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Revisiting behaviourism, cognitivist, constructivism and teaching adult learners

Asiimwe Specioza [1*], Magunda Hilary [2]
[1] College of Education, Open, Distance and E-Learning, Kampala International University, Uganda
[2] College of Economics and Management Studies, University of South Africa, Uganda

* Corresponding Author: **Asiimwe Specioza**

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Abstract
The purpose of this article is to revisit the learning paradigms of behaviourism, cognitivism, and constructivism as they relate to adult learning. Adult learning is gaining global interest due to the whirl wind of high knowledge mutability with exponential growth. This has been exacerbated by changes in the demographic structure, economic crises, wars, pandemics, and flux technology. This context has created an urgent need to provide adults with learning opportunities that make them more functional, resilient, and productive. Through literature review, both as a research methodology and data collection tool, this exposition established that adult learners like their younger counterparts need continuous development of their cognitive, affective, and psychomotor domains. Therefore, they must acquire, retain, and apply functional knowledge and skills. The study also demonstrated an existence of a nexus between the three paradigms that makes them reinforce one another to create a holistic adult learning context. The study urges educators to incorporate the principles of behaviourism, cognitivism, and constructivism in design and delivery of adult learning programmes.

Keywords: Behaviourism, cognitivism, constructivism, pedagogy, learning theories, adult learners, learning domains

Introduction

Adult learning continues to be a matter of concern to both scholars and development practitioners. It is a visible friend to development as this segment of the population needs more than basic numeracy and literacy skills to function effectively. UNESCO (2013) [26] notes that countries with higher learning opportunities for all, adults inclusive, have less poverty, improved health outcomes, greater economic growth and development, and social cohesion. It is such a realisation that makes adult learning a fundamental pillar of lifelong learning. Since 2015, adult learning has attained formal recognition in the global development agenda under the Sustainable Development Goals (SDGs), specifically, Goals; 3 on health, 5 on women, 8 on economy, 9 on infrastructure, 12 on consumption, and 13 on climate which have aspects related to adult learning (Benavot, 2018) [6]. The current wave for adult education is accentuated by the global demographic, technological, environmental, economic, cultural, health, and work related trends. Adults are becoming more challenged to learn throughout their lives to fit in the rapidly changing and challenging physical and social environment. Precedents such as improvement in life expectancy, disruptive technologies, emergency of pandemics like Covid-19, climate change, voluntary migrations, and displacement of people by wars such as the Syrian and Russian-Ukrainian Wars, among others, have created a vacuum for new knowledge and skills. Further, Ruhose, Thomsen, and Weilage (2019) [22] note that benefits of adult education are many and diverse. The main benefit being enabling entire economies to prevent human capital depreciation, while remaining competitive in a globalised and ever changing work environment. At individual level, adult education enables adults to maintain and upgrade their skills; acquire competencies needed to remain competitive in the job market; build resilience against shocks; self-actualisation; and civic participation, and social inclusion. While the need to learn among adult's remains, and the efforts aimed at promoting adult learning exist including the implementation of the provisions of the SDGs and functional adult literacy, the need to make adults learn more effectively persists.

Rationale

While adult learning can forestall human capital depreciation, enhance human capital stock, and drive development when effectively functional, the reality is that, on the one hand, adults experience more complications when it comes to learning a new skill, trade, behaviour, a language, or adapting to a new environment. This is where revisiting behaviourism, cogntivism and constructivism and their practical application in teaching adult learners proves essential. This exposition is intended to emphasise how educators can adopt effective teaching practices within the above paradigms to facilitate effective adult learning. The purpose of this paper is to review existing literature to provide a critical, and an in-depth explanation of how the above learning theories can be effectively used in designing and delivering learning programmes for adult learners. The practicality of the literature formed is expected to equip educators with both specific and notions on facilitating adult learners. Henscheke (2016) suggests that a twenty first century adult learner is used to multitasking and processing a variety of information at once. The learner lives in a competitive world, with competing needs for time, space, emotional and financial resources. Disruptive technologies define the adult learning landscape, while catastrophes such as the Covid-19 pandemic, wars, and economic crises, exacerbate the complex nature of adult learning. The educators and other knowledge facilitators for adult learning whether in a school, organisational, or community setting are challenged to adopt and adapt proven and innovative methods and practices in facilitating learning. The contribution of this paper is to provide more supportive practical information on application of the theories of behaviourism, cognitivism, and constructivism in the modern teaching and learning approaches suitable for adult learners.

