

DEMOCRATIC CITIZENSHIP EDUCATION: TOWARDS A MODEL FOR ESTABLISHING DEMOCRATIC MATHEMATICS TEACHER EDUCATION

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ABSTRACT

This article provides an explication of the concepts of democracy and democratic citizenship from a political dimension, it also offers insight into the nature of democracy and democratic citizenship in post-apartheid South Africa. The article further outlines the relationship between mathematics and democracy, as well as a number of pedagogical approaches which are capable of fostering democratic principles in mathematics education classrooms. Finally, the article proposes a model which encompasses a trilogy of democratic principles; humanising pedagogy; and social, cultural, economic and political issues which can be employed in preparing mathematics student teachers to become fully democratic citizens.

Keywords: democracy, democratic citizenship, mathematics teacher education, pedagogy

INTRODUCTION

Human beings arguably do not possess a genetic trait which determines whether they will become autocrats or democrats. Authoritarian and/or democratic values and behaviours are learned through different agencies such as the family, religious groups and the media, among many others. Notably, education policy in many developing countries (including in Africa) now explicitly stipulates democracy as a key educational goal (Harber and Mncube 2012). Current South African education policy (teacher education policy included) represents a decisive break with the past. Postapartheid education policy, for instance, is based on an explicit commitment

to education for democracy – the *Manifesto on Value, Education and Democracy* notably provides a detailed explanation of how democracy can be put to practical use in every educational context (Department of Education 2001). Despite legislation to guide related efforts, teacher education appears to be a significant hindrance to schooling in education for democratic citizenship.

While an integral part of educational reform in postapartheid South Africa is aimed at undoing historical and race-based inequalities, while at the same time implementing a system capable of cultivating a citizenship education that promotes a democratic society, very little or no attention has been given to teachers' narratives, identities and experiences (Davids 2018); as well as how mathematics education might serve a very different social function through the cultivation of democratic citizens, given that mathematics has an important role in social development (Skovsmose 2011).

However, when apartheid became the dominant race doctrine and practice, South Africa became the most racially oppressed country in Africa while also being the richest (Neocosmos 2010). Thus, to achieve education that promotes a democratic society, the establishment of outcomes-based education (OBE) in 1997 was viewed as a pedagogical exit strategy from apartheid education (Chisholm 2005; Davids 2018). In light of the corrosive legacy of apartheid, citizenship education in postapartheid South Africa faces unique challenges.

THE CONCEPTS OF DEMOCRACY AND DEMOCRATIC CITIZENSHIP

Democracy involves the exercising and practising of community engagement; it defines how people communicate with one another, for instance when making decisions. According to Mafeje (2005), the term “democracy” is as old as mankind itself, but the meaning thereof has seen a variety of definitions and reconceptualisations over the years. Most democratic practices hinder the manner in which people are allowed to contribute to shared decision making or deny them access to the process, thus limiting their freedoms and hampering their equal participation (Mafeje 2005). Hoselitz (1956 as cited in Chiroma 2015) opines that democracy accommodates two theoretical points of view: first, there is the contemporary theory, as characterised by equalitarianism, meritocracy and functionalism; and second, the conventional theory, which is distinguished by particularistic, undifferentiating, and autocratic features. As Hoselitz (1956 cited in Chiroma 2015) opines, contemporary and traditional notions of democracy are formed based on the beliefs, values and attitudes of specific societies.

Harber (1997) elucidates that democracy, if taken back to its traditional Greek roots, denotes “rule by the people”. Many view this understanding as referring to a domineering form of government which hampers people's choices, restricts their beliefs and silences their

discourse. As Harber (1997) argues, democracy is an act requiring concessions and accommodations, the practise of temperance, negotiation, collaboration, open-mindedness and justice. Harber (1997) further argues that, for education to contribute to a political culture, it must be framed by democratic ideas which support the principles of mutual respect and acceptance in the face of diversity. In other words, education should support the equal treatment of all, irrespective of race, gender or ethnic origin.

