann Chappell, *Post-Secondary Correctional Education and Recidivism: A Meta-Analysis of Research Conducted 1990–1999* (University of Cincinnati, 2003).

⁴ Ntombizanele Gloria Vandala, “The Transformative Effect of Correctional Education: A Global Perspective,” *Cogent Social Sciences* 5, no. 1 (2019): 1677122.

⁵ Knowles, Malcolm Shepherd. “Theory of Andragogy.” *A Critique. International Journal of Lifelong. Cambridge MA* (1984).

⁶ Malcolm Shepherd Knowles, “Theory of Andragogy,” *A Critique. International Journal of Lifelong. Cambridge MA*, 1984.

⁷ Rima Vesely-Flad, *The Moral Politics of Crime Policy: Racial Narratives, Policing Practices, and Disproportionate Black Imprisonment in US Society* (Union Theological Seminary, 2013).

⁸ Mohamed Salum Msoroka, “Problematics of Accessing Tertiary Education in Tanzanian Prisons,” *Journal of Adult Education in Tanzania* 22, no. 1 (2019).

⁹ Vandala, “The Transformative Effect of Correctional Education: A Global Perspective.”

¹⁰ Lungile Goodness Mngoma, “Challenges Faced by Male Parolees in Lamontville EThekweni Municipality, KwaZulu-Natal” (2023).

¹¹ Paula Maccini et al., “Math Instruction for Committed Youth within Juvenile Correctional Schools,” *Journal of Correctional Education*, 2006, 210–29.

mathematics education¹² cannot be used to even benchmark or estimate the state of adult offenders' mathematics performance because of three reasons. Firstly, adults learn mathematics differently from youth and children.¹³ Secondly, juvenile offenders learn mathematics on a full-time basis, whereas adult offenders learn mathematics through the Adult Education and Training programme on a part-time Basis.¹⁴ Thirdly, pedagogical approaches are used to teach mathematics to juvenile offenders whereas in adult mathematics education, andragogy is used as the strategy for helping adult offenders reach the advanced abstraction level in mathematics and early numeracy.¹⁵ The paper will, hence, not focus on reviewing the literature on juvenile mathematics education, but on reviewing the preceding literature on the andragogical practices in general [because of the limited scholarship on mathematics andragogical practices, particularly in the South African context].

Scholarly Conceptualization of Andragogy

Andragogy is the art and science of helping adults to learn.¹⁶ In addition to the latter definition, different scholars have conceptualized andragogy in various ways. For example, Zippert et.al¹⁷ defines it as the intentional and professionally guided activity that aims to help an individual adult reach his or her full potential, whereas Boone et al.¹⁸ perceive it as the preeminent practice-based adult instructional method. For Bradley et al.,¹⁹ andragogy is the guiding principle on how to best educate adults. While these definitions arguably converge at one point, which is perceiving andragogy as a practice-based and learner-centred approach towards helping adults to learn, there is limited scholarship on whether these definitions can be operationalized to describe adult offenders' learning. However, the researcher argues that, because of the contextual open-mindedness in the aforementioned definitions, each can be used to understand and conceptualize the learning of adult offenders in correctional centre classrooms.

According to McGrath, acknowledging adult learners as self-directed and autonomous beings as well as acknowledging the teacher as the facilitator of learning rather than the presenter of content are two important attributes of andragogy that undoubtedly shift the focus of learning needs and curriculum design from being teacher-centred to being learner-centred. In the context of the present study, the researcher argues that centring learning on adult offenders is the andragogical strategy worth employing in the correctional centre classroom because of its inquiry-based nature, which hones adult offenders for the world of skilled trade.²⁰ While this argument might be bedevilling, it is worth noting that andragogic philosophy was successfully tested and refined on a broader spectrum in settings such as corporate situations; workplaces; business industry contexts; professional and religious environments; elementary secondary and remedial education contexts.²¹ However, there is limited discussion in terms of how the andragogic philosophy can be followed in teaching adult offenders, particularly in the South African context. Therefore, centring learning around adult offenders might be operationalized as the epistemological stance for understanding andragogy in the context of correctional centre learning.

¹² Irma Cahyaningtyas, "Development Rights: An Application Model Of Education For Juvenile In Juvenile Prison," in *CELL 2019: Proceedings of First International Conference on Culture, Education, Linguistics and Literature, CELL 2019, 5-6 August, Purwokerto, Central Java, Indonesia* (European Alliance for Innovation, 2019), 134.

¹³ Helen J Boon, "Neuroscience for Old Pedagogy.," *Australian Association for Research in Education*, 2013.

¹⁴ Kimberly Bender, "The Mediating Effect of School Engagement in the Relationship between Youth Maltreatment and Juvenile Delinquency," *Children & Schools* 34, no. 1 (2012): 37–48.

¹⁵ Patrick Filipe Conway, "Getting the Debate Right: The Second Chance Pell Program, Governor Cuomo's Right Priorities Initiative, and the Involvement of Higher Education in Prison," *Harvard Educational Review* 90, no. 4 (2020): 598–616.