Materials and Methods

The study adopted a literature review methodology as a method, and tool for collecting, analysing, synthesising, and interpreting information obtained from secondary sources. The information was obtained from journal articles, text books, discussion papers, opinion papers, and some university websites. The essence of adopting this approach was to obtain a deeper understanding of the theoretical and practical aspects of adult learning across contexts and time in a short time span, but in a systematic manner. Through this methodology, the researchers synthesised and evaluated relevant literature on adult learning to sift out, discuss, and explain the various views about the research phenomenon. From this exposition, the researchers suggest effective ways through which educators could facilitate adult learning.

Adult Learning: Conceptual Reflections

Adult learning and education may be described as the whole body of learning processes, whether formal, non-formal or informal, in which adults develop and enrich their knowledge and capabilities for both living and working, either, in their own interests, and or for those of their communities, organisations and societies (UNESCO, 2015) [27]. The essence of learning is to enhance acquisition, enrichment, or modification of knowledge, skills, values, attitudes, behaviours and worldviews.

An adult is defined according to the particular and peculiar institutional context. According to Collins and Hands (2002) [11], an adult is 'a grown-up', 'mature person', 'person of mature age'. Further, an adult is a person who has reached full growth and development – adulthood. This seems to differ from one context to another, and ranges from 14 – 21 years.

These definitions are accentuated by Heschenke (2016) who characterised adult learners as people with a number of unique features that set them apart from ordinary or young learners. Adults are: a distinct group and vary from one another; autonomous, independent, and self-driven; goal oriented; voluntary learners; relevancy oriented; endowed with wealth of experience and knowledge; in need of respect, and boosting self-esteem and self-image; people with established opinions, values and beliefs; motivated intrinsically but could also benefit from extrinsic motivation; people with multiple responsibilities; practical and task and problem oriented; less open minded; people with declining physical potential – more especially older adults; people facing emotional barriers; and people that learn better in learning communities of shared experiences. Knowles (1984) [14] in the theory of andragogy stresses the uniqueness of adult learners suggesting that they learn better when they know why they need to learn something; are learning experientially – learning through experience/hands-on; the topic or themes addressed relate to what they presently do; and learning is seen as a problem-solving exercise. Further, adults have intrinsic motivation - adults learn best when the drive to learn comes naturally from within themselves as learners, though, external motivation is also helpful. Knowles contrasts the features of adult learners aforementioned from those of children whom he describes as dependent on teachers, take information at face value, acquire knowledge for future use, are clean slates – opened minded, and lack experiences to share. Henscheke (2016) suggests that these differences between children and adult learners have both theoretical and practical implications. The greatest implication being the degree of freedom that should be allowed adult learners for self-determination and goal seeking in the learning process.

Brookfield (1995) [8], among others, criticises Knowles assumptions as lacking in empiricism to provide a theoretical grounding for adult learning. However, as noted by Abeni (2020) [1], Desta and Gugssa (2022) [12], and Tezcan (2022), bearing in mind the characteristics of adult learners in designing training programmes for adults yields better results. The potential of Knowles' assumptions, therefore, to prescribe appropriate approaches for training adults remains fundamental not only in design of training programmes, but also their delivery. Moreover, subsequent theorisation of adult learning seems to accentuate the fact that adult learners are unique and need suitable approaches to help them learn better (Chakanika *et al*., 2019) [10]. It may be inferred that acknowledging the adults' sense of self-determination, motivation, experience, goal achievement, relevancy of information, the urge for help and mentorship, respect and self – esteem, and practicality of knowledge, is key to successful delivery of adult training programmes. However, the question is, can these features of adult learners be embedded in the design and delivery of knowledge such as development and implementation of an educational training programme? The learning paradigms such as behaviourism, cognitivism, and constructivism seem to provide theoretical frameworks to ensure development of knowledge, skills, and behaviours adults need including instances of learning new knowledge from the basic to expert level. The expositions in the next section attempt to address the above question.

