A Critical Analysis Of Self-Regulated Learning And Strategy Use: SRL In NZ Schools' Policies, And Some Implications For Students With Learning Difficulties

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Abstract

Self-Regulated Learning (SRL) is an extraordinary umbrella that includes various aspects of learning like cognition, metacognition, behaviour, emotions and motivation. It has become an important topic of research because of the high correlation between SRL strategies and academic performance. There are several theoretical perspectives that help us analyse the concept of SRL and multiple definitions aimed at identifying the important features of self-regulated learners. Several models of SRL have been presented which help us understand the key cognitive and metacognitive processes involved in the learning process and how the use of strategies can help to optimize achievement among learners. Zimmerman's cyclical model of self-regulation is of specific importance as it not only presented a multi-dimensional perspective of learning, but also provided teachers with a framework to introduce strategy instruction in the classroom and improve self-regulation among students. Having established the high correlation between SRL strategies and academic performance, the present research sets out to understand how SRL strategy instruction could help enhance the academic performance of students with learning difficulties. Several cognitive and metacognitive strategies like self-monitoring, time management, self-instruction, imagery, goal setting and deep processing strategies are found to be effective in helping students who find learning tasks challenging. Good and effective feedback by teachers is another important tool that can help place students on a pathway of empowered strategic thinking and action. The process of feedback can be specifically important for students with learning difficulties as it helps them to understand their own learning behaviour and the strategies they can use in future to improve their performance. To gain an understanding of how SRL skills and strategies, and the key competencies are embedded in the curriculum delivery system in New Zealand, the school charter and strategic plan of five schools were studied. A huge variation was found in the planning and vision of different schools and it was only through the process of purposive sampling that enough data could be collected around the use of key competencies in the curriculum. This research helps us to understand that while the use of SRL strategies is considered an important indicator of academic success, there is a need for further research into the topic. There is a need to understand the causal relationship between SRL and academic performance in the context of students with learning difficulties, and develop a module of intervention that can be implemented in the Innovative Learning Environments in New Zealand through inquiry based learning.

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Chapter 1- Research Methodology and Introduction to the Topic

As an educator working in mainstream classrooms, I have been actively engaged in trying to help students find the best ways to learn, planning intervention strategies to equip them with skills required to become independent learners. Through this journey with my students, I encountered several students who struggled with the process of learning. I researched the best strategies and processes to support students, especially those who faced challenges and difficulties in their learning. As I sought and implemented various strategies to make learning easier and more meaningful for my students, I questioned why some strategies worked more than the others and what was the best way to equip learners with the tools and skills necessary for independent learning. It was these questions that led me on the quest to do research and seek answers. The first step in this research process was to refine my general question and identify more specific research questions.

The process of students devising strategies to accomplish the goals they set for themselves, and taking more control of their learning process is related to the concept of Self-Regulated Learning (SRL). As I started exploring the concept of SRL, the key research question that I set out to answer was: - Which self-regulated learning strategies have a higher correlation to academic performance and can these strategies be taught to enhance the learning outcomes for students with learning difficulties? After identifying the key research question, I also looked at some secondary questions that would help me with collecting all the information around the concept of SRL.

- How is SRL defined by key theorists and researchers, and how the understanding of the concept has changed over the years?
- What are the key characteristics of self-regulated learners? Do they use specific strategies while learning and could these strategies be taught to learners who do not possess them, specifically students with learning difficulties?
- Is there a model of SRL that can easily be used by teachers as a framework to facilitate the teaching of specific strategies of self-regulated learning in the classroom?
- Is there a correlation between strategy intervention and academic performance of children? If so, can these strategies be taught to children to improve their performance in the classroom?
- Which strategies have the highest positive correlation to academic performance and are therefore most effective in ensuring positive outcomes for students?
- Can strategy intervention help students with learning difficulties?

- What is the role of the teacher in promoting self-regulation in the classroom, which specific teaching strategies can be used to motivate children to engage in independent learning?

1.1 Literature Review

After identifying the key questions, I started conducting a comprehensive literature search, focusing specifically on the components of SRL interventions that have a high correlation to academic performance. A clear, in-depth study of literature related to specific components and strategies linked with SRL was carried out. I attempted to understand what constitutes an effective intervention model while helping children with learning difficulties.

In order to do a complete review of past and recent literature in the field of self-regulation, I started with a comprehensive literature search of keywords drawn from the questions for study, e.g. self-regulated learning, SRL, self-regulation strategies, self-regulated interventions, self-regulation and academic performance, self-regulation and learning difficulties, models of SRL, and impact of learning strategies on academic performance.

As I read the various articles, research papers and thesis, I identified that there was a lack of direct connections to the New Zealand context. For my research to be able to contribute to the current setting, it was important to make linkages between classroom delivery models and how self-regulated learning is incorporated within it. I therefore incorporated another question in my list of secondary questions: -

How does the New Zealand curriculum encourage and ensure the teaching of self-regulation to children?

There is a great emphasis on building curriculum activities around the five key competencies which are used as guidelines for teachers to consider the skills students need to develop. These questions are, do these key competencies link to the components of SRL, and how are they used across the schools in New Zealand to encourage independent learning in students? I therefore needed to expand my literature search to include the key competencies and how they link to SRL.

The literature collected was then analysed and sorted according to the various sections. The search was also narrowed to focus on the role of SRL strategy intervention while working with children with learning difficulties. SRL strategies were studied in detail with a focus on the ones that had a strong and positive correlation with academic

performance. It was important to classify the collected information and organise it according to the structure of the thesis. In order to review the literature, it was also important to examine, analyse and synthesise the information collected (Machi & McEvoy, 2016). This was done through the following steps:

1. Manage the data

The first step to writing the literature review was to manage the data that I collected by ensuring correct bibliographic documentation. Endnote is an effective tool to reference information collected from different sources. It helped me to simultaneously cite information using the APA format. It also allowed me to integrate all the information I collected without getting overwhelmed. I could catalogue all the articles, papers, sites, reports and thesis that I planned to review or the ones that had the potential to help me gain a better understanding of my topic.

2. Scan the literature

This was an important step as it helped me to understand the topic in greater depth, understand the concerns and strengths associated with it and to use it to justify the relevance of the study. I focussed on a wide range of data spanning across several years of research to help me understand how the topic evolved. Keywords related to the topic were used to search through the various research databases. Starting with the term self-regulated learning, I added other terms like self-regulated learning strategies, self-regulated learning and academic performance, how self-regulated learning strategies help students, self-regulated learning in schools, role of feedback in self-regulated learning, how to use self-regulated learning to enhance academic performance and so on. It helped me to expand my query to include more descriptors which I used later to organise the literature review. A variety of electronic databases were used to gather the literature. I kept making written notes to understand the information collected and to try and organise it into chunks.

3. Skim the literature

The next step of the literature review was to skim the gathered data to understand which parts were useful and could be included in the study. It was important to link the collected data to my research and to understand where exactly it fitted into my thesis framework. While doing this, I realised that I needed more data on intervention studies for children with learning difficulties. I had collected a lot of papers that explained self-regulated learning in the context of mathematics and computer science. I decided to omit this data as it would widen my research to include too many elements. There was also a lot of

data around the use of self-regulated learning strategies among college students. I decided to omit this data too as I wanted to keep my focus on SRL strategy use by children in schools.

4.   Map the collected data

After skimming through the gathered information, the next step was to organise it in a way for it to make sense. It was important to organise the literature in such a way that it contributed to the central theme of the thesis. As self-regulated learning was the central theme, it was important to provide a comprehensive explanation of the topic. The theoretical perspectives of self-regulated learning and description of the different models of self-regulated learning, were therefore important components of the review. All these components were used to support the core idea and to help the reader understand the concept of self-regulated learning and how different strategies can be used effectively to support classroom learning. While mapping and organising the data, it was also important to understand the various perspectives of SRL as given by various researchers. I also identified Zimmerman as the key researcher who contributed immensely to the concept of SRL. His 3-phase model of SRL was used as a conceptual framework to understand the various self-regulatory processes that are used while learning. The model is also important because of its focus on teachable strategies and skills for self-regulation and motivation.

Once all the information was collected, the next step was the organising and mapping of the data, and cataloging of the evidence. The data was interpreted, analysed and mapped to the relevant sections of the thesis.

1.2 School Documentation Search

In order to understand how schools in New Zealand encouraged the development of key competencies and independence to learn, I conducted a school discourse analysis whereby I studied the written text available on their websites. Discourse analysis is a qualitative research technique and it helped me understand how the key competencies were incorporated in the curriculum by studying the school principles, charter and strategic plan available on their public domain. The aim was to study the school charter of primary and intermediate schools across Auckland.

In New Zealand, deciles are a measure of the socio-economic position of a school's student community. The decile ratings are from 1 to 10, with 1 indicating that a school has the highest proportion of students from low socio-economic communities, whereas

10 indicates a school has the lowest proportion of these students. For my research, I wanted to pick two schools each from deciles 1,4,7 and 10 schools, thus covering a range of schools. The schools chosen would be the ones that had clear reference to key competencies in their school charter and strategic plan. I put together a list of all the schools with the mentioned decile ratings and started studying their websites. I soon realised that most of the school websites did not have enough data available on their websites. There was not enough information regarding their strategic plan and how the key competencies are incorporated to create greater autonomy while learning. In order to obtain a diverse range of data and gain complete insight into the information presented by schools, I decided to use the method of purposive sampling. This method is a judgmental or selective sampling method that allows the researcher to reach a targeted sample quickly. I started with putting key terms like 'school charter and key competencies', 'key competencies in schools in New Zealand', 'self-regulated learning in New Zealand schools', 'school strategic plan and key competencies', and started to go through the websites of schools that showed up in the search engine till I found some schools that could provide a range of data for my research. I also realised that given the small number of schools that had a clear link mention of key competencies on their school website, I would have to limit my search to include five schools. The schools that I researched were all primary and intermediate schools with a range of decile ratings. Since the focus was the study of the school charter and plan, I did not limit my search to any one area and continued searching through the websites of all schools in Auckland till I found five schools for the study. The schools are mentioned in the study as School A, B, C, D and E, along with details of their decile rating, demography and student profile.

School A is located in a suburb 5 kms from Central Auckland. It is a decile 6 co-educational Primary School that caters to a diverse community of learners. 6% of students are Maori, 3% Tongan and 3% Samoan. Almost 24% of students are enrolled in the program for students of other languages. There is also a large population of Asian students in the school.

School B is located in south-east Auckland in one of New Zealand's newest communities. It is a co-educational state Primary School for learners from years 1 to 6. The school's culturally diverse roll comprises 5% Maori, 29% Indian, 26% Chinese, 7% Cambodian and 6% Pakeha learners. There are also other children of many other ethnicities. Over half of the children attending the school are supported to learn English as an additional language. The school is developing ways to respond to Maori and other children whose progress needs to be accelerated. It is a decile 7 school and offers Innovative Learning Environments to its students. There is a great emphasis on

accelerating the learning of all the learners and addressing the disparity in achievement for Maori and other learners.

School C has a socio-economic decile of 9. It is a co-educational school catering for students from years 9 to 13. The school roll comprises 4% Maori students and 2% Pacific students. The school also has 33% Chinese students on the roll. It is situated in a suburb 13 km east of Auckland's CBD. The school's mission is to educate every student to achieve their full potential and to make a lifelong, positive contribution to society.

School D is a co-educational school catering for students from years 1 to 6. There are students from 22 different ethnic backgrounds attending the school. It is located in East Auckland and is a decile 8 school. The school puts a lot of emphasis on the achievement of Maori and Pacific children. The Maori learners in the school achieve at par with the other learners. The achievement of Pacific learners in the school is very high in relation to the national standards.

School E is a decile 9 Primary School catering to children from years one to eight. It is a co-educational school located in south-east Auckland. It is an old school rooted in tradition and has a unique rural character. The school celebrates diversity and respect for all, which are also the core principles of the school.

1.3 Introduction to the Thesis

The purpose of this thesis is to conduct a critical analysis of the concept of Self-Regulated Learning (SRL) and to understand how SRL strategies impact the learning outcomes and academic performance of children with learning difficulties. Self-regulated learning is a process of active knowledge construction where students utilize all the resources, skills and strategies available to them, with the aim to improve their academic performance. Zimmerman was a key theorist who not only provided a theory of self-regulation which was grounded in social constructivist principles, but also provided a framework for teachers through his cyclical model of learning (1990). His work has greatly influenced my interest in the topic and has also shaped my initial thinking as I set out to research the topic. Zimmerman (1990) shared how Benjamin Franklin used various techniques to enhance and guide his learning. Franklin provided details of how he set new goals for himself and devised his own system of self-improvement. Zimmerman suggested that the use of these strategies by Franklin are a strong indicator that self-

regulation has been considered an important aspect of learning, even if the term was not used.

An important and well-researched topic in education (Zimmerman, 1989,1990; McCombs, 1989; Paris et al., 2001), self-regulated learning has been described using multiple definitions. Different theoretical perspectives that researchers have used to analyse SRL have all aimed to identify self-regulated learners and how they use specific processes, strategies or responses to achieve academically. These theories offer insight and direction to educators and teachers to help students enhance their learning skills. Several models given by various researchers like Zimmerman's Cyclical Phases Model (1990) and Pintrich's Self-Regulated Learning Model (1990), have also helped us to gain an improved understanding of the processes involved during self-regulated learning. Though the models differ from each other, they all agree that self-regulated learning helps students become more aware of their own skills and helps them create and pursue their own goals. The models provide a framework for teachers to include strategic instruction as a part of their teaching.

One of the key models of self-regulated learning discussed here is the cyclical model developed by Zimmerman (1990) as it has important implications for educational planning. It provides teachers and educators with a framework to implement academic intervention as it considers the phases that precede, guide and come after learning. It therefore guides teachers to incorporate strategy intervention during the different phases of learning. Most of the strategies defined by Zimmerman can be useful to guide students who are not able to perform optimally and who may lack an understanding of the strategies due to their learning difficulties.

The role of metacognitive knowledge, self-efficiency and motivation in influencing self-regulated learning and academic performance is analysed in chapter four. The role of the teacher is crucial in guiding students, endorsing and sustaining learning, and helping them have faith in their own abilities and skills to learn. Constructive and effective feedback by the teacher is also a decisive factor in progressing learning (Cleary, 2018). It not only helps students become aware of their own strengths and weaknesses, but also provides them with ways to improve. The emotions generated during the feedback process also have a great influence on how it will be used in the future, again emphasising the role of the teacher in making it effective (William, 2012).

A key focus of the thesis is to understand how SRL strategies can help students who lack the cognitive and metacognitive skills to pursue learning tasks. Some key SRL strategies that can help advance the academic performance of students with learning difficulties have been identified and discussed. Explicit strategy instruction is considered

to have a positive influence on the academic performance of students with learning difficulties (Graham & Harris, 1989). It was also found that there is a dearth of intervention studies that analyse the impact of strategy intervention (how, when and which strategies are most effective) to help students who either lack self-regulated learning skills or are too overwhelmed to use them. Further research in this area will equip teachers and educators with strategies to address the needs of varied learners in their classroom.

Schools across New Zealand are embracing the Innovative Learning Environments (ILEs) (Osborne, 2016) with a big shift from guided learning (where teachers make the key decisions about the learning goals, strategies and learning outcomes) to experiential learning (which is determined by learner's motivation and discoveries). Schools have also made a major shift from conventional teaching methods to inquiry-based learning which encourages students to ask questions, share ideas and learn in a way that works for them. Introducing self-regulated learning strategies through an inquiry-based learning pedagogy would be specifically helpful within classrooms that work on the innovative learning environment model. Such strategy instruction would greatly help students with learning difficulties acquire the strategies that would help to enhance their performance on academic tasks.

Chapter 2- Defining Self-Regulated Learning

Educators across the world look through various strategies, interventions and programmes that are aimed at creating lifelong learners. These learners are excited about learning new tasks, are intentional, independent and self-directed. They are able to acquire, assimilate, retain and retrieve new knowledge on their own. In other words, they possess a repertoire of self-regulated learning strategies that help them to regulate their own cognitive, metacognitive and academic behaviour, and to acquire the necessary skills for success on academic tasks.

2.1 Multiple definitions of Self-Regulated Learning

The concept of self-regulated learning was first introduced by Gardner (1963) who understood the significance of personal enterprise in learning. Since then, self-regulated learning has been an important topic which has led to a lot of research in different fields of education. Though there have been multiple definitions and explanations of the concept of self-regulated learning, the key identifying area has been of making the student a key player in their own learning (Zimmerman, 1990). Zimmerman and Schunk (1989) described it as students becoming 'masters of their own learning'. In order to be considered 'self-regulated', students must use the necessary strategies that would help them accomplish the goals they have set for themselves based on their perception of their own abilities (Zimmerman, 1989). It is therefore a multifaceted process which includes cognitive, motivational and contextual elements. All these elements are controlled by metacognition which is also the foundation of the self-regulated learning process (Boer et al., 2013).

SRL is a fairly simple and intuitive concept to understand, though it sometimes may seem complex and one that is difficult to acquire. At a theoretical or conceptual level, (Butler et al., 2017) described self-regulated learners as ones who display behaviours or patterns which are driven by their will to persistently pursue a task, their intentional use of processes that will help them to learn, and their knowledge and consciousness about their learning tasks which helps them in planning, monitoring and evaluating their performance. Simply put, self-regulated learners are the ones who are purposeful and strategic in figuring out ways to do well on an assigned activity and are therefore able to realize their goals (Cleary, 2018).

Bill Parcells (1995), a Hall of Fame NFL football coach, describes students who attain great success as ones who always find a way to win. From his viewpoint, success is not

only the outcome of one's wishes or motivation to excel but also consists of an efficient use of resources available to realize one's goals.