¹⁶ Diana Purwati et al., "The Six Characteristics of Andragogy and Future Research Directions in EFL: A Literature Review," *Elsya: Journal of English Language Studies* 4, no. 1 (2022): 86–95.

¹⁷ Erica L Zippert et al., "Helping Preschoolers Learn Math: The Impact of Emphasizing the Patterns in Objects and Numbers.," *Journal of Educational Psychology* 113, no. 7 (2021): 1370.

¹⁸ William J. Boone, John R. Staver, and Melissa S. Yale, *Rasch Analysis in the Human Sciences* (Dordrecht: Springer Netherlands, 2014), <https://doi.org/10.1007/978-94-007-6857-4>.

¹⁹ J Bernard Bradley, John Rachal, and Lin Harper, "Online Professional Development for Adults: Utilizing Andragogical Methods in Research and Practice," in *Adult and Continuing Education: Concepts, Methodologies, Tools, and Applications* (IGI Global, 2014), 396–418.

²⁰ Valerie McGrath, "Reviewing the Evidence on How Adult Students Learn: An Examination of Knowles' Model of Andragogy.," *Adult Learner: The Irish Journal of Adult and Community Education* 99 (2009): 110.

²¹ Terry Hyland, "Changing Conceptions of Lifelong Learning," *Journal of the Philosophy of Education* 33, no. 2 (1999): 309–15.

Andragogy in the Context of Correctional Centre Classrooms.

In his discussion of prison andragogical practices, Conway deliberates on the “prison” teaching strategies that emphasize and value process over content, critical thinking over rote memorization, and offender agency over instructor absolutism.²² These andragogical strategies, even though not quite ostensibly, relate, to a much greater extent, with Knowles’s epistemological principle of self-concept because owing to this principle, offenders typically move from being dependent on the prescribed content (and on the instructor), to being critical thinkers, who understand not only the prearranged curriculum but the application thereof and the motive behind the learning process.²³ The latter discussion, even though contextualised within the United States prison setting, is parallel to the South African proposed approach towards offender education, which is discussed in the scholarly work of Mathebula as that which should facilitate environments where offenders are involved in the planning, delivery, and assessment of their own learning.²⁴

The South African proposed approach toward offender education is cemented on the paradigm shift between children’s and adults’ learning practices as discussed by Moberg.²⁵ The question, however, of whether the proposed approach is feasible, considering the state of South African correctional centres, is worth asking. Amongst the scholarly discussions that juxtapose the current state of South African correctional centres and the correctional centre teaching and learning, Mbanjwa and Lineo assert that South African correctional centres not being originally intended to function as education and training centres, but are designed with punitive justice in mind, reveals that peculiar andragogic approaches have to be employed by educationists to improvise for the attainment of formal education to adult offenders.²⁶ As a matter of fact, some scholars have indicated that correctional centres need to apply unique teaching and learning strategies to overcome “prison challenges” and to guide offenders towards “holistic behaviour rehabilitation.”²⁷ These strategies will be discussed at a greater length in the subsequent part of the literature review. Nonetheless, it is important to note that the strategies do not speak satisfactorily, particularly to the teaching and learning of mathematics in correctional centres, but they are generic in nature. Hence, there is still a research gap in terms of how educationists make improvisations and apply peculiar andragogical approaches as far as mathematics or basic counting in correctional centres is concerned.

Andragogical practices employed by numeracy educationists in teaching adult offenders in correctional centre classrooms.

According to Holton et al., the initial andragogical strategy to be employed by correctional centre educationists is that which they term “the andragogical learner analysis”, where the individual offenders’ learning motives(s), learning styles as well as their desire and preparedness for self-direction are analysed with an intention to derive the appropriate subsequent andragogical method(s) of helping the adult offender.²⁸ This andragogical strategy is in line with what McGrath terms the adult self-concept, wherein the particular individual characteristics and learning styles of each adult are taken into cognisance.²⁹ However, there is a need for literature which explores the different learning styles and the learning motives for mathematics because the motive behind learning mathematics might differ from the motives behind learning other subjects because the content areas in mathematics are a stairwell towards the development of skills development programmes.

²² Conway, “Getting the Debate Right: The Second Chance Pell Program, Governor Cuomo’s Right Priorities Initiative, and the Involvement of Higher Education in Prison.”

²³ Malcolm S Knowles, “Applications in Continuing Education for the Health Professions: Chapter Five of Andragogy in Action,” *Möbius: A Journal for Continuing Education Professionals in Health Sciences* 5, no. 2 (1985): 80–100.

²⁴ Nkarhi Excellent Mathebula, “Educational Challenges Facing Prisoners at Kutama-Sinthumule Correctional Centre: A Case Study of Grade Twelve (12) Young Adult Learners,” 2014.

²⁵ Eric Moberg, “Pedagogy Is for Kids: Andragogy Is for Adults.,” *Online Submission*, 2006.

