Educational Leaders’ Continuous Professional Development for the 4IR: A Systematic Literature Review across Africa

The role of continuous professional development (CPD) in advancing educational leaders in the context of the fourth industrial revolution (4IR) cannot be over emphasised in the actualisation of positive change in the school system. The 4IR transformed the nature of work across human endeavours requiring education leaders to be trained and retrained. This study adopted a systematic review of the existing literature within the African continent on the CPD for educational leaders in 4IR. The results indicated that CPD activities should focus on enhancing educational leaders' abilities to manage, build teams, act professionally, communicate effectively in interpersonal situations, teach and assess. Furthermore, various models of CPD to prepare educational leaders for the 4IR were identified. These models are inclusive of but not limited to in-service training, cohort meetings, group learning/collegial learning, learning by exposure, formal leadership training for new principals, compulsory leadership courses through the leadership training centre, regular training, networking, and coaching.

Keywords: continuous professional development, collegial training, education leaders, in-service training, 4IR

Introduction

Leadership plays a vital role in the actualisation of positive change in every organisation including the school. The current global changes call for improved leadership capacity to lead a sustainable system (Fry & Egel, 2021; Schein, 2015; Leadership and leadership for sustainability, n.d., Rogers, 2011). The school like every other sector is faced with changes and globalisation (Wiseman, 2014). As part of the basic education system, educational leaders are responsible for leading continuous improvement of national curriculum framework (Nuttall et al., 2020). Therefore, educational leaders, involved in the routine administration of educational system need to take time to consider on their individual and professional development as leaders and administrators in the changing world (Cravens & Zhao, 2022; Norazana & Zabidi, 2021; Tran et al., 2020). The Fourth Industrial Revolution (4IR) brought about changes to career and institutional development. The rapid change of the 4IR transformed the nature of work across human endeavours. The presence of 4IR in Africa and other continents of the world is regarded as the great world-shaking shift in this generation and provides opportunities for enhancing human life (Ramaphosa, 2020). It is inevitable that “disruptive technologies like machine learning, artificial intelligence, and big data are changing the way we live, the way we work and do business, and the way we govern” (Ramaphosa, 2020). The 4IR is seen as an instrument of providing a solution to Africa’s challenge
namely, access to quality and sustainable education (Kayembe & Nel, 2019; Ramaphosa, 2020; Xiaolan, 2020). Hence, educational leaders must be abreast of this fact and harness possible approaches for placing the school at the centre, in the realisation of this goal.

The 4IR movement led to a shift from a handicraft economy-based approach to a machine economy-based approach (Ndung’u & Signé, 2020). Educational institutions are not left out of this rapid shift. Theories of professional development continue to evolve and remain focused on the tradition of integrating educators with the world of work based on the 4IR. Journeying through history reveals that humans have aspired to improve production (Lange, 2019; Melber, 2020; Brahma, 2020; Lin & Lukodono, 2021). During the First Industrial Revolution (IR), steam and waterpower were used to automate production operations. During the Second IR, the operations moved from the use of water and steam to electric power. While in the Third IR, advancements in electronics and information technology contributed to the automation of manufacturing and service provision (Brahima, 2020; Lin & Lukodono, 2021). The 4IR arose from the Third (IR); the digital revolution that has been gaining traction since the mid-twentieth century. It is distinguished by a convergence of technologies that blurs the distinctions between the physical, digital, and biological domains (World Economic Forum [WEF], 2017). Robotics, virtual reality, cloud technology, big data, artificial intelligence, the internet of things, and emotional intelligence have all contributed to the 4IR's development (Chao Jr, 2017). Besides blurring the lines between physical, digital, and biological aspects of life, the 4IR marked by the integration of technologies.

