

**INFORMATION COMMUNICATION TECHNOLOGIES (ICTs) AND INCLUSIVE
PEDAGOGY: A SOUTH AFRICAN PERSPECTIVE**

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Abstract

The world of technology in education has grown rapidly and at an alarming rate. In South Africa, in particular more and more technology has been adopted towards teaching and learning. This came amidst the implementation of inclusive education. This study therefore sought to analyse the role of ICTs and social media in relation to enhancing the pedagogy of inclusion. The study was a qualitative Participatory Action Research. Five ICT teachers, a focus group of learners and five members of the School Based Support teams of selected secondary schools in one education district of South Africa took part in the study. A group interpretative and critical inductive analytical frameworks were used to analyse data. Among the findings of the study was that while ICTs are widely used in the process of teaching and learning they fall short in addressing notions of equitable learning, cognitive justice which are profound to the pedagogy of inclusion. Among the recommendations is that the use of ICTs should be preceded by a detailed teacher and learner training in developing their ICT inclusive context relevant teaching strategy which, clearly define the purpose of their use within inclusive pedagogic discourse.

Key concepts: information and communication technology; inclusive education; inclusion, inclusive pedagogy; teaching and learning.

INTRODUCTION AND BACKGROUND

Inclusive Education is an approach to education that recognises that all learners could be taught in the mainstream classes regardless of their abilities and needs (Makoelle, 2013). South Africa like many other countries implemented the system of inclusive education from 2001 (Makoelle, 2012). The White Paper 6 became the road-map for the implementation of inclusive education (DoE, 2001). Since then there have been efforts to conceptualise and understand the notion of a pedagogy that is inclusive (Makoelle 2012). This exploratory process came amidst the increasing shift towards the use of technology in education.

Modern classrooms are equipped with the required technological devices to aid instruction, and teachers have to use such devices to ensure that all learners have access to the teaching material. Technological systems abound. The two technologies that seem dominant in the inclusive literature are computer-based instruction (CBI) and information-communication technology (ICT). The former CBI uses computers to conduct lessons, capture learner performances and give feedback about learner progress, while information-communication technologies such as web quests, spreadsheets and graphic presentations are lately being used to support instruction. ICT also includes the constructivist dimensions that focus on problem-solving data analysis to develop critical thinking. The main system currently is what is called *universal design*, which is a framework used to adapt technology to the needs of all learners, for example modified keyboards, speech recognition, text speech, scalable fonts and the virtual environment (Florian, 2009).

Similarly, the use of computer-assisted instruction highlights the significance of this kind of technology in building concept maps and organising study guides. Different software programs are being developed, and the use of multimedia technology in promoting learning is growing. Similarly, the use of the Internet makes it possible for learners to meet 'cyberpals', publish their work, search websites for information, receive online mentoring by experts, and share class projects with others. Most teachers regard technology as a tool to aid their work and not as a replacement for the teacher (Bender 2008).

The use of these technological devices has different results for different types of learners. Technology aids processes of learning such as collaborative learning, collaborative problem-solving and ensure the participation of learners in the learning process (Florian, 2009). Although technology offers some solutions to the challenges of inclusion, it only produces positive results when the use of this technology is carefully planned, takes into consideration the needs of all learners, and if the learners and teachers are skilful in using it without causing any barriers to learning. However, learners should not depend on these devices to a degree that hinders the learning process (Nind, Rix, Sheeny & Simmons, 2003). While it is important for teachers to plan how they would promote participation among the learners in their classrooms, learners also have to bring their side. There has been a move to adopt Information Communication Technologies (ICTs) in the classrooms of South African schools. Some of the ICTs used more and more in the classrooms include for example computers, laptops, smart boards, data projectors and lately tablets and IPADS. The Department of Basic Education (DoBE) has initiated TLI to provide teachers with laptops. The intention is to supply teachers with laptops for their subject planning and keeping of records. It is still has to be seen if this will produce results, as many of South African teachers are not computer literate; however, there is a strong belief on the part of the DoBE that this initiative will improve the teachers' ability to do their work with ease, leading to the improvement of the quality of their work and consequently school improvement.

