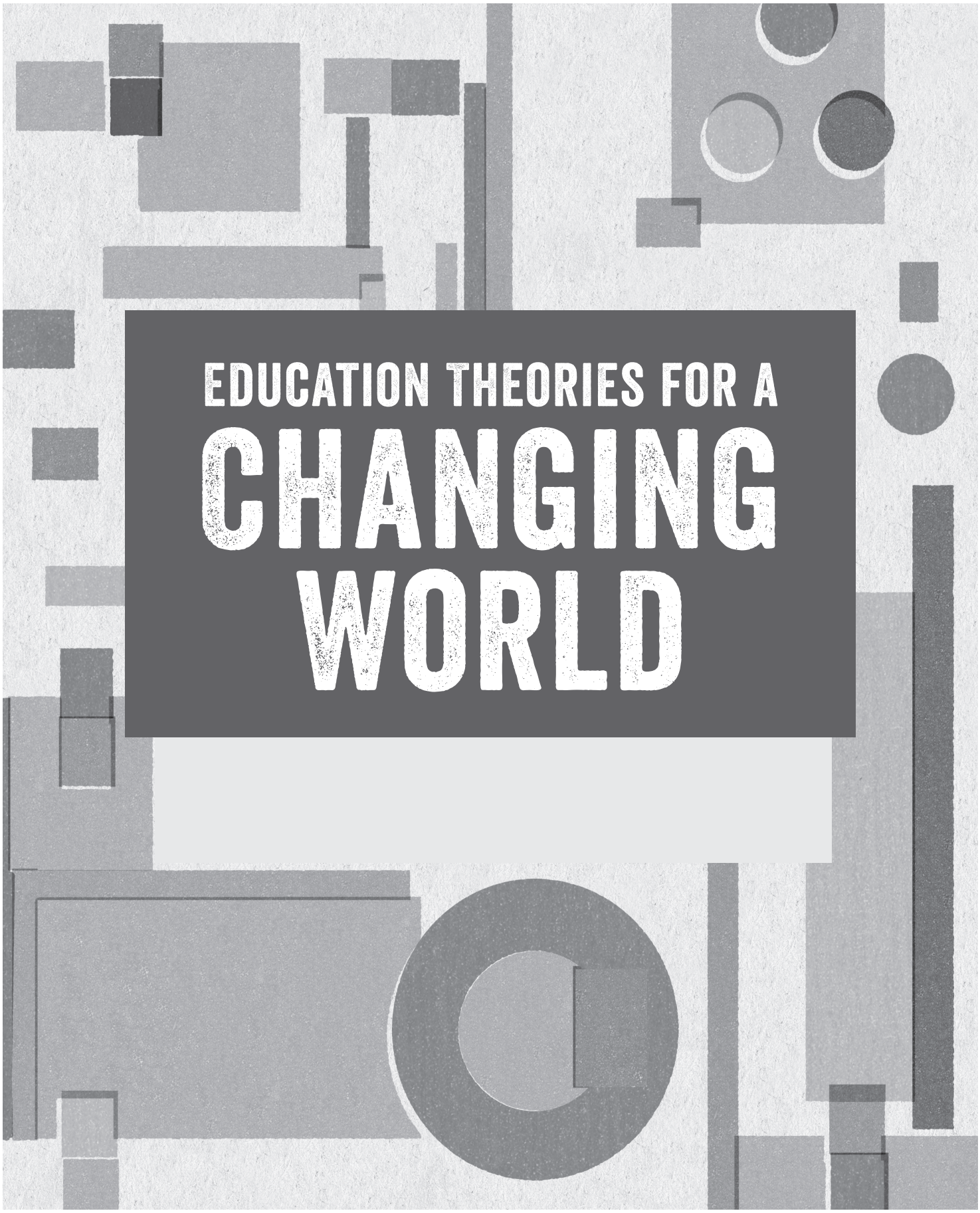

EDUCATION THEORIES FOR A CHANGING WORLD

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ABOUT THE AUTHORS

Karl Aubrey has recently retired from his post at Bishop Grosseteste University where he held posts as a visiting tutor, senior lecturer and Programme Leader on the Professional Studies in Education. He does however continue to follow and write about his research interests. Prior to this, Karl was the Programme Leader for a range of initial teacher education and professional development programmes at a large city Further Education college. Between 2003 and 2005 he was seconded to the DfES Standards Unit as a learning and teaching practitioner in the East Midlands. His doctoral thesis explored the reforms in Further Education teacher education from 2000 to 2010, from the viewpoint of teacher educators. Karl's research interests include inclusion, education policy, pedagogy and work-based learning.

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INTRODUCTION

WHY A BOOK ABOUT EDUCATIONAL THEORIES FOR A CHANGING WORLD?

The aim of this book is to present a case for a compassionate, democratic and inclusive form of education that enables students to cope and thrive in times of change and uncertainty. The reader will explore the current key themes that are evident in society as they affect education. In doing so, we have sought to invite the reader to consider a socially just form of education in an ever-changing world by offering alternative theoretical and practical notions to reflect upon.

The state of flux in the world is very evident as events and crises become ever more frequent. Sherwood (2022: 9) lists 'Brexit, war, climate disasters, a tanking economy, political instability, global insecurity, … [and] … a sense of doom' as examples of some of the major changes that are now almost commonplace. Such is the rate of recurrence of events that the *Collins English Dictionary* word of the year for 2022 was 'permacrisis'. *Collins English Dictionary* has defined permacrisis as 'an extended period of instability and insecurity' that succinctly encapsulates how dire the experiences have been for many people in recent years, particularly 2022 (*Collins English Dictionary*, cited in Sherwood, 2022). Arguably, it is as if the notion of permacrisis has been normalised, yet such events and crises can, and have, a profound impact on education, especially when policies and practice appear to be increasingly fixed in ideas of traditional, instrumental and didactic principles of the past. It is contested that to prepare young people for such uncertain times, an alternative outlook is needed.

We feel that this book, *Educational Theories for a Changing World*, is timely in that it challenges the traditional aspects of educational thinking and practice in a time of uncertainty, crises and amid some key societal issues. Unlike our other books, in this volume we look at how education can be used as a vehicle for social change by exploring key themes through an educational lens on how these could/can be addressed. It does so by considering seven themes and by interweaving theories,

ideologies and philosophies that seek alternative ideas for the future. Therefore, the aim of this volume is threefold. First, to explore the various aspects that influence educational thinking, policy and practice. Second, to offer readers the opportunity to examine the major themes and to analyse the impact they have on education. These major themes are: the curriculum, education as a vehicle for social mobility, the rise of right-wing populism, the Black Lives Matter movement, the COVID-19 pandemic, LGBTQ+ and the climate crisis. Finally, it proposes ideas and aspirations to strive for in the creation of an education in a changing world. Underpinning these ideas and aspirations we include concepts, including social justice, democracy, inclusion, emancipation and compassion, all of which we hope will prepare learners for the challenges they face in uncertain times. Our overall ambition for this book is to evaluate the ways in which education can be a transformational activity to tackle crises and changes in society. We should clarify that this book is not a comprehensive account of each of the themes explored; rather, it is an introduction and overview that we hope acts as a helpful and informative starting point for readers that will enable them to delve deeper into the themes that interest them.

The book takes into account education from an international perspective when considering each of the themes, as well as employing the ideas of educational thinkers from around the world as the themes themselves are of global concern. It is argued that the impact of these themes affect all sectors of education. The scope of the book somewhat limits us, for the most part, to the UK and compulsory state education. The school systems in the four nations of the UK have differed for some time, even before devolution in 1999 when Scotland, Wales and Northern Ireland were formally given powers to set their own education policy agenda. However, since the Conservative and Liberal Democrat Coalition formed in 2010, and under the direction of Michael Gove as the Secretary of State for Education, the English school curriculum was reformed with the emphasis on subject-specific knowledge. Subsequently, however, the Scottish curriculum (Curriculum for Excellence) prioritised the application of knowledge, which the Welsh Government (2022) in their new curriculum has also embraced. There are also divisions regarding the use and promotion of standardised testing, and the compiling and publication of league tables between the devolved nations (Institute for Government, 2020). These differences are, for the most part, ideological in nature, which in turn could affect the way that each nation thinks about and formulates education policy which influences learning and teaching. Therefore, in the following chapters we will refer to the UK if the context is broad enough to cover all four nations. Otherwise, if the contextual point is specific to a devolved nation, we will refer to that nation individually.