²⁶ Khulekani Collin Mbanjwa and Lineo Rose Johnson, “Strategies in Overcoming Teaching and Learning Challenges in Correctional Facilities in South Africa,” *Current Politics and Economics of Africa* 11, no. 2/3 (2018): 129–60.

²⁷ Morakinyo Akintolu and Moeketsi Letseka, “The Andragogical Value of Content Knowledge Method: The Case of an Adult Education Programme in Kwa-Zulu Natal Province of South Africa,” *Heliyon* 7, no. 9 (2021).

²⁸ Elwood F Holton III, Lynda Swanson Wilson, and Reid A Bates, “Toward Development of a Generalized Instrument to Measure Andragogy,” *Human Resource Development Quarterly* 20, no. 2 (2009): 169–93.

²⁹ McGrath, “Reviewing the Evidence on How Adult Students Learn: An Examination of Knowles’ Model of Andragogy.”

For Davis-Kean et al., adult offenders learn better when experiential learning is prioritized within andragogy.³⁰ This andragogical strategy springs from the key recognition, as described by Abdullah et al., which is: “To children, experience is something that happens to them; to adults, experience is who they are.”³¹ If adult learners’ experiences are diminished or devalued, it is akin to rejecting them at a personal level.³² Experience, in the context of adult mathematics learning, is prioritized particularly in the neuroscience scholarly literature which discusses the role of the hippocampus in retrieving memory, which becomes instrumental in mathematics conceptual understanding.³³ The question, however, of whether the educationists prioritize experience in the actual process of teaching mathematics (basic counting in particular) is worth asking.

The development of learning contracts is discussed as one of the andragogic strategies which have been employed by adult educators.³⁴ According to the latter scholars, learning contracts help resist the more compulsory aspects of formalized education because compulsory experiences are rarely joyful and generally contribute to the transactional model of education. Furthermore, according to Dantus,³⁵ a learning contract can help promote greater autonomy, as students actively participate not only in developing their own individual learning objectives but also in establishing how their work will be evaluated. The present study seeks to explore, (amongst many other andragogic practices employed by mathematics educationists), whether the contracts are perceived as practically important in the teaching of basic counting, as feasibly instrumental in the development of learner-centred, and inquiry-based correctional centre classroom situations.

THEORETICAL FRAMEWORK

The study is reviewed through the epistemes of the Andragogic theoretical ideas, which were developed and synthesized by Malcolm Knowles, in 1984. The Andragogic theory was initially developed in the twentieth century as an instructional approach which can be operationalized in adult learning situations, after various debates around whether adults could learn or not. After the critical analysis of adult knowledge construction and cognitive development, advanced the andragogic approach to the fully established theory, whose fundamental principles were assembled upon the learner-centred teaching ideology.³⁶ After raising concerns about the changes of perspectives on how adult learning differs from children’s learning, and yet the continued use of the archaic term “pedagogy” to describe the art and science of teaching both [children and adults], co-ordinated six principles that underpin adults’ learning (which will be discussed concisely in the subsequent subsection).³⁷ After the development of the theory of Andragogy, through tailoring the six assumptions that underpin adults’ learning, several other scholars subsequently advocated for the adoption of the term andragogy to refer not only to theoretical ideas but also to focus on the creation of an independent, adaptable individual out of the adult learner.³⁸

The Six Principles of Andragogy

According to Knowles, the way in which adults learn can be conceptualised within the framework of the six coordinated principles, which are, self-concept, internal motivation, independence, experience, need

³⁰ Pamela E Davis-Kean et al., “It Matters How You Start: Early Numeracy Mastery Predicts High School Math Course-taking and College Attendance,” *Infant and Child Development* 31, no. 2 (2022): e2281.

³¹ Mukhammad Abdullah, Nur Chamid, and Khamim Khamim, “Reorientation of the Andragogy Concept and Its Relevance to Higher Education in Indonesia for Answering the Global Era of Information: Critical Review of Malcolm Knowles Perspective,” in *Proceedings of the 2nd International Conference on Islamic Studies, ICIS 2020, 27-28 October 2020, Ponorogo, Indonesia*, 2021.

³² Anna Tsatsaroni and Jeff Evans, “Adult Numeracy and the Totally Pedagogised Society: PIAAC and Other International Surveys in the Context of Global Educational Policy on Lifelong Learning,” *Educational Studies in Mathematics* 87 (2014): 167–86.

³³ Sipelele Mbatha, “The Role of Translanguaging in Teaching Mathematics at Adult Correctional Centre Classrooms in South Africa,” *E-Journal of Humanities, Arts and Social Sciences*, 2024.

³⁴ Ben Meadows et al., “Video Reflection: An Emerging Tool for Training Client-centred Communication Skills in Staff Supporting Adults with Learning Disabilities in an Education Setting,” *British Journal of Learning Disabilities* 48, no. 2 (2020): 132–41.