Paradigmatic discourses and their practical implications on teaching adult learners

Learning as a process has an objective to achieve or an outcome to demonstrate. Learners have goals to realise through learning whether immediate or long term. Educational theorists identify three broad areas of learning; cognitive, affective, and psychomotor as domains which are associated with learning goals (OECD, 2010). The central thesis is that all three domains are fundamental to adult knowledge and skills development. The starting point is to take into account adults' learning needs when designing, delivering, and evaluating adult learning intervention. Moreover, an understanding of motivators for behaviour change among adults is important when designing approaches to promote adult learning.

Bloom *et al*. (1956) [7] provide a taxonomy of educational objectives summarised into the three learning domains as cognitive domain – development of intellectual skills or knowledge; affective – shaping of attitudes such as feelings and emotions, among others; and psychomotor – domain of action and physicality, which includes developing motor skills and coordination like using gadgets such as a computer, or imitating a given behaviour, response, adaption, and origination (Anderson & David, 2001) [3]. While these objectives are considered to apply to young learners, they apply to adults as well when the knowledge, skills, and behaviours that need to be developed are derived from those domains. Examining the psychomotor domain first, educators training adults need to understand what may promote or inhibit adults from acquisition of such skills. Age, sex, environmental factors, self-drive, and prior knowledge are key influencers of the adult's ability to acquire and master these skills (Sahar *et al*., 2022) [23]. In designing and delivering training programmes that include development of psychomotor skills, educators must pay attention to the adults' motivation to learn both intrinsic and external, feedback about the adequacy of performance training, rewarding effects of corrections during practice, and the amount of rewarded practice. Moreover, feedback must be relevant and reinforcing to affect permanent increments of habit strengths acquired and exhibited. In addition, designing work distribution to provide for smooth movement of skills on the simplicity – complexity continuum of tasks, rests and resumption of training is central to better training of psychomotor skills among adults. These views seem consistent with Knowles (1984) [14] suggestions in andragogy. Adults need both internal and external motivation and self-direction.

According to Anderson and David (2001) [3], the *affective domain involves the individual's feelings, emotions and attitudes.* The domain may be subdivided into receiving phenomena; responding to phenomena; valuing; organization; and characterisation of phenomena. Cannon and Feinstein (2005) [9] point out that the receiving phenomena creates awareness of the feelings and emotions, responding to phenomena involves active participation during training or in social activities, valuing includes having the ability to see the worth of something and express it like sharing the views raised during training. Meanwhile, organisation derives from the learner's ability to prioritise, while characterisation deals with the ability to internalise values to control behaviour of the learner. When training adult learners, it is imperative to ensure that the programme design, its delivery and evaluation bring out these learning outcomes in a manner that suits them.

Meanwhile the cognitive domain is concerned with intellectual development outcomes of the learner. Bloom et al (1956) [7] provide a taxonomy of the cognitive domain identifying six levels of intellectual or knowledge development that guides educators in designing teaching strategies to achieve learning outcomes. These include remembering, understanding, applying, analysing, evaluating and creating which fit on the old taxonomic frame of knowledge, comprehension, application, analysis, evaluation, and synthesis. According to Anderson and David (2001) [3], and Abudi (2010) [2], these include: (i) Remembering – ability to recall, retrieve, or recognise the relevant knowledge from memory. To develop remembering skills, educators need to emphasise activities that enable adult learners to develop abilities such as defining, describing, identifying, labelling, listing, matching, naming, outlining, quoting, recalling, reporting, reproducing, retrieving, showing, stating, tabulating, and telling, among others. Though these skills are presumably acquired during the basic learning years of one's life, some adults either lack them or still need to build on them to enhance development of higher level skills. The skills are ideal in teaching new concepts to the adults. Educators need to use the right verbs to elicit the correct responses from the adult learners and to evaluate the outcomes of the learning process.