CONTEMPORARY DEVELOPMENTS IN EDUCATION

To give background and context to the current picture of education from our point of view, we offer the following brief outline of contemporary historical worldwide events.

Up until the 1950s and the early 1960s, education was still very much viewed and practised as a knowledge/skills-based, hierarchical and examination-driven activity. However, the 1950s witnessed huge variations in world order following the horrors of the Second World War and there was a rush of people calling out for a fairer society. Many European nations, such as France, Belgium, Holland and Portugal, rapidly started to give up their colonial responsibilities. The Cold War focused people's minds regarding the frightening possibility of a cataclysmic nuclear conflict. That was until the fall of the Berlin Wall in 1989 and subsequent opening of the border between Soviet-controlled East Berlin and the Western-occupied West Berlin, bringing an end to the communist regime in the region and marking the symbolic ending of the Cold War. In the United States of America, there was an upsurge of interest and involvement in the civil rights movement, mass protests against the Vietnam War and increased calls for gender equality. Furthermore, in the UK it was not unexpected that the highpoint of 'British state-sanctioned progressivism contained in the Plowden Report [1967] coincided with the decriminalization of homosexuality and [the end] of capital punishment, [and] the legalization of abortion' (Howlett, 2013: 3). These major changes were in keeping with the social open-mindedness of the UK in the 1960s, and in particular with Harold Wilson's Labour government (Howlett, 2013; Aubrey and Riley, 2021, 2022).

Starting at the end of the last century, there was, however, some disquiet about the perceived poor state of education. Thomas (2013) argues that this disquiet was noticeable on both sides of the Atlantic where there 'was a new political awakening, and politically inspired changes affected the way education would develop for the next thirty years' (2013: 60). This political awakening corresponded with a new economic concept called neoliberalism. Thomas (2013) defines neoliberalism as a

> brand of economics that put markets and individual choice at the core of economic success.… The neoliberal turn gathered speed in the early 1980s, happening alongside the ramping up of the Cold War rhetoric that had emerged as part of the Thatcher–Reagan alliance. There was an invigorated narrative about the failure of state-run systems and a focus on the contrasting economic models in use on either side of the Iron Curtain.
>
> (p. 61)

This focus on a neoliberal model has consequently led to the marketisation of education, promoted by right-wing agendas both in England and in other neoconservative governments in different parts of the world, with the idea of shrinking the role of state in education 'and opening up the provision of educational services to the competitive discipline of the marketplace and private providers' (Coffield and Williamson, 2012: 35). The results of this marketisation of education has produced a proliferation of quasi-markets in the form of parental choice and competition between schools. In these quasi-markets, students and their parents are seen as customers or purchasers and schools as 'providers'; the more well-liked schools would prosper, while the

schools that were less well liked would lose pupils and possibly even close (Thomas, 2013: 65). Together with quasi-markets and increasingly evident competition between schools, marketisation has also increased emphasis and frequency of testing, and the publication of the results of this testing in league tables. The emphasis on testing and choice is also of concern in the USA and is powerfully expressed in the seminal work of the renowned academic and educationalist, Diane Ravitch, *The Death and Life of the Great American School System: How Testing and Choice are Undermining Education* (2010).

Marketisation, testing and choice feature heavily in business and also play their part in affecting the competition between schools, each trying to succeed in the race to the top of the league table. The burden of this pressure to attain top results 'is not just on staff, but on the children themselves' (Thomas, 2013: 67). Marketisation also plays a part in creating and promoting a curriculum, the content of which prepares students for employment rather than their holistic personal development. The choice of subjects mostly prioritises the science, technology, engineering, and mathematics (STEM) subjects, usually to the detriment of the arts. This competition and prioritising of STEM subjects is by no means exclusive to schools; universities are also witnessing funding cuts for arts subjects.

NEED FOR CHANGE

We have already briefly outlined what we consider is the picture of education, including a fleeting overview of how educational thinking and practice has changed over the last 75 years or so. Education, we suggest, needs to be forward-looking and helping learners to take an active part in society by fostering such values as hope, building aspirations and courageous advocacy, encouraging harmony, dignity and respect. There are optimistic steps being planned and implemented which will help learners prepare for these uncertain times – for example, the Ofsted (2019, updated 2021) Education Inspection Framework under the element of *Personal Development* looks to see if educational establishments are preparing learners for life in modern Britain by equipping learners to be responsible, respectful and active citizens who will contribute positively to society. But the Statutory Inspection of Anglican and Methodist Schools (SIAMS) (2018) goes even further, seeking wisdom as well as knowledge and skills, as they look for evidence of fostering values such as hope, building aspirations, courageous advocacy, communities and living well together, dignity and respect. These positive comments, although well-meaning, require more substance and a complete change of direction in the way that education in all sectors is viewed, legislated for and practised. This, we feel, will require more than just educational reform; it will need a radical transformation.

A detailed evaluation of the transformation needed to address the key issues will be analysed later in the book, particularly in the final chapter about realigning education with social justice in changing times. However, as a brief foretaste at this early stage,

it is fitting that we indicate where some of these needs may be focused. Our wish is that education should be at the forefront of personal development and aspiration. With this in mind, we will consider the range of barriers and difficulties that learners might encounter in achieving their ambitions. Ideology, particularly when aligned with populism, is a thread that we contest runs deeply throughout this book. In the UK and in other countries, populism is a powerful and, we argue, a degenerating force. It will also consider the Black Lives Matter movement in relation to education. Furthermore, we reflect on the disruptive effect on learning and teaching resulting from the tragic global impact of COVID-19, which, while resulting in some innovative practice through the application of e-learning, also highlighted some significant inequalities such as the lack of internet access and appropriate devices for some students. Moreover, the considerable disruption to teaching through extended lockdown periods, school closures and the exam results fiasco will surely have an impact on this generation of students in years to come. The book will also appraise issues of inclusivity, in particular LGBTQ+, since, while it is heartening that progress in this area has been made to some extent, we acknowledge that much still needs to be done in all sectors of education to ensure inclusivity for all. Finally, the current and looming crisis of climate change is an area where education has, and can, play a major role for the future of the planet.

OPPOSING NOTIONS OF THINKING ABOUT EDUCATION

Trying to define and categorise the different notions of how we think about education is a risky undertaking because not only are grey areas involved in such a task, but also there are many overlaps and contradictions, and the way we think about education evolves with time. However, as a starting point, broadly speaking there are two opposing ways of thinking about education: traditionalism and progressivism, which will be explored later. Although this book focuses on the key themes featured in each of the chapters, which have and will have an impact on education, at this point it is fitting to reflect on how we endeavoured, and to some extent struggled, to place educational thinkers' ideas into categories of thought. Our previous two books focused on individual theorists, their concepts and a critique of their thinking, and offered ways of putting their ideas into practice. For example, in *Understanding and Using Educational Theories* (2022) we attempted to group the thinkers' ideas into the three broad psychological schools of thought: behaviourism, constructivism and humanism. In *Understanding and Using Challenging Educational Theories* (2021), although the thinkers included could, to some extent, be classified in either the constructivist or humanist schools of thought, they were all, to varying degrees, progressive in their thinking. All the thinkers in this volume advocated a progressive learner-centred approach, bolstered by their persuasive awareness of social justice and democracy; for them, education was an emancipatory, active and a transformative process. We attempt to offer our own groupings for these thinkers here, although we acknowledge there are limitations in doing

so. These groupings are: freedom in childhood, home schooling and deschooling; social class, race and gender; the relationship between power and knowledge; caring education; critical and transformative education. We acknowledge that these groupings are eclectic in nature, but we hope they will be evident and useful when analysing the major themes covered in each of the chapters of this book.