2.2 Key characteristics of self-regulated learners

Self-regulated learners can attend to new and challenging educational tasks with self-assurance, thoroughness, and resourcefulness. They are aware of their own learning skills and will always look for steps and information to master skills and facts that they are unaware of. Self-regulated learners understand that acquiring knowledge is a methodical and manageable process, and they take great ownership for their achievement outcomes (Borowski et al., 1990). Although, there is a lot of variation in the definitions of self-regulated learning in relation to specific processes, as given by different researchers and their theoretical orientations, a common aspect that has been identified among these students "is that they are metacognitively, motivationally, and behaviourally active participants in their own learning" (Zimmerman & Pons, 1986, p. 308) . In relation to metacognitive processes, self-regulated learners involve themselves actively in their learning process as they can set goals, organize themselves, monitor their progress, and assess their learning at various steps during the learning process. These processes used by self-regulated learners ensures that they have more awareness, knowledge and decisiveness while approaching learning tasks. They are highly motivated, believe in their own capabilities and have a lot of inherent motivation to pursue and complete a given task (Schunk, 1986; Zimmerman, 1985). Self-regulated learners often show a lot of initiative while attempting new tasks. They also display a lot of perseverance, intrinsic motivation and effort while pursuing learning tasks. In their behavioural processes, these learners engage actively with their environment in order to enhance learning. They are able to tap resources, take advice, procure information, seek out for opportunities to learn and keep up their motivation.

Cleary (2018), describes self-regulated learners as ones who project behaviour and cognitive patterns characterized by their desire to pursue learning tasks persistently, intentionally devise strategies and procedures that would help them to learn, and possess good metacognitive understanding and skills. Self-regulated learners endeavor to perform well on assigned tasks and decisively and strategically figure out ways to attain their goals. Students who are equipped with self-regulated strategies will display a high level of motivation in the face of academic and classroom challenges, and will "purposefully strive to regulate or manage their thoughts, actions, or their learning environments to get things done. In many cases, the internal spark for self-motivation is a function of the types of beliefs, perceptions, and mindsets that students possess as well as their commitment to attaining their goals" (Cleary, 2018, p. 21).

As we observe self-regulated learners, we can easily categorize them as individuals who attend to academic tasks with self-assurance, diligence, and resourcefulness. Such learners are conscious of their own abilities and constraints and thus find it easier to work on their own learning. In fact, self-regulated students are proactive in seeking out the required information and take steps that are essential in helping them in the mastery of the task (Zimmerman, 1989). When faced with obstacles in the way of their learning, they always manage to find a way around it. Self-regulated learners consider the acquiring of skills as an organized process which can be controlled by them, and they are eager to take charge of their own learning and the eventual achievement outcome.

2.3 Self-regulation processes and strategies

As we put together the definitions of self-regulated learning, it is imperative to differentiate between self-regulation processes and strategies. Self-regulated learning processes "refer to actions and processes directed at acquisition of information or skills that involve agency, purpose, and instrumentality perceptions by learners" (Zimmerman, 1989, p. 329). Every student uses self-regulation processes during their learning process, but self-regulated learners are differentiated by their understanding of the association between the various processes of self-regulation and academic achievement, and their use of strategies to reach the goals set by them. They use strategies aimed at metacognition, motivation and behaviour to achieve academic success (Zimmerman, 1989).

2.4 Feedback as a cyclic process

Another important aspect of the definitions of self-regulated learning is a 'self-oriented feedback loop' (Carver & Scheier, 1981; Zimmerman, 1989). This feedback loop involves a cyclic process during which all learners will evaluate the process of their own learning, the strategies they have used and also relook at their learning process based on the feedback they receive. This response could be in the form of a covert change in perception or an obvious change in behaviour, for instance rethinking the use of learning strategies. According to phenomenological theories of self-regulated learning, the cyclic process is viewed in relations to covert perceptual processes like self-esteem and concepts about the self (McCombs, 1986, 1989). Operant theorists lay emphasis on overt processes like recording, instructing, and reinforcing the self (Mace, Belfiore, & Shea, 1989). Social cognitive theorists (Bandura, 1989) stress the importance of positive feedback as an important motivator to raise the bar for oneself and set goals according

to the one's own skills and competencies. Regardless of the theoretical differences in defining self-regulation, all researchers agree that it is highly dependent on the feedback of one's learning effectiveness.

2.5 The use of strategies by students

The last important facet of the definitions of self-regulated learning is an understanding of the reasons due to which students choose certain strategies to self-regulate. Students are required to make a lot of effort, time and planning to use self-regulated learning strategies. It also entails a lot of self-motivation which is only possible if there are sufficiently attractive outcomes of these efforts. Operant theorists (Mace et al., 1989) suggest that students' motivation to self-regulate is highly governed by external factors such as positive or negative reinforcers. On the contrary, phenomenological theorists suggest that students are driven by the need for self-esteem or self-actualization (McCombs, 1989). There are also other theorists who lay emphasis on factors like self-efficacy, academic tasks achievement and cognitive capabilities.

Most theories of self-regulated learning give a lot of importance to the interdependence between learning and motivation. For example, when students possess a high level of belief in themselves, they are motivated to learn and put in extra effort, which in turn leads to better academic achievement on assigned tasks (Schunk, 1984, 1989). Students who are self-regulated in their learning, are not just reactive to their learning outcomes, but they are active in seeking out opportunities to learn (Zimmerman, 1989). They take initiative to involve themselves in activities which helps them to observe their own learning, evaluate themselves better and work towards improving their performance on challenging tasks (Zimmerman & Pons, 1986). Their increased motivation can be seen in their persistence on tasks and the propensity to set higher learning goals for themselves, an important characteristic that Bandura (1989) called self-motivation.

Research suggests that students who utilise self-regulated learning strategies while attempting learning tasks can achieve better (Pintrich & De Groot, 1990; Zimmerman, 1990, 2008). It has therefore become important to teach SRL strategies to students, especially to those with learning difficulties. The focus of many research studies has been to enhance SRL skills and strategy use through classroom-based interventions (Winne & Perry, 2000; Zimmerman & Schunk, 2011). An intervention study conducted by Zimmerman and Moylan (2009) aimed to improve the use of metacognition and motivational strategies for students who struggled in the classroom. This was done by providing them with feedback and helping them to use it to interpret their grades (Zimmerman & Moylan, 2009).

As we define self-regulated learning in students, we can clearly see three important features:- how students utilize self-regulated learning strategies, how they respond to self-oriented feedback regarding the effectiveness of their learning procedures, and how they utilise motivation to help them move ahead. (Zimmerman & Schunk, 2011). Self-regulated students can therefore choose the self-regulated learning strategies that will help them to achieve their academic goals. In doing so, they utilize the feedback they receive about their learning efficacy and ability.

2.6 Self-regulation and learning

Zimmerman (1989, p. 308) defined academic self-regulation as "the extent to which learners are metacognitively, motivationally, and behaviourally active in achieving their learning goals". Self-regulated learners are able to make learning goals for themselves and are able to make use of appropriate strategies to attain their goals. They are able to constantly gauge and evaluate their progress and device appropriate learning strategies. They are able to self-motivate and avoid distractions so that they can focus on their learning. They are able to reach out for guidance and support when needed, and make sure that their environment is favourable for learning. Self-regulated learners therefore have active involvement in their own learning process and are able to control their thinking, behaviour, and environment to realise their academic goals (Zimmerman, 1990).

Since SRL helps students to understand their own skills, it has a high correlation with student learning (Fisher & Ford, 1998). As proposed by Pintrich (2000b), students who are self-regulated can advance their capabilities to learn by choosing appropriate metacognitive and motivational strategies; they are proactive in selecting, structuring and creating a learning environment which works for them; and they play a vital part in selecting the kind and amount of instruction they require. As students go through the course of learning new concepts, strategies and skills, they encounter several challenges which are both natural and inevitable. For some students, particularly those with learning difficulties, these challenges may be accompanied with negative emotions like anxiety, depression and anger, and social difficulties. If these students lack the ability to use self-regulated learning strategies, they may become demotivated, and may disengage, avoid or dislike school. Instruction of self-regulated learning strategies can positively impact their academic achievement and ensure self-regulated learning (Livingston, 1996). These students can also be taught cognitive and metacognitive strategies, along with

motivational factors like self-efficacy which are very important for strategy use (Pintrich and DeGroot, 1990).

Some of the core characteristics of self-regulated learners (Cleary, 2018) are given as: -

• They take initiative to attempt a task and have a self-starter attitude
• They are prepared to deal with challenging tasks
• They consistently work towards their goals
• They plan for tasks in advance and use various strategies to enhance their performance
• They are aware of their own skills and abilities and are able to assess their own performance
• They can adapt their strategies and learning behaviour as required

Self-regulation cannot be linked to intelligence or to the skills that students may possess for academic performance. Instead, it is considered to be a process where learners direct themselves and use their cognition and capabilities to help them with academic tasks (Zimmerman & Schunk, 2001b). SRL is therefore considered an activity that some students undertake to pursue their own goals proactively, rather than as an event that they have no control over and one which is largely because of the teaching experiences that students have. Self-regulated learning theory and research is therefore not only limited to concepts such as self-teaching or understanding the learning process, but also incorporates the social aspects of learning like modelling, supervision, and feedback from the external environment (Zimmerman & Schunk, 2001b). Therefore, as one sets to define learning as self-regulated, the key issue is not if SRL is a socially isolated concept, but if learners make conscious efforts for it, displaying personal initiative, persistence, and are able to adapt their skills.

Zimmerman (1994, 1998) argued that an important component of self-regulation is a learner's personal choice and control as these are important to help him become autonomous. Zimmerman and Pons (1986) also emphasised that self-regulation is not only an important educational goal but a lifelong learning skill and hence it's importance. In the self-regulated learning (SRL) process, learners are seen to actively pursue and process information. To be self-regulating, learners need to have the ability to adapt their circumstances in such a manner that they are able to understand individual goals and needs in the context of their own learning. To be a self-regulated learner means that one is proactive and adaptive in constructing calculated plans which are intended to help the learner to achieve optimally (Butler, 1998). Zimmerman (1989) theorised that though there were many varied perspectives on the concept of self-regulated learning, they all had a few common features that include: (1) the assumption that individuals use specific

strategies in a purposeful and proactive manner in order to optimize their academic performance; (2) the postulation that there exists a higher degree of interdependence between the concepts of learning and motivation, and it is difficult to understand any one concept independently; and (3) the assumption that the most significant element of the learning process is the self-oriented feedback loop. Self-regulated learning is a process where a learner uses all available motivational, emotional and social resources to work towards acquisition of knowledge and achieving defined goals.

Zimmerman (1995) defined three phases through which self-regulated learning develops. These processes take place repeatedly during a learning process. The three processes are, forethought or planning; performance or execution; and evaluation. These processes are considered to be cyclic in nature and form the core of the self-regulation process. The acquisition and development of SRL abilities in students is an intricate task and is dependent on many factors. Blumenfeld (1992) gives immense importance to the learning environment and suggests that creating and structuring the environment is of immense importance as it offers the opportunity to regulate the vital aspects of learning and also chances to reflect and revise learnt concepts based on the feedback received. Boekaerts (1996a) suggests that self-regulating strategies are connected with positive emotions and promote learning. In contrast, negative emotions, such as confusion, stress, fear, irritation etc. hamper learning as they lessen the impact of focus, thinking and action. These negative emotions are connected with controlling the self instead of regulating it (Boekaerts, 1996a). Research also suggests that learners who do not have adequate self-regulation skills are often not able to excel academically and could even have issues with their emotions and behaviour, maintaining social relationships and expressing themselves and understanding others (Boekaerts, 1996a).

Dwek and Leggett (1988) emphasize the importance of collaborative learning experiences to help learners develop SRL abilities. Linnenbrink and Pintrich (2002) suggest that individual training and learning intervention help learners to self-regulate their learning process to the best. All learners have different abilities and hence learn differently. This makes it very difficult to devise an educational model of learning that would work for all. Overall, the SRL process is vital to the learning process as it places the learner at the centre of the process and therefore motivates the learner to devise the best strategy that is needed to learn. Hence, the progression of learning is as important as the results, as constant assessment of the learning process allows learners to work on and better their ability, and puts them on the path of lifelong learning. Learning is therefore not limited to the context of school, but a lifelong process. A self-regulated learner should have the skills to use the best strategy available to them and should also

be able to apply learning contexts to new situations (Winne, 1997) . McCombs and Marzano (1990) propose that according to SRL techniques, learning is not just about the understanding of concepts, but about making learners active participants in their learning. They should therefore be motivated to ask questions, make choices and involve themselves in the learning process. Learners should know how to use their knowledge, ability, awareness and skills to help them work toward their goals. They must also regularly self-reflect and evaluate themselves so that they can advance their learning process.

Chapter 3- Different Theoretical Perspectives of Self-Regulated Learning

Various theories of self-regulated learning have aimed to establish the concept of SRL and how self-regulated learners can be recognized. Such learners work to produce thoughts, emotions and actions which help them to work towards and realize their learning goals. SRL as a concept has been described in many ways and most of these definitions look at how students use specific processes, strategies, or responses to achieve academically. Researchers who base their theories on cognition like the constructivists, base their definition with a focus on the covert processes, while behaviourists favour definitions that discuss overt responses (Zimmerman & Schunk, 2011). However, in all these definitions, students with SRL strategies are considered to be conscious of the self-regulation processes that they possess and how they can be best used to improve their academic achievement.

The second important aspect of a majority of definitions of self-regulation is the presence of a self-oriented feedback loop while learning (Zimmerman & Schunk, 2011). This loop is defined as a cyclical process through which students observe the efficacy of their learning methods and strategies, and respond to the feedback they receive in varied ways which range from changes in self-perception to deliberate changes in their behaviour (Bijou & Baer, 1961).

The third common feature is the motivational dimension while defining self-regulated learning. It defines the reasons and the process through which students choose a particular self-regulated strategy. This dimension is defined differently by different theorists. Operant theorists emphasise the role of external factors like reward or punishment in controlling SRL responses by students (Zimmerman & Schunk, 2011). On the contrary, phenomenologist theories argue the importance of intrinsic factors like self-esteem or self-concept as being the main motivator for governing SRL processes (Zimmerman & Schunk, 2011). Theorists from both aspects choose motives such as success in tasks, accomplishment of goals and self-efficacy as defining factors in making students self-regulated learners. Self-regulation theories are important because they emphasise the relationship between student motivation and learning, and can therefore be used by educators who try to find strategies to work with students who lack the motivation to work on their learning (Zimmerman & Schunk, 2011).

In the following section, self-regulation theories are discussed through seven important theoretical perspectives- operant, phenomenological, information processing, social cognitive, volitional, Vygotskian, and cognitive constructivist approaches.

3.1 Self-Regulated Learning through the viewpoint of Operant Theorists

Operant researchers, pursuing the principles of B. F. Skinner, form a very large and important part of research on self-regulation.

Motivation as a key factor for Self-Regulation

Operant theorists (Skinner, 1971) suggest that the self-regulatory responses given by a student have a direct correlation with external stimulus and reinforcers. According to them, the self-regulation responses generated by students are used to help them gain success on academic tasks (Bijou & Baer, 1961). Therefore, if a student uses a self-reinforcement strategy like extra breaks and if that strategy proves to be successful, it is likely that the student will continue the use of that strategy in future. However, if these extra breaks fail to produce the desired results, then, according to operant theorists, the self-reinforcement will be discontinued. Students who can self-regulate, are able to delay instant rewards in favour of alternate (and often greater) rewards (Ito & Nakamura, 1998). Operant theorists indicate that students' choice to self-regulate will depend on the magnitude of the instant and delayed rewards and the time lapse between them (Zimmerman & Schunk, 2011).

The role of self-awareness in self-regulation

Keeping up with a behavioural-environmental method for motivating self-awareness, operant theorists highlight the need for self-recording and self-monitoring as a key element that can help students to self-regulate their learning. These recordings are in the form of narrations, behavioural references, duration and frequency, time-sampling procedures, and archival records. The process thus involves events that can be observed.

The important self-regulation processes

Mace and his contemporaries define four major categories of self-regulated learning responses: self-monitoring, self-instruction, self-evaluation, and self-reinforcement (Mace et al., 1989). The significance of self-monitoring has been discussed above. As for self-instruction, as early as 1924, operant theorists like Watson (1924) considered thought to be a form of covert speech which he calls a form of self-instruction. According to Vygotsky (1962), self-directed speech leads to thinking whereas operant theorists suggest that it is usually a response to a stimulus. On the contrary, Mace and his colleagues (Mace et al., 1989) suggested that statements in the form of self-instruction will eventually act as a reinforcer for particular behaviours. According to them, self-instruction is either a written or oral stimulus that helps students to respond to a situation where external reinforcement is not available. Self-instructive statements are therefore

considered to have a superior stimulus quality as compared to the verbal or covert response. Self-evaluation, which is the third self-regulative process, entails that students equate some aspect of their behaviour to that of a standard which refers to the accuracy and improvement in performance (Belfiore, 1998). Self-evaluations are highly effective as they influence self-corrective responses. They, therefore, help to either adapt earlier responses so that they have a better effect or will work towards adjusting the standards if they are found to be inadequate (Belfiore, 1998).

The last self-regulative process is self-reinforcement which also acts as a big reinforcer for behaviour. Unlike cognitive behaviourists, Mace and his operant colleagues (Mace et al., 1989) emphasise the necessity to externally reward self-reinforcing responses. These responses do not necessarily have a 'self' sustaining value but are highly influenced by external factors such as social status and perceptions. It is therefore important for teachers to adhere to a stringent reward criterion while allowing students to self-reinforce.

The effect of social and environmental factors
Operant researchers lay a lot of emphasis on the link between self-functioning and the environment. According to them, all internal processes are displayed in the form of overt behaviour, and operant theorists focus on the relationship between such overt behaviour and the environment (Zimmerman & Schunk, 2011). This relationship with the environment is crucial in evolving effective instructional intervention procedures. Operant theorists have not attributed much importance to how issues related to development of children affects self-regulation. However, they have greatly highlighted the importance of external factors like modelling and reinforcement as key elements that help in learning to self-regulate. At first, the external environment plays a role in the shaping of the self-regulation responses. Eventually, the external signals are removed and the 'short-term reinforcers' are also weaned out slowly (Cleary, 2018). The presence of effective external cues are therefore important factors that influence self-regulative responses.

How do students develop the ability to self-regulate?
Operant theorists are of the view that developmental factors do not contribute much to one's ability to self-regulate. They instead give a lot of importance to the part played by external factors in learning to self-regulate. According to them, the important methods of instruction that can be used to train students for self-regulation are modelling, verbal training and reinforcement. Positive reinforcement has been very helpful in shaping learning patterns and behaviours of children with learning difficulties. If a learning behaviour is immediately rewarded with positive reinforcement, learning will occur more

rapidly (Kaplan, 2018).   In the beginning, external factors are used which help to shape the self-regulation responses. Eventually, these external factors are removed gradually, and short-term cues of reinforcement are also faded. Operant theorists view that the presence of effective models, and external or environmental factors play a significant role in helping students to regulate their own learning (Cleary, 2018).