In the era of 4IR and the impending transformation required, educational leadership development is an essential strategy to increase teachers’ effectiveness and promote a knowledge-based education institution. The rapid change, development, and globalisation as a result of 4IR; have posed challenges to institutions of learning today as compared to the past. To remain relevant in terms of comparative advantages, institutions require agile, resilient, and adaptable leaders (Mdluli & Makhuphe, 2017; Naidoo et al., 2021). Such contemporary school leaders should possess goals and aspirations to place their institution on the global map through regular training and development of their workforce to navigate the unknown future. Somogyi (2021) contends that reflective learning skills, technological and intercultural competence should be given priority now, more than ever, for employees to navigate the 4IR terrain. For basic education to have a favourable comparative advantage and achieve its goals in 4IR, it requires a sound human capital development foundation, as people and knowledge serve as key drivers of today’s world (Rasool & Botha, 2011; Aiyu & Kabiru, 2014; OECD, 2017; Awodiji & Ijaiya, 2019). Educational institutions are sub-systems that embrace much of the nation's development and produce most of the skilled professionals required in the labour market (Mansoor, 2010; Awodiji, 2018). School leaders with regular continuous development programmes tend to have
better staff retention, higher job performance, increased productivity, and comparative advantages (Aliyu & Kabiru, 2014; Awodiji, 2018).

Basic education, being foundational education as a citadel of learning, cannot be left behind in the 4IR due to the need for primary relevant human capital required for the demand of the industry 4.0 society. Research has established needs for reskilling educational leaders in the rapidly changing technological environment and to effectively lead schools for the 4IR era (Naidoo & Potokri, 2021). Naidoo and Potokri (2021) identified 4IR skills required of education leaders and acknowledged the need for them to be better trained. Hence, the educational leaders’ continuous professional development programme (LCPDP) cannot be jettisoned in the rapidly changing world. COVID-19 as a catalyst for change with the experience of “New Normal” demands retooling educational leaders’ skills, knowledge, and competences. School administration has changed due to several influences including the pandemic, technology advancement, digitalisation, remote learning, and other 4IR attributes. Thus, the role of educational leaders at all levels of the system (school principals and their management teams, district education leaders, school supervisors, educational board members, local government education inspectors, department/ministry of education officers among others) cannot be underestimated, which necessitates review on suitable models for leaders’ continuous professional development for 4.0.

Against this background the research question that formed the basis for this study is:

What continuous professional development initiatives for the 4IR are available for educational leaders in the literature across Africa?

Literature Review

The Concept of Educational Leadership

Education leadership is commonly understood as the act of influencing subordinates in schools with a primary aim to achieve educational goals (Bush, 2019; Connolly et al., 2017; Johnson, 2020). Daniëls et al. (2019) define leadership as "a process of influencing whereby an individual exerts intentional influence over others to shape activities and relationships in a group or organisation." Educational leadership in Africa has been conceptualised under ten models of leadership out of which three models (transformational, instructional and distributed) have been established in the literature (Bush & Glover, 2016; Shaikh et al., 2018; Mestry, 2021). Educational leadership studies have revealed that school leaders come to the fore in ensuring effective school climate and student achievement (Witziers, et al., 2003). For decades, educational leadership has been studied, resulting in a variety of leadership styles, such as instructional leadership, situational leadership, transformational leadership, distributed leadership, shared leadership, democratic leadership and
team leadership (Harris, 2013; Zaccaro, et al., 2001; Gupta, et al., 2010; Terzi & Derin, 2016; Jones et al., 2016; Buch & Glover, 2003; Hallinger, 2003; Daniëls et al., 2019; Naicker & Mestry, 2013). Educational leadership is conceptualised as emerging approaches so that a diversity of administration methods can be employed to accomplish an educational institution’s most significant key mission (Witziers, et al., 2003). Studies have recognised three elements of educational leadership as defining the school mission, managing the instructional programme, and promoting a positive school learning climate (Witziers, et al., 2003; Panagiota & Markaki, 2015; Blackmore, 2013; Farrell, 2019). These dimensions led to other educational leadership responsibilities, such as to frame goals, coordinate curriculum, monitor progress, and set expectations (Robinson, 2007; Macbeath & Dempster, 2009; Robinson, 2011; Cambridge Assessment International Education, 2017). In the attainment of these functions demands continuous development of school leaders in the changing world.

