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Original Research Article

A critical analysis of the impact of research in education: A systematic review

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ABSTRACT

Many studies have demonstrated the impact of research in many spheres of life. With the scientific knowledge on the rise, we postulated that the impact of research is evident in different scientific fields, which includes education. It is not easy to provide a scholarly definition of the term impact of research as it lacks a standard definition and has various applications. Its use ranges from measuring specific measures to measuring different phenomena. However, the impact of research is a demonstrable contribution outside academia. It is a benefit that society gets because of research activities, and one way of archiving this benefit can be through the addition of value and improvement of the quality of life because of research. From the education perspective, the meaning of the impact of research may include developing skills, knowledge, values, and cultural norms of a people. It equally alludes to the ability to transform the art of teaching, which might lead to valuable lessons that explain the curriculum to the benefit of the students. The impact of research can also mean the ability to modify educational policies to align them with the global educational trends. This critical systematic review addresses the gap in knowledge about the impact of research in basic education. It further provides a broader understanding of how the research impact affects teaching approaches, education policy, and how it influences education management. The authors carried out a systematic literature review of peer-reviewed journal articles about the impact of research. It has been demonstrated from the reviewed literature that research impacts teaching approaches, education policy, and education management.

1. Introduction

Many studies have demonstrated the impact of research in many spheres of life. These studies show that research has the potential of initiating an evolution of how things can be done and or pursued. With the scientific knowledge on the rise (Gustafsson, Wolf, and Agrawal, 2017; Bolisani and Bratianu, 2018), we can postulate that impact of research can be evident in different scientific fields. However, before we proceed to analyse the impact of research, it is necessary to provide a scholarly definition of the term impact of research. Sadly, it is not easy to give a detailed description of the term as it has pretty diverse meanings. Since the impact of research lacks a standard definition, Harris, and Clayton (2010) contend that reasons for this are perpetuated by how the impact of research is used. It ranges from measuring specific measures to measuring different phenomena.

According to Jones and Grant (2013), the impact of research is a demonstrable contribution outside academia. Penfield, Baker, Scoble, and Wykes, 2014, p. 21) define the impact of research as a benefit that society gets because of research activities. One way of achieving this benefit can be by adding value and improving the quality of life because of research. Through research, positivity is added and or altered on culture, services, and public policy. Impact of research attempts to establish how research affects or affects specific changes or benefits, especially outside academia (Penfield et al., 2014). Banzi, Pistotti, Facchini, and Liberati (2011) define the impact of research as any output of research, which can have a positive return.

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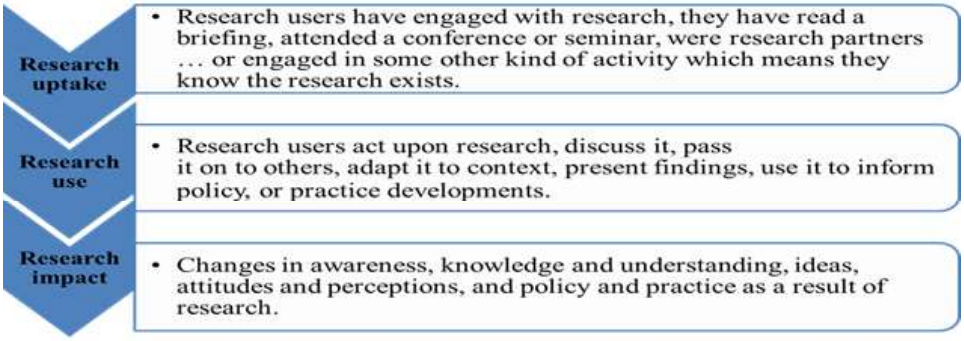
The use of research in policy formulation and possible management intervention is a developing trend aligned with evidence-based research. However, as argued by Harris and Clayton (2010), research, policy, and management practice exist as three distinct cultures, which are pretty different from each other. Moreover, these cultures seem to conflict with the formulation and implementation processes, especially in the light of the consequence of research evidence. The contention is furthered much because the policymaking process has several considerations to make, especially in education. Some of these considerations are political; some are international as education systems do not operate in silos (Watson, 2007).

From the education perspective, the meaning of the impact of research may include developing skills, knowledge, values, and cultural norms of a people (Rymer, 2011). It can equally allude to the ability to transform the art of teaching, which might lead to valuable lessons that explain the curriculum to the benefit of the students. The impact of research can also mean influencing the modification of educational policies to align them with the global educational trends (De Jong, Barker, Cox, Sveinsdottir, and Van Den Besselaar, 2014). This definition expands the argument by Beacham, Kalucy, and McIntyre (2005), who defined the impact of research as the effects and consequences of the results of knowledge utilisation. These effects and outcomes include the value and benefits that educational research brings to the effective functioning of schools.