3.2 Self-Regulated Learning through the viewpoint Of Phenomenological Theorists

Researchers with a phenomenological view have greatly highlighted the significance of self-perceptions in understanding human psychological functioning. According to them, self-perceptions were prearranged into a characteristic identity or self-concept which impacted all areas of behavioural functioning (Cleary, 2018). These included academic performance and achievement. A reactive self-system defined all human experience as it could highly influence the incoming information in such a way that it was viewed to be either positive or negative in agreement with one's self-concept. For students who had a positive self-concept, all academic errors were reinterpreted as opportunities to learn. However, students with a negative self-image viewed them as signs of failure. These negative experiences deterred their motivation to learn. According to phenomenological theorists, students' concept of self therefore played a huge role in determining their capacity to self-regulate. These views have further been studied to make it more objective and easier to follow.

Motivation as a key factor for Self-Regulation

According to researchers with a phenomenological perspective, the main reason for students to self-regulate is to improve one's concept of self. McCombs (1989) suggested that as one goes through the process of learning, the self is able to generate motivation which further helps one to persist through new and challenging tasks. He also states that the self-system is further divided into global and domain-specific forms. The global form of self-concept is based on the image that self-regulated learners have formed of themselves. This concept contains their beliefs around their own knowledge, skills, and abilities (Zimmerman & Schunk, 2011). This global concept of the self is therefore able to override any single concept they may have of themselves and helps them envision how they might take their learning to the next step in the future (Markus & Nurius, 1987).

On the other hand, a domain specific self-concept is the belief that students have of their own skills, knowledge, motivation and cognition in a particular domain like Mathematics, Science, or English (Zimmerman & Schunk, 2011). These self-perceptions will then

guide students in understanding their own self-regulation processes when learning in that specific area. McCombs (1989) explained through his model that the reactions or feelings generated during a learning process will play an important role in motivation. If self-perceptions elicit negative emotions, it will lead to anxiety, which will further curb motivation. This will be followed by helplessness, dodging or moving away from the task presented to the student and its context. On the contrary, if perceptions of self elicit positive emotions, students will not only exhibit confidence during learning, but will also have the intrinsic motivation to see through a task. It will therefore be important to help build a positive sense of self for students with learning difficulties. This will generate positive emotions and feelings for them during the learning process, and motivate them to attempt learning tasks without getting stressed.

The role of self-awareness in self-regulation

Phenomenologists consider self-awareness to be an ever-present condition of human psychological functioning. Most people are naturally self-aware and do not have to be taught this, however, their own personal defensiveness can greatly influence their perceptions of self. Students who have doubts regarding their abilities will have anxiety around their performance and may try to avoid learning tasks and may even be convinced that they would not succeed on a given task (Zimmerman & Schunk, 2011). Evidence given by researchers (Davis, Franzoi, & Markwiese, 1987) proposes that a heightened level of self-consciousness leads students to pursue self-knowledge whereas a lower level relates to self-defence. McCombs (1989) recommends that when students are engaged in self-monitoring and self-evaluation processes, they are able to get a better understanding of their own self. This helps them perceive their own learning more effectively and they are able to guide and motivate themselves to perform to their best.

The important self-regulation processes

Researchers have further emphasised the importance of students' perceptions of themselves, both in terms of their worth and identity. According to McCombs (1989) the perceptions that students have of themselves greatly influences their learning processes like self-evaluation, planning their steps for learning, setting goals and targets, checking and assessing their performance and use of strategies. The role of self-evaluation is therefore considered an important one that governs ones' capacity to self-regulate their learning process.

The effect of social and environmental factors

According to phenomenologists, students' perceptions of self plays a greater role in their ability to self-regulate as compared to the role or impact of external or environmental factors. McCombs (1989) suggests that adults and teachers can help youngsters deal with feelings of doubt or lack of self-confidence by helping them understand the importance of the learning task, deal with negative self-evaluations of their own self, and set realistic learning goals. This will be of particular importance for students with learning difficulties as they may find learning tasks daunting and unattainable. Similarly, Rogers (1951) suggested that teachers must gauge the effectiveness of their activities according to the perceptions that it creates in the minds of the students. Keeping up with phenomenological views, there is a huge emphasis on the importance of teachers' reassurance in endorsing student self-confidence in learning (Laird, 1988).

How do students develop the ability to self-regulate?

Self-regulated learning is viewed as being dependent on the development of self-system processes in children (McCombs, 1989). As children move through primary and middle school, their perception of the self in terms of their own academic competence changes. Children develop an overall notion of self-esteem or self-worth around 8 years of age (Harter, 1987). When children are much younger, they are unable to differentiate their mood from their interest and are unable to judge their own skills and abilities (Nicholls & Miller, 1984). When students have a weak perception of the self and they lack self-regulatory processes, it is essential for the educators to help them build their self-system processes (Rogers, 1959).

3.3 Information Processing views of Self-Regulated Learning

Information processing (IP) is largely used to explain the various aspects of human cognitive functioning and how human beings self-regulate. Various Information processing models explain people's neural limitations and their mental variations, such as their use of specific strategies to improve memory and retention. These models tried to bridge the understanding between mind and brain descriptions of cognitive functioning and generated a lot of interest among different scholars and researchers (Laird, 1988). These researchers projected human mental functioning into two types of mental components which are memory stores and information processing. They described the elementary unit of human functioning as a symbol, which was described as bytes of information. These bytes were automated into the memory stores of computers to be used during processing.

The basic unit of self-regulation was the recursive feedback loop, which was depicted by Miller and his associates (Miller, Galanter, & Pribram, 1960) as a TOTE sequence (i.e., Test, Operate, Test, Exit). In this construction, keyed information is first tried against a predefined standard. If the match is inadequate, the input is worked on and then is retested. This process of testing continues until the information is according to the test standard, and at that point, it is produced in the form of output. This TOTE is therefore self-regulatory as it helps the computer or person to regulate the changing input conditions. The foundation of self-regulation during this process is to learn negative feedback, indicating a difference between performance and the expectations from the test standard. Since this discrepancy is supposed to be toxic, it coerces learners to reduce it.

Motivation as a key factor for Self-Regulation

Information Processing (IP) theorists paid little emphasis on the role of motivation to self-regulate learning. They instead gave more attention to the knowledge state of the individual or the strategies used for reasoning. However, they soon understood the limitations of their models and added motivational components to it. For example, self-efficacy beliefs have been added to control loops in order to deal with self-doubts or anxiety associated with one's ability to perform (Carver & Scheier, 1990). Winne (2001) adds four motivational variables in his model: expectation regarding outcomes, judgment of efficacy, attribution, and motivation or value. Thus, motivational processes in modern IP models are intended as affectively laden information, such as self-reinforcers, which are processed like other forms of information within recursive feedback loops (Carver & Scheier, 1990).

The role of self-awareness in self-regulation

According to IP theorists, cognitive self-monitoring plays a crucial role in self-regulation as it helps one become aware of their own functioning. Self-consciousness plays a vital role in helping to make variations and its use must be limited when trying to work at optimal performance levels. IP theorists also suggest that when performances become automatized, students are able to self-regulate without paying much attention to the process. This helps to free them to carry out self-regulation strategies at a higher level, involving more complex goals and feedback loops.

The important self-regulation processes

The self-regulation process uses three types of memories. Sensory buffer memories are short in duration and are related to the senses, e.g. visual or auditory information.

Information is stored in the sensory buffer for a second or two. If information is rehearsed frequently, it can stay in short term memory. Information that is further attended to or programmed is shifted to long-term memory, where it is kept for unlimited lengths of time. An inability to access information stored in long term memory is ascribed to recovery problems by IP theorists. Thus, students can regulate their memory by attending to it and by organizing it into a form that can be easily retrieved. Students can use a wide range of strategies like chunking information, using mnemonics etc to improve their recall of information.

The effect of social and environmental factors

Winne (1998) suggests that social context is an important aspect to be considered during task completion and therefore includes it in his model. He states that social aspects like the presence of a distracting peer will affect a student's ability to self-regulate effectively.

How do students develop the ability to self-regulate?

Siegler and Richards (1983) suggested that students develop increasingly elaborate rule governed systems for processing information with age and experience, and Winne (2001) points out that such rule systems form the basis for self-regulation of learning. Winne and Stockley (1998) recommended using a computer-assisted learning system called STUDY to help students to increase their level of self-regulation during efforts to study. STUDY provides individualized assistance to students according to their phase of self-regulated learning.

3.4 Self-Regulated Learning through the viewpoint of Social Cognitive Theorists

Bandura's social learning theory has led a lot of researchers to study the role of social factors in self-regulation. In the social cognitive theory (Bandura, 1986), there is a lot of emphasis on the symbiotic contributions of personal, behavioural and environmental influences. The theory helps researchers to study the relationship between social and cognitive processes. Further emphasising the role of these three components, Schunk (1989) contends that the efforts put in by students to self-regulate while learning is not only dependent on the personal processes, such as cognition or emotions, but the environment and behavioural factors also influence these processes.

Motivation as a key factor for Self-Regulation

Bandura and Walters (1977) stressed that expectations linked to the outcome of a task influenced one's motivation. They contended that what motivates people are the potential outcomes of their behaviour, rather than the actual reward. This was completely different

from the view presented by operant theorists who considered consequences to be influenced by the environment. In 1977, Bandura introduced another expectancy construct called self-efficacy. He defined self-efficacy as students' perception regarding their ability to meet academic goals, and introduced a program which aimed to study how motivation can be predicted, especially when students are faced with difficult or challenging situations (Bandura, 1997). Schunk (1984) and Zimmerman (Zimmerman, 2000b) evaluated extensive research suggesting that students' steps to improve their self-efficacy was connected to their choice of tasks, perseverance, the effort they put in, and acquisition of skill. Students' hopes to attain self-efficacy on given tasks helps them to set goals for themselves. These personal goals act as standards against which future performance is assessed. Once learners are able to satisfy themselves on achieving set goals, they are likely to persist on given tasks until their performances meet the standard they set for themselves. The drive to self-regulate, therefore, involves two cognitive bases: self-efficacy and outcome expectations and goals.

The role of self-awareness in self-regulation

The social cognitive theory suggests that a number of self-perceptive states arise from explicit self-observation responses. Self-observation is therefore considered to be helpful when it carefully considers the factors that improve learning, like the time, context, and length of performance (Schunk, 1989). Students can use self-recording techniques to keep a record of their self-observations. Research recognized that the consistency of self-recording is important for the precision of self-observational responses (Ollendick & Hersen, 1984). Hence, the accuracy of self-observation eventually decides success in SRL as it offers the required detail to guide future efforts to self-regulate. Self-observation therefore gains a lot of significance as an important tool to guide students in their learning process.

The important self-regulation processes

Bandura (1986) suggested that self-observation, self-judgment and self-reaction were important subprocesses in self-regulation. They were all interlinked and constantly overlap and network with each other. The first factor, self-observation, helped students to self-evaluate. These cognitive assessments of self eventually lead learners to an assortment of personal and behavioural self-reactions.

The manner in which the role of goal setting is defined by social cognitive theorists explains the uniqueness of their triadic approach. They attribute a lot of attention to the context of goal-setting by students, such as the specifications of the goals, the level of challenge involved, and the duration of time involved (Zimmerman, 1983). Schunk (1989)

also lays a lot of emphasis on the significance of goal-setting and performance ascriptions. According to him, goals that are not directly linked to the abilities or efforts of students are not likely to generate self-reactive consequences. Two important types of self-reactions were identified by him, personal and environmental (Schunk, 1989). The personal feelings of being satisfied or dissatisfied are the evaluative motivators. Tangible motivators are the self-administered reward or consequence that are given after the task is completed. Self-reactions also help students to make alterations in self-observation or self-judgment.

The various processes of self-regulation are represented according to a three-phase cyclical model involving forethought, performance, and self-reflection (Zimmerman and Schunk, 2011). The first stage is the forethought process which includes goal setting. It lays the foundation for the performance phase, where different strategies are deployed with the aim to attain goals. The key aspect to the performance phase is self-monitoring as it helps to produce feedback which is then assessed for progress and used during the self-reflection phase. These self-reflections will then affect forethought goals for the future, thereby completing the self-regulatory cycle. This cyclical model not only explains causal links among self-regulatory processes, but also evidence of cumulative effects of efforts to self-regulate, such as increasing self-efficacy and growing skill (Zimmerman & Kitsantas, 1997).

The effect of social and environmental factors
Social cognitive theorists researched the relationship between specific social processes like modelling and the key self-regulation processes. In addition, they also researched the role of environmental aspects like the setting in which the task takes place. Modelling was considered to be highly effective in influencing students' perception of their own self-efficacy (Zimmerman and Schunk, 2011). Observing coping models can motivate children and they may try to attempt challenging tasks on their own (Schunk, Hanson, & Cox, 1987). Schunk and Ertmer (2000) listed many overt training processes for various self-regulation processes. These include self-verbalization, self-attributions and goal-setting. These training processes help students to create clear perceptions regarding their own ability.

How do students develop the ability to self-regulate?
Social cognitive theorists believe that the developmental level of children influences the various subprocesses of SRL. They do not automatically develop as children progress in their life, nor are they passively developed by interacting with the environment. Schunk (1989) highlights many developmental changes in children that influence their ability to

self-regulate. These include age differences in capability to comprehend language, knowledge level, and their ability to make social analogies. It is therefore important for training in SRL to consider the developmental history of children.

3.5 Self-Regulated Learning through the viewpoint of Volitional Theorists

Early views of volition studied the significance of human will-power which was viewed as the main human faculty. The will is considered to be the most important as it directs action and other psychological activities. Intention or the will to do something comes even before feeling (Watson, 1963). Will was considered to be very important as it guided action and Descartes contended that it played a significant role in connecting thought and action (Watson, 1963). It is considered to be demonstrated in one's intentions to act. Researchers have studied the role of intention in creating experience and also gave a comprehensive explanation of will or voluntary action that emphasised the part played by selective attention (Misiak & Sexton, 1966). This theory on the role of volition was met with some challenge by Lewin (1926), who probed if intentions were different from needs. Over the years, different researchers (Seligman, 1975) who worked on the concept of learned helplessness persuaded Kuhl (1984), that volition is indeed different from motivation. Kuhl contended that motivated individuals can lose their focus due to environmental factors not directly linked to the task.

Motivation as a key factor for Self-Regulation

Motivation is a multifaceted process that can be explained at several levels. At a general level, motivation can be explained as the underlying psychological drive that regulates action (Zimmerman and Schunk, 2011). Kuhl explained motivation at a more explicit level and suggested that the motivation for self-regulation is dependent on the expectations that people have to achieve a set goal (Kuhl, 1984). According to him, motivational processes differ from volitional processes. Corno suggests that motivational processes facilitate the forming and promoting of decisions, whereas volitional processes help in carrying out those decisions and protecting them (Corno, 2013). However, he states that though intentions for carrying out a particular action are a result of motivational factors, it is one's will which determines how the level of involvement in a task and will helps one to persist in the face of challenges. Therefore, once learners are sufficiently motivated to achieve success on a particular task, volitional processes function to encourage involvement.

The role of self-awareness in self-regulation

In 1984, Kuhl assumed that students need to be aware and conscious in order to access volitional strategies and if students have good self-regulation, they are able to access the entire range of volitional strategies (Kuhl, 1984). He laid a lot of emphasis on the importance of self-awareness in volition. He mentioned two kinds of cognitions: - action-oriented cognitions and state-oriented cognitions. Action-oriented cognitions helped a student to focus their attention on the current intention and to block out action tendencies that were not required. State oriented cognitions deal with the emotional state and feelings of the learner. Kuhl stated that people could be grouped according to the cognitive orientation which is most central to them and he formulated a scale to measure the two orientations (Kuhl, 1984). According to him, three state orientations interfered with action control: ruminating, extrinsic focus, and vacillating. Ruminating entails the inability of a learner to block away thoughts of previous failure. Extrinsic focus is laying too much stress on the future instead of the immediate outcomes. Vacillating results when there is a lack of confidence in deciding the future course of action for an activity. These thoughts will largely affect how information is processed and intention is formed. Corno (2013) suggests that certain techniques to monitor cognition can help students to channelize these state-oriented cognitions. Kuhl (1984) defined attention-control strategies which could move the focus of a student the self to the task.

The important self-regulation processes

Corno (2013) carefully studied the six volitional control strategies developed by Kuhl (1984). These six strategies were: - attention control, encoding control, information processing control, incentive escalation strategy, emotional control and environmental control. Of these strategies, only environmental control is dependent on forces outside of the individual whereas the others are metacognitive in nature. It therefore shows that the volitional accounts of self-regulation have a high metacognitive quality.

Furthermore, volitional methods are distinct as they lay great emphasis on strategies which influence the intention of the learner (a cognitive concept) instead of their learning. Therefore emotional-control strategies that help students to sustain their attention on a given task, help them get through the difficult parts. Motivational control strategies help to enhance a student's intent to learn by helping them focus on the positive or negative outcomes of achievement or failure.

The effect of social and environmental factors

Corno assumes that students' desire for learning can be amplified by making a change in the task or in the context in which the task is accomplished (Corno, 2013). This may

involve changes in their environment like moving to a quiet corner, studying with hardworking and motivated peers, acquiring learning apps and aids or seeking help from supportive teachers and parents. Though volitional theorists acknowledge the role played by the environment on emotions and motivation, they still attribute a stronger correlation to the influence of cognition.

How do students acquire a capacity to self-regulate?

Kuhl considered a person's action-control alignment as the capability for commitment to a non-dominant action tendency and to control the urge to execute this tendency even when there exists a great need for it (Kuhl, 1984). Explaining a student's action-control orientation as an ability instead of a process suggests its low level of flexibility. Even having said that, Kuhl and Corno have suggested several ways in which volition could be augmented. Both of them have suggested training students to use the six volitional subprocesses that are an important part of self-regulation.