The problematic task of grouping and categorising ways of thinking encountered in our attempts mentioned above is also apparent when trying to differentiate the two seemingly obvious distinctive educational notions of traditionalism and progressivism. Superficially, it might appear a simple division between the traditionalist way of thinking being knowledge centred and the progressive being learner centred. However, the difference is more complex. For example, the debate on the divide between the two philosophies has been a long-standing and profound concern not only for educators, but also for politicians and the public, although such concern may be more of a perception than a reality at times. Furthermore, there is an argument for adopting a neutral and blended approach rather than either a 'child-centred *or* a teacher-centred one is appropriate for *all* children' (Carr, 2000: 137). In short, and as a starting point, traditionalists can be associated with a knowledge-based, product-based, teacher-centred and subject-centred approach, while progressives can be aligned with a child-centred, learner-centred, radical or experimental approach (Carr, 2000; Howlett, 2013). Each of the two notions have their own educational thinkers who support either traditionalism or progressivism. For example, traditionalism is mostly associated with the works of B.F. Skinner and his fellow behaviourists, as well as Barak Rosenshine and other like-minded cognitive psychologists. While progressivism is aligned with thinkers who have a more holistic notion of learning and teaching where social justice and democracy are to the fore; thinkers include, for example, John Dewey, A.S. Neill, Carl Rogers, bell hooks and Henry Giroux. These thinkers and their ideas will be explored in further depth.

WHO WOULD FIND THIS BOOK RELEVANT?

Our aim is that this book will be useful for both undergraduate and postgraduate students, and as a valuable professional development resource for practitioners who are involved with learners in all sectors of education, particularly as the themes are matters of current and future concern. The contemporary nature of the content links key societal issues with education. It is also felt that those involved within youth work and the broad field of social sciences would find this book of use and interest. We fully recognise that this is a wide remit. However, similar to our two previous books, we are keen to include a broad scope of readers whose practice does, or will, involve work with learners in formal education, such as in schools, further education (FE) colleges and universities, as well as informal education, such as early years, youth work and offender education. It also includes initial teacher education for teaching in schools

and FE colleges, education studies and youth work undergraduates. Our aspiration is also to refresh, and perhaps introduce for the first time, readers to alternative educational concepts and ideas proposed by progressive thinkers. Hopefully, it will be of interest to those seeking ideas and theories for how education can prepare learners for the current permacrisis we encounter in education and society at large.

ORGANISATION AND STRUCTURE OF THIS BOOK

Chapters are presented in a way that we feel is logical in respect of the purpose for the book. Each chapter has similar features, as they all list the learning outcomes that indicate what the reader should be able to do having read the chapter; this is then followed by the key words that are relevant to the specific chapter. The Introduction sets the scene for the chapter. The structure of the chapter differs according to the theme being explored. Each chapter closes with a summary of the content and a glossary of terms of the key words. The key words are emboldened in the text on their first mention. Every chapter finishes with ideas for further reading, which readers can extend their in-depth study, as well as a reference list of the sources cited in the chapter.

Chapter 1 explores the different influences on educational thinking, policy and practice. This includes a further analysis of educational thinking through the three key schools of thought and how these have evolved to support our knowledge of learning and instruction in a changing world. This we do with the goal of promoting a democratic, socially just and inclusive environment for learners, communities and practitioners. In so doing, this opening chapter also acts as an antecedent to provide the reader with food for thought on how the way we think about education can improve the outcomes for learners, teachers and communities in relation to the eight key themes explored in the subsequent chapters.

In Chapter 2, the curriculum Part 1 considers a brief historical perspective up until the current times, as well as reviewing curriculum influences and the theoretical curricula models. In Chapter 3, the curriculum Part 2 explores the notion of the curriculum from the 1944 Education Act, including the increasing influence of politics on shaping the curriculum content. The chapter also considers the diverging curriculum implementation of the devolved UK nations. Chapter 4 evaluates the notion of education as a vehicle of social mobility by analysing the complexities and challenges involved. The chapter also draws upon the work of Pierre Bourdieu and Basil Bernstein regarding social class, as well as outlining some of the initiatives designed to tackle inequality in education. Chapter 5 contemplates the rise in populism internationally as well as in the UK, and its impact on education, including the language and division created in the ensuing culture wars. We look at the Black Lives Matter movement in Chapter 6, while highlighting the inequalities currently evident in society, including ideas to improve learning opportunities and decolonise the curriculum. Chapter 7 evaluates the impact that the COVID-19 pandemic has, and is having, on students, staff and education as a

whole. The chapter highlights errors made during the pandemic by governments and underscores the positive innovative pedagogical practices during lockdown. Chapter 8 considers LGBTQ+ equality and the notion of education and inclusion, and the role of education as a positive vehicle for social change. The last key theme at Chapter 9 focuses on the climate crises and how education can create a platform for raising awareness. Finally, Chapter 10 offers the reader ideas for changing and uncertain times by challenging current educational thinking and opting for a new radical approach.

All chapters include matters of historical context, political/social/cultural influences and impacts, theoretical thinking that underpins (and challenges) the topic, and, where relevant, ideas for practice and possible case studies.

USING THE BOOK

There are a number of ways in which you could use this book. You could, if you wished, start with the Introduction and read straight through, or you could go straight to whichever key theme you are interested in, or the theme which is the topic of your assignment. We do hope, however, that even if you skip the thematic chapters, you start with the Introduction and the following next chapter, as well as finish with the final chapter to give you a greater depth of context to support the theme of your choice and consider progressive ideas in how to strive for better educational outcomes. Furthermore, although Chapters 2–9 are presented as individual key themes, we argue that they are significant contemporary phenomena and that they are mainly connected with each other in a number of ways. Making these connections, we feel, will help you construct critical and analytical synthesis between the themes. For example, Chapters 2 and 3, the curriculum Parts 1 and 2, and Chapter 6, the Black Lives Matter movement, and Chapter 5 Populism, could be aligned with most other chapters. You could also use the References and Further Reading to explore topics of interest in more depth. Irrespective of the way you use the book, it is our sincere hope that it will help with your understanding of the educational perspectives of the key themes, and the influences, ideologies and theories that affect them. In doing so, we also hope that it will help stimulate a deeper perception of the issues faced in current state of education and help prepare for future events and crises.

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1

HOW THEORY HAS SHAPED PRACTICE

LEARNING OUTCOMES

Having read this chapter, you should be able to:

- identify how educational theory has helped to shape practice;
- recognise key educational theories and associated theorists;
- understand how theories can be applied to developments in educational practice including through digital technology.

KEY WORDS

accommodation; advance organisers; assimilation; classical conditioning; empiricism; networks; nodes; operant conditioning; rationalism; zone of proximal development.

INTRODUCTION

While this text seeks to examine the way in which theories can be applied to an ever changing world, it is important to note that this is not a new idea. Arguably, it can be suggested that the work of theorists have had a significant influence on policy and practice, most significantly in education where the work of key theorists such as Piaget, Vygotsky and Skinner have shaped educational practice. Moreover, significant to this text is the way in which these early thinkers have influenced the work of the more contemporary theorists detailed in the chapters.

Educational psychology in particular seeks to help us understand why humans think and behave in the way they do and thus provides a secure framework from which to develop theories on learning. Kimble (1961), cited in Long (2000: 10), defines learning as an experience 'which produces a relatively permanent change in behaviour, or potential behaviour', thus excluding those changes that occur naturally as part of development or growth. MacBlain (2014) observes that learning is more than simply acquiring new information and knowledge within a classroom situation, and argues that it is a complex concept for which multiple views are held, particularly when trying to help us understand how children learn. From a psychological perspective, general principles have been derived stemming from the different ways in which theorists approach the phenomenon of learning (Phillips and Soltis, 2009). Ertmer and Newby (1993, 2013) argue that learning theories stem from an attempt to illuminate the timeless debate of how people acquire knowledge and how they come to know, suggesting that two opposing positions exist: **empiricism** and **rationalism**. They go on to observe that these positions are evident in the 'modern learning viewpoints' commonly used today, which they categorise as behaviourism, constructivism and cognitivism, a view supported by Yilmaz (2011) who posits that typologies of learning can be categorised into these three main schools of thought.