A brilliant example of the impact of educational research is how various educational systems change to adopt policies that align them with the sustainable development goals of the United Nations (Yamada, 2016; Bebbington & Unerman, 2018), how education systems took the universal policies of ending corporal punishment (Mortorano, 2013). How educational systems adopted student-centred teaching strategies into policy as discussed hereafter. The periodic transformations that occur affect the educational policies and teaching strategies and effect change in educational management, especially in schools. Additionally, the revision and changing of national curriculums, which every education system embarks on periodically, can realign the educational policies, teaching strategies, and educational management.

The changes that take place in basic education are necessary and appropriate in the daily lives of students, for they maximise the required explanation of the curriculums (Ottevanger, Akker &Feiter, 2007). Figure 1 below demonstrates the flow of research in the process of policy formulation. The process flows from research uptake (*engagement*), research use (*actions*), and research impact (*changes*) in people, organisations (*education systems*), and other societal groupings.

Figure 1: Creating research impact (Morton, 2015)



The impact of research in education that enables changes in curriculums, education policies, and management produces and transforms knowledge (Penfield et al., 2014). In the process, the education system(s) get transformation, which in return benefits the society at large. These happenings can be alluded to the impact of research in education as research informs the education system(s) about those which students should be able to achieve as teachers interpret the curriculum (Alberts, 2009). In pursuit of scientific knowledge, educational research should be able to appraise and produce research-based practices as it engages scholarly discourses (Cobern, Schuster, Adams, Applegate, Skjold, Undreiu, & Gobert, 2010).

When it comes to educational management practices, the impact of research acts as the informant and influence, even though the main driver into practice lies else way. The main driver of educational practices is the political regime of the day, as it has the operational mandate (Harris and Clayton, 2010). The availability of resources in schools, including human resources, is also the other influencing factor. Like any other field, disseminating research output to all the relevant users is essential if the research impact is

realised. However, as argued by (Estabrooks, Derksen, Winther, Lavis, Scott, Wallin, and Profetto-Mcgrath, 2008), putting policy to use is not a natural act in basic education. Some of the hindrances in ensuring that the research uptake takes place include the theory-practice gap due to the failure of educational professionals to adopt evidence-based practices, which has the potential of changing behaviour.

It is also essential to note that research can identify issues the system(s) might not be aware of for possible correction and/or reaffirmation. For instance, Awe and Kasanda (2016) and the Ministry of Education (2009) both observed that Namibian teachers dominate the actual pedagogical practices in classes as opposed to the dictates of the student-centred teaching approach. This is quite thought-provoking because the curriculum policy underscores the application of a student-centred teaching approach, which seems to be rarely implemented in classroom practices. Therefore, it is evident in this scenario that research not only advances scientific knowledge but can also reaffirm and or correct the previously adopted policies. Equally, knowledge advances as the practitioners of the profession can realise the impact of research (Ebadi and Schiffauerova, 2016; Fursov, Roschina, & Balmush, 2016).

Remember, research implies different things for different people. Therefore, in trying to elucidate as much academic argument as possible, three central areas in education have been identified. Furthermore, these identified areas seem to be affected by the impact of research the most. These are the impact of research on teaching approaches, the impact of research on education policy, and the impact of research on education management practices.

This critical systematic review addresses the gap in knowledge about the impact of research in basic education. This may lead to a broader understanding of how research impact, affects teaching approaches, education policy, and policy formulation and how it influences education management. This further advance the significance of this study as it can contribute broadly to the pool of knowledge about the influence impact of research has in basic education.

In this systematic literature review, the main research question of the impact of research in basic education is subdivided into three research questions:

- What are the impacts of research on teaching approaches?
- What are the impacts of research on education policy?
- What are the impacts of research on education management practices?

2. Research methods

In an attempt to answer the research questions, we conducted a systematic literature review. There are fourteen types of reviews, and among them, we chose a systematic review approach. According to Grant and Booth (2009); Lim, Antony, and Albliwi (2014), a systematic review has several advantages. Among them includes the ability to bring together all identified realities about a subject of study in this case (the impact of research in basic education) and systematically examine these realities (Grant and Booth, 2009).

