



Department of  
**Creative  
Education**



**Postgraduate Certificate in Teaching & Learning**

**ASSIGNMENT: ACADEMIC ESSAY**

***EDUCATIONAL THEORY & ITS APPLICATION IN PRACTICE***

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## 1. INTRODUCTION

Encouragement is oxygen to the soul.

-George M. Adams

The reason I choose to open my essay about teaching and learning with this quote is because encouragement underpins educational theories that personally resonate with me. Who am I? I am a researcher in statistical modelling, a supervisor, a lecturer and a student. I teach by encouraging and inspiring each and every one of my students: both in academia and outside of it. I teach martial arts to adults since 2010 and statistics to level 9 students since 2020. To better understand why I teach the way I teach and to back up my beliefs by research I will look into the philosophy statement, its definition and try to formalise it.

The term 'philosophy statement' is here defined as a philosophical framework of values, goals and beliefs reflecting my personal approach to teaching and student learning and incorporating a justification for why I teach the way I teach. Through writing statement, I will 'engage in deep reflection, create a vision and purpose for my teaching and set priorities' (Caukin, 2017). A statement of teaching philosophy is a cornerstone of reflective practice in teaching and learning and a requirement of applicants to academic, teaching positions or tenure tracks. However, many candidates report that "they have never reflected on what they do when they teach and that they have never systematically written about their teaching philosophies and goals" (Schönwetter, 2002). Yet, a personal teaching philosophy is very important as the process offers an opportunity for developmental reflection (Beatty et al, 2009). A spectrum of approaches and frameworks to generate a comprehensive teaching philosophy statement can be used. A philosophy statement not only reflects personal beliefs (self) but also cultures pertinent to a particular subject (discipline) and institutional context (organisation) (Schönwetter, 2002). I believe, a well-defined teaching philosophy statement is particularly important in teaching statistical subjects, as many educators have acknowledged their students' phobic attitude toward statistics and statistics anxiety is generally recognised as educational problem for a long time (Forte, 1995).

The aim of this essay is to generate a personal teaching philosophy statement in the context of statistical discipline and convey my personal teaching values and goals. I will start this essay by exploring behaviourism and social cognitive educational theories that particularly resonate

with me. Then I will reflect on how they can be applied in my own context i.e. teaching statistics and contribute towards my approach to teaching. Finally, I will personalise my key learnings and generate a personal teaching philosophy that will help me to make informed choices about the selection of teaching approaches.

## **2. EDUCATIONAL THEORIES**

Turning now to educational theories it is clear that they compliment each other in many respects, I believe, therefore, there is no single theory that can be applied in all cases. Here, I focus on two theories that reflect my beliefs and values as a teacher and supervisor. These are behaviourism and social cognitive theory.

### **2.1. BEHAVIOURISM**

Behaviourism is one of the earliest established theories that had a direct and profound impact upon education (Wollard, 2010) . This educational theory is concerned with human behaviour and shaped by rewarding desirable behaviour via positive reinforcement and discouraging undesirable behaviour via negative reinforcement. J. B. Watson (1878-1958) and B. F. Skinner (1904-1990) are the two principal originators of behaviourism. Watson's view of learning was based in part on the studies of I. Pavlov (1849-1936) who was well known for his research on classical conditioning through studying the digestive process and the interaction of salivation and stomach function. In his experiments with dogs he found out that learning occurs when a neutral stimulus becomes associated with a stimulus that naturally produces a behaviour. Furthermore, Skinner (1976) believed that seemingly spontaneous action is regulated through rewards and punishment and people's behaviour is shaped by the world. He believed people's behaviour to be predictable as a chemical reaction. In defining behaviour, changes in behaviour that result from stimulus-response associations made by the learner are important. Teacher adopts the system of rewards and punishments in the classrooms through the evaluation process by rewarding desired behaviours and punishing undesired ones. Consequences are associated with the stimulus or response that is followed by reinforcement (Ertmer and Newby, 2013). However, since behaviourism is known as a predominant psychological model (Harold and Corcoran, 2013) rewards need to vary to be important to the learner as success depends on each student's stimulus and response. Although behaviourism can be effective in any settings, in particular, it is effective in inclusive education as it has been highlighted by Al-Shammari, 2019. Instructional

approaches such as explicit or direct instruction include a step-by-step and systematic process provided by a teacher and followed by students (Zhang et al., 2016). The teacher introduces a lesson, teaches a structured lesson, and monitors student understanding. Teacher arranges practices where prompts are paired with the target stimuli and determines which cues can elicit the students' desired responses. Environmental conditions are then arranged in such a way that students can make the correct responses in the presence of those target stimuli and receive reinforcement for those responses (Ertmer & Newby, 2013).