Citizenship implies a sense of belonging which, according to Yuval-Davis (2011), is grounded in social and political conceptions with three basic tenets: the first is the societal location of an individual; the second is his/her identification with, and emotional connection to, different groups; and the third is the political and moral value system through which s/he makes value judgements. Based on these categorisations, belonging is characterised by both geographical and social space, individuals' identity and emotional connections, and the values and beliefs governing those connections.

The term "belonging", in this sense, speaks to both socialisation space and topographical space, and the personalities and enthusiastic connections that individuals develop – depending on their different groups –and the values and morals that rule those connections (Yuval-Davis 2011). The argument which Yuval-Davis (2011) makes, is that there are various understandings of belonging, including political constructions in which the creation of boundaries, as well as the inclusion/exclusion of various rights and responsibilities underpinning such conceptions, renders power relations trivial. For Waghid (2010), belonging and active citizenship are related to specific type of involvement with each other. As such, "belonging means that people are committed to the task of education through being more accountable to the process and deepening their attachment to it" (Waghid 2010, 20). Yuval-Davis (2011) adds that citizenship is constructed on various notions, including constitutional and civic rights, socioeconomic rights, spatial security and cultural rights, as well as the duties and responsibilities of citizens. A contemporary understanding of citizenship is, however, based on activist citizenship, which is largely influenced by the fight for freedom and democracy, as well as the misuse of technology (now restricted in some parts of the world, for instance, the Middle East) (Chiroma 2015). Other familiar conceptions of citizenship relate to sexual privileges brought about by permeable state borders, consumer citizenship in the fight for free markets, multicultural citizenship due to the spread of civilisation, and racial discrimination (Yuval-Davis 2011). All of this indicates how disturbingly complex citizenship is.

Democratic citizenship: A political dimension

Gutmann (1987) proposes creating a model of education which reflects democratic standards

and principles that can be applied to a wide range of divisive policy issues. Gutmann's analysis was founded on the claim that education policies and reform initiatives in many countries are too frequently established and disputed haphazardly, within overly restricted normative settings (Gutmann 1987). For Gutmann (1987), the answer lies in a range of traditional notions about who ought to manage education. One possibility is Plato's "family state", which delegated power to the state in order to foster social unity by instilling in citizens a sense of public good. Gutmann (1987) refers to the second option as the "state of families," in which parents have fundamental control over their children's education. Lastly, there is the "state of individuals", which advances the notion of impartiality, with a view to upholding a balanced measure of individual freedom (Gutmann 1987).

Spragens (2018, 28) points out that Gutmann's contentions are incomplete, as the first account "is incompatible with our identity as parents and citizens"; the second confers far too much authority on parents "on the unfounded assumptions that they have a natural right to such authority or that they will thereby maximize the welfare of their children" (2018, 42); and the third – despite being underpinned by the idea of providing individual citizens supreme independence – ignores the fact that schools can never be impartial, for "even if schools avoid all courses that deal explicitly with morality or civic education, they still engage in moral education by ... non-curricular practices that serve to develop moral attitudes and character in learners" (2018, 53).

Admittedly, the notion that democratic societies can cultivate the requisite abilities for citizenship in future citizens, is not that far-fetched. The question is how it ought to be done, with what limitations and by whose power, rather than questioning whether it should be done (Spragens 2018). Gutmann and Thompson (2004), whose work interrogates the role of deliberative democracy, present the concept of democratic citizenship education. The four characteristics of deliberative democracy which Gutmann and Thompson (2004) propose, include reason-giving, reciprocity, time limitation and dynamism. In their view, these four elements corroborate one another as part of deliberative democracy, especially when individuals jointly look for ways to solve problems. Deliberative democracy thus allows individuals to contribute equally and freely, without reservation, to open discourse. They are permitted to substantiate and validate their ideas, but in turn have to allow others to contribute as well, thereby signifying respect and understanding (Gutmann and Thompson 2004).