Systematic literature review utilises the application of randomised control – which unfortunately has been criticised by other academics that it has the potential to confine and control a study (Grant and Booth, 2009; Ham-Baloyi and Jordan, 2016). To the opposite, confinement and control make it more appropriate because it summarises known realities about a subject of study (Lim et al., 2014). The criteria of trustworthiness, which are credible, transferable, dependable, and confirmable, are equally validated through the application of a series of steps in the implementation process (Anney, 2014; Cypress, 2017). Microsoft Academic and Google Scholar were the primary databases used to obtain the needed possible articles for a systematic literature review. Reviewed articles were restricted to those published from 2009 to 2020 as generated by Microsoft Academic. Each article had an equal probability of being selected (Creswell and Creswell, 2018), but a randomised purposeful selection was applied to select the articles for review (Creswell and Pot, 2018). In this paper, we considered broadly all articles that argue about the impact of research in basic education. Therefore, the findings might have the potential of being generalised across the basic education systems.

3. Findings of the review

In this chapter, the findings of this systematic literature review are presented. The result presentation follows the format of the research hypotheses. After that, a detailed critical analysis of the findings is presented. This makes the results to be combined with the discussion.

3.1 The impact of research on teaching approaches

The hypothetical ideologies, views, and standards that reinforce the pedagogical processes are referred to as teaching approaches (Katukula, 2018). Sometimes, these hypothetical ideologies, opinions, and measures might be unambiguously and reinforced by research. Nonetheless, they can also be spontaneous interpretations, which a teacher might not even be

explicitly aware of. Therefore, various education theories have classified these approaches into two main categories: student-centred and teacher-centred.

It is from these two teaching approaches that, generally, all teaching methods are informed. However, according to Katukula (2018), there are disagreements about which of the two teaching approaches is more effective. However, from the look of things, the student-centred approach seems to be the most preferred by various education systems. The main reason for this could be the perceived understanding that it provides students with an opportunity to build new knowledge under the supervision of the teacher (Tracey and Morrow, 2012; Schrenko, 2016). Hence, the supposed established knowledge becomes more significant to students as it allows them to learn practically. Katukula (2018), on the other hand, argues that the teacher-centred approach seems to be less favoured. This is because of the assumption that it places teachers in the position of know-it-all beings with the ability to determine which students need to learn and achieve (Gurses, Demiray, and Doğar, 2015).

Opponents of the teacher-centred teaching approach argue that students do not get accorded enough opportunities to engage with the learning materials during the learning and teaching process. They further contend that this has the potential to negatively influence students in undesirable ways because it lacks novelty in knowledge construction (Tracey and Morrow, 2012; Schrenko, 2016). However, the pro-teacher-centred teaching approach contends otherwise. They argue that it is a teaching philosophy that avails explicit directives that openly clarify intended concepts and skills required for the students during the teaching and learning process (Clark, Kirschner, Sweller and Clark, 2006; Kirschner and Sweller, 2012; Gurses et al., 2015). Sometimes referred to as the *traditional way of teaching,* Kirschner et al. (2006) further argue that it is a teaching approach that is more suitable for basic education students, as basic education mainly deals with the early stages of schooling.

Clark, Kirschner, and Sweller (2012) states that a teacher-centred teaching approach consists of a series of steps that students have to follow as they solve well-defined problems. With their teachers readily assisting and taking students through the process, learning becomes more meaningful. The support in this regard can be through different classroom-based activities, which could range from *direct instruction* (lecturing), *practical activities* (presentations, practical demonstrations, and modelling), *computer-based activities* (video and audio clips) (Kirschner et al., 2006).

The advocates of the student-centred teaching approach further argue that students learn by constructing knowledge with minimal guidance from the teachers (Kirschner et al., 2006; Westwood, 2008; Sweller, 2009; Clark et al., 2012). Advocates of the teacher-centred teaching approach contend that learning in this approach occurs when a change occurs in long-term memory (Sweller, 2009). This is mainly induced by the fact that teachers dutifully dictate how the pedagogical process takes place and provide complete guidance to students as opposed to minimal guidance of the student-centred approach.

The different views that emanate from these two teaching approaches have an impact on teachers when selecting specific teaching methods as various educational systems have adopted and implemented theories of (Piaget, 1926; Vygotsky, 1962; Bruner, 1960; Wood, 1986). These philosophies dictate that students are active participants in knowledge acquisition. Therefore, many resources have been ploughed into the study and expansion of constructivism theories and student-centred teaching approaches to the negligent of the teacher-centred teaching approach.