The aim of this chapter, therefore, is to examine how these schools of thought were developed and how they influenced practice, both at the time of their inception and in the period subsequently. Furthermore, the chapter will seek to identify how these theories have evolved through the development of new theories and in response to developments in the field of education.

HISTORICAL CONTEXT: TYPOLOGIES OF LEARNING THEORIES

This section will detail the evolution of the three main theories of learning, commencing with behaviourism, and then examining the development of cognitivism and constructivism as a response to some of the criticisms of behaviourist theory.

BEHAVIOURISM

Influenced by the empiricist view of learning that sees experience as the primary source of knowledge, and reflecting the philosophy of John Locke who argued that the mind at birth was a *tabula rasa* (blank slate) to be filled with ideas as the world is experienced through the five senses, behaviourism purports that behaviour is shaped through forces in the environment. Furthermore, behaviourists expound the view that changes in behaviour are determined by others who shape the desired behaviour through providing stimuli which act as reinforcers for the behaviour to occur. Behaviour can be explained as everything that a person says or does, and it is the study of these overt behaviours and how these can be observed and measured that provided the basis of behaviourism (Ng'andu et al., 2013). It was behaviourism that provided the foundations for learning theories and their influence on modern curriculum development and classroom practice (Cunningham et al., 2007; Yilmaz, 2011; Ertmer and Newby, 2013; Ng'andu et al., 2013). Thus, it is pertinent to explore the foundations of behaviourism before considering how it made, and continues to make, such an impact on practice.

Behaviourism originated through the work of Russian psychologist, Ivan Pavlov, who established the branch of behaviourism known as **classical conditioning**. Through his experimental work on salivation in dogs, in which he observed that the natural responses of dogs to salivate on the sight of food could be conditioned through the unnatural stimulus of the ringing of a bell, Pavlov developed his theory of conditioned reflexes, the precursor to classical conditioning. According to MacBlain (2014) this subsequently provided the impetus for other theorists to examine the nature of learning, one of whom was John Watson who is credited with establishing the school of behaviourism in 1913 (MacBlain, 2014).

Watson proposed that all behaviours were acquired through the process of conditioning, expanding on Pavlov's work with animals to explore how classical conditioning might be used to shape human behaviour. Watson is perhaps best known for his experimental work involving children, the most well known being the case of Little Albert for whom he conditioned a fear response. Establishing that Albert showed fear in loud sharp noises, Watson paired this with a white rat for which Albert had previously shown no fear. Watson repeatedly made the noise that had previously startled Albert, while at the same time showing Albert the rat. Eventually, Albert cried at the sight of the white rat even when no sound was present, leading Watson to conclude that he had conditioned the fear response in Albert. This work led Watson to claim:

> Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I might select – doctor, lawyer, artist, merchant-chief and, yes, even beggar man and thief, regardless of his talents, penchants, tendencies, abilities, vocations and the race of his ancestors. (Watson, 1928: 82)

This view resonates the empiricist view of learning and the previously referred to ideas of John Locke that promote a view of learning as a passive rather than active process (MacBlain, 2014).

In contrast, another proponent of classical conditioning, Edward Thorndike, theorised that learning was an active process. From his position as Professor of Educational Psychology, Thorndike adopted the principles of classical conditioning, while at the same time developing his own theory of connectionism which built on the stimulus response framework observed by Pavlov. For Thorndike, however, learning was a result of trial and error, in which a behaviour could be strengthened if rewarded, leading to his law of effect which stated that a response followed by a rewarding state of affairs is likely to be strengthened and repeated in a similar situation. Moreover, Thorndike suggested that where a response failed to gain an expected reward, then connections became weaker.

It was Thorndike's work which inspired perhaps the most well-known behaviourist, B.F. Skinner, who, drawing from this work, established his own branch of behaviourism, **operant conditioning**. Like Pavlov, Skinner conducted his experimental work in a laboratory with animals, but with the specific intention of using his work to learn more about the behaviour of humans. While this has been the source of much criticism of his theories, Feeley argues that his work should not be discounted on this basis, as it 'led to important findings regarding how humans behave and thus learn' (2023: 132). Feeley (2023) goes on to observe that Skinner was one of the most influential psychologists as his findings have been applied to enhance learning in a variety of environments.

From his work with pigeons and rats, Skinner was able to establish important behavioural principles that led to his theory of operant conditioning, this being the systematic application of a stimulus to condition a desired response (Feeley, 2023). In his work, Skinner designed a box, known as the Skinner Box, in which rats were placed. Skinner then used a system of levers and switches to condition the rats to undertake certain actions to release food, which he called positive reinforcement. Subsequently, electrical circuits were introduced to the box as a form of negative reinforcement, again to elicit a response from the rats.

As we will see later in the chapter, principles of behaviourism were consistently applied to thinking and practice in educational settings for three decades in the fifties, sixties and seventies. However, as seen in the next section, a shift from this way of thinking was seen as new theories began to emerge.

COGNITIVISM (COGNITIVE CONSTRUCTIVISM)

A criticism of behaviourism was its focus solely on those behaviours that were observable, thereby negating any internal thought processes or the impact of emotional

responses in a given situation (Yilmaz, 2011). This notion that not all behaviour is observable and that learning is not simply a change in behaviour, paved the way for a new way of thinking from theorists who claimed that prior knowledge and mental processes were more important than stimulus in eliciting a behaviour or response. Consequently, cognitivism, otherwise known as cognitive constructivism, was established.

Yilmaz (2011) observes that the cognitive revolution began in the 1950s with a number of theorists emphasising the importance of cognitive processes on learning. Cognitive processes were defined as mental structures, including memory, attention, concept formation and information processing, which were seen as a way in which to understand how knowledge is acquired. Like behaviourists, cognitive theorists still emphasised the need for observation, but as a vehicle by which to infer the internal mental processes. From the cognitivist perspective, learning is an active process in which the learner is an active participant in the drive for knowledge acquisition. Important in cognitivism is the knowledge already held by the learner, which should serve as a foundation on which to build subsequent knowledge. Thus, learning should be meaningful, allowing learners to code, organise and build on the structures that already exist (Ally, 2008).

While American psychologist Edward Tolman can be credited with initiating the cognitive movement (Yilmaz, 2011), it is Swiss psychologist Jean Piaget who is most commonly associated with cognitive theory. Golder (2018) observes that Piaget's theory of cognitive constructivism comprises two key elements – ages and stages – which help to predict what learners can and cannot understand, depending on their age and stage of development. Piaget identified four stages of development in children, commencing with the sensorimotor stage (0–2 years), through the preoperational stage (2–7 years) and concrete operational stage (7–11 years) and ending with the formal operational stage (11–15 years) (Aubrey and Riley, 2022). In his original work, Piaget observed that children must pass through each stage successfully before moving on to the next, although in his later work he did acknowledge that children developed cognitively at different rates and recognised that some may be able to access advanced learning at a younger age than others (MacBlain, 2014).

In addition to his stage theory, Piaget also posited that in order to process new information, it was necessary for young children to build on already constructed understanding and knowledge gained from their interactions with their environment. These internal mental representations, which he theorised existed in the brain, he referred to as 'schemas', adopting the ideas of one of the original pioneering cognitive psychologists, James Mark Baldwin. Piaget explained the formation of schemas through the dual processes of **accommodation** and **assimilation** (MacBlain, 2014). Piaget then saw learning as an active process, and while his early work was conducted in a laboratory setting, much like behaviourism, latterly he observed children in their natural settings, interacting and listening to them as they engaged in activities. This led to

Piaget emphasising practice which focused on the 'whole child', presenting the notion of 'child-centred' education that was seen as a viable alternative to the behaviourist approach.

Nonetheless, Piaget was not without his critics, which subsequently paved the way for the final influential theory of learning – social constructivism.