Gutmann and Thompson (2004) argue that the validation of ideas should be open to every citizen, thus promoting political (educational) discourse in public spaces where everybody is involved and allowed to freely participate in decision making. This type of mutual understanding grants citizens various opportunities to express their opinions, understand and

value the opinions of others, and use the opportunity to ask questions. Spragens (2018) posits that Gutmann and Thompson's (2004) notion of deliberative democracy is significant, for seeking to produce binding decisions that are also rational. Gutmann and Thompson (2004, 3) propose that "citizens be treated as free, equal and independent agents who participate in the governance of their society through elected delegates", and do so openly, rather than becoming inactive individuals who have to accept whatever legislation is imposed on them. In this context, citizens should exercise their freedoms by actively participating in social discourse, by giving justifications and reasons, and not solely by casting a ballot during elections. Hence, deliberative democracy is a vibrant process which permits citizens to critique previous decisions and jointly seek new solutions to problems, through open and continuous discourse (Olawale 2021).

Politically, Gutmann and Thompson's (2004) notion of deliberative democracy equates to a process of government in which equal and free citizens (and their legislatures) collaborate to authenticate decisions which are based on justifiable, tolerable and accessible reasons, to arrive at conclusions that are binding yet open to being contested in the future. The aim of Gutmann and Thompson's (2004) deliberative democracy is to promote an acceptance of joint decisions, inspire humanitarian views on public matters, and foster polite decision making, which includes correcting any mistakes that arise in the process.

On the educational level, Gutmann and Thompson (2004) affirm that, in a democracy, schools are best placed to prepare future free and democratic citizens. To achieve this aim, schools must train learners to deliberate. As such, deliberative citizens are involved in various forms of social, political and moral activities, which seek to attain the public good. According to Gutmann and Thompson (2004), democracy will never flourish unless citizens are well educated, hence they urge schools to train learners in the skills and abilities needed to participate in democratic deliberations. This could be done by providing learners with sufficient knowledge to assist them in understanding political institutions, socioeconomic and international history, and improving their numeracy, reading, and critical thinking skills; all which are goals of mathematics education.

DEMOCRACY AND DEMOCRATIC CITIZENSHIP EDUCATION: THE SOUTH AFRICAN CONTEXT

Moodley and Adam (2004) argue that rather than enjoying of equal rights, there is a sense of displacement in the subconscious of many South Africans. Thus, in the quest for truth and reconciliation in the postapartheid era, the enactment of the new constitution was a milestone in the establishment of a democratic society. However, one aspect that contradicts and

complicates how democratic citizenship education is implemented, is the fact that “government blatantly contradicts the lessons taught at school” (Moodley and Adam 2004, 172). Furthermore, South Africa’s constitutional ideals are weakened by political cultures that frequently practice the opposite of what the constitution purports to promote in civic education. As a result, vital democratic values such as accountability, non-sexism, free debate, as well as non-racism tend to be disregarded by political leaders (Moodley and Adam 2004). Waghid (2018) argues that in the African continent, democratic citizenship education focuses on the crippling impact of political autocracy as a notion which aims to undermine the democratic ambitions of the public who are more cognizant of the country’s, as well as the continent’s socio-economic and political instabilities.

He argues further that many African political autocracies such as the likes of South Africa, Zimbabwe, Democratic Republic of Congo, and Central African Republic, have remained in power due to high voters’ turnout, and because majority of these African leaders do not want to give up powers. As such, they have maintained control at the detriment of civic engagement and democracy (Waghid 2018). These very concept of political authoritarianism in African countries is a barrier to democratic citizenship education, which puts autocracy in jeopardy for a variety of reasons, the most salient of which is that people engage with one another collectively. Thus, Waghid (2018) posit that autocracy inhibits participation because only those in power are regarded valid articulators of speech; it excludes others, putting co-belonging at danger; and it exerts authority brutally, thereby reducing the likelihood of individuals coming into contact with one another. Thus, given that political autocracy still persists in many parts of African countries, the concept of democratic citizenship education presents an urgent challenge for many political leaders (Waghid 2018).