Leading in an education system usually involves influencing teachers and other stakeholders without relying on one person alone. The influence process should ideally result in an effective learning climate that all stakeholders (such as students, teachers, parents, and society) perceive as a benefit and ensures that all school organisational processes (such as monitoring the instructional process, managing personnel, and allocating resources) run smoothly (Daniëls et al., 2019).

The Concept of Continuous Professional Development

Leadership development is central in the attainment of institutional goals (The Wallace Foundation, 2013). Globalisation and change, calls for training and retraining at all levels of educational system. Continuous Professional Development (CPD) as philosophy and training is enabling human capital to improve instructional and professional performance, which keeps the school capable to continue and optimise its potential (Raza, 2010). CPD is an institution-wide concept that dates back centuries (Awodiji, 2021). CPD is conceptualised as prearranged, long-term programmes aimed to improve educational leaders’ roles, promote student success, and support reflective practice (Fenwick & Pierce, 2002). According to Filipe, (2014) CPD refers to those activities that enhance school leaders’ competence, knowledge and skills in management, team building, professionalism, interpersonal communication, technology, teaching, and accountability (Herbert & Rainford, 2014). CPD is denoted as events targeted at improving the skills and knowledge of educational leaders through orientation, training, and assistance (Lessing & de Witt, 2007). CPD is the “deed taken to maintain, update and grow the knowledge and skills required for our professional role” (Institute of Training and Occupational Learning, n.d, p.1). CPD is recommended as the emerging consciousness of educational leaders’ incompetence or lack of skill to operate according to expectations or laid-down standards (Steyn, 2008).

The CPD is described as the method of improving and strengthening the instincts, skills, abilities, competencies, and processes of educational leaders
that educational system requires to continue to exist, adapt, and thrive in a 4IR world (United Nations, n.d.). CPD is an educational approach offered to educational leaders to gain expert qualifications such as university degrees, formal coursework, conferences participation, and informal learning openings, established in preparation for identified needs in the changing world (Awodiji, et al., 2020). CPD includes higher education training, conferences, workshops, mentoring, and more (Mathib, 2007; Tingle et al., 2017; Daniëls, et al., 2019; Awodiji, 2021).

The CPD is further considered as learning events, which necessitate a shift in educational leaders’ behaviour because of knowledge and skills required for the changing world of work (Awodiji, 2021). CPD serves as a structure for assisting educational leaders to build their individual and functional skills, knowledge, competencies, and capabilities; thereby increasing value to them towards the attainment of educational objectives in the 4IR world (Isabirye & Moloi, 2013; Sarbeng, 2013; Ijaiya, 2017; Awodiji, 2021). CPD is a means of preparing educational leaders with the knowledge, skills, understanding, competences, and access to information that empowers them to operate efficiently (Whittle et al., 2012). Moreover, CPD is regarded as actions that improve an educational leader’s expertise, competence, skills, knowledge, and attitudinal change (OECD, 2009; 2020), with aim of increasing the quality of pupil learning (Asghar & Ahmad, 2014), and effective change management in the school system (Othman & Abd Rahman, 2013; Tsotetsi, 2013).

**Educational leaders’ continuous development in fourth industrial revolution**

As schools and society are constantly changing, preservice training is no longer a reliable basis for teaching long-term. Consequently, continuous professional development is essential for upgrading and updating educational leaders’ skills, competences and knowledge (Luneta, 2012; Lo, 2020). A school-based leadership professional learning effort will be effective if it emphasises motivation, continuous improvement, teamwork, and the development of its professional learning culture (Fullan & Quinn, 2016). In the same vein, schools will be more effective when their leaders are kept up to date (Ahmadi & Keshavarzi, 2013; Daniëls, et al., 2019). Modern educational trends are focused at developing productive schools. Modernised schools cannot exist without appropriately trained educational leaders (Daniëls, et al., 2019). Without staying abreast with current developments and accepting professional advancement, educational leaders cannot be effective (Jovanova-Mitkovska, 2010). Netolicky (2016) argued that professional personalities and behaviour of educational leaders are influenced not just by formal education, but also by life experience.