3.6 Self-Regulated Learning through the viewpoint Of Vygotskian Theorists

A lot of researchers have looked into the work of Vygotsky to understand the role played by language in the self-regulation process. Their interest focused on two explicit aspects highlighted in Vygotsky's theory:- inner speech which is the basis of knowledge and the interaction between adults and children as a means to expressing and understanding language (Vygotsky, 1962). Many psychologists used Vygotsky's concepts in their research. For instance, Meichenbaum (1977) established a technique to teach self-instruction to students who had learning challenges. This process or technique involved explicit imitation of the speech of an adult followed by covert use of this speech in the absence of the adult.

Bruner (1984) has used the term ideational scaffolding as a process by which adults provide a framework to children in the early years of life to learn a new concept or skill. Palincsar and Brown (1984) established a process to teach reading comprehension that had its basis on the Vygotskian idea of reciprocal teaching. In this procedure, teachers switched parts with students and allowed them to take over the teaching process once they acquired competence. McCaslin and Hickey (2001) emphasised that co-regulation was at the heart of Vygotsky's approach to teaching and learning as it helped to create a mutual understanding of a given task. As suggested by these researches, Vygotsky's theory therefore stands out in comparison to the findings of other researchers on self-regulation as it greatly emphasises the role of "linguistically mediated social agents in

children's development and in the functional role of inner speech" (Zimmerman and Schunk, 2011, p. 24).

Motivation as a key factor for Self-Regulation

Vygotsky (1962) provided explanations on how task-involved and self-involved forms of inner speech were different from each other. However, he believed that the two did not differ in the effect they had on students' motivation and their ability to learn. According to him, self-involved inner speech referred to motivational and emotional accounts that could help advance self-control. Also, inner speech related to a task was considered to be statements that helped students to solve problems and hence improve their control over the task. He further suggested that both task-involved statements and self-involved statements played an important role in influencing motivation. Vygotsky believed that the environment had a great influence on the mental processes of human-beings. He alleged that social interactions largely influenced human knowledge and hence task-involved statements played a big role in motivating people. A complete understanding and control of the environment was considered an important goal, and self-directive speech helped people to accomplish it.

The role of self-awareness in self-regulation

According to Vygotsky (1962), self-awareness is an important part of consciousness and he proposed the basic unit of consciousness as word meaning. Words induce consciousness when children internalise their meaning. This happens when they shift their focus from others' speech to their own inner speech. This shift is enabled by children's use of explicit egocentric or self-directed speech to enable them to perform (Gallimore & Tharp, 1999). According to Vygotsky (1978), as children understand the meaning of words, they can be involved in guiding, planning, and monitoring their own activities. He proposed that once a skill is learnt to the point of automaticity, self-consciousness is no longer needed and actually acts as a barrier to the performance of a task.

The important self-regulation processes

An important process that helps students to self-regulate is egocentric speech, which Vygotsky (1962) defined as a child who only talked about himself and had no interest in people around him. He makes no effort to communicate with others and does not expect them to either listen or respond to him. He regarded this egocentric speech as a change from external to internal speech control and was an important aspect of building language in children. While external speech converted thought into words which were

eventually spoken, inner speech helped to convert words into thoughts. Internalised speech was therefore capable of directing action.

The effect of social and environmental factors

Vygotsky focussed on the significance of the physical and social environment on the growth of children. Social connections with adults helped children to internalize speech. However, once it was internalized, inner speech helped children with self-regulation. It acted as a means that helped children to interact with their environment and learn new ways of adapting to it. Inner speech therefore helped students to regulate themselves, get rid of their compulsive behaviour, plan solutions to problems before executing it and work towards mastering their own behaviour (Vygotsky & Cole, 1978).

How do students acquire a capacity to self-regulate?

Vygotsky (1962) used internalization as an important aspect to define self-regulation. He stated that the interactions that children have with people in their environment plays a huge role in helping them internalise. Starting with sounds at birth, children are repeatedly exposed to language through which they comprehend the meaning of words. This enables them to use speech to direct them towards the required action. Thus, self-regulation may start as a process of interactions between children and their environment but it is gradually adopted by children. Finally, by using inner speech, children are able to direct themselves towards the required action.

3.7 Self-Regulated Learning through the viewpoint Of Cognitive Constructivist Theorists

Most cognitive constructivist views have been largely influenced by the works of Bartlett and Piaget. Barlett, a British psychologist, introduced the concept of the schema and referred to it as a plan or outline which describes the relation between different ideas or concepts (English & English, 1958). Schema played a crucial role in memory as it helped to restructure the key underlying mnemonic process. Memory, therefore, was more than a process of recall of information and involved recreating cohesive details from underlying schemas. Bartlett laid emphasis on the non-random errors during trials for recall of information. He suggested that students tended to sharpen information connected with the story they have read and omit material that is not related. He suggested that any study of human memory must study how students form and use schemas. Following his research, Piaget and Cook (1952) also suggested that children, even very young ones, formed schemas during learning. These schemas were also present when young children indulged in repetitive sensorimotor behaviour. They

accredited children with the formation of schemas by using the processes of assimilation and accommodation. Assimilation is the receiving of information from the environment and accommodation refers to changes that one needs to make in existing schemas to fit the new information. These schemas therefore keep changing through the lifetime of an individual and tend to improve substantially in their structure during development (Piaget & Cook, 1952). Both Bartlett and Piaget emphasised the role of a cognitive schema as the crux that helped human beings to learn and recall. They also advanced the role of logic and the understanding of concepts in the development of these schemas. According to them, human experience was converted into schemas and could be used as a major tool for psychological analyses. Paris, Byrnes, and Paris (2001) suggested the notion of a theory to explain constructive representation in place of a schema. They said that students constructed personal theories of learning in place of a schema, but their views were still in agreement with the work of Bartlett and Piaget. Constructivist views of cognitive functioning therefore suggest that students are able to self-regulate their learning by actively engaging themselves during the process of recall.

Motivation as a key factor for Self-Regulation

According to cognitive constructivist theorists, human beings are inherently wired to create meaning from different experiences. Paris, Byrnes, and Paris (2001) emphasise that the key principle of constructivism is that there is an inherent drive in human beings to pursue information. Researchers like Sigel (1979), through the concept of cognitive conflict, explained that information that conflicts with current schemas and which cannot be assimilated easily is considered detrimental. Some researchers (Berlyne, 1960) consider inquisitiveness to also be closely related to this. These two instances cause an uncomfortable state which makes learners make accommodations in their cognitive make up so as to reclaim their cognitive balance. Motivation may also play an important role here and it is suggested that constructivist researchers should include it to explain SRL.

The role of self-awareness in self-regulation

Piagetian constructivists presume that self-awareness has an important role to play in the formation of schemas among children. Young children find it difficult to comprehend other people's objectives and viewpoints due to their egocentrism, which in turn influences the correctness of their cognitive constructions (Piaget, 1932). The cognitive processes of children become completely rational (i.e., operational) only when they are able to assimilate their own perceptions with those of other people. Until the child enters the development phase of formal operations, the child will not be able to achieve self-regulation which is the highest level of self-awareness. When this occurs, youth become

more aware and in control of their own thoughts. At this higher cognitive level, humans are able to control and monitor their own cognitive functioning (Flavell, 1979). Paris, Byrnes, and Paris (2001) suggest that children's perceptions of their own academic competence changes as they become cognitively more advanced. Though their perception of their own academic performance is unrealistically high on entering school (Benenson & Dweck, 1986; Stipek, 1981), it begins to gradually weaken as children progress through school (Eccles et al., 1983; Simmons et al., 1979). Paris and colleagues (Paris et al., 2001) suggest that the changes in self-awareness are due to the developmental changes in cognitive functioning, like an improved ability to discriminate between competence in academic and social contexts (Stipek & Tannatt, 1984), and between efforts and capabilities (Nicholls, 1978). Changes in the social context of the school like feedback from teachers, achievement grades etc also affect their self-perceptions.

The important self-regulation processes

Paris, Byrnes, and Paris (2001) presume that students form theories for regulating four components of their learning:- self-competence, agency and control, schooling and academic tasks, and strategies. The role of strategies, which are defined as thoughtful actions performed to achieve set goals, are considered crucial. Theories of strategy use by students includes knowledge regarding a strategy (declarative knowledge), how the strategy is used (procedural knowledge), and the context and time when the strategy can be used (conditional knowledge) (Paris et al., 2001). Though classical constructivists focus on the role of strategies, Paris and colleagues further suggest that SRL is multifaceted and gave an explanation of the process of self-regulation. This was done by incorporating theories of students' self-competence which includes their perceptions of their own academic ability and their potential to self-regulate. This helped them to pay attention to their understanding of their own success and failure, the intentions to self-regulate and the amount of effort they were willing to put in to achieve the same. Finally, students can understand what is essential to succeed on tasks by evaluating their own theories of schooling and academic tasks. They are able to pay attention to the task properties, and their impact on the students' goal orientation, thus helping them to adopt either mastery or ego/performance goals.

The effect of social and environmental factors

Piagetian constructivists gave importance to learning procedures that cause an increase in cognitive conflict. They did this either by using discovery learning tasks (Smedslund, 1961) or social conflict learning groups (Murray, 1972). The process of discovery learning entails providing a student with results they did not expect. Social conflict, like providing

students with diverse and conflicting viewpoints or cognitive levels, is helpful in producing cognitive conflict required for productive growth (Zimmerman & Blom, 1983). Paris, Byrnes, and Paris (2001) argued that creating a cognitive conflict is only at an individualistic level and does not take into account the social context. They instead adopt a situated cognition perspective which suggested that students' concept of self and their use of the approaches of self-regulation can be adapted to the social context (Brown, Collins, & Duguid, 1989). Zimmerman and Schunk (2001, p. 30) suggest that "the constructs of discovery learning, cognitive conflict, and equilibration from solo cognition accounts have been largely replaced as mediating constructs with cooperative learning, personal theories, identities, and adaptive actions in Paris and colleagues' formulation".

How do students develop the ability to self-regulate?

Historically, constructivists highlighted the significance of variations in how children develop cognitively as an important indicator of their capacity to learn self-regulation. Researchers like Paris, Byrnes, and Paris (2001) suggest that there are several developmental limitations on learning that influence students' theories of skill, performance, agency and strategy use. As children grow older and perceive themselves in the social context, there is a significant decline in the perception of their own competence to achieve on academic tasks. Their overall sense of self competence also becomes more organized and they are able to differentiate the different task related aspects of competence. As children undergo developmental changes through the different stages of their life, they can understand the importance of ability and effort in academic performance, how they can influence their own ability, the nature and complexity of academic tasks and the importance and use of strategy. This understanding further helps children to produce developmental changes in their concept of self.

3.8 Conclusions

Theories presented place emphasis on different ways in which students self-regulate while learning. Operant theorists suggest that the self-regulation processes used by children must have a connection to external reinforcement stimuli and have therefore given emphasis to the significance of external factors in learning to self-regulate. Phenomenologists have focussed on the role of self-perceptions in understanding the psychology of human-beings. This brings forward the role of the teacher who could train pupils to keep an eye on their feelings and emotions while learning, and therefore enhance their understanding of their achievements. Information Processing (IP) theorists suggested that students develop increasingly elaborate rule governed systems for processing information with age and experience, and Winne (2001) points out that such

rule systems form the basis for self-regulation of learning. According to IP theorists, cognitive self-monitoring plays a crucial role in self-regulation as it helps one become aware of one's functioning. Through the social cognitive theory, Bandura (1986) explained the triadic explanation of human functioning, which emphasises the discrete but symbiotic contribution of personal, behavioural, and environmental influences. The theory helps researchers to study the relationship between social and cognitive events. It also suggests that students are not only influenced by their own personal processes like cognition and emotions while attempting to self-regulate their learning, but are also highly influenced by their own behaviour and other environmental factors. Volitional theorists lay a great amount of emphasis on free will and suggest that motivational control strategies can help enhance a student's intent to learn by helping them focus on the positive or negative outcome of achievement or failure. Vygotsky believed that the environment had a great influence on the human mental processes and that social interactions largely influenced human knowledge. An understanding and control of the environment was considered to be an important goal, and self-directive speech helped students to attain this goal. The Social Constructivists emphasised the role of a cognitive schema as the foundation for human learning and recall. They also advanced the role played by the understanding of concepts in the creation of these schemas. According to them, human experience was formed into schemas and could be used as a major tool for psychological analyses.

The various theories of self-regulation therefore give a lot of emphasis on how a student activates, alters, and sustains precise learning practices in private and social settings, and in informal and formal situations of instruction (Zimmerman & Pons, 1986). Through different research findings and theoretical explanations, it can be understood that learning is an active process that can be highly influenced by factors like will and motivation, and not a passive event that is beyond the control of the learner. Therefore, for learning to take place, students must become proactively involved in the learning process and take charge of the different processes that can help them to learn. These theories can guide the way and provide insight to educators into the processes of self-regulated learning and can in turn help students with self-regulation of their learning.

Chapter 4- The role of Metacognition, Motivation and Goal setting in Self-Regulation of learning

"Self-regulation refers to self-generated thoughts, feelings, and behaviours that are oriented to attaining goals", as defined by Zimmerman (2000a, p. 14). Self-regulated learning therefore helps learners to evaluate their learning process and regulate their cognition and reasoning ability. It directs the learners to use their knowledge across a vast range of situations. Steffen (2006) stated that SRL is important in helping students to adapt to a new situation, resolve challenging problems and create effective interactions with others, in real and in virtual contexts. The learners are encouraged to understand, evaluate and control their own learning and also to gain new skills which will help them in their learning. It eventually helps them become autonomous learners, take responsibility of their own learning and participate in tasks like goal-setting, planning and self-reflection (Klimas, 2017).

4.1 What is metacognitive knowledge?

Metacognitive knowledge includes knowledge about cognition and consciousness of one's own cognition. One of the main areas of focus of teaching is to help learners gain more knowledge about their own learning and also take responsibility for their own cognition and thinking. As children develop and mature, they acquire a better understanding of their own thinking and also become more informed about cognition as a concept. As they work on this consciousness, they are able to learn more efficiently (Bransford, Brown, & Cocking, 1999). Metacognition includes "the development of meta-cognitive knowledge, metacognitive awareness, self-awareness, self-reflection, and self-regulation" (Pintrich, 2002, p. 219) . Knowledge of metacognition consists of knowledge of strategies, an understanding of the situations under which these strategies could be used and which strategies would be most useful in helping students achieve their learning goals (Flavell, 1979; Pintrich, 2000a). When students go through learning tasks, they learn about different strategies that would help them understand their own learning process. Students also gain an understanding of their own strengths and challenging areas relating to the learning activity, along with an understanding of their own motivation to complete assigned activities. Once they understand this, they can change or adjust their approach to the task, thus making learning easier and more effective. They can also gain an understanding of the knowledge that they require for particular situations and conditions, to solve a problem in a particular context and change their approach accordingly (Pintrich, 2002).

In contrast, self-regulation and metacognitive control form a part of cognitive processes used by learners for monitoring, controlling, and regulating their cognition and learning (Pintrich, 2002). They therefore help students with responsibilities such as keeping a check on their progress through a task, plan for future goals and generate new ideas and strategies. The metacognitive and self-regulated processes are embedded in activities such as proof-reading, correcting and planning. Such processes are not a part of metacognition which is only limited to the information regarding cognitive strategies, and not the use of these strategies (Bransford et al., 1999). Students who have knowledge of different strategies and an awareness of their own learning, are more likely to use them in their learning. Also, students who are knowledgeable about general strategy use that can help them think and problem solve, will most likely use them when attempting a variety of classroom tasks (Bransford et al., 1999). These learners are also able to realize by themselves which strategies are most effective in a given learning situation. On the other hand, students with learning difficulties might not have this knowledge and awareness, and need to be taught these strategies directly (Vaidya, 1999). An important concept in classroom learning, metacognitive knowledge of strategies can help learners to enhance their performance and learning.

Metacognitive knowledge of various strategies also helps with the transfer of knowledge which helps learners to use information acquired in one setting or situation in another situation which could be different in nature and complexity (Bransford et al., 1999). During the learning process, students are usually faced with new and challenging situations that requires them to apply knowledge or skills they have not yet learnt. In such cases, it is not possible for them to depend exclusively on their explicit previous knowledge or skills to attempt a new task. They need to know a few general strategies that will help them deal with a new or challenging task. Self-knowledge can help students gain a better understanding of their own strengths and weaknesses so that they can adapt their own thinking and learning while attempting new tasks. An understanding of this also helps students to devise new and different strategies while attempting tasks they find difficult. They are thereby able to regulate their own learning, which is not possible for students who lack self-knowledge or an awareness of strategy use. This could also be a challenge for students with learning difficulties who lack an understanding of strategies and are therefore unable to use them when faced with challenging or difficult situations. Though some learners are able to attain metacognitive knowledge with experience on learning tasks and maturity, educators and teachers need to explicitly teach these to the other students to help them acquire knowledge about the self and thus regulate their own learning.

4.2 Metacognitive Strategies and Self-Regulated Learning

Metacognition, or an understanding of one's own thought process, is an important aspect of learning and a key component of SRL (Flavell, 1979). It is a higher order cognitive process which consists of the knowledge and regulation of cognition (Schraw & Moshman, 1995). The knowledge of cognition means that learners have an understanding of their way of learning, while regulation of cognition explains the ability of a learner to regulate their own memory and learning (Sperling et al., 2004). Research indicates that students who possess higher metacognitive skills are able to achieve better academically (Cleary & Zimmerman, 2001; Zimmerman & Schunk, 2011). These students have a good understanding of their cognitive processes, and their own cognitive strength and weakness, all of which are important for self-regulation and academic functioning (Flavell, 1979). However, students with learning difficulties find it harder to evaluate their skills and progress, and are unable to implement the strategies for academic success (Wong, 1991).

SRL helps learners to evaluate their own learning and prepare them better for success in future tasks. This cognitive awareness is achieved through the application of metacognitive strategies. Zimmerman (1989) stated that metacognition in relation to SRL can be described as a learner's ability to control and influence one's learning process. There has been research (Mekala & Radhakrishnan, 2019) to study the impact of metacognitive strategies on developing SRL with precise reference to its three phases: forethought phase, performance phase and reflective phase as stated by Zimmerman (2002). These three stages are discussed here with reference to metacognitive strategies which help them regulate their learning in each phase.