In the South African context, Mathebula (2009) posits that in postapartheid citizenship policy, with the establishment of equal citizenship as well as a non-racial democracy, some may believe that citizenship education, which is clearly based on democratic participation, is critical for bringing previously divided citizens together. In theory, “the South African constitution (Republic of South Africa 1996) embodies an updated version of the Athenian democracy and its notion of citizenship” (Mathebula 2009, 8). This conception of democracy implies genuine commitment, as well as strong discourse on any future educational programs that will produce critical, inquisitive, and active citizens who are capable of building, strengthening and upholding the South African democracy. In actuality, however, South Africa’s post-1994 citizenship idea is much different and “tends toward a “transformed” citizen able to overcome the apartheid divide, i.e., race and ethnicity-based contested notions of citizenship in South Africa, without committing to the provision of the tools necessary for such transformation (both

internal/personal and external/political), in pursuit of a modified version of the prototypical concept of democratic citizenship” (Mathebula 2009, 109–110).

Mathebula’s (2009) argument is a clear indication that there is a conflict between a transformational and substantive understanding of democracy, as well as democratic citizenship in the South African context. Enslin (2003, 73) provides detailed insight into this tension, noting that

“South Africa’s emergent conception of citizenship has to be understood in the context of the negotiated transition to democracy that was marked by the election of 1994, as well as the period of struggle against apartheid that preceded it This transition and the radical break with the past that it is supposed to represent, means that South Africans do not yet have a settled conception of citizenship to draw on. ... Thus, citizenship education too is still in a formative stage.”

The above assertion clearly reveals that the effects of the past, which have a bearing on the understanding of South African citizenship in democracy, continue to linger. Patel and Graham (2019) contend that South Africans exhibit a lackadaisical attitude in terms of their support for democracy. This mindset runs counter to the country’s aim to fostering an active, democratic citizenship culture (Msila 2013). Thus, a democratic society such as that of South Africa continues to face challenges in educating successive generations of young people for responsible citizenship. This is why the country [South Africa] is regarded as one of the few nations in the world, according to Mattes and Denemark (2012), where democratic ambition does not increase with educational level. This is attributable to the educational history and customs of the country. As a result, two significant concerns emerged amid the bustle of educational policy reform, as well as the demand for a single, consistent curriculum in South African schools which will cater for all learners from different racial backgrounds (Davids 2021). The first focused on the policy’s underlying assumption that all teachers were well prepared to begin a journey of educational reformation via citizenship education. While the second is the undisputable conclusion that all teachers embraced not only the surge of the new educational policy, but also the belief that through their teaching methods, they should be promoting democratic civic education (Davids 2021).

However, Mattes and Denemark (2012), argues that while the new curriculum was intended to transform not just South African teaching, but also the country’s political culture, there are no special courses or modules devoted to civic education or democracy, either officially or implicitly. Although schools in South African have been captivated in and by various educational reforms, Davids (2021) also contends that very little, if any, consideration has been devoted to how the teacher fits into the concept of a democratic classroom. As such, Jansen (1998) raises concerns about the curriculum’s political, epistemological, and

philosophical foundations, as well as how it might address apartheid's major historical disparities. Therefore, Biesta (2011) explains that while policymakers and political leaders continue to view education as a critical tool for the "creation" of responsible citizens, it frequently involves an overemphasis on citizenship education and insufficient attention to how citizenship is really taught in and through the processes and practices that make up children's, young people's, and adults' daily lives.

As such, Biesta (2011) argues for a shift in emphasis from citizenship education to the numerous ways in which people at the young age can "learn democracy" via engagement in the context and practices that makes up their daily lives. Mathebula (2009) urged South Africans to focus on "substantive" rather than "transformative" issues of citizenship, participation, and representation. As such, both schools and society as a whole will need to place a renewed emphasis on education as a way of teaching the citizens the essential worth of democracy and provide them with the adequate resources needed to contribute actively in the political processes (Mathebula 2009). As Schoeman (2006) argues, for each new generation, the skills, knowledge and dispositions underlying a constitutional democracy, must be developed. Thus, these dispositions should be fostered and nurtured by means of related words/language, through study and by the power of example. This indicates that students should be equipped for their obligations as members of a democratic society in the future (Schoeman 2006). Thus, to prepare students for future responsibilities as democratic citizens and strengthen their knowledge of political systems, education for democratic citizenship should strive to improve their enquiry and reasoning abilities, promote mutual understanding, encourage intercultural discourse, reject gender disparities, and combat discriminatory relationships amongst and within societies. Mathematics, in particular, should act as the gatekeeper to participation in any community's decision-making processes, given that exclusion from mathematics might mean social and political oppression, and, eventually, exclusion from society (Olawale 2021).