SOCIAL CONSTRUCTIVISM

Ertmer and Newby ([1993] 2013) identify similarities between behavioural and cognitive theories as being 'primarily objectivist', suggesting that the world is real and external to the learner (p. 54). They go on to argue that this had resulted in some theorists questioning such a basic, objectivist approach in which the goal of instruction is to map the world to the learner, instead adopting a more constructivist approach (Jonasson, 1991, cited in Ertmer and Newby, [1993] 2013). In constructivism, knowledge is not seen as independent to the knower, but rather the learner constructs their own knowledge from their interactions within their environment. While Piagetian theory is considered a constructivist theory – hence often referred to as 'cognitive constructivism' – it should be noted that there is a discrete difference between this and social constructivism. As seen above, Piaget saw children as constructors of their own knowledge through assimilation and accommodation, which he saw as a continuous process (Dagar and Yadav, 2016). However, Piaget did not see learning as a social process and posited that with the right environment, learning would proceed with minimal interaction. This was in opposition to the later theories of social constructivists who viewed knowledge as socially constructed between the learner and a more knowledgeable other.

A key social constructivist theorist is Russian psychologist, Lev Vygtosky, known as the father of social constructivism (Dagar and Yadav, 2016). Vygotsky believed the origin of knowledge construction to be the social intersections of people, through interactions that involved sharing, comparing and debating. Vygotsky saw child development as a construct which was 'driven by a complex interplay of biological maturation, societal expectations and the child's own active participation in culturally determined activities and social interactions' (Bodrova and Leong, 2023: 62). To this end, child development was culturally situated and depended on the social context of each child. Learning then, for Vygotsky, commenced in the home prior to formal schooling and proceeded by way of experiential learning. Vygotsky emphasised the importance of culture in knowledge construction and referred to the social patterns of behaviour and beliefs passed down through generations by way of cultural tools such as stories, rhymes and art (MacBlain, 2014).

Underpinning Vygotsky's social constructivist approach was the importance of language as a means by which meaning is transmitted, and at the core of his work was the reciprocal nature of language with children taking an active role in interpreting what they hear and responding accordingly. Moreover, Vygotsky believed that children

are born with innate cognitive abilities such as attention, memory and visual recognition which enable them to learn through the guidance of others. The guidance of others was central to Vygotsky's notion of the **zone of proximal development** (ZPD) and the role of the more knowledgeable other (MKO) in this. Vygotsky saw the ZPD as a 'theoretical space of understanding that is just above the level of understanding of a given individual' (Pritchard, 2018: 28). Vygotsky theorised that this was the area of learning that the learner would move on to next, and in which, with the support of the MKO, they could work effectively. The role of the MKO could be undertaken by an adult, such as parent or teacher, or even a sibling or peer who had already achieved that level of learning. In supporting the learner to their next stage of development, the MKO adopts a scaffolding approach, a concept that another social constructivist theorist, Jerome Bruner, developed from Vygotsky's work.

Like Vygotsky, Bruner saw learning as a social process, whereby learning and thinking were progressed through interactions with those around them (MacBlain, 2014). Bruner viewed these interactions as a form of scaffolding, which he believed was everywhere in the lives of children. Scaffolding is a flexible approach, tailored to the needs of the individual child, and requires providing support to the learner, at an appropriate level of sophistication, and targeted at just the right time. Scaffolding might occur through discussion or through the provision of specific resources, but importantly, it should support the learner in achieving the next stage of development according to the theory of ZPD (Pritchard, 2018). As we will see in the next section, the work of both Bruner and Vygotsky have had a notable influence on current classroom practice.

APPLICATION OF LEARNING THEORIES TO PRACTICE

This section will discuss the influence of the three identified learning theories on practice. Commencing with behaviourism, which was the first of these learning theories to influence practice, the section will examine the evolution of subsequent theories in the light of an increased understanding in how children learn.

MacBlain (2014) posits that behaviourism can be seen evidenced in classroom practice on a daily basis. Furthermore, since it is a theory so firmly embedded, he goes on to suggest that for most practitioners this practice is predominantly carried out on an unconscious level. Setting aside the Skinner-inspired use of reward systems in settings, which sees practitioners utilise a variety of strategies to mould a desired behaviour while employing sanctions to discourage unacceptable behaviours, behaviourism can also be seen in other aspects of curriculum delivery. Pritchard (2018) observes that teachers might use verbal praise and encouragement to motivate children to complete work, or in some cases more tangible rewards such as stickers or team points might be utilised. For Skinner, reinforcement strengthens the behaviours of individuals, so

the child is likely to repeat the behaviour in anticipation of the offered reward, thus learning proceeds.

Skinner's interest in applying his behaviourist theory to education followed a visit to his daughter Deborah's fourth grade school in 1953 (Buxton-Cope, 2020). On observing Deborah's maths class, Skinner remarked that 'through no fault of her own the teacher was violating almost everything we knew about the learning process' (B.F. Skinner Foundation, n.d., para. 10). From his laboratory work, Skinner established that a successful learning process should be personalised, starting from the learner's current level of understanding, and broken down into small steps, in which success should be rewarded and reinforced regularly. Furthermore, feedback should be given as immediately as possible after learning had proceeded, giving the learner the opportunity to rectify any errors. However, contrary to this Skinner noted that all students were expected to complete the same work, resulting in some learners being unable to complete the work due to the tasks being out of their reach, while for others the task was well below their ability level, meaning that learning was not extended. Furthermore, since the teacher was unable to provide immediate reinforcement, which Skinner had previously established was most effective in strengthening behaviour, feedback therefore lacked impact. Skinner's response to this was to design his first teaching machine.

While Skinner was not the first psychologist to develop a teaching machine, he was the first person to advocate them as a means by which to personalise learning. Skinner recommended that each child had their own machine which they could work on at their own pace, with the machine only allowing them to proceed to the next stage, having successfully completed the preceding stage. Skinner referred to this as 'programmed instruction'. Skinner spent ten years working as part of the teaching machine movement, and programmed instruction particularly held appeal for educationalists. Nevertheless, from a practical perspective, the teaching machine proved too complex to be viable and, despite its potential benefits, content soon reverted back to a book format (Buxton-Cope, 2020).

Nevertheless, it could be argued that Skinner was a theorist who was ahead of his time since teaching machines could be considered as the precursor to Integrated Learning Systems (ILS) commonly used in schools today, which maximise the processing power of modern computers (Pritchard, 2018). Semple (2000) observes that the principles of the teaching machine were replicated in these more traditional computer-based systems which adopted the fundamental principles of behaviourism – namely, drill and practice tutorial programmes. Early programmes were sequenced such that the learner could practise and master simple concepts before being allowed access to more complex problems, with regular and positive feedback motivating the learner to engage in the programme. Furthermore, from a diagnostic perspective, the teacher is able to keep track of the progress made by each learner.

Semple (2000) argues that the advantage of drill and practice is through their ability to teach new skills by way of rote learning, as well as strengthening pre-existing associations and reinforcing knowledge. Furthermore, since the application can employ different levels of difficulty and variation it remains stimulating for the learner. Nevertheless, the application of behaviourism and associated learning systems is not without its criticisms, heralding a rise in the application of alternative theories to the learning process. Most significantly, behaviourism contends that learning can be explained through observable behaviour, without accounting for the mental processes that underpin this, thus leading to the suggestion that this was too limiting to explain learning. Moreover, Pritchard (2018) argues that a cause for concern lies in the apparent lack of understanding engendered by the process alongside the criticism of the solitary and individualistic style of learning promoted by the ILS which fails to acknowledge the importance of social interactions in the learning process. Pritchard (2018) contends therefore that while behaviourism has a place in the planning which teachers undertake it should not be used in isolation since other theories might be better suited to understanding and promoting learning.

It was cognitive constructivism that provided a viable alternative to behaviourism and which subsequently influenced the learning process from the late 1950s onwards (Ertmer and Newby, 1993, 2013). The appeal of cognitive constructivism over behaviourism was its emphasis on the acquisition of knowledge through the application of mental structures. Rather than emphasising observable behaviours, cognitivists sought to establish a conceptual understanding of the learning process, examining how information is received, organised, stored and retrieved. It was through an understanding of this process which then underpinned the learning experience provided.