³⁵ Sabine Jean Dantus, “A Triadic Worldview? The Misconception and Bias of Universality in Knowles’ Andragogy,” *Commission for International Adult Education*, 2021.

³⁶ Stephen Paul Forrest III and Tim O Peterson, “It’s Called Andragogy,” *Academy of Management Learning & Education* 5, no. 1 (2006): 113–22.

³⁷ Knowles, “Theory of Andragogy.”

³⁸ Nomazulu Ngozwana, “The Application of Adult Learning Theory (Andragogy) by Adult Educators and Adult Learners in the Context of Eswatini,” *Uneswa Journal of Education (UJOE)*, 2020.

for learning, and responsibility towards learning. These six principles ostensibly put the adult learner at the centre of learning (see Figure 1 below).

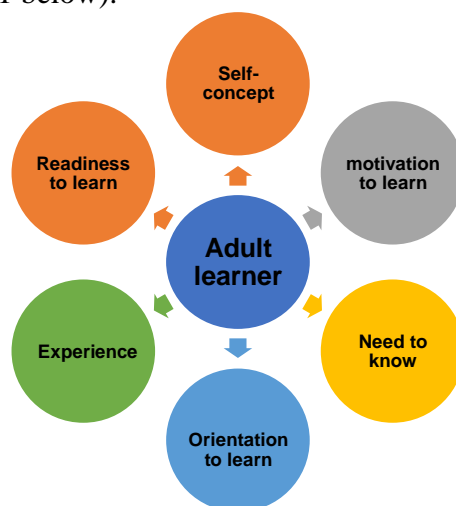


Figure 1: The principles of andragogy

The six principles can be used to understand, analyse, and underpin the process of adult knowledge construction. In the discussion below, each of the three principles is described, alongside its educational implications on adult learning. While each of the six principles equally implicates the learning and the development of adults, adherence to these principles aids adult educators and educationists to design and implement adult-appropriate instructional approaches, while, on the other hand, they [six principles] enhance learner-centredness.³⁹ Hence, the six principles were used as a lens for analysing the andragogical strategies employed by educationists in teaching basic numeracy in correctional centre classrooms.

Need to Know

The andragogic theoretical stance assumes that adult learners are aware of the reason why they have to learn, master and apply or implement the content. However, the teacher remains responsible for making the benefits of learning clear and intrinsic by explaining the learning objectives at the beginning of the course.⁴⁰ In other words, under this principle the adult teaching process is two-fold. Firstly, instructors ought to structure their andragogical practice by taking into account adult learners' motives behind learning. Secondly, adult instructors ought to clarify the learning objectives prior to, during and after the lesson. In the context of adult offenders' mathematics learning, this principle implies that the need-to-know mathematics, even though it cannot be presumed for each adult offender, is commonly for the purposes of the completion of the rehabilitation process (see Figure 2 below) and for offender post-incarceration employment prospects. Hence, the objectives have to be aligned, even though not ostensibly, with those two fundamental need-to-know purposes.

³⁹ Fletcher H Glancy and Susan K Isenberg, "A Conceptual Learner-Centered e-Learning Framework," 2011.

⁴⁰ Aura Codreanu and Cezar Vasilescu, "E-LEARNING BEHAVIORS AND THEIR IMPACT ON ANDRAGOGY.," *E-Learning & Software for Education*, no. 1 (2013).

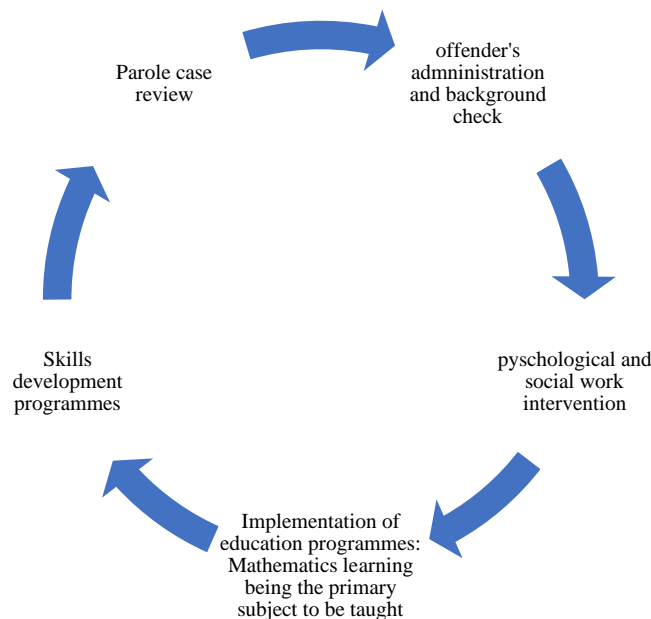


Figure 2: The illustration of how mathematics learning is a vehicle towards the completion of the rehabilitation process.