MATHEMATICS AS A CO-FACTOR OF DEMOCRACY

It is often assumed that mathematical education has no political impact. Surprisingly, the strategy or argument utilized largely in mathematics today was not originally designed for practicing mathematics; rather, it was designed to fight Greek sophists and their rhetorical approach to teaching (Hannaford 1998). This is because their training provided the wealthy and privileged with such a large advantage in public speaking that democracy was imperiled. Thus, developing a new form of argument governed by logical reasoning and evidence was a very radical act of enlightened democratic education, paving the way for the teaching and learning of mathematics in the form of open, critical dialogue, which continues to be a powerful form of

education in democratic attitudes (Hannaford 1998). Hannaford (1998) argues that if mathematics is to truly act as a co-factor of democracy, it should be viewed and taught in a way that is contrary to the common opinion that it is abstract and has no value, but acts as a strong shaper of political ideals which can be taught throughout a society (Hannaford 1998). As such, mathematics should be taught through continuous, open debate between free persons to demonstrate how it promotes healthy democracy. In contrast, when students are taught mathematics as if there is no room for freedom or as if they should at no time question, criticize, or disagree with established knowledge, the beauty of mathematics is ruined. Hannaford (1998) argues further that if we do not teach young people to accept and esteem others who have varied opinion or “wrong” ideas (or even no ideas at all), we are doing more than damaging learners’ mathematics. As a result, students are expected to receive excellent mathematics instruction, as this will teach them a great deal about freedom, skills, and, of course, the discipline of expression, dissent, and tolerance that democracy requires in order to thrive. (Olawale 2021).

PEDAGOGICAL APPROACHES THAT FOSTER DEMOCRATIC TENETS IN MATHEMATICS EDUCATION

Mathematics education is critical for improving young people’s post-secondary options, and it is also the most globally relevant of all curriculum courses. In all aspects of life, whether private, social, or civil, mathematical comprehension influences decision-making. Many students struggle with mathematics and become disengaged as a result of the challenges they face (Anthony and Walshaw 2009). Salazar (2013) argues strongly that learners and teachers do not make meaning from the current education system, because of contradictions between educators’ or teachers’ pedagogical approaches and existing structural constraints (e.g., mandated curricula and standardised testing). For Huerta (2011), restrictive educational policies are what prevent educators from developing more humanising approaches. Freire (1970, 55) had already lamented the dehumanising state of education, asserting that “the only effective instrument in the process of re-humanization is humanizing pedagogy”. A humanising pedagogy is thus vital for the success of both educators and learners, and for ensuring their social and academic resilience (Reyes 2007). Therefore, in the formation of citizens who are democratic, it becomes vital to understand and apply pedagogical approaches in the teaching and learning environment that might improve the transmission of positive hidden messages, values, and norms (Olawale 2021).

Critical pedagogy and mathematics education

In some sense, all classroom dialogue is critical since it is fundamentally political, and critical

pedagogy is based on the implicit knowledge that both teachers and students negotiate power on a regular basis (Sarroub and Quadros 2015). The teaching and learning space [classroom], according to Sarroub and Quadros (2015), is a distinctive conversational space appropriate for implementing critical pedagogy. Critical pedagogy, according to Lilia (2004), is primarily concerned with educational methods and theories that help us comprehend the interconnections between ideologies, culture, and power relationships. Hence, over the years, critical theory has advanced and it has turned out to be “a crucial body of scholarship in education that offers a lens for understanding the role of schools in propagating and challenging [the] race, class and gender interests of state and society” (Jansen 2009, 150).