(ii) Understanding includes demonstrating comprehension through explanation of concepts for example, comparing events in different regions, and classifying concepts or aspects (Anderson & David, 2001) [3]. An adult that is learning new concepts needs to demonstrate an ability to arrange them logically following basic principles, and articulate the concepts correctly. In computational subjects, the adult needs to be able to compute figures following the basic rules, distinguish between aspects basing on their key features, explore, generalise, rearrange, paraphrase, summarise, translate, and make inferences from the knowledge learned. The educator designing a learning programme or teaching adults must ensure that the verbs used to demonstrate skills development focus on the likely outcomes and so should the training focus and process themselves. (iii) Applying relates to being able to use information or skills in a new situation like applying a model learned during training in a real life context. Learners may use for example a negotiation model to facilitate negotiation during a role play. In adult training, an educator should use activity verbs like demonstrate, interpret, practice, solve, use, illustrate, modify, predict, examine, experiment, and operate in designing learning objectives, and should be emphasised during training and evaluated at the end of the training programme. Use of the right verbs accentuates teaching effectiveness, and attainment of the expected learning outcomes for adult learners. Like other abilities, this depends on correct application of the basic principles to deliver the expected results.

(iv) Analysing requires the learner to develop the ability to break down the material learned into smaller elements, and determine the relationships between the parts, so that its organisational structure is understood (Anderson & David, 2001; Abudi, 2010) [3, 2]. The educator during learning programme design, delivery, and evaluation has to emphasise outcome verbs like analyse, arrange, classify, differentiate, distinguish, explain, order, organise, and relate, among others, to ensure effective teaching and development of this

level of skill among the adults. (v) Evaluating is about making judgement based on the criteria and standards set. The learner has to use the basic principles to make right judgement. The adult learner at this level should be trained to be able to detect inconsistences and falsehoods, and to select best methods to apply with reasoned justification. The learner must be able to weigh situations and select the best course of action among the competing courses of action. Programme design, delivery and evaluation for adult learning benefits from application of activity verbs like appraise, argue, determine, grade, justify, rank, recommend, select, standardise, and validate, among others. (vi) Creating, which is considered the highest form of cognitive development of knowledge and skills involves putting the elements of information together logically, to form a new coherent or functional structure. For example, an adult working on a project should be able to develop and test hypotheses, write a project report, develop a new product, or design new organisational processes, and others. The educator needs to design, deliver, and evaluate the training programme basing on activity verbs such as assemble, collect, compile, compose, construct, create, modify, design, generate, propose, reconstruct, revise, specify, synthesise, and plan, among others. In the diagram below, in support of the reflections above, Mohidin (2010) [16] illustrates the learning processes in the cognitive domain that also suit adult learners who have to develop their cognitive abilities along the suggested hierarchy.