Self-Concept and Experience

In the andragogic philosophy, adult learners conceptualise and understand themselves as active participants in the process of learning. It is the teacher's responsibility, therefore, to ensure that tasks given to adult learners elicit critical thinking, confidence, and high self-esteem. The discussion about the principle of self-concept cannot exclude the principle of experience because, for adult learners, experience is the stairwell and the foundation upon which content knowledge is assembled. As a matter of fact, Lewis and Bryan assert that adults accumulate a reservoir of experiences (from their lifetime) that becomes a rich resource for learning and a base upon which new learning can be built.⁴¹ Experience(s) and pre-formal education familiarities are advantageous not only in developing adult learners cognitively but also in stimulating the formation of adults' brains.⁴² Therefore, the andragogic principle of experience and self-concept are intertwined and can be used to assume the experience-based and the self-concept aligned andragogical strategies in adult correctional centre classrooms. In other words, educationists can use these two principles in their andragogical practices as the "scaffold" for developing adult offenders to the advanced level of abstraction.

Motivation to Learn

For the andragogic theory, if adult learners are not motivated to learn, they may not participate in the classroom because motivated adult learners interact optimistically with the teacher and other peers. Adult learners are motivated by both internal and external factors. Internal motivation factors are related to self-concept and the need to learn (which has been discussed above), while external factors include appraisals, teacher motivations, interactions (with fellow adult learners), the appealing and inspiring surrounding environment and safe ambience.⁴³ Either way, individual adult learners' motivation is drawn from active participation in the learning process, inquiry-based learning and learner-centredness. Both external and internal motivations form part of the andragogical approaches to be employed in the process of teaching adults.

⁴¹ Nicole Lewis and Venise Bryan, "Andragogy and Teaching Techniques to Enhance Adult Learners' Experience," *Journal of Nursing Education and Practice* 11, no. 11 (2021): 31–40.

⁴² Vladimir M Sloutsky and Wei Deng, "Categories, Concepts, and Conceptual Development," *Language, Cognition and Neuroscience* 34, no. 10 (2019): 1284–97.

⁴³ Alex Acquah et al., "Literature Review on Theories of Motivation," *EPRA International Journal of Economic and Business Review* 9, no. 5 (2021): 25–29.

Orientation to Learn

Even though experience is important in adult learning, adult instructors still need to orientate learners on how to integrate new information into the pre-existing pattern of experience. Furthermore, neuroimaging studies affirm that without teacher orientation, the pattern of existing experiences might cause misconceptions and misinterpretations of new content.

Readiness to Learn

Adult learners learn best when the process of learning can help them solve an immediate real-life problem. Their time perspective changes from one of the future applications of knowledge to one of the immediate applications, giving them a problem-centred rather than a subject-centred orientation to learning. In this regard, adults' readiness is more oriented toward the development of their social roles as opposed to achieving good academic results. This principle is often discussed concurrently with the principle of motivation because motivation increases in adults when there is an immediate reason to learn.

The latter discussion on andragogic principles denotes that adult learning springs from humanistic philosophy and psychosocial development perspective. Readiness to learn, self-concept and experience, for instance, indicates that adults are independent beings who have forged their identities from knowledge about themselves and unique personal experiences. Furthermore, the six principles, when combined, lead the readership to an understanding of the relationship and antagonism between andragogy and pedagogy. In other words, the andragogic theory opined that, unlike young children, adults learn and construct meaning based on self-concept, motivation to learn, orientation to learn, need to know and readiness to learn. These six principles will be used as a lens for understanding the andragogical strategies employed by correctional centre educationists in the teaching of basic counting.

CONTEXTUALISING THE STUDY

The study was contextualized in one of the correctional centres in the province of KwaZulu-Natal. Through the intervention study on the use of the three-dimensional approach for teaching addition and subtraction through the medium of isiZulu, the researcher inferred the different andragogical strategies which are employed by educationists in their teaching of basic counting to adult offenders. In other words, even though the intervention study was primarily on the use of the three-dimensional approach through the medium of isiZulu, and between the researcher and the adult offenders, the data, which indicated that the existing basic counting skills for adult offenders are substandard, re-directed the researcher towards involving the correctional centre educationists with an intention to compare their andragogical strategies with the Knowles's six principles (which have been discussed above).

METHODOLOGY

The study was designed to evaluate, through qualitative data, the andragogical strategies employed by correctional centre educationists in teaching basic counting to adult offenders. Four educationists responsible for teaching numeracy to adult offenders who are enrolled on the Adult Education and Training Level Three programme in one correctional centre facility in the province of KwaZulu-Natal were purposively selected. The selected participants have taught numeracy in a correctional centre for a period of ten years and have experienced two waves of curriculum reform in adult education. Data was then collected through semi-structured interviews with the selected participants. It (data) was transcribed, carefully sifted, and thematically analysed to address the question: What are the andragogical numeracy strategies employed by correctional centre educationists to build firm basic counting skills for adult offenders? Data was initially coded to observe patterns, and it was, thereafter, arranged according to different themes. These themes were then used as findings in the discussion and presentation of the results.