Aslan-Tutak, Bondy, and Adam (2011), in an article titled “Critical pedagogy for critical mathematics education”, identify three emerging domains in mathematics education, namely mathematics education and equity, ethnomathematics and culturally responsive teaching. All three areas focus on creating a more just and democratic mathematics classroom, but employ different approaches to attain their objectives. According to Aslan-Tutak et al. (2011), the purpose of critical mathematics education should be to provide students with the necessary information, abilities, and attitudes for building democratic societies, both inside and outside of the classroom.

According to Gutstein (2006, 106), the main “objectives of critical pedagogy in mathematics education include reading mathematical worlds, succeeding academically (in the traditional sense) and changing learners’ (and teachers’) orientation to mathematics”. Reading the world, according to Gutstein (2006), entails acquiring mathematical abilities to deduce mathematical generalisations and offer creative approaches to issues while considering mathematics as a tool for socio-political criticism. For Olawale, Mncube, and Harber (2021, 94) “academic success in the real sense implies that learners must excel by passing tests and examinations, and graduating from school in pursuit of careers related to mathematics”. Shaping people’s attitudes and beliefs of mathematics requires perceiving mathematics as a powerful tool for interpreting complex, real-world occurrences, rather than as a series of incoherent rules to be memorized (Gutstein 2006). As Bartolomé (1996, 249) explains, “unless educational methods are situated in the learners’ cultural experiences, they will continue to show difficulty in mastering content [...] that is not only alien to their reality, but is often antagonistic toward their culture and lived experiences”.

According to Aslan-Tutak et al. (2011), critical pedagogy in mathematics education does not diminish learners’ exceptional results, but rather attempts to inform students for a more just and democratic society. The prospect of a “critical mathematics education aims to combine multiculturalism and equitable initiatives with critical viewpoints in order to overcome misconceptions about mathematics and its teaching while also increasing critical awareness and

democratic values” (Aslan-Tutak et al. 2011, 6). To achieve these objectives, teachers need more curriculum materials and reforms that will shift their role away from that of being robots who aimlessly implement pedagogy (Giroux 2006), since their role as facilitators of learning is indispensable (Aslan-Tutak et al. 2011). As a result, educating teachers for critical education is vital in achieving crucial changes in mathematics classrooms, and in developing a critical consciousness in different cultures and contexts (Gutstein 2006; Olawale 2021).

Social pedagogy and education

Historically, “social pedagogy is based on the belief that an educator can decisively influence social circumstances through education. Thus, social pedagogy started with efforts to confront social distress pedagogically, in both theory and in practice” (Hämäläinen 2003, 71). In the Western world, social pedagogy is referred to as a profession as well as a discipline (Petrie et al. 2009). Notably, social pedagogy sprang from the work of educational theorists such as Rousseau, Pestalozzi, and Froebel as a manner of expressing alternatives to mainstream schooling patterns (Kyriacou et al. 2009). Social pedagogy involves education that directs individual will towards the higher levels of a communal will (Kyriacou et al. 2009). In a practical sense, social pedagogy is a humanising approach to education. It is dynamic in that it takes account of, and goes beyond, subject learning (Kyriacou et al. 2009). Social pedagogy is a relationship-based method that seeks to blend academic knowledge with emotional awareness in the context of hands-on practical activity in order to achieve “a holistic humanistic approach” (Lloyd et al. 2014). It promotes unconventional teaching methods and creative experimental assignments.

The humanistic nature of social pedagogy, according to Eichsteller and Holthoff (2012), can be encapsulated in the phrase “head, heart, hands” – “a phrase first coined by Johann Heinrich Pestalozzi (a Swiss educational reformer) in the late 18th century, to demonstrate that the whole person is involved in the process of teaching” (Black, Bettencourt, and Cameron 2017, 206–207). The linkages between the aforementioned three aspects, according to Pestalozzi, are the essence of teaching (Soëtard 1994). In the classroom, a synergy of care and teaching can be developed and maintained by “being” with children rather than “doing”. Thus, the focus of practice is directed toward the following: “(i) The values and beliefs you hold relating to education (Head); (ii) How you express these values and beliefs (Heart); and (iii) Activities that form part of your everyday practice (Hands)” (Black et al. 2017, 207). An exploration of these three elements offers valuable insight into how the social pedagogical approach can be employed in mathematics education classrooms, to support teachers in creating and upholding a synergy between caring and educating (Olawale 2021).