While there have been pockets of studies about using technology to facilitate teaching and learning, the use of technology to enhance inclusion has not been extensively explored. It is however still not clear if the ICTs have merit within the South African context in ensuring the inclusion of learners with different abilities and needs within the inclusive education environments. It therefore became significant to pose the following research questions:

To what extend do ICT been used to facilitate learning in learners with diverse abilities and needs?

How can ICT be used to enhance inclusion of diverse learners in an inclusive class?

In this article I argue that the role of ICTs in contributing to the inclusion of learners with different abilities and needs within inclusive settings have not been adequately explored and that a more strategic use of ICTs to facilitate inclusive teaching and learning needs to be implemented.

THEORETICAL FRAMEWORK

My thinking in this article was guided by Critical Research (CR) paradigm. I depart from the premise that knowledge is not value free and that knowledge should be understood within the particular social context (Newman 2006). I am inclined to believe that reality is constructed through socially interacting humans. In this study Participatory Action Research (PAR) was used because one of the objectives was to achieve the critical emancipatory ends through an interactive-collaborative process. The use of critical research sought to attain emancipation through participation and engagement by the research participants in more dialectical, reflexive and critical ways in order to deconstruct the current status or situation (Scott and Morrison 2006). In his work Makoelle (2010; 2012) postulates that critical action research is geared towards empowerment and emancipation and harbours political intentions. The remnants of dominant, subjugating and uncritical education practices of the past education dispensation of the apartheid era in South Africa are still prevalent and calls for a more radical research praxis to unmask the existing constraining structural and hegemonic regime of thoughts and practices. Because of the emerging conceptions of inclusion and inclusive pedagogy, the use of PAR was a better place to stimulate critique, reflexivity and creativity among the teachers (Makoelle 2010). The use of PAR ensured that there was an equitable distribution of powers and involvement among the research participants and sought to ensure that participants act as a community of enquiry to develop their own local theory about their own social context (Reason and Bradbury 2006). The notion of being “critical” was instrumental in asking the question about the nature and concept of inclusive pedagogy and how it could be operationalised using ICTs. This led to a deeper understanding of patterns of thinking and meaning making and consequently the synthesis of a coherent articulation of context relevant description of what constituted an enabling pedagogy within the evolving use of ICTs in the classrooms.

CONCEPTUALISING ICTs IN EDUCATION

ICT's are widely implemented in schools throughout the world. There is a move towards facilitating teaching and learning through the use of ICT's. However the literature on ICT and education point that the availability of ICTs does not always translate into optimum and appropriate use.

For instance the European Commission (2013) conducted a survey in school to determine the extent to which ICTs were used. Interesting findings came to the fore. For example the survey indicated and confirmed that the availability of ICTs does not always translate into frequent use. Therefore more frequent use of ICTs was recommended, if they have to have a remarkable impact on accessibility of education to all. The survey also demonstrated that the availability of ICTs at home and school was ideal for influencing educational performance of learners positively. Furthermore it was also found that more training was necessary for the appropriate and optimum use of ICTs in education. Similarly, the other study conducted by Zinnbauer (2007) was to determine to what extent the ICTs can enhance Social capital in the community. The study showed that ICTs through their networking could improve the school capital and thus impact on collaboration among those involved in the teaching and learning enterprise which is fundamental for cooperative achievement of the goals of educative teaching and learning. While the use of ICTs is sometimes hailed as a solution for many educational problems, some authors such as Mdlongwa (2012) are still skeptical about the merits of ICTs in education for instance Mdlongwa cautions that the use of ICTs especially social network has brought some challenges, for example the use of texting language on social media which has profoundly negative effects on the ability of users to write and spell correctly.