4.3 Zimmerman's stages of self-regulated learning with reference to metacognitive strategies

Forethought Phase
The forethought phase is the planning phase in which students set goals for themselves, foresee the outcomes of their learning and augment their self-motivation. In this phase, students use strategies of metacognition for thinking, planning and systematizing their goals towards learning (Mekala & Radhakrishnan, 2019). The metacognitive strategies that learners use during this phase are planning and organizing. These two strategies help learners to set goals, enhance self-motivational beliefs by creating a positive attitude to think about their own thinking and also inspires the learners' motivation towards learning.

Performance Phase

In the performance phase learners observe and analyse their progress in learning. The metacognitive strategy that can help learners during this phase is 'monitoring' (Mekala & Radhakrishnan, 2019). It enables learners to monitor their learning process and to realize their goal as they have planned during the forethought phase (Mekala & Radhakrishnan, 2019). Monitoring helps learners to regulate their own learning by analysing it and enables them to change their learning strategy if it does not help them achieve required academic success.

Self-Reflective Phase

In this phase, learners use self-judgement and self-reaction to reflect on their learning process. The metacognitive strategy used during this phase is evaluation. It helps learners to improve their critical thinking skills and make judgements regarding their learning process (Mekala & Radhakrishnan, 2019). It also enhances their reasoning and reflective ability which helps them review and evaluate their performance.

The application of metacognitive strategies enables learners to control their cognitive process and regulate their learning. This eventually helps them perform as autonomous learners. Metacognitive strategies to plan, organize, monitor and evaluate helps students to regulate their thought processes (Mekala & Radhakrishnan, 2019). It encourages reflective thinking among learners which helps them self-regulate their learning. This is done by helping learners set their own goals, adapt strategy use, monitor and evaluate their performance, reflect on their learning process and self-motivate themselves (Mekala & Radhakrishnan, 2019).

Teachers and facilitators play a powerful role in encouraging learners to implement metacognitive strategies in the classrooms to achieve challenging skills. They must help learners to identify and use these while performing learning tasks, thus making them more conscious of their learning process. Teachers and educators need to appreciate and acknowledge efforts and students' attempts to improve themselves instead of their performance or abilities, use varied methods of assessment and refrain from comparing their work with others, proclaimed Salter (2012). Teachers can encourage a growth mindset by encouraging students, including those who face learning difficulties, to reflect on their own learning. The role of the teacher is therefore of paramount importance in enriching learners' knowledge and motivating them in their learning process. Butler (2000) suggests that teachers must allow students to share their understanding of concepts as a part of their learning and students should interpret the feedback received by the teacher as a way to guide them on future assessments. Teachers should help

learners evaluate their own performance so that they are more involved and motivated towards their learning process.

4.4 Self-regulated learning and motivation

Two key concepts that play an important role in promoting student achievement are cognitive and metacognitive strategies. Motivation plays an important part in encouraging students' strategy use and also in the regulation of their cognition and persistence on tasks (Paris et al, 1983). Encouraging teachers, cooperative peers and positive classroom environments can foster motivation (Malone, 1981). Also, students' understanding of their classroom and their own motivation to perform remains an important predictor of success in the classroom (Ames & Archer, 1988; Nolen, 1988). Motivation among students is a key factor and is often considered a precursor to self-regulated learning. It's effect on student behaviour and drive to learn makes it an important predictor of academic achievement.

Motivation as a predictor of Academic Achievement

Student motivation is regarded as a dynamic, multi-layered phenomenon (Graham & Weiner, 1996; Seifert, 2004). Many theorists have put together several motivational theories to explain how students' motivation is solely for the purpose of academic success (Pintrich, 2003). The main aspects of motivation discussed here are theories of intelligence, self-efficacy beliefs, the effect of task value beliefs and the role of setting achievement goals.

Students' beliefs about intelligence-

Dweck's (1999) social cognitive theory of motivation investigates the theories that students have about the importance and influence of intelligence. A few students think that intelligence is flexible and can therefore be changed or controlled, thus favouring an incremental theory, while some other students hold the belief that intelligence is permanent and cannot be controlled, thus favouring an entity theory (Mega et al., 2014). The students holding on to the incremental theory of intelligence have belief in their own abilities to enhance their intelligence and skills through persistence, hard work and learning. On the contrary, students who hold on to the entity theory of intelligence trust that everyone has a certain amount of intelligence that is inherent to them and it is not possible to change it. These theories of intelligence help to form the basis of self-regulated learning and strategy use among students (Bråten & Strømsø, 2004). The students who think that intelligence can be augmented or improved through effort, may endeavour to use diverse strategies to take part in and regulate their own learning. By

contrast, students who think that intelligence is a fixed component, may not involve themselves in the learning process once it becomes too challenging and may eventually decrease the level at which they use strategies (Mega et al., 2014). Also, research has established the effect of implied theories of intelligence on the academic success of students at university (Dupeyrat & Mariné, 2005; Kennett & Keefer, 2006). Students who believe that abilities are fixed and cannot be changed, may avoid difficult tasks, thus undermining their long-term academic success (Hong et al., 1999).

Self-efficacy beliefs-

Self-efficacy is an important predictor of motivation and refers to a student's belief that he can perform at optimal levels on an assigned task (Bandura, 1997; Schunk, 1991). The beliefs that students have of their own self-efficacy has a strong link to past accomplishments, problems and experiences (Lackaye & Margalit, 2006). According to Zimmerman (2000a), students have different concepts about their own abilities to learn and achieve academically, and choose different courses based on their beliefs about what they can achieve and learn. "Students who have a strong belief in themselves and their abilities are much more likely to be motivated in terms of effort, persistence, and behaviour than students who feel they are not capable of succeeding in given tasks" (Pintrich, 2003, p. 671). Self-regulated learning also has a strong link to students' belief in their self-efficacy (Bong & Skaalvik, 2003; Ferla, Valcke, & Schuyten, 2008). Before attempting a task, students are most likely to ask, 'Can I complete this task?' Students who feel they have the capability to attempt and succeed in given tasks are most likely to be self-regulating. When these students face challenging tasks, they put in efforts for understanding the problem at hand, and for planning, monitoring, and regulating their academic work (Linnenbrink & Pintrich, 2003; Seifert, 2004). Such students are most likely to change or adapt their strategy to a more effective one if they are not satisfied with their academic progress (Mega et al., 2014). They are also more likely to involve themselves in the use of metacognitive knowledge, in cognitive strategy use, and will persevere at challenging and complex tasks as compared with learners who lack this belief in their own abilities (Fincham & Cain, 1986; Schunk, 1985). Many research studies have discussed the correlation between self-efficacy and classroom performance (Ferla et al., 2008; Walker et al., 2006). Even at the university level, self-efficacy has been an important indicator of academic performance as students who have faith in their abilities to do well are usually able to perform much better (Chemers et al., 2001). On the other hand, students who face difficulties in learning tend to have a lower perception of self, higher levels of anxiety and stress, and do not have very high academic expectations (Hen & Goroshit, 2014). Increased self-efficacy could potentially lower the stress levels and encourage independent learning for these students.

Eccles (1983) introduced three aspects of task value which have a strong link to achievement. These are the students' awareness of how important the task is for them, their own level of interest, and their observation of how they value the task for upcoming goals. Task value therefore refers to the value that a student assigns to a particular task (Pintrich, 1999). Interest includes student's liking and curiosity of the task. The utility value comprises a student's understanding of the value and purpose of the task for them (Pintrich, Smith, Garcia, & McKeachie, 1993). They will therefore look at the short term and long-term benefits of involving themselves in a particular task, which in turn motivates them to go ahead with it. Learners who exhibit a high level of interest in the task and assign a high value to it, are likely to use more strategies while attempting a task and also put in more effort in monitoring and regulating their cognition (Pintrich, 1999).

Achievement goals

Goal orientation or the role of achievement goals has been widely studied by educational researchers (Huang, 2012). As a concept, achievement goals are related to the aims all learners set for themselves as they involve themselves in achievement related behaviour. The two types of achievement goals defined are:- mastery goals, which are aimed at developing capability; and performance goals, which are aimed at the demonstration of this ability (Ames, 1992). Studies have introduced the approach–avoidance aspect to classify four types of achievement goals: mastery–approach, performance–approach, mastery–avoidance, and performance–avoidance (Pintrich, 2000b). The approach dimension is linked to higher academic achievement, and the avoidance dimension is linked to lower academic achievement (Huang, 2012). Students focused on mastery–approach goals work to improve their knowledge and skills to approach a task. They believe that intelligence is flexible and are hence able to motivate themselves and self-regulate effectively in an attempt to outperform others (Muis & Edwards, 2009). The goal orientation component largely deals with the reasons students have for doing a task. It relates to questions like, 'Why am I doing this task?' Students who are motivated to achieve their goals, learn and challenge themselves, will be more engaged metacognitively, use cognitive strategies and manage their efforts more effectively (Pintrich, 1999).

It can therefore be seen that these key components have an essential part in motivating students. They have a close association to self-regulated learning and enable and impact numerous self-regulated learning strategies. They therefore help to endorse and sustain performance on academic tasks.

In conclusion, it is clearly understood that self-regulatory strategy use is highest among students who have faith in their own abilities and skills to learn. As suggested by Bandura's (1986), efficacy theory, self-efficacy is an individual resource that can be used by students when they encounter challenges in their learning. Students' belief in the value of a task also has a positive correlation to self-regulated learning. The learners who find tasks exciting, significant and beneficial will most likely use more self-regulatory strategies. The Expectancy-value theory developed by Eccles (1983), also suggests that students who attribute value to a given task are more eager to put in effort and give more time to it. Such students are also most likely to stay focussed, value their school work and use prior knowledge while attempting new tasks (Schiefele, 1991). Goal orientation is another component that has a positive correlation with self-regulated learning. Students who have concrete and clear goals in sight are most likely to utilise cognitive and metacognitive activities for improving their learning and performance (Pintrich, 1999). Goal-setting intervention studies suggest that setting academic goals positively impacts the academic performance of students who face challenges across a wide range of learning areas like reading, math and writing (Johnson, Graham, & Harris, 1997). Setting clear and realistic goals helps them become more organised, confident, understand learning tasks better and enable them to track their own work (Lee, Palmer, & Wehmeyer, 2009). Goal setting strategies helps them to set and achieve various kinds of academic goals and helps them deal with their learning challenges.

Metacognition and motivation both play an important role in influencing self-regulated learning and academic performance in students. Student participation in self-regulated learning tasks has a close association to their beliefs about their competence to accomplish challenging tasks, to the interest they have in these tasks and the value they assign to them. However, metacognitive knowledge, self-efficacy and motivation alone are not sufficient to succeed in academic tasks. Students need to have both the 'will' and the 'skill to be successful in classrooms (Pintrich & Blumenfeld, 1985). Their use of self-regulated learning strategies and their achievement on academic tasks may also vary with different age groups and classroom settings, and educators need to assimilate all these different aspects into their models of classroom learning.

Chapter 5- Models of Self-Regulated Learning

There are as many models of self-regulated learning as there are definitions. However, there are four common features that have been agreed by most researchers. First, self-regulated learning is considered to be an active, constructive process, as suggested by Pintrich (2000b). Zimmerman's definition also supports this when he defines students as active participants in their own learning (Zimmerman, 1986). Self-regulated learners are therefore conscious of their own skills and abilities. They actively pursue academic tasks proactively and are able to set their own goals and strategies.

Second, self-regulated learners are able to establish learning or achievement goals that are specific to the tasks assigned to them (Boekaerts, 1996b; Pintrich, 2000b). The goals set by them are a vital component of self-regulated learning (Boekaerts, 1996b) as they form the basis on which students assess their performance on a given task (Pintrich, 2000b). The third aspect of the self-regulated learning model is the existence of a self-oriented feedback loop (Carver & Scheier, 2012). This feedback loop helps students to monitor and assess their performance on an academic task. If their performance is not up to the standard expected, self-regulated learners adapt their approach and look for strategies that will help them. This could involve altering the strategies they had chosen initially or even the goals they had in mind (Zimmerman, 1990). This self-oriented feedback loop, therefore, helps students in monitoring and regulating their thought, drive, and behaviour (Pintrich, 2000b).

The fourth common aspect that is a part of the models of self-regulated learning is the understanding and acceptance of the role of students' cognition, behaviour, and motivation (Pintrich, 2000b). One way that students self-regulate their thinking is by deciding which strategy would work best for an academic task. The strategies used by the students becomes a part of the cognitive processes that they use while attempting a learning task, and are often a part of metacognitive processes. These metacognitive skills help students to regulate their academic behaviour, including skills that students have for managing their time and structuring their environment (Pintrich, 2000b).

The last common feature agreed by researchers is the role of motivation throughout the process of self-regulated learning (Boekaerts, 1996a; Schunk & Zimmerman, 1994; Zimmerman, 1990). Metacognitive processes offer an explanation of the processes used by students to self-regulate their learning, motivation explains the reason for them to do so (Garcia & Pintrich, 1994). Motivation is therefore an important aspect that helps students to both start and continue self-regulated learning (Zimmerman & Schunk, 2001a).

The goals that students set for themselves are considered important in influencing self-regulated learning while pursuing academic tasks (Boekaerts, 1996a). Goal setting is therefore, an important metacognitive process that influences self-regulated learning. Goal setting is considered an important component of the planning process, where learners use their metacognitive knowledge to develop a strategy for attempting a new task (Garcia & Pintrich, 1994; Pintrich, 2000b). They use their previous knowledge to understand the effectiveness of a strategy. This metacognitive knowledge helps them to understand the task and develop a strategic plan (Pintrich, 2000b; Winne, 2001).

As students transition from preparation for a given activity to actually performing it, they monitor and control their learning process. This helps learners to gauge their progress or performance on the task (Pintrich, 2000b; Zimmerman, 2000a). It also helps them understand the difference between their performance on the task and the learning goals they had set for it. As students understand this difference, they are able to use self-control which includes a change or adaptation of strategies to enhance their academic performance. Hence, both metacognitive monitoring and control are significant features of the students' self-oriented feedback loop (Pintrich, 2000b; Winne, 2001).

As self-regulated learners complete a given task, they do a reflection of their performance. This involves evaluating how they approached the task, utilised their metacognitive knowledge, and evaluated their success or failure (Zimmerman, 2000a). The self-evaluation done by the learners is considered an important metacognitive process and self-regulated learning is considered the basic foundation for understanding aspects of learning like cognition, motivation and emotions (Panadero, Kirschner, Järvelä, Malmberg, & Järvenoja, 2015).

Different Models of Self-Regulated Learning

5.1 The Dual Processing Self-Regulation Model

Boekaerts developed two models of SRL. In the first Self-Regulated Learning Model, Boekaerts (1991) used situation-specific measures to assess motivation. It is a structural model where self-regulation was classified into six components:- knowledge and skills in relation to a context, cognitive strategies, cognitive strategies for self-regulation, beliefs of motivation, motivational strategies, and self-regulatory strategies of motivation (Boekaerts, 1996b). The six components were planned according to the cognitive and motivational aspects of self-regulation.

The second model developed by Boekaerts was the Adaptable Learning Model which eventually progressed into the Dual Processing self-regulation model. This Model gave a theoretical framework to help understand the motivational, emotional, metacognitive, , and learning aspects (Boekaerts & Cascallar, 2006). In this model, it is important to understand how students assess a task as it will determine the goal pathways or knowledge structures that the student will use (Boekaerts & Cascallar, 2006). For instance, if the student considers the task to be challenging, then it will generate negative cognitions which will eventually lead to negative emotions. This will cause the students to move onto a well-being pathway where they deploy strategies to guard themselves. On the other hand, if the task enables students to meet their goals, it activates positive emotions and motivates them to try their best, moving them into the mastery/growth pathway. Boekaerts (2011) stated that learners who have initiated an activity in the mastery/growth pathway could move on to the well-being pathway if they feel that they will not be able to accomplish their goals. According to Boekaerts (2011, p. 410-411) , "there are three different purposes for self-regulation: (a) expanding knowledge and skills (b) preventing threat to the self and loss of resources so that one's well-being is kept within reasonable bounds and (c) protecting one's commitments by using activities that re-route attention from the well-being pathway to the mastery pathway". The mastery or growth pathway is referred to as the 'top–down' approach as it is largely influenced by the goals that the student sets. The well-being pathway is called 'bottom–up', as students usually deploy strategies to prevent themselves from getting hurt. Sometimes students want to shift from the well-being to the mastery/growth pathway, depending on the emotions they feel while pursuing a task. Emotions therefore play a significant role in Boekaerts' model.

5.2 Winne and Hadwin: Exploring SRL from a Metacognitive Perspective

The model of SRL developed by Winne and Hadwin is based on metacognitive perspectives that recognize self-regulated students as being actively involved in their own learning and managing their learning by self-monitoring and using metacognitive strategies (1995, 1996, 1997; 1998). There is a strong influence on the model of the Information Processing Theory (Greene & Azevedo, 2007; Winne, 2001), and the various cognitive and metacognitive features of SRL are looked at in greater detail. Their model stated that learning is driven by four different phases of SRL (Winne, 2011). The four phases are: (a) defining or understanding the task; (b) setting goals and making plans to work towards them (c) using different strategies to achieve the goals; and (d) making long term changes in the thinking styles and beliefs to attempt future tasks. Additionally, there are also five components of tasks that take place during the process of self-

regulation (Winne & Hadwin, 1998). The COPES acronym identifies the five components of the task (Winne, 1997) namely: - Conditions: limitations and resources that are specific to the environment; Operations: the cognitive process and strategies used by the student, referred to as SMART -Searching, Monitoring, Assembling, Rehearsing and Translating (Winne, 2001); Products: the information shaped by operations; Evaluations: feedback which is either internal or provided by external sources; and Standards: measures against which products are assessed (Greene & Azevedo, 2007; Winne & Hadwin, 1998). The model also explains how students use their cognition while planning, executing and assessing a learning task (Winne, 2011). A key factor is setting of goals by students and the model describes how students are constantly in the process of monitoring and evaluating their activities while performing a task (Winne & Hadwin, 1998).