Reflecting Piaget's stage theory, a cognitivist approach to learning acknowledges the importance of ensuring that teaching reflects the age of the child. While it is important to note that Piaget later modified his views, acknowledging that children did develop at different rates, it can be seen that the national curriculum in England still loosely reflects the ages and stages identified by Piaget. Since its inception in 1988, the national curriculum in England applies to children from 5 to 16 years of age, divided into four key stages; subsequently, provision for children in the age group 0–5 years was articulated through the Statutory Framework for the Early Years Foundation Stage (EYFS) in 2006. As can be seen from Table 1.1 below, there is some correlation between these stages and those identified by Piaget.

Piaget also advocated for an approach that not only emphasised the importance of how a child reached a correct answer, but also why incorrect answers were given. He was particularly interested in readiness, suggesting that if learning was accelerated beyond what the child was capable of, they would not have the required building blocks to complete the task; as such, teachers should engage children in tasks

Table 1.1 The relationship between Piaget's ages and stages, and the national curriculum

Age	*Key Stage*	*Piaget's Stage*
0–5 years	Early Years Foundation stage	Sensori motor stage (0–2 years) Pre-operational stage (2–7 years)
5–7 years	Key Stage 1	Pre-operational stage (2–7 years) Intuitive stage (4–7 years)
7– 11 years	Key Stage 2	Concrete operational stage (7–11 years)
11–14 years	Key Stage 3	Formal operational stage (11–15 years)
14 –16 years	Key Stage 4	

appropriate to their stage of development. This too can be seen reflected in the national curriculum, which states that:

> The national curriculum provides an outline of core knowledge around which teachers can develop exciting and stimulating lessons to promote the development of pupils' knowledge, understanding and skills as part of the wider school curriculum.
>
> (DfE, 2013: 6)

The nature of the national curriculum is such that concepts are revised and revisited, allowing learners to build on previously learned knowledge reflecting a constructivist approach which emphasises the importance of 'making knowledge meaningful and helping learners organise and relate new information to existing knowledge in memory' (Ertmer and Newby, [1993] 2013: 54). Bruner referred to this as a spiral curriculum, in which topics or subjects are revisited throughout a child's school career with the complexity of the material increasing on each revisit. In this way, new learning has a relationship with previous knowledge and thus has a context. Bruner advanced the notion that even young children can learn complex material provided that it is properly structured and presented (EPI, 2012).

It can be seen then that the application of cognitivist theories is underpinned by current thinking in education, with Ertmer and Newby ([1993] 2013) emphasising delivery which draws on the learner's previous experience when planning activities. Furthermore, delivery style should be tailored to individual learning styles with a focus on how new information is organised and structured; consideration should also be given to how new information might be assimilated and accommodated to the learner's existing mental structures. Cognitivist theory then supports learners as active participants in their own learning, since it is through these first-hand experiences that mental structures are developed. Piaget emphasised the importance of the whole-child and posited that children have a natural propensity to learning, provided the environment supports these natural tendencies.

The active application of cognitive theory in learning includes enquiry learning, discovery learning and problem-based learning, affording the opportunity for learners to gain mastery of the subject matter through drawing from the structures that already exist. Moreover, similar to behaviourism, advances in technology have also seen the principles of constructivism reflected through computer applications. As seen above, cognitivists see learning as an internal process, involving memory, thinking, reflection, abstraction, motivation and metacognition. Therefore, the view of learning is from the information processing point of view through accessing different types of memory (Ally, 2008). Ally (2008) observes that information is received through the senses where it is processed in the sensory store; this information remains in the sensory store for a very short space of time, during which it is retained in the working memory. Any information not retained in the working memory is subsequently lost, while information in the working memory is transferred to the long-term memory, allowing for assimilation and accommodation to proceed. Appropriately designed Information Technology applications can support this process through presenting materials which maximise sensory experiences and order information in a logical manner. Ally (2008) suggests locating information centrally and minimising the amount of information to proceed is most effective for ease of processing. Furthermore, design should pay close attention to attributes of the screen including colour, graphics and text size, while at the same time pacing information and varying modes of delivery.

Information technology from a behaviourist perspective was criticised for the emphasis on rote learning, reflecting convergent thinking by which answers were restricted and predetermined. However, from a constructivist perspective, applications could be responsive to the information already held by the learner in which divergent thinking could be stimulated. Ally (2008) advises the use of prerequisite test questions in order to activate the required knowledge structure needed to access new materials, capitalising on the flexibility of learning systems which allow learners to choose their own path to develop new knowledge. Once a baseline has been established, learners are encouraged to follow their own line of enquiry – for example, through the use of the internet. A further benefit of this style of learning is the responsiveness to different learning styles, defined as how a learner perceives, interacts with and responds to the learning environment (Ally, 2018).

Additionally, another benefit of computer application from a constructivist perspective lies in the use of programming tools whereby the learner becomes 'part of the construction of new knowledge' (Waite-Stupiansky, 2023: 16). This involves especially designed, child-friendly computer programming tools such as LOGO, a turtle robot, which allows the learner to tinker and make their own creations. Nevertheless, while the cognitivist approach presents a learning experience which is tailored more to the individual needs of the learner, there remains a concern that learning is still a somewhat solitary experience. Waite-Stupiansky (2023) observes that a dilemma for teachers

today is the way in which technology isolates learners from each other through their connection to technology over face-to-face interactions, going on to suggest that interacting through the internet could well be marginalising children in respect of the importance of real-life, first-hand experiences.

Semple (2000) notes that Piaget's theory of cognitive constructivism has been criticised for the lack of emphasis on social interaction and cultural transmission, especially when relating to supporting learners. This then lends credence to the work of Vygotsky and Bruner, which will be the focus for the final part of this section. In contrast to Piaget's stage theory, Vygotsky believed that readiness to learn could be determined and promoted through the teaching and learning process which he argued should be child led. Vygotsky (1997) states that:

> The old point of view … assumed that it was necessary to adopt rearing to development (in the sense of time, rate, form of thinking and perception proper to the child, etc.). It did not pose the question dynamically. The new point of view … takes the child in the dynamics of his development and growth and asks where must the teaching bring the child.
>
> (p. 224)

This then led to the development of the aforementioned ZPD theory which emphasised the role of the adult, or MKO, in moving the child's learning outside of their current level of development to their learning potential. Thus, learning proceeds faster than it otherwise would, and as the child performs more complex tasks, a new level of assisted performance emerges, hence leading to a cycle of increasingly more complex skills and competencies (Bodrova and Leong, 2023). Vygotsky promoted the notion that learning should be targeted at the highest level of a child's ZPD, which presupposes a personalised learning approach for each child, and while logistically this may prove challenging, Bodrova and Leong (2023) suggest that classroom practice has evolved around this. They contend that assistance from the MKO in supporting the ZPD does not necessarily need to be an adult, and settings have instead utilised learning in social contexts through group working and peer mentoring. Moreover, advances in technology have also facilitated provision by way of specifically designed materials and tools that allow the child to self-assist.

Semple (2000) suggests that computer simulations present opportunities for learners to draw from their sociocultural backgrounds, which is also a key feature of social constructivist theory. In this way, a community of peers is built in which children start to view one another as a resource for learning. In this respect, technology may be viewed as the cultural tool of their generation, with collaboration, either face-to-face or online, being seen as fundamental to the learning process. Furthermore, through adopting a multimedia approach, educational and cognitive processes can be developed through co-operative learning, problem solving, critical thinking and reflection.

Ultimately, the social constructivist approach seeks to help children make the transition from assisted to independent performance (Bodrova and Leong, 2023) involving the use of scaffolding. Scaffolding is a process by which support is offered when a new or more complex concept is being taught, with the intention of gradually removing the support until it is no longer required. It was Bruner who popularised scaffolding as a construct, and argued that scaffolding should be observed in all aspects of a child's learning experience, both formal and informal. In classrooms today, scaffolding can be seen through the breaking down of tasks into smaller steps, modelling how tasks or problems can be solved, or through creating groups of mixed ability children to solve problems. Moreover, scaffolding might exist through classroom displays or resources available which might serve as an additional prop for those children who need it. MacBlain (2014) observes that this way of working to progress learning is a powerful motivator for many children.