While there seems to be extensive literature on the use of ICTs in education limited number of studies exist about how well ICTs can be used to facilitate inclusion in education. Some studies on ICTs and inclusion paint a bleak picture about the extent to which they have been used in this regard, for example Benigno, Boccino and Ott (2007) postulate that to use ICTs to foster inclusion requires change and modification in educational contents, appropriateness, structures and strategies, it is not just a given that they could be used in whatever way. Teachers therefore need to be assisted in choosing appropriately relevant ICT tools for e-learning. While there is this skepticism about the success and merit of ICTs use for inclusion, there is a positive view by some that with appropriate and prolonged use, ICTs could have a positive impact on educational processes. For instance Smart

Inclusion Team (2009) conducted a study in schools on the use of smart boards for facilitating learning in learners with communication disabilities used alongside assistive devices. The result were that participation and learning were positively enhanced.

In South Africa the use of ICTs in education has been encouraged. For instance according to Ndlovu and Lawrence (2012) the use of ICT in South Africa IS driven within the framework of the ICT policy, the white paper on e-education (DoE 2004) and Guidelines for Teacher Training and Professional Development of ICT (DoE 2007). However, Ndlovu and Lawrence (2012) postulate that ICTs in South African schools are poorly utilized, thus indicating poor implementation of policy. They indicate that ICTs were just made available in certain instances without training teachers about the appropriate and relevant use in delivering Pedagogic content knowledge.

This lack of implementation of the use of ICTs calls for more research which could determine the extent to which ICTs could be used, especially in enhancing a pedagogy that is inclusive and widen the participation of all learners regardless of their diverse needs.

METHODOLOGY

The study was conducted using Participatory Action Research (PAR). Participatory Action Research (PAR) is a kind of study where a group of practitioners probe, critique and reflect on their practice to improve it (Makoelle 2012). The action research stages of Kemmis and [Mctaggart \(1998\)](#) were adopted in data collection. These were planning (during which objectives for PAR were determined), observation (current practice observed), action (new practices put into action) and reflection (reflecting on PAR processes). During these stages a series of reflective meetings were held as part of data generation and group interpretative analysis. A number of meeting were determined by when theoretical saturation was reached (when no new information came to the fore). In this study a research group was constituted by 5 teachers from the SBST of each of the conveniently selected secondary schools, Five (5) ICT teachers from the same schools and a focus group of learners.

Data collection process was a cyclic and followed the action research process. So in this study data was collected using free brainstorming meetings, observations, reflective meetings and focus group of learners during PAR. The PAR process was carried as follows:

Phase 1 planning: We firstly established a research group. The research group decided to have rotating secretarial and chairperson role as a mechanism to balance power relations and have all participants active. During this phase the research group had a brainstorm meeting to determine the objectives for PAR. All ethical aspect of the research process were handled during this phase. The following research question was agreed upon.

How can ICT's and social media tools be used to promote an inclusive Pedagogy?

To answer this over-arching research question the following sub-questions were asked.

- How can learners use ICT's or social media be used to facilitate teaching and learning?
- How can assessments be made more inclusive by using ICT and social media?
- How can access to information about content be made more accessible to all learners?

During this phase the research group discussed their understanding of the notion of inclusion and inclusive pedagogy to come a consensus about what the concepts mean.

Phase 2 observation: during this phase the research group reviewed the current practices in relation to how well the ICTs and social media were used to facilitate a pedagogy that is inclusive. Observations were made about the ICTs and social media used in the classroom. Several ICTs and social media were identified. Then the research group decided to determine the extent to which those ICT's and social media are used. To collect responses from the research group about the extent to which those were used to promote inclusion the questionnaire with three options of Low, average and high to rate the use was used.

To complement statistical data by the research group open ended questions were asked for the research group to elaborate on the extent to which those were used to enhance inclusive pedagogy.

Phase 3 action: the research group based on evidence from observations and a questionnaire with open ended questions decided to adopt the identified ICTs and social media over a period of six months to gather evidence on how they could be used to facilitate a pedagogy that is inclusive. During this phase reflective meeting were held to discuss the outcome of process and to interpret data. Focus group Interviews were conducted with learners from classes in which the identified ICTs and social media were used to determine their perspective on practices adopted to facilitate teaching learning. Focus group was used to explore the opinions, perceptions and views of the participants without putting any pressure on them. Focus groups were used in this study because

they are known to stimulate high levels of involvement among participants when there is a need to generate ideas from the individuals in a collective.