PRESENTATION OF FINDINGS AND DISCUSSION

The following findings were inferred from the thematic analysis of data. During the process of thematically analysing data, the following themes emerged.

Theme one: Using the fact that numeracy is the prerequisite for enrolment into skills development programmes as the motivation to learn.

Two educationists indicated that one of the andragogical strategies they employ is supplementing the intrinsic motivation to learn mathematics with extrinsic motivation. As the theory of Andragogy posits, adult learners are motivated by both internal and external factors, with internal factors relating to self-concept and external factors relating to appraisals and teacher motivations. While the source of “internal motivation” of mathematics learning for adult offenders remained unclear from the findings, the external motivation, according to the responses of educationists from the semi-structured interview questions, is predominantly the constant re-affirmation that numeracy learning, understanding and good performance thereof will guarantee adult offenders’ admission into the skills development programmes, which make them [adult offenders] be eligible for parole. The response from Educationist A, verbatim below, indicates that offenders draw interest and get engaged in activities that qualify them for parole eligibility. In this regard, this educationist motivates adult offenders to do numeracy, computation, and basic counting, to be guaranteed entry into skills programmes, which form part of their “rehabilitation profile.”

Educationist A

The fact that numeracy qualifies them [adult offenders] for enrolment into the Skills Development Programs is the constant source of motivation for the majority of adult offenders in our correctional centre. Offenders lose interest in formal schooling, and they have a negative attitude towards anything that involves numbers, counting, problem-solving and critical thinking. Unless you motivate them and remind them of the importance of numeracy in their lives, particularly in their journey of rehabilitation, they will not participate in mathematics and numeracy.

Educationist B indicated that appraisals and the awarding of meritorious certificates do not always motivate adult offenders to enrol for and perform better in numeracy. Rather, the constant reminder that numeracy is the stairwell and the basic entry for skills development programmes has been (for Educationist B) resourceful in motivating adult offenders to perform computation, procedural fluency, and basic counting, particularly in AET levels two and three.

Educationist B

I have tried to issue meritorious certificates and other forms of appraisals; however, adult offenders seem not to be moved by appraisals that have no clear connection and contribution to their journey toward parole eligibility. On the other hand, being reminiscent of the fact that numeracy and mathematics are first, instrumental in the rehabilitation circle, and secondly, it is the stairwell towards the Skills Development Programmes, that seemed to motivate adult offenders to perform better in numeracy and in mathematics.

In summary, the two educationists reiterate the principle of motivation to learn (as Knowles posits) as the andragogical strategy that can be employed in teaching basic counting, numeracy, and computational understanding. Nonetheless, the two educationists emphasize the external motivation to learn over the internal motivation to learn. This does not imply that adult offenders are not internally motivated to learn numeracy, however, both internal and external motivation are equally important as far as the attitude towards, and the learning of basic counting and numeracy is concerned. Thanh and Thanh for example, argue that the “parallelity” between internal and external motivation yields positive attitudes toward the subject learnt.⁴⁴ (see the diagram in Figure 3 below).

⁴⁴ Nguyen Cao Thanh and T T Thanh, “The Interconnection between Interpretivist Paradigm and Qualitative Methods in Education,” *American Journal of Educational Science* 1, no. 2 (2015): 24–27.

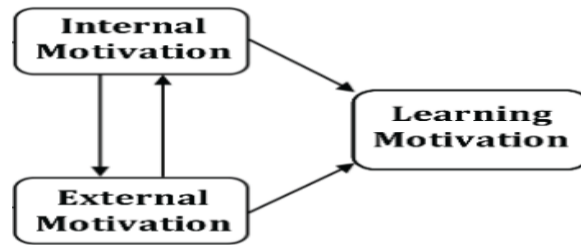


Figure 3: The parallelity between internal and external motivation

The internal motivation, for each individual offender, to learn numeracy remains an area that is worthy of in-depth academic exploration for the subsequent scholarly works, particularly because internal motivation is arguably subjective and dependent on the adult learners' individual values.⁴⁵

Theme two: The use of the teacher-centred approach over the inquiry-based approach in the teaching of numeracy and basic counting

Educationist C revealed that he uses the teacher-centred approach in teaching numeracy and basic counting because of the following reasons:

- The learning space and the correctional centre classroom infrastructure are not conducive enough for the inquiry-based approach.
- The “prison contextual factors” (i.e. gangsterism and violence) prohibit the grouping and the collaborative learner-centred discussions amongst the offenders.
- AET level one offenders, in particular, require more teacher-centered instruction because they lack prior exposure to basic counting and numeracy.

Adult offender C:

I teach and let them do the listening, and assess them based on the numeracy aspect which I have taught. You cannot make them “take the driver’s seat” and teach each other because the classrooms are not spacious enough for group discussions. Again, offenders are part of different gangster groups. If you let one offender from the opposing gangster group demonstrate the counting or the solving of a certain mathematical problem in your classroom, you are compromising prison security. AET level one adult offenders are not familiar with mathematics computational understanding. Until you demonstrate and teach them addition or subtraction either by grouping, column method, or by a number line, they will not understand.