INFLUENCE OF TYPOLOGIES ON CURRENT THINKING

As seen above, theoretical thinking has informed practice since its inception and continues to do so. Furthermore, as will be discussed in this section, modern-day thinkers have also utilised the principles of these theories in advancing ideas to meet the needs of a learning society.

As noted earlier in the chapter, behaviourism has been used in settings as a means of modifying behaviour. Arguably, since the abolition of corporal punishment in England in 1986, schools have sought ways in which to manage pupil behaviour, underpinned by a number of government acts and legislation, the most recent of which sets out that:

> Using positive recognition and rewards provides an opportunity for all staff to reinforce the school's culture and ethos. Positive reinforcements and rewards should be applied clearly and fairly to reinforce the routines, expectations, and norms of the school's behaviour culture.
>
> (DfE, 2022: 16)

This resonates with the work of B.F. Skinner, as outlined in the preceding section. Furthermore, the document goes on to outline that challenging behaviour should be addressed through the implementation of a range of possible sanctions that should be clearly set out and made clear to the pupils. Alongside this, and in acknowledgement of a rise in challenging behaviours in settings, Skinner's work has been further advanced to address specific behaviour problems in learners – namely, through the application of Applied Behaviour Analysis (ABA). ABA was pioneered in the 1960s by Ole Ivar Løvaas, and was aimed at improving the lives of children with autism and their families (Smith and Eikeseth, 2011). Underpinned by an understanding of

the science of learning and behaviour, ABA has three main principles: first, it contends that behaviour is affected by the environment, and second that this behaviour can be strengthened or weakened by consequences. Finally, reflecting a behaviourist approach, changes to behaviour are more effective when positive over negative reinforcement is used. Specific to ABA is the personalised approach to the application of rewards, with rewards being offered having specific meaning to the learner (Autism Speaks, 2022). Smith and Eikeseth (2010) observe that children receiving early ABA interventions made significant gains in development.

In contrast, a behaviourist who rejected the principles of positive reinforcement was Edward Tolman who challenged the idea that people are passive learners and instead developed his own cognitive branch of behaviourism, referred to as 'latent learning'. Conducting his own experiments on rats, Tolman's theory of latent learning proposed that organisms can still learn even if immediate reinforcement is not received (Tolman and Hoznick, 1930). Furthermore, Tolman (1930) expressed that learned behaviours were not immediately obvious since the learner may choose not to display learned behaviours until motivated to do so, which was a departure from traditional behaviourist theory that held that learned behaviour was directly observable following stimulus reinforcement. In explaining this, Tolman believed that learners develop their own cognitive map – or mental map – a structure to be stored until such times as it is needed. Pell (2020) observes that latent learning is challenging to see in the classroom, largely because it is a phenomenon which is happening all the time, but by its very nature not immediately obvious. Nevertheless, he proposes that children can be encouraged by allowing them to conduct their own research into topics, as well as providing opportunities to develop skills and knowledge which has previously been learned.

The idea of drawing from skills and knowledge previously learned also reflects the principles of constructivist theory and, as with behaviourism, contemporary thinkers have sought to develop the work of constructivists such as Piaget and Vygotsky to better reflect learners today. One such thinker is Ernst von Glasersfeld who referred to himself as a radical constructivist (Phillips and Soltis, 2009). Glasersfeld rejected the idea that the individual learner receives knowledge through an external reality and believed that all knowledge is constructed rather than perceived through the senses (Macleod, 2019). In this sense, Glasersfeld argues that knowledge is invented not discovered and only helps the learner to function in their own environment. Moreover, each individual has their own reality; thus, it is wrong to assume that all understandings are the same as this is based on the learner's personal construction. Applying his work in an educational context, Glasersfeld suggests that teachers should not present 'sacred truths' (p. 10) to learners, but instead should present opportunities that allow learners to trigger their own thinking. Furthermore, rather than just developing knowledge around a set curriculum, Glasersfeld (2001) recommends 'a repertoire of didactic

situations in which the concepts that are to be built up can be involved. And these situations should be such that they evoke the students' spontaneous interest' (2001: 10). Glasersfeld (2001) further recommends that as opposed to emphasising right or wrong answers, teachers should be more concerned with how learners reached the answer they have given. He expounds that:

> Students rarely produce a random solution. They have worked at it, and if the result which they consider to be right at the moment is not what the teacher thinks it should be, their effort must nevertheless be acknowledged. Disregarding it, is a sure way to demolish whatever spark of motivation they had. And then it is not surprising that their willingness to tackle new tasks disappears.
>
> (2001: 11)

While Glasersfeld (2001) acknowledges the challenges of working with the thinking processes of each individual student, he promotes the idea that providing problem-solving activities to learners will promote thinking, while at the same time encouraging a wide range of skills that can be applied to a range of situations.

THE RISE OF CONNECTIVISM

Siemens (2005) observes that the three broad learning theories – behaviourism, cognitivism and constructivism – came to prominence before the impact of technology began to influence learning. While the preceding section has identified some of the ways in which these theories have been modified to fit some of the changes in technology, Siemens suggests that where the underlying conditions have altered so significantly that modifications to existing theories are no longer sensible, then a theory of learning which embraces all that technology has to offer is required. In response, Siemens established the term 'connectivism', which he first used in a blog post in 2004, followed by a 2005 article entitled 'Connectivism: a learning theory for a digital age'. In the same year, Stephen Downes produced a similar article on connectivism, 'An introduction to connective knowledge', which also emphasises the importance of establishing a learning theory that reflects learning in a digital age.

In advocating for a theory specific to the digital age, Siemens (2005) posits that traditional theories focus too heavily on the notion that learning occurs inside the person, emphasising the process of learning over the value of what is learned. He goes on to argue that in an environment where knowledge is in abundance, then it is necessary to focus on how information is acquired, with an emphasis on how that information is evaluated in terms of its relevance. Thus, intrinsic to learning is how information is processed and categorised, particularly in an environment where information is constantly changing and evolving. Siemens states:

> In today's environment, action is often needed without personal learning – that is, we need to act by drawing information outside of our primary knowledge. The ability to synthesize and recognize connections and patterns is a valuable skill.
>
> (2005: 3)

Thus, Siemens holds the view that the very nature of learning is changing with the evolution of technology, necessitating a new approach to how we view learners and present learning experiences to them. Arguably, as discussed later in Chapter 7, the need for this was accelerated during the COVID-19 pandemic when education was hastily forced online. It would seem prudent, therefore, to capitalise on this as an opportunity to examine how connectivism might take its place as a dominant theory of learning.

The principles of connectivism lie in a view of learning as a construct which resides outside of the self and is therefore not entirely under the control of the individual. Furthermore, it relies on the connecting of information sets which enhance learning outside the current state of knowing (Siemens, 2005). Siemens (2005) presents that the ever-changing state of knowledge requires the learner to be responsive when making decisions, and draws distinctions between important and unimportant information when acquiring new knowledge. Furthermore, the learner needs to be prepared to alter a course of action promptly when new knowledge becomes available.

Siemens (2005) identifies the following eight principles of connectivism:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialised nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

(Siemens, 2005: 5–6)

Applying these principles to the learning environment, Siemens (2005) suggests that learners should be prepared for learning in a digital age, with teaching material reflecting this. Ally (2008) posits that this goes far beyond placing materials on the web or linking the learner to other digital materials on the web, suggesting that online learning requires careful and deliberate planning, encompassing a range of activities that reflect

different learning styles. In this way, the learner takes some control over their learning through selecting a mode of learning that best suits them.

Ally (2008) proposes that when delivering online learning, the following components should be considered.

PREPARATION

Learners should be informed of the learning outcomes and be aware of any prerequisite knowledge or skills. Self-assessment tests at the start of the learning module will allow learners to identify whether they have the prerequisite skills. Concept maps are included to establish and activate cognitive structures and **advance organisers** are then used as the means by which to underpin the structure and organisation of learning content. Key to preparation is establishing the purpose and process.

LEARNING ACTIVITIES

Online learning should reflect the potential of digital learning, providing a range of activities capturing different learning styles. This might include reading textual information or listening to podcasts. Visuals or video materials provide an alternative means of content delivery. Research can be conducted online, through the web or links to e-books. Learners should be encouraged to track progress through reflective journals, and carefully planned assessment activities allow the learner to track their own progress and revisit concepts.