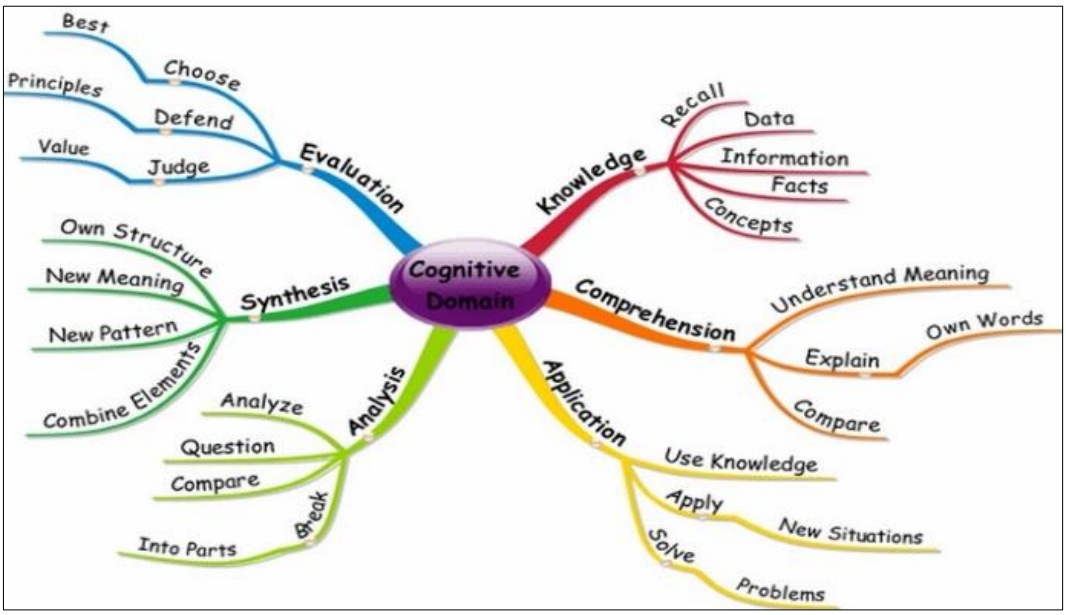

Fig 1: Mohidin (2010) [16] Using Mind Maps

These levels seem arranged in an order of prepotence from lower order thinking to higher order thinking. It is assumed that a lower order intellectual skill influences the development, and masterly of the higher order skill. Perhaps, it would be an error for an educator to assume that an adult learner will demonstrate understanding of information that they are not able to remember, or apply what they have not understood. Similarly, one may not reasonably analyse, evaluate or create new structures out of information whose application they cannot visualise. Anderson and David (2001) [3] indicate that Bloom's Taxonomy of Cognitive Domain privileges mere intellect over heart like much modern education guided by both modernism and post-modern theorisation. Meanwhile, Barney (2021) [4] finds this taxonomy reductionist and seems to detach the head from the body – hands (psychomotor), and the heart – (affective) domains of educational objectives. However, Anderson and David and Barney seem to ignore the centrality of Bloom's Taxonomy in laying out and defining a clear set of goals that educators must pursue for effective intellectual development. They also appear not to have considered the knock on effects on the affective and psychomotor domains derived from better cognitive and intellectual development. The authors aver that the taxonomy of cognitive domain despite the aforesaid reservations provides a helpful guide to develop and deliver learning programmes that benefit adults. To this extent, therefore, educators are enjoined to incorporate the views from Bloom's Taxonomy to meet the intellectual elements and goals of training adult learners.

Modern theorisation of learning provides a plethora of learning theories. These include behaviourism, cognitivism, and constructivism (Timar & Moraru, 2011) [25]. Behaviourism is identified with training, cognitivism with teaching, while constructivism – adult education with self-directed learning. From another angle, Merriam and Bierema (2014) [15] suggest that learning paradigms include behaviourism – controlled behaviour; humanism – self-directed learning; cognitive learning- process of knowing, perceiving, and remembering; social cognition – learning through observation of one's social environment; and constructive learning – constructing meaning and knowledge from experience. Meanwhile, Belanger (2011) [5] differentiates between the main learning theories as behaviourism, cognitivism, and socio-constructivism, and from the adult learning theories, suggests the humanistic theory, experiential learning theory, and transformative learning theory. These have different implications on ensuring the effectiveness of adult teaching strategies. This study focused on the three paradigms of behaviourism, cognitivism, and constructivism as primary frameworks that have the potential to guide knowledge, skills, and behaviour development for the adult learners in a way that is likely to

make them more resourceful.

Behaviourists as championed by theorists such as Skinner assume that learning should cause a change in behaviour or acquisition and improvement of a specific skill, which should be rewarded – operand conditioning (OECD, 2010). Further, the more one practices the right behaviour or skill, the more one masters it. Therefore, reward and repetition reinforce behaviour change and consolidation or acquisition and application of a skill. This theory allows learners to focus on one goal. However, critics find this theory mechanistic and reductionistic, yet learning takes place in many different ways. Besides, more factors need to be considered in designing learning programmes since people learn differently. Nonetheless, in the adult learning environment, this theory accentuates the goal focused approach to learning, and where the outcome of learning is acquisition of skills or specific behaviour. It is ideal where adults need to learn concrete tasks or performance oriented activities that have definitive answers or measurable standards of achievement. Adults, like children, need learning stimulus, and positive reward to develop and consolidate skills or positive behavioural traits in the community. Fitting the behaviourist model in Knowles andragogical – pedagogical assumptions, it views the learner as a machine that requires mechanical learning, intended to train, where the role of the educator is that of a trainer, the learner is to acquire and perform a specific skill or behaviour, and the tasks to learn are simple.