5.3 <u>Pintrich's Self-Regulated Learning Model</u>

Pintrich developed a model of self-regulated learning which analysed the connection between SRL and motivation (1990), and how there was a weak correlation between motivation and cognition (Pintrich et al., 1993). His model proposes that SRL has four phases: "(1) Forethought, planning and activation; (2) Monitoring; (3) Control; and (4) Reaction and reflection" (Pintrich, 2000b, p. 454). These phases further have four areas for regulation: cognition, motivation/affect, behaviour and context. A combination of these phases forms the SRL processes like use of cognition, self-observation and assessment of one's own performance while attempting tasks. Pintrich (2000b) further described how the various SRL components help students to regulate their work in different phases. He used information from metacognitive research to emphasise the importance of cognition, quoted his own work (Pintrich, 2004; Pintrich et al., 1993) to show how students could regulate their own motivation and emotion, and based his description of regulation of behaviour on Bandura's work (Bandura, 1986, 1997; 1977) and Zimmerman's Triadic model (1989). He incorporated the attempts made by students for controlling their own behaviour (Pintrich, 2000a), thus making it the only model that included this area. He defined the SRL conceptual framework (Pintrich & De Groot, 1990), and also described the relationship between SRL and motivation. Pintrich also included the regulation of context in his model as it helps students in monitoring, controlling and regulating the learning context. Another significant contribution made by Pintrich is the development of an instrument to measure SRL, the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1993). This questionnaire consists of 15 scales, which are divided into a motivation section with 31 items, and a learning strategies (SRL) section with 50 items. These sections are further subdivided into three

types of scales: cognitive, metacognitive, and resource management (Duncan & McKeachie, 2005). The MSLQ is a powerful tool as it combines SRL and motivation, and provides complete information about how students use learning strategies.

5.4 Metacognitive and Affective Model of Self-Regulated Learning (Efklides)

The self-regulated learning model given by Efklides (2011) has a foundation in metacognition, with motivation and affect at the centre. Efklides presented the Metacognitive and Affective Model of Self-Regulated Learning (MASRL) (2011). The MASRL is divided into two levels, the person level and the task-person level. The person level is the macrolevel which emphasises the individual characteristics of the student. It consists of "(a) cognition, (b) motivation, (c) self-concept, (d) affect, (e) volition, (f) metacognition in the form of metacognitive knowledge, and (g) metacognition in the form of metacognitive skills" (2011, p. 11). This level is considered to be top down by Efklides as it revolves around the goals that students set for a task. Students are guided by their goals and use their cognitive abilities, skills and efforts to achieve their goals (Efklides, 2011).

The task-person level is described by Efklides to be a microlevel in which there is a correlation between the characteristics of the student and the type of task. This level is considered to be bottom–up, as the emphasis is on the demands that a task presents and how students use their metacognitive abilities to address it. In this level, the student focuses all his efforts towards performing the task, keeping in mind the learning goals. The student therefore gets involved in microlevel monitoring (2011), and the motivation and emotions of the students are largely dependent on the feedback they receive from the teacher. Efklides classifies this level into four basic functions: "(a)cognition, (b) metacognition, (c) affect, and (d) regulation of affect and effort" (2011, p. 13). The most important feature of the self-regulated model given by Efklides is the difference between the two levels. The person level emphasises the individual characteristics, skills and abilities of the student which is driven by the goals they set. This is comparable to the person-level model given by Zimmerman (2000b). The task-person level focuses on the challenges presented by the task and a lot of effort and processing is required to meet with the demands of the task. This level is therefore less conscious and the task takes centre stage, similar to the model presented by Winne (2011). This model therefore explains, in detail, the association between metacognition, motivation, and emotions through the communication of the macro and micro levels (2011). It also validates the various cognitive and metacognitive processes used by students while attempting a task,

a phase with the maximum cognitive load where every cognitive resource leads the activity (2011).

5.5 Hadwin, Järvelä, and Miller: SRL in the Context of Collaborative Learning

Self-regulated learning was explained in the context of social and collaborative aspects by Hadwin et al. (2011) and Järvelä and Hadwin (2013). They discussed the use of information and communication technology (ICT) and computer-supported collaborative learning (CSCL) settings (2011). They contended that though collaboration had several advantages for learning (Traum & Dillenbourg, 1996), it also causes a lot of cognitive, motivational, social, and environmental challenges (Järvelä & Hadwin, 2013). Good and effective collaboration necessitates all members of the group to work as a team, have common goals, and share strategies and perceptions regarding the task (Winne, Hadwin, & Gress, 2010). It is therefore a shared self-regulation of their learning (SSRL). One of the biggest challenges with SSRL is that it combines the individual and social processes, thus making it difficult to be studied at an individual level.

 In the context of collaborative settings, the SSRL model describes three modes of regulation: self-regulation (SRL), co-regulation (CoRL), and shared self-regulation (SSRL) (Hadwin et al., 2011). Self-regulation in collaboration signifies the individual actions of the learning aimed at regulating the self. These include cognitive, metacognitive, behavioural, emotional and motivational aspects that help to adjust the communication with the other members of the team. Co-regulation refers to the restraints that lead students to utilize appropriate strategies, plan, reflect and adapt to other students in the group (Hadwin et al., 2011). SSRL in collaboration occurs when group work encourages one to thoughtfully and strategically plan, act on a task, reflect and adapt (Hadwin et al., 2011).

5.6 Zimmerman's Cyclical Phases Model

The cyclical phases model given by Zimmerman studies the role of forethought, performance and self-reflection in the process of self-regulation. It suggests that self-generated reactions by students can positively or negatively affect their approach to a task in future. It therefore describes how the metacognitive and motivational processes work together at an individual level.

The model consists of three sequential phases: forethought, performance, and self-reflection. The first phase is the forethought phase which includes the learning processes that students use before initiating a task. These include their preparedness for a task,

motivation and the efforts they are willing to put. It also includes their analysis of the task and their beliefs of self-efficacy. The performance phase includes processes that take place during learning. These include self-monitoring and strategy use by students. The self-reflection phase includes processes that that take place after learning. These processes influence learners' reactions to their learning experience, such as their evaluation of their own learning and their feelings of gratification. This self-reflection, in turn, influences students' forethought related to future learning efforts—thus finalizing the self-regulatory cycle (Zimmerman, 2000a).

Zimmerman's cyclical model therefore covers cognitive, behavioural and motivational aspects, and describes the correlation between motivation and self-regulation. His model is very comprehensive and discusses a large number of key processes which are used by students during their learning. It provides a framework to introduce self-regulation strategies in the teaching process and the various phases of the model coincide with the various phases of learning, making it an easy and practical model to follow while planning intervention.

Chapter 6- Zimmerman's Model of Self-Regulated Learning

Self-regulated learning has a strong correlation with academic performance and an understanding of SRL processes helps to lay out guidelines for teachers for classroom teaching to enable them to improve the academic performance of students by teaching them how to regulate their learning. Given the importance of self-regulation in academic performance, it becomes essential to study the models that can be best fit to meet the educational needs of students, and specifically those with learning difficulties, in classrooms. One such model is Zimmerman's Cyclical Phase Model which provides specific information on the key SRL processes (2009). This model of SRL discusses the processes of self-regulation as they are used before, during, and after learning (Panadero & Alonso Tapia, 2014). Through a measured assessment of students' actual use of SRL strategies during the learning process, it is possible to make effective interpretations regarding their fundamental role (Panadero & Alonso Tapia, 2014).

6.1 The rationale for applying Zimmerman's model

The cyclical model given by Zimmerman has provided important inputs to the field of self-regulation. His model includes features related to cognition, behaviour and motivation, and discussed in great detail the relation between motivation and self-regulation (Panadero & Alonso Tapia, 2014). The model lists important key processes that guide a student during their learning, and also provides a framework to help teachers understand how they can improve self -regulation among students.

Two researchers (Puustinen & Pulkkinen, 2001) compared the self-regulated learning models of Boekaerts, Borkowski, Pintrich, Winne and Zimmerman. They found that Zimmerman's theoretical perspective included meta cognitive behavioural and socio environmental factors, thus providing a multi-dimensional perspective of learning. They also concluded that Zimmerman's model reflected Bandura's social cognitive theory, thus building on the social foundations of thinking and behaviour. A closer study of the components revealed that Boekaert's and Pintrich's models are motivation oriented whereas Borkowski's and Winne's research is strategy oriented (2011). The research presented by Zimmerman and self-regulation models incorporate both motivation and strategy, making it the most comprehensive model.

Zimmerman's model is important to use as a reference while explaining the use of SRL strategies for enhancing academic performance as it connects the processes which

precede, guide, and follow the efforts put by the student while learning (Panadero & Alonso Tapia, 2014). Interventions planned using Zimmerman's cyclic model can help address key SRL processes in each phase, like helping learners in setting challenging goals for themselves through the forethought phase, monitoring their progression towards their goals through the performance phase, and accrediting causality to their goals through the self-reflection phase (Panadero & Alonso Tapia, 2014). The cyclic model can also help teachers and educators to break down a student's learning into phases. For instance, the academic achievement of a student performing below class levels enhanced due to training in self-regulation (Cleary & Zimmerman, 2004). However, even after achieving on academic tasks, the student did not continue to use these self-regulation strategies as he was not able to understand which strategy helped him. Self-reflection enabled him to make that connection.

This model is also important because it explains the relation between motivation and specific metacognitive processes. When students use SRL processes, they use personal enterprise, effort, and perseverance. These motivational factors are related to specific motivational beliefs like self-efficacy, perception of self, outcome expectations etc. There is also extensive evidence that suggests the relationship between the processes of metacognition used by the students and the basis of motivation. While considering the motivational variables through the learning process, this multiphase model explains how students proactively develop self-enhancing cycles of learning (Panadero & Alonso Tapia, 2014). When these motivational variables are taken into consideration during cyclical learning, they help the multiphase model to provide an explanation for students' proactive development of self-enhancing cycles of learning (Panadero & Alonso Tapia, 2014).

The cyclical phase model given by Zimmerman was presented in 2000 with the processes divided into different phases. The model was revised in the year 2003 and 2009 where more processes were included in the performance phase. More detail was also provided for all the processes and how they interact with each other.

6.2 Forethought phase

The initial phase in which the students approach a task is the forethought phase. This phase consists of students approaching assigned tasks, analysing it, assessing their ability to perform, and establishing goals and planning to complete it (Panadero & Alonso Tapia, 2014). Their interest in the activity or task, and the goals that they set play an important role to help them plan a task and attempt it. In this phase the students do two main activities. Firstly, they do an analysis of the task and create a plan of how to

approach it. Secondly, they do an analysis of the value of the task, which affects their motivation, effort, and their focus while performing the task. It thereby leads to the activation of self-regulated learning strategies (Panadero & Alonso Tapia, 2014).

1.Task Analysis-

The first stage of the self-regulatory cycle is task analysis where students fragment a task into smaller segments and use personal strategies based on past knowledge and experience . This phase helps to establish goals and strategic plans which are the prerequisites for self-regulation to occur (Winne, 2011).

2. Beliefs, value, interest and goals

The personal factors that sustain the motivation to perform are beliefs, values, interest and goals. Students' motivation to accomplish a given task is because of the interplay of these variables.

a. Self-efficacy- This is one's belief about their ability to perform a task. Self-efficacy is a very important component for learning and motivation. If students consider themselves to be capable, their motivation increases, whereas if they lack faith in themselves, they are not motivated and will therefore not put in the required effort to complete the task. (Usher & Pajares, 2008). In contrast to this, students with high self-efficacy expectations will have greater motivation to use strategies required to attempt a task. This is especially true of students with learning difficulties who have built negative perceptions about their capabilities over time. These students therefore, do not make many efforts to pursue academic tasks. Building self-efficacy among these students is a crucial first step in getting them motivated about the learning task.

b. Outcomes expectations- This is the belief regarding the success of a given task (Zimmerman & Schunk, 2011). Similar to self-efficacy, students who have low outcome expectations will not make the required effort to succeed.

c. Interest and task value- These are variables that help students work towards their goals. If a student assigns meaning and value to a task, he will be motivated to perform and learn from it and will devise more strategies to help with its successful completion (Wigfield, Hoa, & Klauda, 2008). It is therefore suggested that when an activity is introduced, teachers explain its relevance to increase students' motivation.

d. Goal orientation- This is another significant variable and refers to the beliefs that a student has regarding the reason of his learning. The first researcher to lay out the importance of goal orientation was Pintrich (2000b). Students who set learning goals can make choices regarding the use of strategies that encourage better learning. They can do a reflection of their learning process, bounce back more easily from academic failures

and are more interested in the tasks (Grant & Dweck, 2003; Harackiewicz, Barron, & Elliot, 1998). Goal orientation is therefore another key self-regulatory strategy that could be of specific interest for students with learning difficulties. Such students find it difficult to pursue challenging or complex learning tasks. They are usually not able to organise their time and resources towards their learning. They also lack task initiation as they are usually unable to understand where to start from. Goal orientation can help these students set long-term as well as intermediate goals for themselves, making it easier to perform on given tasks.

These four processes given by Zimmerman are interconnected and play a significant role in the forethought phase. They enable the student to move from just looking at a task to actually doing it.

6.3 Performance phase

Students need to concentrate and use required learning strategies during the performance phase. It will keep them motivated and help them work towards their goals. The two key processes during this phase are self-observation and self-control.

1. **Self-observation**

Self-observation of their task performance helps students to get a better understanding of how they are progressing. For students to self-observe effectively, they need to self-monitor and self-record. Self-monitoring, which is a form of metacognitive monitoring or supervising the self makes comparisons between the task and the expected standard for it (Winne & Stockley, 1998). Though similar to self-assessment, self-observation occurs after the completion of the completion of the task (Panadero & Alonso Tapia, 2014). Self-recording, is becoming aware of one's actions while working on a task. It is therefore an external strategy that is helpful in monitoring and enhancing reflection once the task has been done (Panadero & Alonso Tapia, 2014).

Metacognitive monitoring & self-recording

The two crucial variables that students consider while setting their goals are the assessment criteria and the performance levels that students wish to attain (Winne & Stockley, 1998) . The assessment criteria is the standard on which a student's performance is judged. Conflicts arise when students are unaware of these criteria; this occurs very frequently as teachers do not always explain the criteria for assessment of a task. When this occurs, students find it more difficult to create suitable goals. Research

suggests that students' learning improves when they have an understanding of the evaluation criteria (Andrade & Valtcheva, 2009; Panadero & Alonso-Tapia, 2013).

Another factor that effects goal setting is the level of achievement that the student wishes to attain as per the assessment criteria (Pintrich & De Groot, 1990). In this case, the performance will depend on the student's interest in the activity, because if that is low, the student is unlikely to make any efforts towards the task.

Self-control

A part of maintaining concentration and interest during performance are eight strategies (Panadero & Alonso Tapia, 2014). The first six of which are metacognitive strategies and the last two are motivational strategies.

a. Specific strategies which can be used when the student knows the task.

b. Self-instruction, where a student is able to direct himself according to the demands of the task. This can be done through verbalisations that enhance learning and are crucial for self-regulation (Schunk, 1984).

c. Imagery, which uses mental images to organise information and improve learning and memory of the task (Zimmerman & Schunk, 2011). Imagery is an important tool as some students are visual learners and imagery helps them create a visual image of the concept. This is specifically helpful for students with learning difficulties who may lack abstract thinking or the ability to visualise written content and make meaningful connections.

d. Time management helps them manage the time for an activity. In my experience of working with children with learning difficulties, management of time has been a great challenge for students. Effective time management skills are crucial to not only enhance performance on academic tasks and help with completion of assessments, but also in easing off the burden and pressure of deadlines.

e. Structured learning environments which are conducive to learning.

f. Help seeking or taking help from a peer or friend.

g. To enhance or maintain their interest during the task.

h. Self-consequences which will help them stay on task.

6.4 Self-reflection phase

Self-reflection enables students to assess their performance and while judging their successes or failures, they experience positive or negative emotions which depends on their personal attributes. These emotions have an effect on their will to motivate and regulate themselves in future (Panadero & Alonso Tapia, 2014).

1. Self-judgment

This strategy helps students to evaluate their performance, and consists of self-evaluation and causal attribution. Self-evaluation is another important strategy that helps students to assess their performance according to the assessment criteria and how they have progressed towards their goals (Panadero, 2011). Teachers can help students understand the assessment criteria before they attempt a task so that they are able to assess their work and gain a better understanding of how they can improve themselves.

Self-evaluation is an important strategy as it helps students to access their work according to the goals they have set for themselves (Winne, 1997, 2011). This strategy can be especially helpful for students with learning difficulties as it helps them access their performance on their own learning goals and not the assessment criteria. This will further help students gain a sense of success or achievement even if they perform averagely on a task, if they have met their personal goals (Panadero & Alonso Tapia, 2014).

2. Self-reaction

Students' understanding of their own performance activates positive or negative emotions, with in turn effects their belief in themselves and their performance on future tasks (Pintrich, 2000b; Zimmerman & Schunk, 2011). This means that the students exhibit emotional and cognitive reactions to their own attributions, and therefore this process of self-regulation is referred to as self-reaction. The reactions that students exhibit might look involuntary and uncontrollable but that is not always true (Schunk, 2008). Students who are ready to learn from the feedback they receive on their performance are able to control their emotions and work on future learning tasks with better preparation.

Researchers   identified two processes related to self-reaction: self-satisfaction/affect and adaptive/defensive decisions (Zimmerman & Moylan, 2009). Self-satisfaction is described as the affective and cognitive reaction that a student experiences as he judges himself (Zimmerman & Moylan, 2009), adaptive/defensive decisions means that the student continues to have the will to perform the task again, either using the same strategies or planning to devise new ones for better academic performance (Panadero & Alonso Tapia, 2014). Defensive decisions prevent students from attempting the task again so that future failure can be avoided (Wolters, 2003a, 2003b).

Zimmerman's model of self-regulation is cyclical in nature because students' previous performance influences their next one (Zimmerman & Schunk, 2011). The emotions that the students experience and their attribution to a task will affect their motivation to perform in the future. If students make defensive decisions and have doubts regarding their future success, they will have decreased motivation to pursue their goals. However, if students consider feedback constructively, they will be able to pursue future goals with better strategic planning (Tapia, 2006).

6.5 <u>Educational application of the model to support students with learning difficulties</u>

The cyclical model given by Zimmerman has important implications for educational planning. It provides a framework that can guide future research for developing and implementing engagement that relates to academic intervention (Christenson, Reschly, & Wylie, 2012). His cyclical model also coincides with the phases that precede, guide and come after learning. It therefore guides teachers to incorporate strategy intervention during the different phases of learning. Most of the strategies defined by Zimmerman can be useful to guide students who are not able to perform optimally and who may lack an understanding of the strategies due to their learning difficulties.