In light of the changes and technological advancement that the 4IR placed on school leaders, as well as the increased complexity of the external factors such as the pandemic and other social forces, it is vital that they are provided with adequate training for their demanding roles (Bush, 2009). Faced with
change, the body of knowledge in educational leadership should be continually learning and updating its instructional leadership skills and knowledge (Luneta, 2012; Whittle et al., 2012). With the COVID-19 crisis that affected schools globally and brought about online learning, blended learning, social distancing, and other unusual activities there is a need for educational leaders to reimagine and reskill their leadership approach. Scholars in the fields of the future-of-work and the future-of-learning proposed that there is a need to adopt the flipped classroom over traditional models. That is, the transition from stock of knowledge to flow of knowledge (McGowan & Shipley, 2015; Yu, 2016). The fourth industrial revolution is characterised with automation, service delivery, cost efficiency, machine learning, artificial intelligence, learning optimisation, emotional intelligence among others (World Economic Forum [WEF], 2017; Chao Jr, 2017). Therefore, the need to train and retrain school leaders to acquire relevant skills to manage schools for the 4IR is important and futuristic.

Any CPD programme for educational leaders in the dynamic and challenging world should be characterised with various skills. Gray (2016) suggests that such skills and competences should include equity leadership, soft skills, ownership of ICT processes and tools, hard work, creativity, critical thinking, people management, service oriented, trans-disciplinary skills, and cognitive flexibility. Furthermore, Education Design Lab (2018) and Reaves (2019) recognised skill development areas for school leaders in the 4IR as initiative, collaborative approaches, creativity, problem solving, critical thinking, empathy, oral communication, resilience, and intercultural fluency. Moreover, for educational leaders to cope in 4IR, they are to be equipped with in-depth knowledge of teachers-learners, cultivating innovation, facilitating resources, engaging stakeholders, and the ability to maximise resources (Nkambule, 2020; Teacher American Association of Colleges of (P21) and Education and the Partnership for 21st Century Skills, 2010; Tigere, 2020). There are CPD models for educational leadership proposed in the literature, which include training, networking, direct instruction by experts or experienced persons, workshops, presentations, conferences, and symposiums (Mathib, 2007). Further models include university-based principal preparation programmes, cohort or peer support meetings, and mentoring (Tingle et al., 2017). Bush et al. (2011) suggests contact sessions, mentoring, and networking, while Daniëls, et al. (2019) posits incidental and informal learning, intentional learning, and formal training. Kempen and Steyn (2016), and Reaves (2019) described CPD models for education leaders as an ongoing, system-wide and individual process as well as traditional learning through courses, speakers, or postgraduate study, collaborative learning, role models and anti-models, coaching, and social media as heutagogical (self-determined) learning.
Methodology

As a form of qualitative research, a systematic review was planned to fill a gap by considering the existing related empirical and theoretical literature (Durach et al., 2017; Hallinger, 2018). It is imperative to outline themes and phrases that would guide and provide relevant literature in the area of review (Nowell et al., 2017; Jansen, 2019). Therefore, the study adopted a systematic review approach (Hallinger, 2018; Bellibaş & Gümüş, 2019; Ahmed, 2020) to identify and create features of the educational leadership continuous professional development literature in Africa. Thus, meta-analysis was done to identify the findings to answer the research question stated.

Hence, words or sub themes that are related to leadership, educational leadership, leaders’ continuous professional development, professional development, and staff development were used. From this, various expressions, and phrases to incorporate into the inquiry terms when utilising database were formed. These keywords/themes explored include leadership, educational leadership, school leadership, instructional leadership, staff development, professional development, and mentoring.