The behaviourist model could help in designing training programmes for the adults where the primary goal is acquisition of a skill or performance of a behaviour. When designing a training programme, and or teaching adults, the educator should focus on the goal that the adult is to pursue, have a clear picture of what the outcomes will be, and how they will be demonstrated, and observed. In addition, the educator should relate the behaviour or skill being learned to how it will be utilised outside of the training environment like solving real life challenge. In a different, but supplementary way, Belanger (2011) [5] suggests that trainers should be aware that learning is hierarchical, and so, should organise the teaching material step by step from the simplest to the most complex. Learning should be explained by combining the proper external environment and be clear on the skills to be learned. This should come out clearly in the teaching/learning objectives by way of using correct action verbs that guide learning. The educator should ensure existence of external material reinforcement. In addition, the learning situation needs to be highly structured, and ensure avoidance of mistakes as they are not treated as learning experiences but problems. However, the educator should note that behaviourist teaching approaches which are teacher centred may not ideal for critical thinking, self-directed motivation, individual practical applications, and making personal meaningful reflection and deliberation. Hence, this paradigm should only be used where it suits the type of knowledge, skill or behaviour to be developed. Therefore, the authors argue that it should not form a singular approach to designing a training programme for adults with complex learning needs but complementary to others to accentuate realisation of the desired goal.

Cognitivism suggests that adults are primed for learning when they have established a clear learning goal or objectives for themselves. Directed learning, a primary focus for adults can be achieved by asking learners what they want to learn and what expectations they have for the course. It centres on the mental and psychological processes of the mind, not on behaviour (Taylor & Hamdy, 2013; Merriam & Bierema, 2014) [24, 15]. It assumes that people learn from experiences and can change behaviour using cognitive processes as active participants in the learning process based on the new information. Cognitive approaches to learning, pay attention to developing comprehension, abstraction, analysis, synthesis, generalization, evaluation, decision-making, problem-solving and creative thinking. These learning processes fit much better in the adult learning characteristics when incorporated in the teaching strategies. The cognitive learning process is concerned with perception and processing of information into knowledge and skills (Taylor & Hamdy, 2013) [24]. The theory builds on Bloom's taxonomy of the cognitive domain and focuses on the human thinking processes as they progress from the simple – remembering, to the more complex – synthesis or creation. Educators should note that adult learners have the ability for conscious thoughts, decision – making, emotions, and expression of ideas through social discourse. The learner is an agent in the learning process deliberately processing and categorising the streams of information fed into him by the external world, including the educator for intellectual development. There is thinking when learning, and adults also progress along the intellectual growth structure as suggested by Bloom *et al* (1956) [7]. Educators, therefore, have to focus on the mental processes that affect learning, thinking, behaviour, and the conditions that influence those mental processes among adults.

Cognitivists claim that learners acquire knowledge by combining both old and new information together in a holistic manner. As noted by Knowles (1984) [14], adults receive information and process it, organise it according to existing knowledge – experience to better be able to recall it later. Cognitivists argue that effective learning for better cognitive results requires active participation of the learner in the learning process and the learner should be able to reflect on the knowledge gained and apply it to their own work. Though this method is considered teacher centred, using cognitive teaching strategies such as helping learners find new solutions to the problems, encouraging discussions or debates about what is being taught, helping them explore and understand how ideas are connected helps learners assimilate new information to existing knowledge. This is a form of learner participation in the process. Strategies such as retrieval practice, feedback-driven metacognition, speed practice, and interleaving may improve cognitive learning among adult learners. Instructional explanations, demonstrations, illustrations, matched non-examples, debates, role plays, and use of rich materials and resources facilitates cognitive learning. Educators must note that cognitivism approaches generate too much information that may go beyond the needs of the adult learners. Therefore, to ensure effective adult learning, effort should be made to provide information that is within the adult learner's capacity to process and apply. The teaching strategy should be based on what the adult learner needs from the training programme – relevance of knowledge. It should be emphasised that the right verbs are used when designing the training programme to ensure that realisation of the training outcomes are demonstrable to both the educator and the learner. In addition, this should not be applied in isolation of other paradigms to ensure a holistic acquisition of knowledge, skills and behaviours needed by adults to function effectively.