Phase 4 reflection: during this phase the research group reflected on PAR processes, made interpretations and conclusions.

Apart from Participatory action research process, data analysis was done to determine to what extent the PAR data answered the research questions and contributions of new knowledge. The following was done to analyse data. An inductive analytical framework was used to analyze and interpret the data. The process of analysis involved analyzing and interpreting the development data inductively according to the following steps (Laws, Harper & Marcus, 2003, p. 395).

Step 1: Reading and rereading all the data closely. This was done to ensure that I was fully conversant with the facts to make the process of analysis more manageable.

Step 2: Drawing up a preliminary list of themes arising from the data. The process involved categorising the data into themes (that is, “coding the data”), assigning labels or texts to all the data collected, and organising raw data into conceptual categories in order to make the data more manageable.

Step 3: Re-reading the data to confirm the themes. By reading the data several times, I was able to verify that the interpretations were correct.

Step 4: Linking the themes to quotations and notes. I then wrote themes alongside the quotations and notes as I went through the data to establish interrelationships.

Step 5: Perusing and interpreting the categories of themes. This was done to discover what the data were telling me in relation to the objectives of the study.

Step 6: Designing a tool to assist in discerning patterns in the data. In order to triangulate and determine the patterns during data analysis, a spreadsheet was used which gave a summary of the themes. For example, the spreadsheet recorded the title of the theme and quotations from different sets of data.

Step 7: Interpreting the data. During this stage, I re-read the quotations and deduced the meaning of each in relation to the others. This resulted in my interpretations, which I presented according to outcome of PAR process. To maintain trustworthiness in this study, the data were triangulated.

FINDINGS

The study has revealed that although teachers recognized the significance of ICTs and social media as tools that could be helpful towards facilitating teaching and learning such were not sufficiently explored to facilitating an enabling pedagogy to all their learners, for instance in the preliminary brainstorming meeting one of the ICT teachers said “ *while I am using computers sometimes to teach learners I have not actually determined to what extent computers helped all learners to access the content that I am trying to teach*” Besides the fact that ICTs were not been adequately been utilized to widen the participation of learners teacher’s understanding of what constituted the use of ICTs and social media to enhance a pedagogy that was inclusive was not the same.

The study has revealed that the following tools were popular with teachers and learners for potential use in making pedagogy inclusive: cell phones, computers, internet, Facebook, blackboard and Dropbox. The preliminary outcome of the extend of the use of ICTs in facilitating inclusion from rating questionnaire seemed as though that teachers did not sufficiently utilised such to facilitate an inclusive teaching and learning as most rated the use from low to average:

| Tool | low | average | High |
|-------------|-----|---------|------|
| Cell phones | 11 | 4 | 0 |
| Computers | 10 | 5 | 0 |
| Internet | 10 | 5 | 0 |
| Facebook | 10 | 5 | 0 |
| Blackboard | 10 | 5 | 0 |
| Dropbox | 11 | 4 | 0 |

The study has indicated that various factors prevented the use of ICTs and social media to facilitate inclusive teaching and learning. For instance when teachers were asked: *Do you use the above ICT’s and social media to enhance inclusion?* The following are some of the responses:

Cell phones: “*I do not allow learners to use cell phones in class except for the use as calculators*”

Computers: “*we do have access to computers we do not use them much to facilitate learning*”

Internet: “*I give learners projects by which they have to look for information on the computer*”

Facebook: *“I have not explored Facebook as a resource for my teaching”*

Blackboard: *“I do not use blackboard at all for teaching”*

Dropbox: *“I only store important documents in a drop box for my future reference”*

The indication of the responses meant that teachers could have underestimated the extent to which ICTs and social media tools could contribute in making learning and teaching inclusive. There were also traditional views about what constitutes a conducive teaching and learning environment and such beliefs and attitudes acted as barriers to the educational use of ICTs and social media tools. While some form of use was detected though insufficient also demonstrated some training need on part of the teachers towards the use of ICTs and social media to facilitating teaching and learning inclusively.