Despite its merits, behaviourism has been subject to a more or less continuous stream of criticism in the period of the late 1950 through the late 1970. The main criticism was an overly deterministic view of human behaviour, one-dimensionality and oversimplification (Schnaitter, 1999). Behaviourism fails to explain abnormal behaviour in terms of the brain inner workings. Schnaitter's 'Some Criticism of Behaviorism' work is over 20 years old and this historical reference was included here on purpose to demonstrate that the period of vigorous criticism has substantially passed. There is no evidence of criticism in the past ten years.

## **2.2. SOCIAL COGNITIVE THEORY**

Cognitive theory places emphasis on making knowledge meaningful and helping learners to be more organized and able to relate new information to existing knowledge. Cognitive theory focuses on memory, self-reflection, thinking and motivation to learn while emphasising thought process (e.g. reflection, and abstraction) and its importance (Petersen, 2014). According to the founder of this theory Piaget, the ability to learn and the process of learning is different during each developmental stage (Evgeniou & Loizou, 2012).

A social cognitive theory which in part paid homage to Piaget's earlier work was proposed and developed by a Canadian psychologist Albert Bandura (1925-2021) (Pritchard and Wollard, 2010). Bandura also largely agrees with behaviourism and adds that not all learning is derived from one's interaction with the environment (Bandura, 2014). He suggests that people learn from observing and interacting with other people. Social cognitive theory explores how social interaction affects learning cognition, and is often referred to as a bridge between behaviourist and traditional cognitive learning theories of Piaget, Vygotsky, and others.

Social learning is also called observational learning, because it comes about as a result of observing models. Bandura proposed the idea of reciprocal determinism, in which the behaviour, personal factors (cognition, affect), and environmental factors all influence each other. He believed that individuals can intentionally act as agents of change within their environment, thus altering the factors that determine their behaviour. In other words, we have the freedom to influence factors which determine our behaviour. Bandura (1977a, p. 203) writes: "Given the same environmental constraints, individuals who have many behavioral options and are adept at regulating their own behavior will experience greater freedom than will individuals whose personal resources are limited".

The most important concepts under social cognitive theory include reciprocal determinism, positive and negative reinforcement and observational learning. According to reciprocal determinism a person, their environment, and their behaviour all influence and interact with each other. Positive and negative reinforcement include a positive or negative response, such as a reward or punishment, that impact future learning behaviours. Finally, observational learning allows learners watch someone else perform an action and repeat that behaviour themselves. Connolly, 2017 discusses the power of role models in sport, which equally applies in all areas.

Self-efficacy is another crucial factor that influences behaviour and concerns with people's beliefs in their capabilities to perform a specific action required to attain a desired outcome (Luszczynska 2015). Self-efficacy levels are directly related to behaviour and can enhance or impede motivation. Perceived self-efficacy represents the confidence that one can use the skills necessary to cope with stress, resist temptation or mobilise one's resources required to meet the situational demands.

Two other concepts often discussed alongside cognitive learning theory are implicit and explicit learning. Implicit learning refers to continuous learning that happens without a conscious effort; explicit learning refers to learning that happens with a conscious effort or active learning (Schunk, 2012).

This theory has also criticisms. One of the main criticisms of the social cognitive theory is that it is not a unified theory, which means that the different aspects may not be connected (Social-cognitive perspectives on personality). The broad scope of the theory does not allow all components to be fully understood and quantified. The findings associated with this theory

are still preliminary. Finally, the theory tends to ignore differences between learners of different ages.

This section has attempted to provide a brief summary of the ideas relating to behaviourism and social cognitive educational theories. These theories will be discussed in the context of statistical teaching in the next section.

### **3. THEORIES APPLIED TO TEACHING STATISTICS**

Before proceeding to discuss how I incorporate theories and strategies presented above to teaching statistics, I would like to briefly set the scene of the importance of teaching statistical methods and difficulties that may arise. Training in research methods and data analysis, particularly statistics, is extremely important both within individual academic disciplines and in cross-disciplinary research. Moreover, the ability to understand and evaluate statistics - 'statistical literacy' enables students to become critical consumers of information who can interpret data and evaluate its quality (Bromage, 2021). There is a greater demand for statistics teaching. However, teaching statistics often has poor reputation and students frequently lack motivation to engage, because they do not appreciate its relevance to their studies and because they do not feel that they have aptitude to be successful. Back in 1995, Forte acknowledged that students generally dread statistics, feel frustrated and apprehensive. This educational problem has not changed today (Delucchi, 2014, Koparan, 2015, Barron, 2014). To make students experiences more pleasant and to encourage learning it is important to understand that learning comes about more effectively and efficiently when it is structured and rewarded. Drawing on behaviourist and social cognitive theories students work for things that bring them positive feelings and for approval from people they admire. Behaviourism is key to my teaching because it impacts how students react and behave in the classroom and therefore influence the effectiveness of their learning. I give my student constant feedback in a form of reinforcement, telling what they did right and wrong, this comes in the form of quizzes, continuous and terminal assessments. In this way I can directly influence behaviour. As a behaviourist teacher I have clearly structured the learning intention and outcomes and make use of activities that stimulate and motivate.