Constructivism sees learning as a process of building one's own subjective reality and is congruent with the notion of self-directed study approaches. Learners construct their own reality through an active, and constructive process involving the interaction between their previous skills and knowledge and the skills and knowledge gained from social interactions with peers, educators, and social activities (Zhou & Brown, 2015) [29]. Through this process, learners create their own interpretation of reality. Knowledge is actively constructed based on the learner's environment, and the physical, and social world which makes it relative (Mukhalalati & Taylor, 2019) [17]. It approaches pedagogy and learning holistically focusing comprehensively on the internal cognitive mechanisms that underlie the learning processes, participation and social interaction. Learning is considered an active process, where new information is linked to old information and contextualised rather than acquired. Therefore, knowledge is developed through the process of contextualisation by cognition and assimilation. In line with adult learning theorem, constructivists assume that the learner is not 'a blank slate' but brings their own interpretation, experiences and cultural factors to a learning experience. It appears also to assume that the adult learner already has the basic knowledge on which to build the new knowledge including the basic principles for its manipulation and application. This makes the constructivist pedagogy a learner-centred approach with opportunities to accommodate adult learners' uniqueness. This is akin to the andragogical process of adult learning where the educator has to create a conducive environment for adult learning.

Under the constructivism paradigm, the educator has to encourage learning by action, use of outcome based learning activities, critical appraisal of knowledge, demonstration tasks, and scaffolding the learners' independent practice of the tasks (Merriam & Bierema, 2014) [15]. The role of the educator is to prepare learners to construct their own knowledge and apply taught concepts in the real world situations by way of knowledge recontextualisation. As the educator, the focus should be on the learners' questions and interests to build on what learners already know, focus on interactive learning, make it learner centred, and engage in dialogue with the learners to help them construct their own knowledge. Further, the educator must encourage them to constantly assess how the learning activity is helping them gain knowledge, facilitate interactive experiences and collaborative dialogue. Techniques which immerse learners in experiences like meaning-making inquiry, imagination, interaction, and hypothesising situations are important. While applying this paradigm, the educator needs to discard the expert's approach of attempting to impose their construction of reality on the learners, but ensure the learning environment is democratic and inclusive. This becomes more successful when learners have a knowledge base on which to develop as some tasks may require cognitive development from the basic to expert level. Evaluating the abilities of the learners before assuming this approach is central to successful programme delivery.

The Behaviourism, Cognitivism, and Constructivism Nexus in Adult Learning

The above literature appears to suggest a behaviourism, cognitivism, and constructivism nexus in the adult learning process. From the behaviourist learning perspective, it seems prudent that adult learning process should impose expert approach to the extent applicable to ensure that adults develop the required demonstrable competences (Merriam & Bierema, 2014) [15]. This may be ideal where specific skills must be developed from the basic to expert level among the adult learners. Behaviourism in this learning environment prepares the adult learner to acquire competences in performing skills under specific and systematic instruction. It provides the educator with an opportunity to introduce the subject, guide the learners from the expert point of view, and emphasise what knowledge, skills and behaviours must be learned and demonstrated in a structured process to achieve the learning goal. The stimuli to learning are external and the educator must reward success, provide feedback, and prepare the adult learner for life-long learning. In circumstances where adults are developing vocational skills, this provides the foundation for successful training of theory and basic skills for development and later demonstration of mastery of relevant theory and practical skills. Self-directed learning which adult learning theorists emphasise arguably builds on this level of basic principles and subject matter expertise. It also seems to shape the way adults see the world, approach it, and construct meaning out of it based on the theory, principles, and basic knowledge developed through the behaviourist approaches to learning. One may aver that this is how behaviourist approaches to learning enable adult learners develop the necessary competences for self-directed studies.