After the process of adopting ICTs and social media in the classrooms, the study has generated the different ways by which ICTs and social media could be used to make teaching and learning more inclusive. For instance the following is a summary of such:

Cell phones: were used to record lesson presentation and learners were encouraged to play the lesson again on their own after classes and at least once at home. Reflecting on the use of cell phones to enhance the participation of learners in the learning process. A focus group of learners from classes of the research group expressed a view that listening to the lesson on the phone several times enhanced their ability to retrieve knowledge learned. One of the learners said *“my memory can now store the knowledge learned easier and longer.”*

Internet: Learners were given tasks to complete by which they were compelled to google answers from the internet, both as individuals and as a group. The use of internet to support the learning process seems to have enhanced both the depth and breadth of the knowledge learned by learners for instance one learner alluded *“the internet allows you to find alternative explanations of concepts thus expand your knowledge base”*.

Facebook: the research group and learners in their classes established a Facebook discussion group by which all can contribute to topics in different subjects. Learners could ask questions and research group members could answer questions. The use of a Facebook by establishing a discussion group seems to have enhanced collaborative learning. For example one learner stated *“Facebook allows*

you to lean in a smart way things from your fellow learners that otherwise you could not learn alone”.

Blackboard: notes, previous question and papers were uploaded on blackboard where all learners could access, a discussion of previous assessment tasks were discussed on an inclusive basis by all learners who are users of the blackboard modules, this leading to collaborative learning. The uploading of notes and previous question papers makes content available for all learners. Furthermore a discussion on previous questions on previous papers seems to have ensured that all possible answers to questions are made available to all learners. Thus learners could do self-assessment by comparing their answers to problems and tasks to those of their peers.

Dropbox: was established by which all learners could contribute extra-information gathered from various sources towards their different school subjects

Computers: There was also an indication that the use of Microsoft word improved the spelling ability of learners whom English was their second language. For instance one of the learners alluded *“since I have to spell correctly on the computer to google and search for information my spelling ability has been significantly improved”.*

The study indicated that post-PAR, the perspectives of teachers about the use of ICTs and social media in enhancing an enabling pedagogy was changed significantly. For instance asked to rate the extent to which they would use the identified ICTs and social media in their endeavour to make their teaching and learning inclusive the following was revealed:

| Tool | low | average | High |
|-------------|-----|---------|------|
| Cell phones | | 6 | 9 |
| Computers | | 3 | 12 |
| Internet | | 5 | 15 |
| Facebook | | 5 | 10 |
| Blackboard | | 7 | 8 |
| Dropbox | | 6 | 9 |

The above statistics indicate that internet, computers and Facebook were highly rated as favourable by teachers in their context. It also became apparent that teachers felt that in their quest to change

their practice towards an inclusive pedagogy was easier and acceptable to them when they have initiated the process change and participated fully in the realisation of the change process. For instance in reflecting about the contribution of the process of adopting ICTs and social media tools to improve the inclusivity of their pedagogy one of the ICT teachers posited “ *I think the process we have embarked upon was very helpful because we do things for ourselves and we can see for ourselves what work and what does not*” The same was supported by learners for instance when asked about to what extent the use of ICTs has helped them to learn one of the learners indicated “ *the mere fact that you can interact with the teacher and classmates even after hours about school work has provided me with the support I have been wishing for*”

However the study has also shown that the learners were also worried about not been able to do certain tasks because they do not have the skills to utilise some of the tools optimally. For example one of the learners said “*if I can be helped on how to use the computer to better I can do a lot myself, the mere fact that we do not use it frequently disadvantages a lot of us*”

DISCUSSION OF FINDINGS

The study has demonstrated the following:

Theme 1 understanding inclusive pedagogy

The study has confirmed that the understanding of what constitutes an inclusive pedagogy was still not clear to the teachers (Florian 2007, Makoelle 2012, and Makoelle 2013). However the study shows that in ensuring an inclusive pedagogy teachers need to have more or less a consensus about what it constitutes and how it could be attained within a particular context. It also seemed as though inclusive pedagogy with the use of ICTs and social media still needed to be conceptualised and operationalised within the context of the school given resources and skills available.