In this way teaching and learning experience can be rewarding for both students and teachers. For example, one of the behaviourist approaches that I use to enhance learning in my classroom include carrying out repetitive activities to develop speed and accuracy. Statistical

modelling is performed using a suitable programming language (R language - <https://www.r-project.org/>). As I live code statistical problems in experimental designs, students are asked to code alone and report their results. At the beginning of the course, with little statistical knowledge and no programming background the learning curve is steep for the most. However, with time and practice students become more skilled and proud of their progress. Students learn by direct copying my behaviour and subconscious imitation which reflects Bandura's theoretical beliefs of observational learning. He explains that, "learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do" (1977).

Another important social constructivist notion that I apply in my classroom is that of situated learning (Dawley, 2014). For example, when I introduce new concepts I try to make it directly relevant to real problem within a context that is familiar to the students and how it can be applied in the future. As a teacher I notice that students tend to obtain most of their knowledge from challenging experiences and assignments (explicit learning) and only a small part by attending lectures (implicit learning). To enhance their learning experience, I designed materials to capitalise on explicit learning in a way that students have a variety of continuous assessments throughout the course. At the end of the semester, I can see that my teaching strategies work well and student have a good experience based on the anonymous student feedback. For example, a half of the students of Advanced Biopharmaceutical Sciences last year was very satisfied with the module, a one third was satisfied and only 15% neutral. I receive emails from some of the students indicating that they would like to pursue their further studies in statistics.

Further educational implications of both theories and how I use them in my teaching are summarised in Table 1:

*Table 1: Behaviourist and social cognitive theory and their implications for teaching statistics*

Theory:	Implications:	Connection with my practice:
Describing the consequences of behaviour increases appropriate behaviours decreasing inappropriate ones.	For example, work submitted late will lead to a reduction in grade.	From the very beginning I am demonstrating to my students what is expected, what is desired and undesired. For example when they submit their programming assignments I require them to write explanations and



		justification of methods chosen. If they do not do they get lower mark – negative reinforcement.
Students learn a great deal simply by observing others.	Group work and pair/triad projects. Roseth (2008) discusses the importance of collaboration in teaching and learning statistics.	At present, students work individually, but they are encouraged to discuss their assignments via forum. This is something I would like to work on more in the future.
Teachers should expose students to a variety of models including peers and other adult models; this is important to break down stereotypes	Stereotype that statistics is difficult.	Some of the students due to a variety of reasons are better than others. Sometimes I ask them to present their work to other students as an example of what can be achieved.
Students must believe that they are capable of accomplishing a task; it is important for students to develop a sense of self-efficacy.	Teachers can promote such self-efficacy by having students receive confidence-building messages, watch others be successful, and experience success on themselves;	I positively reinforce students belief in themselves and their abilities by acknowledging their efforts no matter how small they are. I always tell them they did a great job and need to continue that way.
Sometimes a task is beyond a student's ability.	Teachers should help students set realistic expectations ensuring that expectations are realistically challenging.	This can be difficult to achieve, because all students are measures by the same standards. But I do personalise advices based on students abilities.

#### 4. TOWARDS A PERSONAL PHILOSOPHY STATEMENT

While working throughout this essay towards my personal philosophy statement I realised the inherent complexity of this task and appreciated how it shaped my thinking towards my professional values, beliefs and goals. My personal values are based on the values of respect, care, integrity and trust as outlined in Teaching Council Code (Teaching Council, 2016), which is a guiding compass for all teachers. My personal beliefs resonate with Dewey's (Dewey, 1897) pedagogic creed: "I believe that education, therefore, is a process of living and not a preparation for future living".