His three phase model (Zimmerman, 2000a) is also unique because of the inclusion of the forethought processes, such as setting goals and planning. Incorporating forethought in the regulatory loop was vital as it strengthened the principle that students have the ability to actively engage in their learning and are not passive members of the process (Bandura, 1989). The strategies which could be particularly helpful for students with learning difficulties, will be discussed in Chapter 6.

Chapter 7- Self-Regulated Learning and Academic Performance

As educators, teachers, parents or adults involved in the learning process of children, we all have, at some point or the other, observed self-regulated learners. They are the ones who approach learning tasks with confidence, thoroughness and creativity. They are aware of their own learning abilities and skills and are conscious of the learning process. They are also cognizant of their own skills or the lack of it. Unlike passive learners, self-regulated students are proactive in seeking out information when needed and consciously work towards mastering it. When they encounter obstacles such as unfavourable study conditions, confusing teachers, or complex learning material, they find a way to succeed. All of this is geared towards enhancing their learning skills and academic performance as they view achievement as a methodical and manageable process, and they accept greater responsibility for their achievement outcomes (Zimmerman, 1990; Zimmerman & Pons, 1986).

All theories of self-regulated learning treat student learning and motivation as processes that are dependent on each other and which cannot be fully understood in isolation. For example, the perception of a student regarding their self-efficacy is an incentive for learning and a consequence of their learning attempts (Schunk, 1986). Students who are able to regulate themselves do not just react to their learning outcomes; rather, they are proactive in seeking out opportunities to learn (Zimmerman & Schunk, 1989). They take initiation while attempting learning tasks and are able to encourage self-observation, self-evaluation, and self-improvement by practicing regularly, training for specialization and taking part in competitions (Zimmerman & Pons, 1986). They keep raising the bar for themselves constantly and are able to motivate themselves to work towards higher goals when they have achieved the previous ones, a quality that Bandura (1989) called self-motivation. Self-regulated learning therefore involves a student's ability to perform a learning response by using self-control and to alter their learning response to new or changing situations based on feedback. It includes efforts made by students to seek out and benefit from learning tasks (1989). Once students become self-regulated, they are metacognitively self-directed and are able to motivate themselves to continue pursuing their goals. Their skill and will are combined factors of self-regulation (McCombs & Marzano, 1990). Such learners can thereby recognize and augment the skills that will help them to attain academic success.

7.1 The role of the learner in the use of SRL strategies

A self-regulated student is characterized as a student who completely understands the requirements of a given task, what skills and abilities he has to attempt the task, and his

own requirements and goals in relation to positive learning experiences (McCann & Garcia, 1999). Self-regulated learners consciously evade behaviours and cognitions that could act as a hindrance to optimal academic performance; they have knowledge of the strategies required for learning to take place and know when and how to apply strategies which will enhance academic performance (Byrnes, Miller, & Reynolds, 1999). Such learners consider learning as a manageable process and spend time in planning, organizing, monitoring, and appraising their learning during this process (Ley & Young, 1998). They set short term and long term goals for themselves, monitor their own learning and progress to achieve these goals and adjust and regulate their thought, motivation, and behaviour so as to achieve their goals (Pintrich, 2004). They are also able to do a reflection of their learning process and also constantly evaluate their progress towards their goals, which are also used as a standard against which future learning is equated. These standards help students to evaluate their learning process and make changes where necessary (Muis, Winne, & Jamieson-Noel, 2007). They are continuously involved in the process of monitoring their own progress and devising ways and strategies to improve their learning outcomes.

In relation to metacognitive processes, self-regulated learners engage in planning, setting goals, organizing, self-monitoring, and self-evaluating at different points during the learning process (Corno, 1986). These processes help them to be self-aware, informed, and decisive in their approach to learning. While looking at motivational processes, self-regulated learners report high self-efficacy, acknowledgement of their learning process, and inherent task interest (Schunk, 1986; Zimmerman, 1985). They come across as self-starters who exhibit outstanding effort and determination through the learning process. In their behavioural processes, self-regulated learners choose and create environments that enhance learning (Henderson, 1986; Wang & Peverly, 1986; Zimmerman & Pons, 1986). They proactively look out for guidance, knowledge, and contexts for learning; they self-instruct while seeking information and reinforce themselves while attempting a learning task (Rohrkemper, 1989). They are strategic, motivated and analytical, choose from a repertoire of effective learning and problem-solving strategies. They are able to analyse their own strengths and weaknesses and also regulate their behaviour to help them optimize their learning to the maximum. Research indicates that when learners engage in academically effective forms of self-regulated learning (SRL) they are successful in and beyond school (Zimmerman & Bandura, 1994). Unfortunately, many learners, across a wide range of ages and contexts, do not regulate their learning in ways that are academically effective (Winne, 2003).

7.2 <u>Theoretical perspectives on the role of self-regulation in determining academic performance</u>

Zimmerman and Pons (1986, p. 308) based their research on the social cognitive theory to "theorize learning as self-regulated to the extent that students are metacognitively, motivationally, and behaviourally active participants in an academic task". This definition helped to understand the major characteristics of a self-regulated learner. Taking a practical and flexible approach to academic tasks, self-regulated learners make learning goals that will help them become successful, and choose from a repertoire of strategies to realise their goals (Winne, 1995; Zimmerman, 1990). They are able to identify when different strategies would be more effective, and are continuously adapting their approach and evaluating its strengths and weaknesses (Boekaerts, 1997; Winne, 1995). Through this self-directed process, students convert their mental abilities into academic skills (Zimmerman, 2002).

Over the years, there has been a lot of disagreement over the main factors of self-regulated learning due to which researchers have used various theories to explain and define the concept of self-regulation of learning (Boekaerts, 1997; Martin & McLellan, 2008; Zeidner, Boekaerts, & Pintrich, 2000). There has been a lot of variation in how the concept has been defined in the conceptual and operational aspect. Due to the interdisciplinary nature of self-regulated learning, there have been many definitions of the concept and many programs of research to study it (Zeidner et al., 2000). Nevertheless, a working definition that includes several perspectives was proposed by Pintrich, who contended that self-regulated learning is a process "is an active, constructive process whereby students set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features of their environment" (2000b, p. 453)

7.3 <u>The influences of SRL learning support and prior knowledge</u>

Self-regulated learning (SRL) among students is recognized when students involve themselves in the learning process, take responsibility for their learning, are aware of their learning process and can take decisions regarding their future approaches to learning (Corno, 1986; Zimmerman, 1990). A lot of research in the field has indicated that SRL greatly affected students' learning performance and academic achievement (Wang, 2011). Specifically, good SRL skills also correlate with high self-efficacy and satisfaction, which can result in better learning outcomes (Artino, 2008). Researchers have indicated that students with strong SRL skills are more likely to be successful in all

kinds of assessments (Bellhäuser, Lösch, Winter, & Schmitz, 2016; Pintrich, 2000b). In other words, self-regulated learning positively affects student's learning (Fisher & Ford, 1998). Zimmerman (2000a) advised that learners with SRL use motivational and cognitive strategies to advance their learning, can work on their learning environment to their best advantage and can play a vital role in choosing the form and amount of instruction they need. While doing this, they also refer back to prior knowledge (Moos & Azevedo, 2008) as it can affect their enthusiasm and learning approaches (Winters, Greene, & Costich, 2008).

7.4 <u>Use of strategies</u>

Self-regulated learning is considered to be "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features in the environment" (Pintrich, 2000, p. 453). With the intention of enabling, managing and controlling the learning process, students may use different strategies (2005; 2006). The cognitive learning strategies such as rehearsing and forming links are related to mental activities like information processing (Roick & Ringeisen, 2018). These strategies enable students to form links between new information and previous knowledge, establish new memory structures, and help in storing new knowledge in long-term memory. The use of metacognitive activities enable students to regulate cognitive strategies related to a context (Roick & Ringeisen, 2018). They denote behaviours which are essential for adjusting and monitoring the learning process. These strategies are therefore important as they help students in controlling their focus and interest. Finally, learners may use resource management strategies which will aid them in organizing their environment or will help them keep up their focus while attempting a task.

Researchers consider self-regulated learning as an ever changing process where the learning strategies that are used by the students can be adapted to the situations that the students are in and their level of motivation, and is further directed by ability beliefs like academic self-efficacy (Boekaerts & Cascallar, 2006; Schmitz & Wiese, 2006) For example, Boekaerts' (1999; 2006) model of self-regulated learning theorizes the interdependence of the processes involved in self-regulation at three different layers or levels. The inner layer focuses on cognitive learning strategies like information processing. At this level, it is crucial for students to choose the right strategy as it is important for the quality of learning. Students have to adjust their learning according to the complexity and difficulty level of the study material. The next layer is the intermediate

layer which focuses on metacognitive knowledge that helps students in the regulation of the learning process. Successful students understand the efficacy of a specific strategy, and are able to adjust it to use in a different context whereas students who are not as successful on academic tasks, are unable to adjust their strategy use and are usually dependent on external guidance. The outermost layer represents processes related to motivation which help students in setting up suitable goals for themselves, initiating and reflecting on their learning behaviour, and dealing with failures and problems.

7.5 <u>Motivators of Self-Regulated Learning as explained by two models</u>

Various researchers have delved into the concept of self-regulated learning to explain the role of the learner in the learning process. They have tried to explain the process by which students learn through different models. These models attempt to define how students become accountable learners by regulating their own learning and performance (Azevedo et al, 2010; Muis et al., 2007; Zeidner et al., 2000). Although these theories present diverse viewpoints on self-regulated learning, they all agree that self-regulated learners are active participants in their own learning and they use numerous cognitive and metacognitive strategies to control and regulate their academic learning (Zimmerman, 2000a).

The self-regulated learning model given by Boekaerts' differentiates between internal and external factors that encourage self-regulated learning. Keeping in line with the social-cognitive theory, self-efficacy is considered a significant internal determinant (Putwain, Sander, & Larkin, 2013), whereas external factors could be conditions in the environment like distractions or the influence of people around the student (Boekaerts & Cascallar, 2006; Zimmerman & Schunk, 2011). Within an educational setting, academic self-efficacy is the ability of a student to deal with the challenges of the curriculum, be successful in completing tasks related to performance, and realise academic goals (Putwain et al., 2013).

Taking from the information presented by Zimmerman and colleagues (2007; 2006), the ever-changing relationship between self-efficacy, learning strategies, and academic performance is presented through the process model of self-regulated learning by Schmitz and Wiese (2006). The model presents three phases: The pre-action phase during which students establish goals and plan their learning, use "cognitive, metacognitive and resource management strategies to reach those goals in the action phase, and reflect on their own learning in the post-action phase" (2006, p. 149). This reflection may change the self-efficacy beliefs of students and it may influence the goals

they set for themselves for future tasks. The learning cycle of the students is therefore a repetitive process where self-efficacy acts as an important variable between the different learning strategies (2006).

If students reflect on their use of strategies after the completion of a task, they are able to understand the usefulness of the strategy. If this produces positive results for the students and helps them realize their academic goals, they attain a mastery experience which further improves their sense of self-efficacy. This sense is also enhanced when students compare their learning processes with that of their peers, receive effective feedback on their strategy use, and experience positive emotions during the learning process. The increase in self-efficacy and competence then helps students to increase the use of strategies that lead to success and let go of the ones that are not helpful during the learning process. Zimmerman and Cleary (2006, p. 149) also recommend that "metacognitive strategies like goal setting and planning are important determinants of self-efficacy beliefs".

7.6 <u>Use of metacognitive and cognitive learning strategies by students to enhance their performance</u>

A vast number of high performing students use a variety of strategies to deal with the demands of academic tasks. These include both metacognitive and cognitive learning strategies. The self-regulated learning model (Schmitz & Wiese, 2006) suggests that diverse learning strategies can go side by side while accessing learning tasks. For example, in order to use cognitive learning strategies effectively students need to simultaneously engage in planning, monitoring and evaluating their effectiveness (Roick & Ringeisen, 2018). Though students use most learning strategies side by side, the use of strategies is usually cyclic in nature which means that some strategies are repeatedly used during a particular learning process, and that there is a positive association between different strategies over time. For example, when students use metacognitive strategies like goal-setting and planning before attempting a task, then they may be encouraged to use cognitive strategies during the action phase. As students receive feedback for their performance on a task, they will be able to modify their strategy use for a future task. This confirms the positive relationship between cognitive and metacognitive learning strategies, and how learners use these effectively to help them with their learning tasks (2006).

7.7 **The relationship between academic self-efficacy, learning strategies, and performance**

There has been extensive research to prove that self-efficacy and strategy use is an important predictor of academic performance in higher education (Geitz et al., 2016; Weissberg et al., 2005). Successful learners were more likely to engage in self-regulation of their learning efficiently. They used cognitive and metacognitive strategies effectively and were able to adapt them according to the complexity of the learning task. They also exhibited a high level of inherent motivation and were able to adapt their motivation and beliefs (Nota, Soresi, & Zimmerman, 2004; Vanderstoep, Pintrich, & Fagerlin, 1996). They use self-regulated learning strategies to reach expected academic levels on the basis of feedback about learning efficacy and skill. Although all learners will involve themselves in the learning process to a certain extent during instruction, students who display enterprise are motivated and take responsibility for their performance are able to achieve the desired results (Zimmerman & Martinez-Pons, 1988). Self-regulated learners can be differentiated by their methodical use of metacognitive, motivational, and behavioural strategies, their receptiveness to feedback related to their learning, and their self-perceptions of academic achievement. Therefore, there needs to be a focus towards developing all three aspects of self-regulated learning in students: metacognitive, motivational, and behavioural.

Over the years, self-regulated learning has become an important topic of research due to its potential to help students improve and enhance their academic performance in the classroom. However, there are a large number of students who face difficulties with learning, are passive participants in their learning and who appear to lack both the will and skill to achieve academically. They are likely to give up, be disinterested in academic tasks, or stay uninvolved through the entire learning process. As discussed earlier, self-regulated learners seem to have a 'tool kit' of strategies that help them to deal with academic challenges and motivates them to use the correct strategies required for the task (Newman, 2002). However, students with learning difficulties lack the cognitive and social competencies to seek out strategies and skills that could help them improve their learning and performance. It is important for teachers and educators to use instructional approaches that can offer direction and insight into the processes of self-regulated learning for students who are unable to learn them automatically.

Chapter 8- Self-regulation Strategy Intervention- Can it help students with Learning Difficulties

The term learning difficulty is used to define students who do not make the required progress on academic tasks, particularly in areas related to language, literacy and numeracy (Westwood, 2004). These students could face challenges in one area or may find it difficult to meet the curriculum demands of all subjects. They find learning tasks challenging and may seek ways to procrastinate or avoid them completely. Environmental factors, inadequate teaching methods, and the lack of adequate strategies or skills may be the reasons these students find learning tasks difficult. They may not have the ability to acquire knowledge, skills and attitudes that would enhance their academic performance. Such students usually experience frustration and failure and develop increasingly negative feelings toward learning in school.

A learning difficulty impacts all aspects of a student's life and they usually require some intervention or support to get through the challenges posed to them by academic tasks. Having worked in the area of special needs in mainstream classrooms in India and New Zealand, I have encountered many students with learning difficulties who lack the required skills to pursue learning tasks, which in turn impedes their academic performance and they usually fall behind their peers in class. Such students require early intervention or remedial instruction and help for different subjects. They generally lack self-esteem, confidence in their abilities, procrastinate with school work and are most likely to drop out of school. Such students need to be equipped with strategies that help them deal with the demands of new and challenging tasks, and allow them to learn effectively, without getting overwhelmed.

Self-regulated learning strategies are considered to be very effective in helping students to pursue learning tasks and achieve academically. They encompass a wide range of skills required for classroom learning and academic performance. It is a process that helps students to manage their thoughts, behaviours, and emotions and helps them to understand their learning experiences (Zumbrunn, Tadlock, & Roberts, 2011). According to Canadian researcher, Shanker (2012), "self-regulation refers to a child's ability to deal with stressors effectively and efficiently and then return to a baseline of being calmly focused and alert" (p. 5). According to many researchers, self-regulation is an essential component for school readiness and has a strong correlation with meta-cognition (Alexander, Entwisle, & Kabbani, 2001; O'Shaughnessy, Lane, Gresham, & Beebe-Frankenberger, 2003). Whereas metacognition involves the knowledge and awareness of one's cognitive strengths and weaknesses, self-regulation is "the ability to regulate one's cognitive activities, underlies the executive processes and functions associated

with metacognition" (Montague, 2008, p. 37). Students who are not equipped with self-regulated strategies would find it difficult to cope with the challenges and demands of learning in classrooms. This is especially true of students who face learning difficulties as they do not possess very strong self-regulation skills or are too overwhelmed to use it where needed. Researchers suggest that cognitive strategy instruction with the aim of enhancing academic performance has become the main focus of research with students with learning problems (Brown, Campione, & Day, 1981; Schunk, 1989). Though a large part of strategy instruction is focussed on recognizing strategies that are effective in improving academic performance, greater emphasis is on the need to create procedures to teach strategies effectively to students who face difficulties in their learning (Sawyer, Graham, & Harris, 1992). For example, a teacher might want to teach persuasive writing to students through the use of strategies as goal setting, planning, self-instructions, self-monitoring etc. and come up with her own instructional design that can help students with learning difficulties in her classroom.

However, developing self-regulation skills in students is not easy and many learning problems are a result of students' lack of metacognitive skill/ability. To ensure that self-regulated learning develops as expected, teachers need to do a demonstration of how to use the correct strategies, offer an explanation in ways that can be understood by students, and frequently and consistently use metacognition and strategy training throughout the school curriculum (Westwood, 1997). Research also suggests that students' ability to self-regulate can be an important indicator of academic success (Blair & Diamond, 2008; Duckworth & Seligman, 2005; Shanker, 2013). Students who do not have the required self-regulation skills will likely have learning challenges that continue through their school years, and students who do not learn strategies at a young age are unlikely to develop them on their own as they progress through their school life. Through my work in the field of special education needs, I have met many teachers who believe that these children lack maturity and will grow out of their behaviours. However, it is unlikely that this would happen unless a concerted effort is made to teach them the required skills.