LEARNER INTERACTION

Interactions occur in a variety of ways in online learning, predominantly through the interface of the online learning platform. Interaction with the content is an essential component of the learning process and design should be such that it does not overload the learner. Rather, learners should be able to sense the information and thus transfer it to their sensory store before it goes into their short memory. Key to this is the development of social cognition by way of external interactions through the instructor, other learners and experts, affording opportunities for the development of social networks.

LEARNER TRANSFER

Learners need opportunities to apply what they have learned in a real-world context, allowing them to go beyond what they have learned online and add meaning to their learning (adapted from Ally, 2008).

Siemens (2005) advocated that teaching through digital technology captured students' attention more effectively and helped them to learn more easily. Moreover,

learning new knowledge was the result of interactions with many rather than being monopolised by a few (Altuna and Lareki, 2015). Learning which proceeds through **networks** and **nodes** allowed for easy access to information, collaboration and the development of learning communities. Moreover, the rapid expansion of new networks and technologies provide ample opportunities for extensive learning opportunities.

Nevertheless, while such developments in technology would lead to an assumption that connectivism is a necessary and obvious way forward it is crucial to proceed with caution. When developing his theory of connectivism, Siemens acknowledged that the field of education has been slow to recognise 'both the impact of new learning tools and the environmental changes in what it means to learn' (2005: 7), and despite his observation that 'connectivism provides insight into learning skills and tasks needed for learners to flourish in a digital era' (ibid.), experiences during the Covid pandemic (see Chapter 7) would suggest that settings still have some way to go before connectivism becomes a viable alternative to the three main theories influencing learning in educational settings.

While acknowledging that connectivism is 'all the rage' in the digital era, Tracey (2009: 8) suggests that rather than viewing instructional design as an evolutionary progression, from behaviourism, through constructivism to connectivism, a more rational consideration would be to view them as complementary. Tracey (2009) argues that all three approaches build on one another in providing a more rounded theoretical toolset for the instructor to exploit. This was similarly observed by Ally who advances the idea that behaviourism, cognitivism and constructivism have, and will continue to be used to develop online learning materials. He suggests that 'behaviorist strategies can be used to teach the facts (what); cognitivist strategies, the principles and processes (how); and constructivist strategies to teach the real-life and personal applications and contextual learning' (2008: 39). Ally (2008) goes on to suggest that connectivism should be used as the means by which to develop online learning, incorporating aspects of other learning theories as applicable. In this way, learning objects that promote flexibility and the development of materials tailored to individual learning styles will become embedded in the curriculum alongside the more traditional and well-established delivery styles.

SUMMARY

This chapter has sought to establish how the three main theories of behaviourism, cognitivism and constructivism have helped to shape educational thinking and practice. Furthermore, it seeks to demonstrate how these theories have stood the test of time in terms of some of the changes to curriculum delivery, which are particularly evident through advances in digital technology seen in recent years. By necessity, the chapter has been limited to the main theorists in the three disciplines, and while briefly

considering influence on more contemporary thinkers, it is important to note that this is merely a starting point. While the application of these theories, and others, have been contextualised throughout the themes in this text, we would also urge readers to examine some of the more specialist texts in the recommended reading section to learn more about the theories per se.

It should also be acknowledged that the three theories were chosen specifically because these are widely considered to be the main theoretical perspectives which have guided educational thinking (MacBlain, 2014). Moreover, it is these theories that have arguably influenced subsequent theories such as Bandura's social learning theory, Gardner's theory of Multiple Intelligences and the humanist theories of Carl Rogers and Abraham Maslow. Furthermore, elements of these theories can be seen not only to have influenced curriculum development as seen in the chapter, but also have underpinned thinking in the educational philosophies of key thinkers such as Maria Montessori, Loris Malaguzzi, A.S. Neill and John Holt. Again, while it was not possible to address this through this chapter, we would recommend further reading to this end.

Nevertheless, key to this chapter is the idea that while all three theories are very different in their approaches, fundamentally they all seek to support our understanding of learning, with a particular emphasis on how this learning can be supported to give the best possible outcome for the learner. While it may be tempting to seek to establish the benefits of one over another, it is anticipated that this chapter will demonstrate the importance of seeing all three theories as complementary to one another, each offering their own insight into learning, and providing practitioners with a range of tools by which to support learners. Furthermore, as we embrace the digital age, it can be seen that each theory can offer something different from the design of a technology-based curriculum, thereby providing for the diverse needs of learners in the changing world.

GLOSSARY OF TERMS

Accommodation

The changing of existing schema in order to accommodate new information. Piaget believed that when children could not fit new experiences into existing schema, it was necessary to adapt these in order to make sense of the new information.

Advance organisers

Popularised by David Ausubel, advance organisers refer to a conceptual framework that enables learners to assimilate and retain information. Ausubel suggests that these should be used when a new topic is introduced to help the learner to process the new information.

Assimilation

A cognitive process by which new information is fitted into existing schema.

Classical conditioning

First established by Pavlov, classical conditioning refers to the reinforcement of a natural reflex that occurs following a specific, sometimes unnatural stimulus. In the case of Pavlov, the ringing of the bell, the conditioned stimulus, elicited the salivation response in dogs.

Empiricism

A view of learning that suggests that knowledge arises and is validated through first-hand experience. Reflecting on the work of John Locke and John Watson, empiricists view the mind as a blank slate (*tabula rasa*), to be formed and shaped through experience.

Networks

Networks refer to the connections between different entities such as computer networks and social networks. Connections created serve to strengthen learning, although weakness in the connections can cause a ripple effect.

Nodes

In connectivism, a node refers to an object that can be linked to another object through networks; the theory of connectivism is based on the idea that learning proceeds when connections are made between these various nodes, including books, web pages and the learners themselves. Nodes are particularly important in an interconnected world.

Operant conditioning

A theory advanced by B.F. Skinner which holds that if a behaviour is positively reinforced, it is more likely to be repeated. On the other hand, negative reinforcement can prevent an unwanted behaviour from happening. Operant conditioning can then be used to shape behaviours.

Rationalism

Rationalism holds that it is not necessary to have an experience for knowledge to be acquired; rather, it can be acquired through reason and logic. Furthermore, reason acts as both the source and measure of sound knowledge, without the need for any sensory experiences.

Zone of proximal development

Vygotsky referred to the zone of proximal development as the area between the learner's actual development and their potential development which could be achieved through the support of the more knowledgeable other (MKO).

FURTHER READING

Kirscher, P.A. and Hendrick, C. (2020) *How Learning Happens: Seminal Works in Educational Psychology and What They Mean*. London: Routledge.

This text covers 28 works of educational significance in the fields of educational and cognitive psychology. Each chapter focuses on a different seminal study, critically examining its importance and offering suggestions as to how it might be incorporated into practice.

Ross, J. (2022) *Digital Futures for Learning: Speculative Methods and Pedagogies*. London: Routledge.

Aimed at higher education, the text examines the potential for technology as a learning resource in post-compulsory and informal learning settings. It provides a vision for how learning spaces might look in the future through adopting theories and pedagogy across a range of disciplines.

Schunk, D. (2019) *Learning Theories: An Educational Perspective*. London: Pearson.

An introduction to the key theoretical principles with a chapter dedicated to each of the major theories of learning in addition to chapters on other aspects of learning, including neuroscience, motivation and contextual influences.

Stephen, C. and Edwards, S. (2018) *Young Children Playing and Learning in a Digital Age: A Cultural and Critical Perspective*. Abingdon: Routledge (European Early Childhood Education Research Association: Towards an Ethical Praxis in Early Childhood).

An examination of how digital development has influenced pedagogy. It provides a history of technological developments before considering how traditional pedagogy has evolved for the digital age.

Thompson, C. and Edwards, L. (2021) *Learning Theories for Everyday Teaching*. London: Learning Matters.

A text that applies learning theory to everyday practice in a critical and meaningful way. It offers suggestions as to how teachers can incorporate theory into practice through the use of case studies and scenarios.

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