Search Approaches

To generate existing empirical, theoretical, and related literature for the review on the educational leadership continuous professional development literature in Africa, it was important to investigate the data accessible through a wide range of stages, for example, visual library, the web, the utilisation of course readings, diaries, meeting procedures, government, and Non-Governmental Organisations (NGO's) reports for the study. Google, Google scholar, Scopus, Research Gate, and the University of Johannesburg e-library were used as search engines. Based on initial hits of 24,363 and 2,510, the limiters such as peer reviewed, report, thesis/dissertation, location (Africa), and English were applied, yielding a total number of 52 results. Selection of articles was based on content, timeliness, relevance, and accessibility; and the analysis of content and abstracts were used to make the decision.

A set of inclusion and exclusion criteria was used in to ensure the resources and bases were appropriate. Inclusion criteria required that all sources be indexed with the words "educational leadership" "school leadership" "continuous professional development" and "leadership development" in both abstracts and full texts. Literature from 2006 to 2021 was used in order to have a view of recent educational leadership professional development progress in Africa.

The exclusion criteria are those characteristics or resources that are excluded from consideration due to publication dates, places of publication, teachers' development, tertiary institutions, and relevance to the study. Therefore, the study excluded literature before 2006. For generalisation and implications of findings, the literature was limited to Africa-based journal articles, books, thesis/dissertations, and reports. Additionally, materials that are
not relevant to Africa were omitted from the study due to national and continental policies addressing issues differently. Furthermore, material that did not focus on the key components or themes were excluded from the study. Therefore, only 11 articles were finally used based on relevancy and accessibility.

Data Analysis

This study utilised thematic analysis because it was a qualitative study that used a secondary research approach. The analysis is flexible and based on the review of literature on the area of concern to generate themes (Braun & Clarke, 2013). Thematically, the study identified related literature on the professional development of educational leaders in Africa to answer the research question.

In academic research, ethical considerations for maintaining individual privacy are paramount (Hallinger, 2018). The researchers, therefore, ensured that the exploration given is scientific, logical, and correct with the aim of providing information in the discipline of educational leadership on continuous professional development for the 4IR in Africa to government officials, educational policymakers, school leaders, scholars, and others.