This impact produced a considerable body of literature on student-centred teaching approaches and student-centred teaching methods. Different educational systems recommended several student-centred teaching methods as the impact of research was realised as academics argued the importance of these methods. This resulted in almost all the education systems adopting student-centred teaching methods with the main emphasis being that the approach enables students to experience learning with hands-on as they mould learning and understanding according to the philosophies of John Dewey (1933), Jerome Bruner (1961), and Jean Piaget (1983).

The interesting observation is that even though the student-centred teaching approach has been adopted in various education systems, its implementation seems not to have been impactful. Scholars have observed that teachers have perpetuated the teacher-centred teaching approach. For instance, in the Finnish education system, Lavonen (2009) and Juuti, Lavonen, Uitto, Byman, Meisalo (2010) contend that Finnish basic education teachers still favour teacher-centred teaching approach as compared to the student-centred teaching approach. Finnish students themselves also confirmed this according to a study conducted by Juuti et al. (2010). Remarkably, Finnish students prefer to be taught using the teacher-centred approach (p. 619).

In Namibia, Awe and Kasanda (2016) argue that, to some extent, teachers do not even know the meaning and interpretation of a student-centred teaching approach. They say that Namibian teachers interpret student-centred teaching approach as “group work”

(p. 43). An earlier report by the Ministry of education equally mentioned that Namibian teachers dominate their classrooms as students attentively "sit back and copy down the lesson summaries" (MoE, 2009, p. 11). The envisaged impact of the student-centred teaching approach seems to have equally failed to be realised in South Africa, Tanzania, the USA, and Turkey (Spreen and Vally, 2010; NRC, 2011; TIE, 2011; Anangisye and Fussy, 2014; Gurses et al., 2015; Tilya and Mafumiko, 2018).

The lack of a generalised impact evaluation framework makes impact evaluation pose a significant challenge (Chowdhury, Koya, and Philipson, 2016). Nonetheless, the argument presented by these various scholars bears evidence of the impact of research in teaching approach. Even though several teaching methods have been developed under the umbrella of the student-centred approach, advancement in research enabled academics to realise several misconceptions. Using the guidelines for Research Evaluation Framework (REF 2014) and the standard evaluation protocol (SEP), these scholarly publications and arguments can be of necessity and relevant to the education environment. Remember, impact is a measure to assess the quality of research (Parker and Van Teijlingen, 2012). It is also a measure of an identifiable benefit or influence that research has towards the public (Penfield et al., 2014; Bayley and Phipps, 2019).

In this case, this research's influence is in basic education, especially with the teaching approaches. The impact is beneficial to teachers as they are now questioning the best strategies to apply when explaining the curriculum to the students explicitly. This impact has the potential of improving the performance of students. It can be regarded as the spilling over of the original novelty in the sense that as teachers adjust their teaching approaches as informed by research, their interpretation of the curriculum becomes enhanced.

Some academics have argued on the inadequacies of the teaching methods originating from the student-centred teaching approach (Tilya and Mafumiko, 2018; Spreen and Vally, 2010; Gurses et al., 2015). Unfortunately, it seems little research has been conducted on how to improve teacher-centred teaching methods even though it appears that many teachers continue to apply teacher-centred teaching methods in practice (Awe and Kasanda, 2016; Gurses et al., 2015).

3.2 The impact of research on education policy

In pursuant to achieving national academic goals, educational systems periodically have to develop and or adopt educational policies as guiding tools towards success. The most fundamental basic education policy is the national curriculum. It must also be noted that the implementation of these policies sometimes is autonomous to individual states, provinces, regions, and or municipalities. Nevertheless, several curriculums seem to have a few similarities in the sense that they all emphasise the importance of quality, efficiency, equity, equality international in nature (Ministry of Education, 2006; Ministry of Education 2009). For some identified aspects the curriculum policies need to have, the impact of research in education policy must permeate through policy formulation processes.

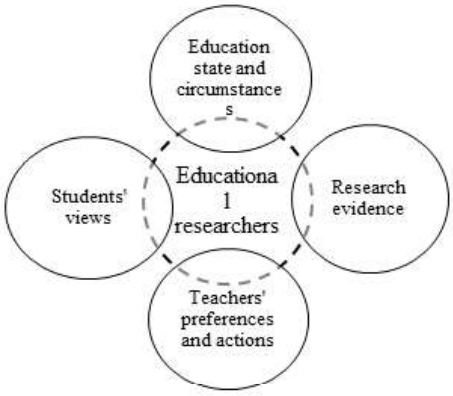
Just as evidence-based medicine in health and clinical practitioners is about changing the "behaviour of clinical practitioners from opinion-based practise to evidence-based practice" (Sackett, Rosenberg, Gray, Haynes & Richardson, 1996), so are also education policies. Changing educational policies can also be seen as a part of instructional practices through which an education system reconciles the global educational policies. This is demonstrated through the fact that the formulation of policies is influenced by the impact of research in education that is evidence-based. This also applies to the revision and or adoption of policies; it is always influenced by evidence-based research.