While the response of adult offender C is legitimate, it has to be taken into consideration that adults (regardless of the context) are self-directed individuals who want to take charge of the learning journey [as the andragogic principle of self-direction posits]. Therefore, it is paramount to make them feel independent and in control of their learning. Furthermore, it was observed that giving adult offenders an opportunity to engage in inquiry-based learning enhances their critical thinking abilities, and makes them derive novel ways of solving mathematical problems (see the photograph below).



Photograph 1: Collaborative learning in a correctional centre classroom.

⁴⁵ Abeni El-Amin, “Andragogy: A Theory in Practice in Higher Education,” *Journal of Research in Higher Education* 4, no. 2 (2020).

In the photograph above, the researcher observed that, by making adult offenders work collaboratively with their peers, new mathematical procedures are deduced. For example, the offender worked out the sum of 35 and 47 by initially rounding up to the nearest ten (from 35 to 40 and from 47 to 50). Afterwards, the difference between 35 and 40 (which is 5) and the difference between 47 and 50 (which is 3) was added (as they are in the family of units, while a sum of 40 and 50 was added (as they are both in the family of tens). Afterwards, the tens (90) and the units (08) were added to get 98. Even though this is a misconception, and hence the answer is incorrect, the concept of place values was learnt and conceptualised through inquiry-based learning.

Theme three: The instruction and assessment of numeracy and basic counting through offenders' second language.

The paper discovered that numeracy, at all levels of Adult Education and Training, is taught in the medium of English, which, for the majority of adult offenders, is the second language. Adult offender D indicated that she uses English in her numeracy classes and in her assessment instructions because it [English], is the common medium between various repertoires within the correctional centre classroom.

Adult offender D

I use the medium of English in my numeracy and mathematical andragogical practice because it is the language which is common amongst offenders of different linguistic backgrounds. The majority, however, does not understand English, and hence, the poor performance in the overall summative numeracy assessments.

The studies show the substandard performance of adult offenders in numeracy [see the findings inferred from the analysis of offenders' numeracy levels from the scholarly work of Chrysikou in the graph below.⁴⁶

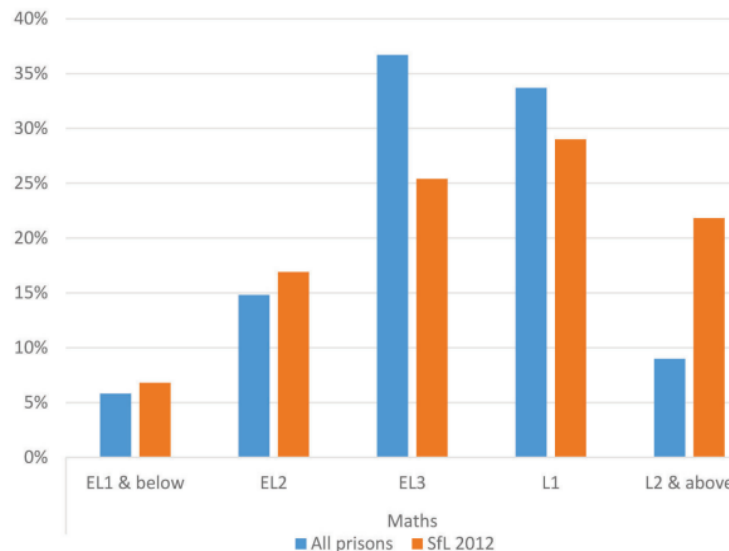


Figure 4: The substandard performance of adult offenders in numeracy

Even though the substandard performance cannot be attributed solely to language factors, second language instruction is arguably among the contributing factors for poor offender numeracy performance. To elevate adult offenders' numeracy performance, the researcher recommends strategies which are proposed for use in multilingual classroom situations, such as translanguaging, code-switching and code-mixing.⁴⁷

⁴⁶ Vasiliki Chrysikou et al., "Alternative Curricular Experiences for Young Prisoners: Developing (Hidden) Mathematical Ideas inside Prison," *Prometeica-Revista de Filosofía y Ciencias*, no. 27 (2023): 741–51.

⁴⁷ S Thara and Prabakaran Poornachandran, "Code-Mixing: A Brief Survey," in *2018 International Conference on Advances in Computing, Communications and Informatics (ICACCI)* (IEEE, 2018), 2382–88.

RECOMMENDATION

Model for teaching numeracy and basic counting to adult offenders in a correctional centre classroom.

From the findings, the researcher has developed this model, which will be ideal for teaching numeracy to adult offenders in correctional centre classrooms (see Figure 5 below).