A MODEL FOR ESTABLISHING DEMOCRATIC MATHEMATICS TEACHER EDUCATION

The persistence of South Africa's democracy will be determined by what goes on in schools (Naidoo 2012). Hence, schools must strive to promote and uphold a democratic way of life, in order to develop a democratic citizenry. Although teacher education programmes in South African universities have their own dynamics, mathematics student teachers' experiences at university and in mathematics education lecture halls can result in the development of democratic dispositions (Phipps 2010). To that end, a comprehensive model is put forward here, of how mathematics teacher education programmes at South African universities can help to develop a democratic citizenry.

Democratic education that strives to close the gap between a democratic principle and social reliability should be the main focus of any programme formulated to educate mathematics teachers (Trent et al. 2010). As Lilia (2004) points out, directly investigating how ideology functions in connection to power in teacher education classrooms is an effective method to ensure that pre-service teachers begin to establish and strengthen their political and ideological clarity.

The argument made here, is that democratic mathematics teacher education programmes which are capable of developing democratic citizens, should encompass a trilogy of democratic principles; humanising pedagogy; and social, cultural, economic and political issues. This notion is captured in Figure 1.

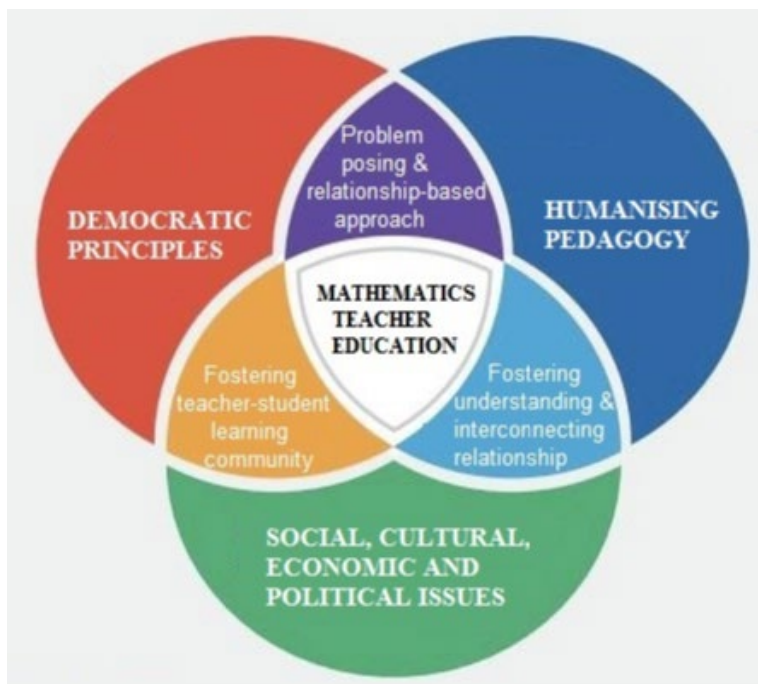


Figure 1: Fundamental components of a mathematics teacher education programme

It is important to point out that the concept illustrated here shows the fundamental components as being closely connected and contributing to the development of democratic citizens. A mathematics teacher education programme which is capable of developing an active, democratic citizenry will therefore accommodate democratic principles, humanising pedagogical approaches and the use of mathematics, to develop an understanding of a range of social, cultural, economic and political issues (Olawale 2021).

Although the list of democratic principles is extensive, and knowing full well that it is impossible to be a democratic citizen without being proficient in mathematics (Ellis and Malloy 2007), the argument advanced here is that, in creating a mathematics teacher education programme that contributes to the development of democratic citizens, it is essential to infuse democratic principles and practices in the mathematics education classroom (and, by extension, the university), such that it becomes a way of life. Amongst the democratic principles and practices to nurture are critical thinking, collaboration, collective decision making, respect, individuals' rights, equality, equity, active participation, informed choice and shared decision making (Olawale 2021).