Following the arguments from education theories of Dewey (1933), Bruner (1961), Piaget (1983), and Vygotsky (1962), educational systems formulated and implemented policies that were more focussed on student-centred teaching approach. This equally qualifies the impact of research in influencing educational policies, as argued from the payback framework. Payback framework is a tool for examining the impact of research (Hanney, Packwood, and Buxton, 2000; Donovan and Hanney, 2011). These authors argue that the payback framework applies a particular case of identified research impact to 'tell the story' of that impact. Therefore, as demonstrated above, the framework serves to structure the story in various academics' arguments regarding the teaching approaches.

One aspect that needs emphasis is the unappreciated impact of basic education in society. Education policy is the most critical impactful element yet often unrecognised as an element of societal change. In formulating education policies, the significance of research is essential to policymakers. It helps them in understanding the preferences and actions of teachers and students. The processes of policy formulation need to have the basis of evidence-based mainly from the views of teachers and students (Thomson & Walker, 2010). From this background, it is evident that educational research impacts the formulation and implementation of education policies. Figure 2 below demonstrates the complex interface of the aspects involved in the policymaking process and how educational research impact the process.

Even though Bailey (2010) seems to oppose the fact that governments tend to possess and control policy prowess, government policy experts base their decision-making on research. They rely much on studies from research institutions, especially universities and schools. Reasons why their decision-making is influenced by educational research, are that the policies have much effect on the universities and the operation of schools. Schools, in return, produce prospective university students. The involvement of teachers, university researchers (*lecturers*), and policymakers makes the formulated educational policies quickly disseminated and accepted by the users of the research. It must be noted that the involvement of all these characters influences the dissemination of the research output. This is because researchers do not necessarily struggle to research the audience in the policy formulation process as the (*audience*) also participates in the process (Harris and Clayton, 2010). Figure 2 below demonstrates how education research bears an impact on education policy formulation.

Figure 1. Education research and educational systems (Adapted from Sackett et al., (1996)



As argued by Morton (2015, p. 40), "people accept information more readily from researchers they trust;" in this case, the involvement of university researchers and schoolteachers. Schools and teachers, in this case, become the disseminators of research, as they are the leading policy implementers. They use it and benefit from its use, which then translates into the needed societal change and awareness, knowledge, and understanding (Morton, 2015). As Rymer (2011) argues, those outside the research system mainly influence the impact of research. These are those directly affected by the outcome of the research, in this case, schools and teachers. Additionally, these might be passive participants in research or may not necessarily form part of the research process (Boswell and Smith, 2017).

3.3 The impact of research on education management practices

School management, which comprises school managers, teachers, and students, is not an easy job or task, especially for those in management position(s). As instructional leaders, these managers have the mandate of building positive school culture through the implementation of educational policies. Mainly, schools, by default, become the implementation phase where the success of the formulated educational policies rests with the educational management practices. From this background, it is essential to analyse the impact of research in educational management practice.

One of the vital policies for implementation is the teaching approach. According to Master, Steiner, Doss, and Acheson-Field (2020), effective teaching is one of the most critical aspects of education management. This is because students' achievement is directly affected by how schools implement the envisaged policy that has to do with effective curriculum content delivery. It is also from effective teaching that measurements for educational outcomes, both national and international, which include (PISA, TIMSS & SACMEQ), are assessed from (Biesta, 2009).

The fact that education systems do not operate in silos (Watson, 2007) gives educational managers pressure to keep themselves abreast of the latest educational research. Thus, utilising research to implement desirable management in schools accelerates the dissemination of research (Knott and Wildavsky, 1980). Furthermore, due to the nature of the education policies and research, governments consistently devise awareness dissemination programs through workshops and periodic training of school managers (Knott and Wildavsky, 1980). The rationale of dissemination is to help policymakers simplify policies for the implementers. In this case, school

managers become agents of change in the process of research use. Therefore, school managers and teachers are forced to infuse in further research in the interpretation and implementation of policies by the nature of their positions. Remember, research use implies the different stages of use and various types of applications (Boshoff, 2014a).