Cognitivism recognises that learning is part of the internal structure of an individual learner which enables learning to happen. While adults are considered to learn what they want, the way they learn it, contextualise it, and later apply it is determined by the cognitive processes. The learner must understand, internalise, and be able to remember what they have learnt in order to apply it (Taylor & Hamdy, 2013) [24]. This requires the educator to act as both the subject expert to impart content, and facilitate participation of the learner during the process. This creates a relationship between the behaviourists and cognitivist approaches. As claimed by Merriam and Bierema (2014) [15], the educator should structure the learning content in a way that may be easily understood by the learner, and related to what the adult learner is facing in the real life in an intellectual way. The educator should aim at development of the cognitive domain from knowledge to creation according to the abilities of the learner and the learner should be active in the learning process. In the process of structuring the intellectual and cognitive processes of the learner, the educator should help them to think about what they know, relate them to the real world, and develop a new context of knowledge in a participatory manner. This from the postulations of both Taylor and Hamdy (2013) [24] and Merriam and Bierema (2014) [15] seems to create a basis on which adults contextualise and recontextualise their knowledge as suggested by the constructivists like Zhou and Brown (2015) [29] and Mukhalalati and Taylor (2019) [17]. This argument creates a link between cognitivism and constructivism processes of learning among adults.

As noted, the constructivism paradigm assumes that the adult learner has foundational knowledge, skills and behaviours from which to build. The main challenge that such a learner faces is recontextualisation of the knowledge and experiences to form new ones. This makes the educator a facilitator of the reconstruction process (Mukhalalati & Taylor, 2019) [17]. However, the researchers posit that in a number of cases,

adults meet new changes that may not be satisfied by mere reconstruction of their current experience and knowledge, but acquisition of new knowledge, skills and behaviours. In this case, adults need to grow along the path of knowledge creation as proposed by behaviourists and cognitivists (Merriam & Bierema, 2014) [15]. This creates a learning environment that demands mixing of learning paradigms to ensure greater learning effectiveness among adults. Learning a skill that requires development of specific knowledge like a performance behaviour takes a behaviourist approach, while learning a skill that involves cognition and intellectual development calls for the cognitivist process. Meanwhile, building on what the adult already knows and personal goals follows a constructivist approach. It may be claimed that construction and reconstruction of knowledge based on one's experiences as propounded by constructivists requires a foundation on which to build. This foundation arises from the basic theories and principles, and a well-developed internal cognitive and intellectual structure established through behaviourist and cognitive processes. This is what forms the nexus between behaviourism, cognitivism, and constructivism as they relate to adult learning. To this extent, therefore, the researchers argue that revisiting the three learning paradigms offers educators an opportunity to appreciate how to design learning programmes that suit the changing knowledge, skills and behavioural needs of the adult learner. The researchers also enjoin educators to adopt a mixed paradigms approach to give adult learners who have not been to school or are in need of making career switch into completely new areas of knowledge an opportunity to develop the basics required to succeed in the new field.

Conclusion

Though there has been much debate on how adult learning may be facilitated, it is clear that the paradigms of behaviourism, cognitivism, and constructivism still provide a potent explanatory framework to guide such learning. They have aspects that help adults in their learning process develop functional competences. They appear to reinforce each other and may provide a holistic learning system that enables adult learners to develop and apply practical skills from theory and basic principles to expert level. They provide a basis and scaffold a learning process that is self-regulated, experiential, need-based, relevant to the context of the learner, collaborative, and goal-oriented that is essential for adult learning. Therefore, rethinking these paradigms as frameworks to guide adult learning necessitates a renaissance. Behaviourism guides adult training, cognitivism streamlines teaching approaches that by extension are applicable to adults, while constructivism regulates self-directed learning that is arguably aligned to the characteristics of adult learners. An appreciation of these paradigms and other lateral theoretical dimensions provides an opportunity to devise strategies and techniques that suit adult learners and optimise their learning potential in a world where there is high knowledge mutability with exponential growth. This analysis provides a canvas to combine various learning paradigms to enable effective adult teaching and learning. Adult learners like their younger counterparts need continuous development of their cognitive, affective, and psychomotor domains to acquire, retain, and apply functional knowledge which stamps the mark of contemporary importance on the paradigms exposed in this article. Therefore, educators are urged to incorporate the principles of each of those paradigms to the extent that they provide teaching and learning opportunities for adults to enable them develop the necessary competences for successful acquisition and application of new knowledge, skills and behaviours in their contemporary context.

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