According to Naidoo (2012), a classroom that is democratic is the centre of any democratic school, and this is where learners co-construct knowledge. Democratic mathematics teacher education classrooms should thus promote democratic principles and practices, where learners' voices are deemed vital in decision making and their views are respected. For this reason, teaching and learning in mathematics teacher education classrooms should become learner-centred, allowing teachers and learners to work collaboratively, to reconstruct a curriculum so that it is inclusive of diversity (Ellis and Malloy 2007). In such a scenario, each classroom will differ in terms of its attributes, because the interactions that take place will be based on learners' experiences, their backgrounds, their immediate environment and their educational context.

With regard to a teaching pedagogy which is capable of developing democratic citizens, many learners, students and educators continue to be impeded from enjoying the benefits of schooling. This is as a result of the contradictions that exist between teachers' pedagogical practices and the prescribed nature of practices, where high-stakes standardised tests and authorised curricula are valued (Huerta 2011). The intention here is not to prescribe a single approach, because in democratic mathematics classrooms there is no one way or context in which a subject can be taught (Bartolomé 1996; Greene 1996; Ellis and Malloy 2007; Aslan-Tutak et al. 2011). Rather, the recommendation is that teacher education programmes evolve into more democratic offerings. Thus, the focus should shift to teaching and learning which employ a problem-posing and a relationship-based approach; that is, a critical and social pedagogy respectively. These pedagogical approaches are capable of nurturing both

mathematics student teachers' and mathematics teacher educators' understanding of the interconnected relationship of ideology, power and culture (Darder 2002; Bartolomé 2011). The development of a critical consciousness will enable students to understand their lives in new ways, and that will guide them to change the existing systems that consistently oppresses them (Aslan-Tutak et al. 2011). The proposed pedagogical approaches will counter those currently used in mathematics teacher education programmes, which dehumanise students.

A mathematics education classroom which is capable of developing democratic citizens should promote issues of social justice, and embrace the idea that students can read and write the world with mathematics (Olawale 2021). Freire (1994; 1997) emphasises that literacy involves reading simultaneously both the word and the world. An individual can only understand words in the context in which they were written. Put differently, literacy is more than the act of processing texts. Rather, it entails an interpretation and understanding of the social norms, cultural values and political issues that shape those texts (Freire 1994; 1997). As such, mathematics literacy necessitates a critical consciousness of how and which numbers are used to dominate and liberate entire populations (Aslan-Tutak et al. 2011).

Critical mathematics education should therefore include reflecting “through”, “with” and “on” mathematics (Skovsmose 2011). That is, mathematics student teachers should be able to reflect “through” mathematics by posing their own questions and making their own conclusions while interacting and talking with others. They should also evaluate mathematics' nature and privileged position, as well as how it might be used to make and justify decisions that influence their lives. Finally, mathematics student instructors should reflect on a variety of social, cultural, economic, and political topics “using” mathematics (Olawale 2021). Hence, to promote the principles of democracy, unity, development, self-reliance and a well-rounded person (*botho*), educational curricula, along with the environment which prevails in schools, must strive to orient learners towards the social, economic, cultural and political values of their unique society (Oats 2014).

CONCLUSION

This study which sought to link mathematics teacher education programmes to democracy and the imperatives of social and economic reforms, provides a canvas for democratizing mathematics teacher education. We propose that while mathematics education has traditionally been about studying mathematics for the sake of knowing mathematics, the onset of the democratic dispensation in South Africa has birthed challenges related to the exercise of power and autonomy in democratizing education. We further argue that teacher education programmes must promote forms of morality and sociality in which student teachers learn to encounter and

engage with social differences from diverse points of view because the main purpose for mathematics in the school curriculum as we see it, is to educate all members of society as opposed to merely creating mathematicians. We put forth a case for the need for a democratic classroom that promotes democratic principles and a humanising pedagogy which seeks to foster learners' understanding of the interconnecting relationships between mathematical ideas and social, cultural, economic, and political issues.

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