4. Conclusion

The study intended to review the impact of research in education, systematically concentrating on three main areas. These included the impact of research on teaching approaches, education policy, and education management. It can be argued that the study has met its purpose as it is concerned with the critical analysis of the impact of research in education, specifically in basic education.

Even though the 2014 Research Excellence Framework assessment (REF, 2014) provides specifications of defined periods of measurement for the impact of research, it can equally take many years to be achieved (Hughes and Martin, 2012). Therefore, the impact of research can occur beyond the period of (7 to 20 years). This is evident, as Hughes and Martin (2012) further contend that impact of research can be defined as an intentional generation and monitoring of 'what counts' and 'what does not count towards a societal benefit (p. 2). Equally, this is proven by the arguments of (Kirschner et al., 2006; Sweller, 2009; Clark et al., 2012), who have demonstrated after many years that there was nothing wrong with teacher-centred teaching approach.

4.1 The impact of research on teaching approaches

Various authors argued mainly from a position of opposition to the teacher-centred teaching approach with more profound criticism. As Katukula (2018) noted, less research has been conducted to establish and improve the teacher-centred teaching approach. This is further proven by the fact that teachers are still using teacher-centred teaching methods as opposed to student-centred methods (Gurses et al., 2015; Awe and Kasanda, 2016). Therefore, there is evidence of the impact of research in teaching approaches as there lies a corpus material in research that argues as to which method is best. The impact is more vivid to the fact that several educational systems bought into the idea of a student-centred teaching approach at the expense of the teacher-centred teaching approach (Ottander and Ekborg, 2012).

The provision of clear and concise research findings to the appropriate audience and users increases the levels of trust between researchers, users, and implementers of the policies. It equally improves policy communication and knowledge transfer to achieve national academic goals. This is what is generally observable during the formulation of education policies. As a result, educational systems develop ways in which they can reach a bigger audience and sensitise them about the prospects of the intended changes.

As argued by Yamada (2016) and Bebbington and Unerman (2018), teachers and other educational specialists are generally involved in this extensive consultation process during a prospective curriculum revision and amendments. This, of course, excludes international policies, which their implementation is of the global interest. An example of these international policies includes adopting policies that align with the sustainable development goals of the United Nations. Therefore, politics do not necessarily influence the dynamics, which govern educational systems as per the claim of Boswell and Smith (2017, p. 4), but of course, have a higher level of influence.

4.2 The impact of research on educational policy

In educational policy, the claim of Boswell and Smith (2017) that "knowledge shapes policy" is plausible (p. 3). This is because factors involved in the formulation of educational policies include the consideration of international agreed-upon policies. Education is universal, and the national curriculum needs to maintain global similarities, especially in the contents of specific courses. At the same time, it qualifies the relevance of the theories of co-production in education policy. Co-production posits that the impact of research in education has a gradual influence on policy formulation according to how the perceptions of the actors involved are modified (Boswell and Smith, 2017, p. 4).

From this position, the impact of research on education policy can easily be assessable. In education, there are international assessments, which nations use to assess the impact of research in education policies as a measure to inform government(s) for possible readjustments. These assessing bodies include the OECD's Programme for International Student Assessment (PISA), the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ), the Trends in International Mathematics and Science Study (TIMSS) (Katukula, 2018). Contrary to what some academics might contend that this type of impact of research can be spurious, it is further from being unauthentic. Educational research has quite a well-established accountability process and a general understanding of the research (Penfield et al., 2014).

4.3 The impact of research on education management

In educational management, the impact of research is quite apparent. It is the phase of research utilisation where research-based knowledge moves into practice

(Boshoff, Esterhuyse, Wachira-Mbui, Owoaje, Nyandwi, &Mutarindwa, 2018). It is from education management, where research knowledge progressively alters the thinking and perceptions of the knowledge users. The exciting aspect of education management is that the disseminators of research knowledge are at the same time the knowledge users of research. As argued by Boshoff et al. (2018), educational research allows teachers and school managers to have a broader understanding of educational concepts and theories. Through productive interaction during workshops, researchers academically interact with stakeholders (teachers and school managers) as they take them through on how to implement the policies.

According to (Molas-Gallart and Tang (2011), research impact takes place when stakeholders (teachers and school managers) start doing things according to the formulated educational policies. Mainly, this happens after they have had a productive engagement with the researchers and or when they have understood the implementation process of the policies.

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