Theme: 2 factors hindering use of ICTs and social media for inclusion

The study has shown that there are several factors that could hinder the use of ICTs and social media to enhance inclusive pedagogy. The argument by Benigno, Boccino and Ott (2007) that to use ICTs to foster inclusion requires change and modification in educational contents, appropriateness, structures and strategies, it is not just a given that they could be used in whatever way was confirmed. The study has demonstrated that the use of ICTs and social media requires that

they be accessible to learners and teachers and that both should be empowered with skills to utilize them. The study has shown that appropriate choice of ICTs and social media to facilitate inclusive teaching and learning was crucial and that not all tools will work in all contexts.

Theme 3 inclusive value of ICTs and social media in classroom

The study seem to have found that the use of ICT's and social media improve on the ability of learners to retain and retrieve new knowledge learned. The use of internet in this study seem to enhance the depth and knowledge breadth of the subjects most learner in that learners are exposed to different plausible explanations (answers) to tasks and problems. The use of a Facebook page as an interactive collaborative platform enhanced collaboration among learners and ability to share knowledge thus widening participation. The uploading of content on blackboard and Dropbox seemed to enhance accessibility and self-assessment by all learners by comparing what they ought to know with what they know. The study has shown that the use of ICT's enhanced the ability of learners to spell words correctly but when using google. However Facebook had the opposite result as the language used to post on Facebook was not always the appropriate one.

Theme 4 training needs of teachers in ICT and social media use for inclusion

The view by Ndlovu and Lawrence (2012) that ICTs in South African schools are poorly utilized, thus indicating poor implementation of policy, and that ICTs were just made available in certain instances without training teachers about the appropriate and relevant use in delivering Pedagogic content knowledge was confirmed by this study. The study indicated that there was still a big gap in the skills by both teachers and learners to take advantage of ICTs and Social media for enhancing inclusive teaching and learning. The study has confirmed that the process of developing inclusive practices required that teachers be trained on how to research own practice by continuously critiquing and reflecting about their practice, thus confirming that action research significant in enhancing a sustainable change which is fundamental to a paradigm shift towards practicing a pedagogy that is inclusive (Makoelle 2012).

Theme 5 self-regulated learning and collaboration

The stance by European Commission (2007) study that the extent the ICT are used could enhance Social capital in the community and that ICT through their networking could improve school capital

and thus impact on collaboration which is fundamental for cooperative learning was confirmed by this study. The ICTs and social media seem to improve on the ability of both learners and teachers to work together and share knowledge easier as they foster networking and interconnectedness. The study shows that learning becomes a self-driven process if learners have access to skills and use of ICTs and social media.

RECOMMENDATIONS

I therefore based on the findings of this study recommend that more research be made in conceptualising the notion of inclusive pedagogy within the use of ICTs and social media. While the ICTs and social media seem to provide hope for an inclusive pedagogy more resources should be invested in making the tools accessible to all learners and teachers. It will also be helpful to train both teachers and learners about the appropriate choice and use of ICTs and social media to support both inclusive teaching and learning. While it could be dangerous to recommend certain ICTs and social media to facilitate teaching and learning inclusively, it suffices however to indicate that schools must do a thorough situation analysis of its human and physical resources and then develop their ICT-social media inclusive strategy. It could also be helpful if teachers can also be taught about researching own practice (through action research) and take advantage of new technological advancements.

CONCLUSION

While the study provided the basis for the use of ICTs and social media for enhancing inclusive and enabling pedagogy, it could be too ambitious to state that it has provided all the answers for the use of such tools in facilitating inclusion. It should be noted that the study was a small scale and took place in a growing and changing and globalising technological advancement and improvement and that not all schools have kept pace with modern developments with regard to the use of ICTs and social media to facilitate teaching and learning. However the study has demonstrated that ICTs with appropriate choice, use and skills may contribute to widening participation in the classroom which otherwise could have been marginalised.

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