Considering the nature of the study, the available data was limited by ethical concerns. The researchers remained objective as much as possible in their review. While reviewing related literature on the subject matter, plagiarism issues were also taken into account. The thoughts were paraphrased and reconstructed in accordance with the current study. All the resources used were acknowledged using appropriate referencing style to avoid violating copyright laws (Santini, 2018; Calver, 2015).
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<th>Authors/ Year</th>
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<td>Uworwabayeho et al. (2020)</td>
<td>Developing the capacity of education local leaders for sustaining professional learning communities in Rwanda.</td>
<td>A Mixed method with triangulation (meta-analysis, surveys and from Focus Group Discussions (FGDs).</td>
<td>Theory of Change</td>
<td>(1) An improvement in the competencies (shared and transformational leadership), confidence, and commitment to roles and tasks of educational leaders after CPD; (2) Leadership behavioural change (LBC) - (frequently arranging coaching and mentoring activities for teachers), and school leadership practices. (3) Improvement in school performance.</td>
<td>In-service training: leadership skills in education, professional ethics in education, moral education and human rights, and the management of extra-curricular activities, and emotional intelligence</td>
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<td>Ebot-Ashu (2020)</td>
<td>Leadership and management preparation and development of school leaders in Cameroon.</td>
<td>Mixed method of case study design was adopted</td>
<td></td>
<td>(1) Educational leaders in Cameroon recognised that leadership training related to personal management (self-advancing skills), administrative leadership practices (financial management, strategic management, and public policy), and community relationship management may not likely prepare them as effective leaders. (2) School leaders seemed to be interested in developmental programmes with focus on pedagogical skills, school health and safety responsibilities.</td>
<td>Leadership learning and development, Conferences and workshops, Training on the Job, and Sharing best practices among school leaders through an informal network.</td>
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| Sofo & Abonyi   | Investigating the self-reported professional development activities of school leaders in Ghanaian rural basic schools. | A concurrent mixed-methods approach was adopted to gather data from three groups of basic schools’ leaders of one rural educational district in Ghana. | (1). Leadership development in Ghanaian basic schools is greatly dependent on casual learning which is personal, hence failing to stimulate collaboration and innovation in leadership within the education system. 
(2). Educational leaders adopted informal and self-directed development initiatives in Ghanian. | Workshops, seminars, forums, unstructured and non-intentional experiences, reading books, coaching and advice from colleagues and supervisors, visits to other schools, and formal university courses are all possible strategies for learning. |
| Usman (2016)    | Professional development, instructional leadership, and learning transfer systems of leaders in Ghanaian basic schools.    | A mixed-methods concurrently approach was adopted to gather data form three groups of basic schools’ leaders of one rural educational district in Ghana. | (1). Methods of informal and self-directed learning 
(2) Attending school meetings, visiting other schools, and reading personal materials, and 
(3) Mentoring from supervisors and peers, as well as workshops and on-the-job experiences | Meetings of school leaders, Workshops, seminars, and forums, learning on the job, Reading (books, newspapers, article, magazines), Coaching/guidance/advice from colleagues and supervisors, Visits to other schools, Performance appraisal, and Formal university courses |
| Mestry & Singh  | Continuing professional development for principals: A South African perspective. | A qualitative approach (interview, focus group, document analysis, and feed note compiled by Centre for | (1)Shared leadership approach based on collegiality, 
(2) Provision of personal and professional growth opportunities, Improved stakeholders-relationships, 
(3)Delivery of the ACE curriculum, The benefits of cohort meetings, and | Collegial leadership approach, Personal and professional growth, stakeholders-relationships, ACE programme, Leadership cohort meetings, continuous assessments for |
<p>| Chikoko et al (2011) | Leadership development: School principals’ portfolios as an instrument for change. | A qualitative research approach using sample from a cohort of the ACE (School Leadership) with 88 portfolio and document analysis were adopted. | Portfo|io Approach | (1) Self-understanding (understanding their strength, weakness, and achievements), (2) Value of principals’ responsibilities, (3) Not diagnostic in the structure of their portfolio testimony, and (4) Reproductive instead of being transformational. | Group learning/collegial learning, learning by exposure, mentoring and induction, and value-based leadership development approach |
| Arikewuyo, (2009) | Professional training of secondary school principals in Nigeria: A neglected area in the educational system. | Review of literature on principalship development programme | Peter principle theory | (1) The need for formal leadership training for principals before assuming principalship, (2) Compulsory leadership programmes at the National Institute for Educational Planning and Administration (NIEPA) before they assume managerial positions | Leadership Training, Professional courses, |</p>
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<td>Mathib (2007)</td>
<td>The professional development of school principals.</td>
<td>A quantitative research approach adopting purposeful sampling technique was used to sample 600 respondents (200 principals, 200 Heads of Department, and 200 educators) in Bojanala East and Bojanala West Regions of Northwest Province, South Africa.</td>
<td>(1) Capacity building is made serious and important, while change management is weak, (2) Capacity building on linkages between school and its environment, (3) Creating structures for service delivery through self-expression, innovation, communication and motivation, (4) Provision of guidance to staff for optimum utilisation of their potential, (5) Promoting teamwork among staff.</td>
<td>Training, Networking, and Coaching</td>
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<td>VVOBrwanda (2019)</td>
<td>Integrating ICT in continuous professional development of teachers and school leaders and classrooms in Rwanda.</td>
<td></td>
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<td>National Open, Distance and eLearning; CPD Diploma Programme in Effective School Leadership; CPD Certificate Programme in Educational; Mentorship and Coaching for STEM SSLs/Heads of Department; Certificate Programme in Educational Mentorship and</td>
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<td>Bush et al. (2011)</td>
<td>Preparing new principals in South Africa: The ACE School leadership programme.</td>
<td>Pilot study approach with the use of desk research, documentary analysis, observation, interview, surveys, and longitudinal case studies on different phases.</td>
<td>(1) ACE had impact on school leaders’ managerial practices in terms of enhanced confidence, improved self-control, principal-educators’ relationships, skills’ development (ICT, problem solving, financial planning, and teamwork), school achievement and improvement, School-community relationships, and accountability.</td>
<td>Mentoring, Networking, Assessment, and Material/Module</td>
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<td>Asheber et al. (2021)</td>
<td>Principals’ perception of postgraduate diploma in school leadership programme as opportunity promoting educational leadership improvement in Madda Walabu University (Ethiopia): A qualitative inquiry.</td>
<td>A qualitative research approach of case study design was adopted. Semi-structured interview and focus group discussion with 16 participants (13 male and 3 female) who have participated in postgraduate diploma in school leadership programme was used.</td>
<td>(1) The training has equipped the school leaders with instructional leadership competences. (2) Education policy and contemporary issues, management of educational change. (3) Improves professional knowledge of the principals and school effectiveness</td>
<td>Postgraduate Diploma in School Leadership (PGDSL), Module Content, Professional Knowledge, Skills and Attitudes</td>
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Discussions of Findings