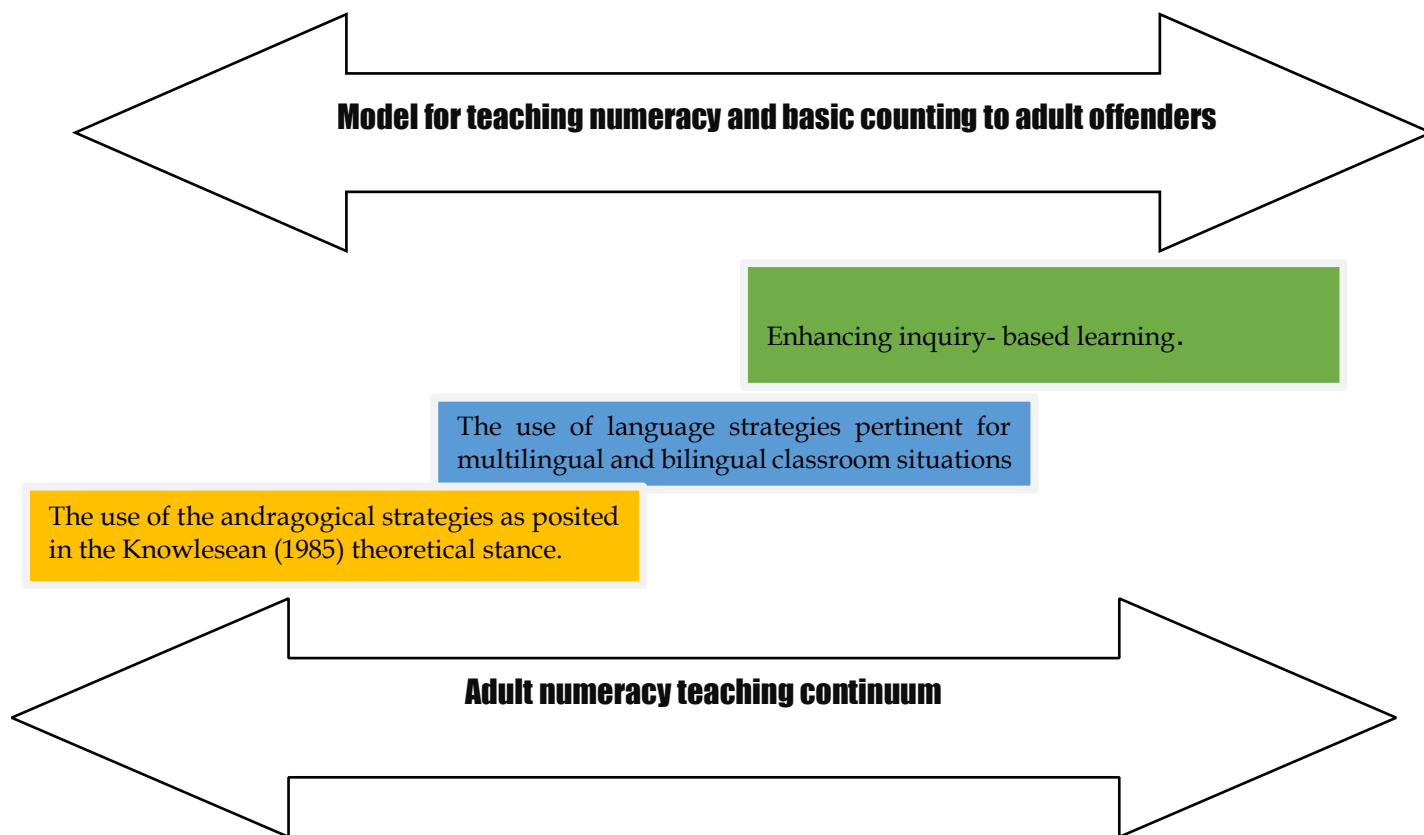


Figure 5: The Model for teaching numeracy and basic counting to adult offenders in a correctional centre classroom.

The research proposes that numeracy educationists use the afore-illustrated model when teaching numeracy in correctional centre classrooms. The Knowles principles can be used as guidelines for teaching adults in correctional centre classrooms, for they [principles] propose the consideration of adults' need to know, motivation to learn, orientation to learn and self-concept. The researcher further proposes the employment of strategies such as translanguaging, code-mixing and code-switching, to cater for offenders' language identities while promoting multilingualism in mathematics correctional centre classrooms. Finally, the researcher suggests inquiry-based learning over the teacher-centred approach in the teaching of numeracy in a correctional centre classroom context.

CONCLUSION

The paper has explored the andragogical strategies used by correctional centre educationist in their numeracy classrooms. The findings revealed that educationists use the teacher-centred approach, and external motivation to learn to arouse the interest of adult offenders to learn numeracy and basic counting. Furthermore, the study discovered that the six principles of andragogy are not sufficiently considered in the teaching of basic numeracy in correctional centre classrooms, and the language through which basic counting is taught is adult offenders' second language. From the findings, the researcher has proposed this model for teaching basic counting in correctional centres. The adoption and usage of this model will enhance the learning of numeracy in correctional centres across South Africa and beyond.

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