I discovered that my philosophy on teaching practice is deeply embedded in behaviourism and social cognitive theory. I believe people learn better when they are motivated to learn, which can be achieved through positive (or negative) reinforcement according to behaviourist theory. This approach, in combination with social environment and role models as in social cognitive theory, can be very effective. Subconsciously, I have always applied and still apply a blend of these theories to my own learning by constantly looking for new sources of motivation and role models but without being able to verbalise it. Now, by studying the underlying theories and trying to draw parallels, I had a chance to enhance and formalise my understanding of the approach to teaching and learnings in the classroom and further progress my thinking. For example, I found out that situated learning can be very effective: student obtain most of their knowledge from challenging experiences and assignments. Also, I positively reinforce students to belief in themselves and their abilities by acknowledging their efforts. Finally, I am convinced that inspiring others to learn is one of the most important qualities of the teacher and I am aiming to reflect upon this in my teaching style.

## **5. CONCLUSION**

The main aim of this essay was to generate a personal teaching philosophy statement in the context of statistical discipline and convey my personal teaching values and goals. I have looked into a blend of behaviourist and social cognitive theories, and discussed their implications for teaching statistics that underpin my teaching and learning style. As a behaviourist teacher I structure the learning outcomes and make use of activities that stimulate and motivate. It is my belief that students must believe that they are capable of accomplishing a task in order to develop a sense of self-efficacy. To introduce new concepts I use situated learning and role models. I also notice that students tend to obtain most of their knowledge from challenging experiences and assignments. This essay helped me to make informed choices in the future about the selection of teaching approaches in teaching statistics and increased my desire to grow as a teacher using a combination of teaching and learning styles.

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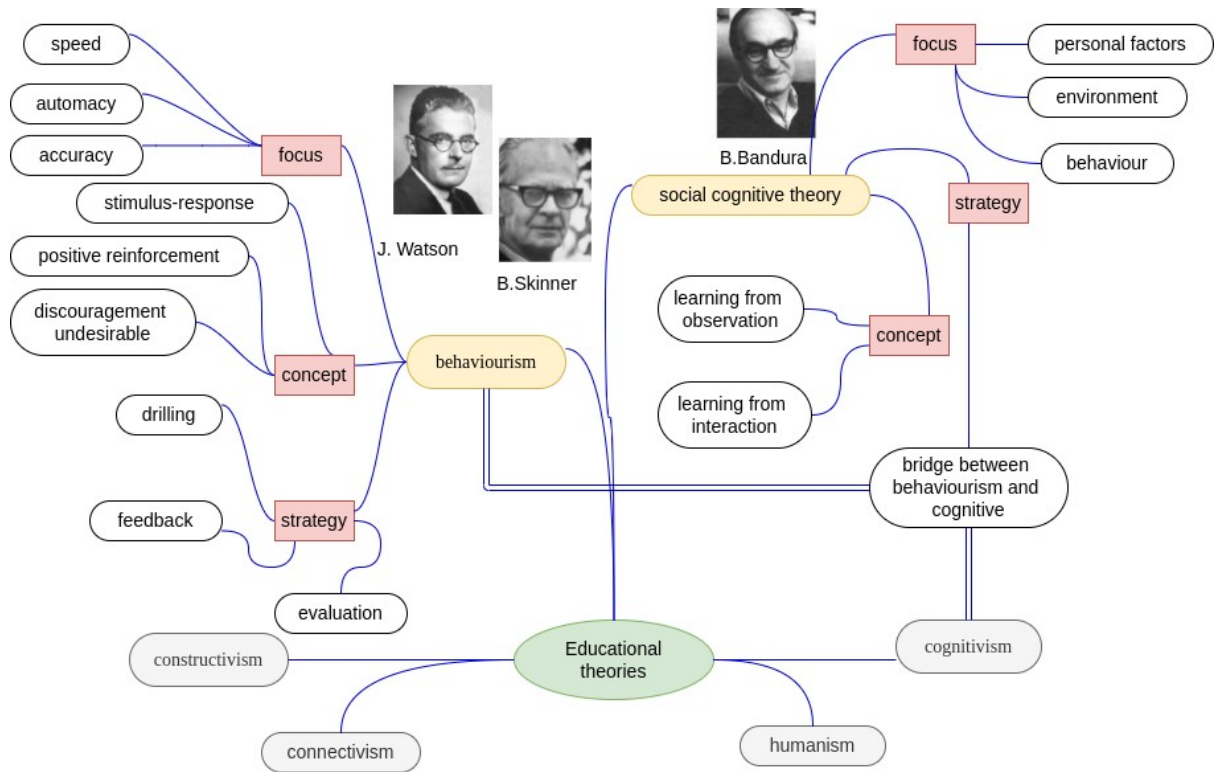


Figure 2: Mindmap of educational theories and their main ideas. Source: author