What are the continuous professional development programmes available for educational leaders in literature across Africa? The objective of this study was to assess evidence based on CPD programmes for educational leaders in the literature across Africa. The role of CPD on school leadership and school development has long been researched globally. Thus, several reviews have been done on school or educational leadership, but this study serves as one of the reviews that synthesises models of educational leaders’ CPD for change in the world of fourth industrial revolution. Findings from the meta-analysis carried out established that CPD has been adopted to enhance or prepare educational leaders’ capabilities for change in Africa (Mestry & Singh, 2007; Mathib, 2007; Arikewuyo, 2009; Chikoko et al., 2011; Bush et al., 2011; Sofo & Abonyi, 2017; Usman, 2016; VVOBrwanda, 2019; Uworwabayeho et al., 2020; Ebot-Ashu, 2020; Asheber et al., 2021).

From authors Uworwabayeho et al., (2020) CPD enhances educational leaders’ competencies (shared and transformational leadership), confidence, and commitment to roles and tasks. Also, CPD in terms of coaching and mentoring was said to have promoted leadership behavioural change (LBC), leadership practices, and school performance. This findings is supported by Raza (2010) and Herbert & Rainford (2014), that CPD is capable of improving instructional and professional performance, thereby promoting the school's potential for continued improvement.

Moreover, Ebot-Ashu's (2020) study shows that general leadership CPD might not prepare them for effective leadership in terms of self-advancing skills, administrative leadership practices, or community liaison activities. Education leaders, however, were found to be interested in CPD that focused on skills related to pedagogy and school health. This is in line with Omogyi (2021) who emphasises the importance of reflective learning, technological skills, and intercultural competencies in CPD for education leaders to navigate the 4IR terrain. Currently, in Ghana, basic school leaders are heavily reliant on casual personal learning, which prevents collaboration and innovation among school leaders. Thus, school leaders used informal and self-directed development initiatives as form of CPD practices (Sofo & Abonyi 2017). In addition, Usman (2016) study reveals that informal, self-directed learning, school meetings, visiting other schools, and reading personal materials, mentoring, and on-the-job learning experiences are forms of CPD adopted for educational leaders in Ghana. This is supported by Daniëls, et al. (2019) that incidental and informal learning, deliberate learning, and formal training are forms of CPD that could be employed to promote leadership skills, knowledge and competency.

Moreover, Mestry & Singh (2007) submitted that collegiality as a basis for shared leadership provides educational leaders with opportunities for personal and professional growth that will enhance stakeholder relationships and school development. In addition, value-based leadership development approach, change
management, interrelationships between the school and the environment, innovation, communication, teamwork and motivation were found as the leadership continuous professional development models that will facilitate educational leaders’ capacity (Mathib, 2007). This is inconsonant with (Fenwick & Pierce, 2002; Raza, 2008) findings that CPD programmes aimed to empower educational leaders’ roles, improve student success, and supportive reflective practice in the changing world. According to Filipe, (2014), CPD activities improve school leaders’ competence, knowledge and skills in management, team building, professionalism, interpersonal communication, technology, teaching, and accountability.

Furthermore, Chikoko et al. (2011) showed that principals’ self-understanding, with regard to understanding their strength, weakness, and achievements, and value responsibilities are the benefits derived from the ACE training in South Africa given as a form of CPD using portfolio approach. This implies that CPD will prepare educational leaders with reflective insight about themselves for leading schools in fourth industrial challenge. Hence, the leaders’ CPD is a structure for supporting educational leaders to build their individual and functional skills, knowledge, competencies, and capabilities by increasing value to them towards the attainment of educational objectives in 4IR world (Isabirye & Moloi, 2013; Sarbeng, 2013; Ijaiya, 2017; Awodiji, 2021).

In the same vein, Arikewuyo’s (2009) study in Nigeria identified the need for formal educational leadership training before assuming leadership training programme as a form CPD programmes at the National Institute for Educational Planning and Administration (NIEPA). This suggests that school leaders should be exposed to CPD a formal training to prepare them for 4.0 beside their initial qualifications. It was discovered that CPD contents for educational leaders in Africa should be focused on leadership skills in education, professional ethics, moral education and human rights, management of extra-curricular activities, and emotional intelligent (Uworwabayeho, et al., 2020). Also, personal management, administrative leadership practices, community relationship management and modern pedagogical skills (Ebot-Ashu, 2020) should be included in the CPD module.

Meanwhile, (VVOBrwanda, 2019) concluded that the adoption of confidence, self-control, leaders-educators’ relationships, digital literacy, skills development (ICT, problem solving, financial planning, and teamwork), school-community relationships, and accountability will promote education leaders’ development. Bush et al. (2011) advocated that contact sessions, mentoring, and networking among other approaches will advance educational leaders’ skills and knowledge.

Lastly, instructional leadership competences, professional knowledge, skills and attitudes, education policy and contemporary issues, management of educational change are suggested to be inculcated in the leadership curriculum (Asheber et al., 2021). In the context of STEM vanguard as forerunner to the 4IR, Uworwabayeho et al. (2020) found that an upgrading in the educational leaders’
competencies, confidence, and commitment to roles and tasks increased capacity and leadership behavioural change with regularly coaching and mentoring activities for teachers and school leaders. Thus improved in school performance.

Thematically, CPD leadership literature for African basic school leaders in this study revealed various models that were commonly used. These models are; leadership professional training courses, conferences, workshops, on-the-job training, informal network, forums, seminars, book and journal readings, coaching, institutional/university based courses, in-service training, networking, part-time/sandwich programme, collegial learning, mentoring, leadership cohort/peer meetings, induction, value-based training, post-graduate/certificate leadership training, self-directed learning, performance appraisal, stakeholders-relationship, and school-based mentoring programmes among others. Thus, these models can be advanced for equipping school leaders with 4IR leadership skills, competences, and knowledge. The study had one limitation in that there was no evidence for CPD models in North Africa, as all of the other regions of the continent were represented.

Conclusion and Implications

This study has reviewed and analysed literature on education leaders’ continuous professional development in Africa and identified the models available in the continent for 4IR. The study identified CPD approaches that could be adopted for preparing educational leaders for 4.0. The common models identified are in-service training, cohort meetings, group learning/collegial learning, learning by exposure, and formal leadership training for new principals. Furthermore, compulsory leadership courses through the leadership training centre, regular training, networking, coaching, National Open, and Distance and eLearning, diploma programme, certificate programme, mentorship, and postgraduate Diploma in School Leadership.

By implication, it is therefore concluded that CPD programmes for educational leaders should be emphasised on improving school leaders’ competence, knowledge and skills in management, team building, professionalism, interpersonal communication, technology, teaching, and accountability. Likewise, in-service programmes, cohort/peer meetings, group/collegial learning, exposure, formal leadership training for new education leaders, compulsory leadership courses through the establishment of leadership training centres, regular training, networking, and coaching among others could be used as models of CPD to prepare educational leaders for the 4IR.
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