8.1 Self-regulated strategy intervention to help students with learning difficulties in Math

Research demonstrates that students with learning disability in Math will find it difficult to use problem solving strategies and see math as a topic that requires memorizing and learning by rote (Butler, Beckingham, & Lauscher, 2005). Butler and colleagues hypothesized that students who were taught skills to deal with the demands and complexities of the subject were more likely to use them during general classroom work. Butler et al. (2005) during their study with three grade 8 students in an urban

Canadian city suggested that students with learning difficulties in math can improve their efficiency and capability when taught to use SR strategies to approach math work. These students were taught math using Strategic Content Learning (SCL) to help them develop self-regulation skills. Previous research suggests that students who received SCL intervention performed better on tasks, they had better metacognitive understanding about tasks and strategies, and had a better perception of their own skills and abilities (Butler et al., 2005). While using SCL, students were encouraged to be active participants in their learning, SR strategies were integrated into the instruction and students were taught to work collaboratively towards their goals. The research findings suggested that for all three students, the SRL strategy instruction helped them to integrate self-regulated learning to deal with their math difficulties. Students established strategies for understanding and solving math problems, and used these strategies when learning new concepts.

In another study conducted by Jitendra, Hoff and Beck (1999), four students with mathematics learning disabilities were taught SR strategies to help them with problem solving. The students were taught strategies to attempt one-step and two-step word problems and compared to a control group working at a similar grade level in maths. At the end of the study it was found that following strategy instruction, all students used more strategies while attempting complex questions. The students also shared that learning the strategies was a positive experience and they would happily recommend their use to their peers.

8.2 Use of compensatory strategies by students with learning disabilities

Researchers working with adults with learning problems have provided observational data from studies of adults who were highly successful in life by deploying processes for self-regulation such as goal orientation; by looking positively at their own needs; by finding a good fit between their strength, weakness, and career choices; and by reaching out to their support system that includes family and peers (Gerber & Reiff, 1994). Studies with high school students with LD suggests that they use compensatory approaches to achieve success on academic tasks (Adams & Crews, 1991; Adelman & Vogel, 1993; Butler, 1998). In another study, Reis et al. (2000) discussed the use of specific compensation strategies that helped students with LD attain academic success. These included study strategies and learning strategies, environmental modifications, study and management skills, making short term and long-term goals and trackers, and devising individual plans through a focus on metacognition and executive functions (Reis et al., 2000). They also used different kinds of text material and supplements, and used techniques like time management and planning to help them work towards their goals.

However, students with learning difficulties find it difficult to use learning strategies effectively unless they receive instruction in the use of these self-regulatory methods, which helps them achieve success in academic settings (Adelman & Vogel, 1993; Butler, 1998; McGuire & Madaus, 1999; Policastro, 1993). Researchers working with elementary and secondary school students (Deshler & Schumaker, 1986) have provided data on the efficacy of teaching study skills and learning strategies to adolescents, suggesting it is crucial for their academic success. Research also suggests that teaching explicit strategies to students with LD resulted in enhanced learning, better academic performance, and greater self-esteem (Saracoglu et al., 1989) .

8.3 <u>How self-regulated strategies effect the performance of students with Dyslexia</u>

According to Lyon et al. (2003), dyslexia is a specific learning disability which has a neurobiological base and is characterized by problems with decoding, word recognition, and spelling which continue into adulthood and which may eventually lead to difficulties in areas of reading comprehension and overall conceptual understanding. Adults with dyslexia also face challenges in the area of spelling and reading (Pedersen et al., 2016; Undheim, 2009). Self-regulated study strategies are intentional, require efforts on the part of the learner and guide them to work towards their goals (Paris et al., 2001; Zimmerman, 2000a). It is therefore difficult for students with dyslexia to use academic self-regulation or strategic processing automatically as they tie up their cognitive resources to deal with the challenges of postsecondary study (Sinatra, Brown, & Reynolds, 2002). Many researchers have conducted studies to prove that students with learning disabilities lack the strategic competence required for optimal academic performance. For example, Bergey et al. (2017) found that first-year university students who faced challenges in the area of reading scored lower on components of self-regulated reading and study strategy when compared with their peers. Heiman and Precel (2003) suggested that students with reading difficulties felt that nothing could help them with their learning problems and Stampoltzis and Polychronopoulou (2009) reported that students with dyslexia did not use any study strategies that could help them with their learning challenges. This is possibly because students facing learning challenges do not think that any effort by them could have a positive influence on their academic performance.

Thus, many studies suggest that students with learning difficulties lack knowledge of efficient self-regulated strategies to help them with their learning tasks and many of them have become passive learners as they feel their efforts will not yield the required

academic results. At the same time, there is other research that suggests that these students could use a variety of compensatory strategies to deal with their difficulties. Numerous studies have also suggested that some students with dyslexia may compensate successfully for their learning challenges and do well on assigned tasks by deploying self-regulated study strategies (Bråten, Amundsen, & Samuelstuen, 2010; Fink, 1998; Strømsø, Bråten, & Samuelstuen, 2003). Therefore, the role and importance of self-regulated learning strategies seems crucial in helping students with learning difficulties to deal with challenging tasks.

8.4 Strategy intervention and how it impacts the academic performance of students with learning difficulties

Helping students with learning problems has become a major focus of educational research (Pressley, 1990; Wong, Harris, & Graham, 1991). Researchers have proposed that effective strategy instruction includes three components:- target strategies; knowledge regarding the use and importance of the given strategy; and development of self-regulation skills required for deploying, monitoring, maintaining, and generalizing strategies in an effective way (Brown et al., 1981; Schunk, 1989). Though there is variation in the use of these three components by different researchers, it has been established that self-regulation interventions have a positive influence on the academic performance of students with learning difficulties. One such study was conducted by Graham and Harris. They wanted to study whether overt instruction in goal setting, self-assessment, and self-recording helped students in acquiring, maintaining, and generalizing the planning strategy for writing stories among students with learning problems (Graham & Harris, 1989). There is no denying the importance of explicit teaching of self-regulation procedures to help students understand strategy deployment and which strategies contribute the most to academic success. Such overt strategy instruction helps in increasing children's self-efficacy (Bandura & Schunk, 1981), and students with LD have responded positively to strategies like goal-setting and self-monitoring procedures (Graham & Harris, 1989; Harris & Pressley, 1991). Graham and Harris (1989) found that strategy instruction had a positive influence on the schematic structure and quality of students' compositions and also helped students to develop an increased sense of self-efficacy.

8.5 Writing difficulties exhibited by students with learning disabilities and the need for strategy intervention

Written expression is an important skill for students and a lack of the ability to be able to effectively communicate thoughts and beliefs in writing is a big disadvantage. Students

with LD face significant challenges in this area due to a lack of the required skills. They find it difficult to organise thoughts and ideas while writing. They lack the skills and knowledge to plan and approach writing tasks. Scardamalia and Bereiter (1986) identified five areas of competence that are challenging for students with LD when developing an essay: (a) producing content, (b) organizing thoughts and ideas, (c) creating goals, (d) competently implementing the mechanical features of writing, and (e) reviewing text and reformulating goals.

Brainstorming for ideas is the first step to writing. This is the time when learners take time to think about a topic and generate their ideas. MacArthur and Graham (1987) suggested that students with LD do not spend much time preparing to write. Instead, they start writing as soon as they are assigned a task. They also tend to use an associative technique where they start writing whatever comes to mind (Thomas, Englert, & Gregg, 1987). This does not give them much time to plan or set goals for themselves. Also, students with LD do not know what to do when they are given time to plan (Burtis, 1983). They lack an understanding of strategies that can be used in the pre-writing phase. They also face challenges while trying to produce content and organize a structure for composition (Graham, 1990). This problem may be attributed to their under-utilization of strategies for retrieving useful information. Thus, these students frequently view a writing assignment as a question/answer task involving little preparation. Graham (1990) did a study with students with disabilities and found that they often abruptly ended their written tasks without providing a concluding statement. Hence, they are unable to put forward their point of view effectively and do not manage to generate the required content. Barenbaum, Newcomer, and Nodine (1987) also stated through their research that students with LD produced significantly shorter and lower-quality stories than their peers. Their stories lacked the desired detail and organisation (MacArthur & Graham, 1987). Students with LD also find it difficult to set goals and work towards them (Graham et al., 1991). In a study by Graham, MacArthur, Schwartz, and Voth (1992), students were asked to ascertain goals for themselves and then taught explicit strategies like processing goals, making and organising notes, planning and evaluating. With the help of these strategies, students met their goals 90% of the time.

Students with LD also find it difficult to understand the mechanical aspects of writing. They make more spelling, capitalization, and punctuation errors in their work as compared to their peers (MacArthur et al., 1995), and their hand-writing is less legible (MacArthur et al., 1995). Since most of these skills are not taught at the high school level, they are likely to lag behind their peers throughout their school life unless taught strategies to gain these skills. Students with LD also fail to realize the importance of revising and refining content (Bereiter & Scardamalia, 1986). They require more

extensive strategies and obvious instruction to acquire skills that other students learn more easily (Newcomer, Nodine, & Barenbaum, 1988).

How strategy instruction can help students with the writing process

Research (De La Paz & Graham, 1997; Wong et al., 1991) suggests that strategy instruction can help students with LD to acquire expected writing skills. Strategy instruction helps students to engage with a task and teaches them the right strategy that can help them with the task. As students learn effective strategies for planning and learn to self-regulate their writing, they are able to produce more sophisticated writing (Wong, Butler, Ficzere, & Kuperis, 1994). MacArthur, Graham, and Schwartz (1991) found that strategy instruction helped students to upgrade their writing skills

To further emphasise the importance of strategy instruction, a study (Chalk, Hagan-Burke, & Burke, 2005) was conducted to help students with LD improve the quality and quantity of their writing. Prior to the intervention, students with LD exhibited a weakness in writing and their writing was of poor quality. Using studies by Graham and Harris (Graham & Harris, 1996; 1989) as a guideline, a SRSD (Self-Regulated Strategy Development) intervention was applied. The results suggested that students benefited from this intervention and it helped them develop strategies for brainstorming, semantic webbing, setting goals, and revising. Their word production and quality of essays also improved. Although the study identified several limitations, the findings were enough to support the use of strategy instruction to improve the writing performance of students with LD.

8.6 <u>Strategies that can help students with learning difficulties</u>

Students with learning difficulties might lack the ability to self-regulate their own learning and achieve their goals. A number of self-regulation processes or strategies can be effectively taught to these students to equip them to deal with challenging learning tasks. One of the most important questions is which specific strategies are the most effective in improving student learning. There is a broad spectrum of strategies including cognitive, metacognitive, and motivational learning strategies that influence student learning in one way or the other. Following are some of the key self-regulated strategies that could support children with learning difficulties.

1.Self-Monitoring: - This is one of the most thoroughly researched self-regulation strategies and a key subprocess of self-regulated learning (Reid, 1996; Shapiro et al., 2002). It is an internal process and is an easy strategy to teach children as it is quick and practical, and has a clearly defined procedure for teaching (Graham et al., 1992; Reid, 1993). Self-monitoring helps students to monitor their learning and strategy use while performing the task, enabling them to make changes that will help them achieve their

goals. Self-monitoring is especially helpful for students who find learning tasks difficult as it helps them to monitor their progress at smaller and regular intervals, allowing them to seek help if they feel they are not progressing adequately. To become strategic learners, students must take responsibility for their learning and performance (Kistner et al., 2010). Self-regulated learners are able to do this by monitoring their progress towards their goals. When students self-monitor their learning, they are able to incorporate a vast range of self-regulated strategies. They first need to first set their own learning goals, plan their approach to the task and what strategies they would use, motivate themselves to work towards their goals and focus their attention towards the task (Zimmerman, 2004). Parents and teachers can help students to self-monitor their learning by helping students manage their time for tasks, keep record of their strategy use and how much time they spend on a task. This exercise helps students to visualize their progress and vary their learning process where needed.

2.Planning: - Planning is one of the first steps to attempting a task. Similar to goal setting, planning helps students to self-regulate their learning before engaging in a learning task. Research suggests that planning and goal setting are complementary processes, as planning can be helpful for students in establishing well thought out goals and strategies to perform optimally (Schunk, 2001). Planning takes place in three stages: setting a goal for a learning task, understanding which strategy would be most effective, and deciding the amount of time and resources that will be deployed to achieve the goal (Schunk, 2001). Guiding students to approach academic tasks with a plan is a practical method for encouraging self-regulation and learning. It is not only an important self-regulatory process but is also a good predictor for success (Zimmerman, 2008). It is one of the main differences between students who are successful and the ones who are not, as successful students spend more time in planning their approach to a task and think through the entire learning process in advance (Hill et al., 2006).

3.Time management: - This helps students to manage the time for an activity. In my experience of working with children with learning difficulties, management of time has been a great challenge for students. Effective time management skills are crucial to not only enhance performance on academic tasks and help with completion of assessments, but also in easing off the burden and pressure of deadlines. Students who are efficient in managing their time are more likely to learn and perform better than students who do not possess good time management skills. Self-regulated learners have an understanding of how to manage their time as they are aware of deadlines and the amount of time it will take to complete a given task. They prioritise their tasks and are usually able to differentiate between them according to the level of difficulty. They can

then decide on the amount of time that they need to devote to each task and are therefore able to prioritise their tasks (Zimmerman & Kitsantas, 1999).

4. Self-instruction: - This is where students are able to direct themselves according to the demands of the task. This can be done through verbalisations that augment learning and are important for self-regulation (Schunk, 1984). Self-instruction involves using of self-statements for directing or regulating behaviour (Graham et al., 1992). It helps students to guide and instruct themselves while attempting a learning task. It helps them to self-regulate their behaviour and choose the correct strategy for the task (Harris, 1990). Graham et al. (1992) listed six types of self-instructions: defining the problem; planning; using the strategy; evaluating the self; coping and self-reinforcement. Teaching self-instruction to students involves guiding them through the process of self-instruction, model how self-instructions can be used, and helping them use it to perform a task (Graham et al., 1992). This strategy can be effectively used with children with learning difficulties as it helps them to guide their own behaviour and strategy using internalized speech (Harris, 1990). It reduces the dependence on outside factors and is an important skill that can guide students during self-study.

5. Imagery: - Imagery uses mental images to organise information and improve learning and memory of the task (Zimmerman & Schunk, 2011). It is an important tool as some students are visual learners and imagery helps them create a visual image of the concept. This is specifically helpful for students with learning difficulties who may lack abstract thinking or the ability to visualise written content and make meaningful connections.

6. Goal setting is an important strategy used by effective learners (Winne, 1997), and is considered to be a key feature of self-regulation (Bandura, 1986). It can be thought of as a standard that regulates the actions of an individual (Schunk, 2001). Goal setting is one of the most important processes that effects feelings of self-efficacy and motivates them to pursue tasks that may seem daunting. Goal setting plays a significant role in structuring efforts, providing information regarding progress on a task, and motivating learners to perform (Schunk, 1990). As one works with students who face learning challenges, it is vital to set goals which are practical and measurable so that students are able to attain a sense of achievement when they reach a goal. Students who are able to satisfactorily progress towards their goals will most likely continue to make efforts to complete the task (Bandura, 1986). Effective goals are the ones that are specific, short term, can challenge the student and improve beliefs of self-efficacy and self-perception once they are achieved. Students' goals can range from simple, short-term ones like attaining good grades on a test to more detailed ones like gaining a better understanding

of a topic. Short-term realistic goals often are used to reach long-term objectives. For instance, setting a short-term goal like creating some time every day to study and using the necessary strategies can help students to realize the long-term goal of attaining good marks in an exam. Research also suggests that motivating students to set short-term goals for their learning can be effective way to help them monitor their progress (Zimmerman, 2004).

6. Deep processing strategies that improve comprehension and retention are more effective than other strategies based on rote learning. Deep processing strategies help with information processing, thus ensuring a better and long term understanding of concepts. Elaboration and organisation are deep processing strategies that help students understand their learning and lead to greater autonomy while attempting related tasks (Dent & Koenka, 2016). These have been extremely helpful as I taught subjects with heavier content to secondary school students. Elaboration and organisation helped not only in the understanding, but also the internalisation of subjects.

8.7 The need for further investigation to understand how SR strategy intervention can help students with learning problems

Self-regulated learning is a complex process that is not easy to teach or learn. Students require a variety of metacognitive and cognitive strategies to deal with the challenges of new and complex tasks. The study conducted by Butler (2005) proposed that children with learning difficulties were able to learn strategies for understanding and problem-solving when self-regulated strategies were incorporated in the instruction for the task. Similar findings were suggested by Jitendra, Hoff and Beck (1999) where students became more equipped with strategies while attempting complex questions when strategies for self-regulated problem solving were explicitly taught to them. Graham and Harris (1989) also studied the effect of explicit instruction on the goal-setting and self-assessment of students with learning disabilities. They found that strategy instruction positively influenced the performance of students on various tasks and it also positively influenced their self-efficacy.

However, not all research studies report a positive correlation between strategy intervention and academic performance of students with learning difficulties. For example, research conducted by Sinatara (2002) suggests that students with learning or reading disabilities might find it challenging to use self-regulated strategies as they do not have enough cognitive resources to engage in these learning strategies. They also lack self-efficacy and belief in their capability to influence their own learning and are therefore reluctant to try new strategies. Even with the high number of research studies

in the field of self-regulation, there isn't enough research data that links self-regulation strategy instruction with student ability. For example, a meta-analysis conducted by Dignath (2008), studied data related to strategy intervention from 1992 to 2008. However, this study does not focus on the difference between strategy acquisition and changes in classroom performance for students with various abilities. Another meta-analysis by Donker and colleagues (2014) studied 95 interventions and found no difference in the results produced through strategy intervention among mainstream students and those with learning disabilities. Both the groups showed equal improvement in their academic performance through strategy intervention. However, there is a need to plan interventions for students with learning difficulties across different age groups, contexts and subject areas to study which strategies are most effective in improving their academic performance. This will help to equip teachers and educators with strategies to address the needs of varied learners in their classroom.

Chapter 9- Impact of Self-Regulated Learning Strategy Instruction on Academic Performance: Study of three meta-analyses

Learning strategy is defined as a process or sequence which helps to enhance academic performance when it is matched to the requirements of the task (Pressley et al., 1989). Academic performance is therefore considered to have a positive correlation with strategy use as suggested by many researchers (Alexander et al., 1998; Hattie et al., 1996; Weinstein et al., 2000). Boekaerts (1997) suggested several activities like planning, goal setting, monitoring and evaluating the learning process to help in the processing of information. There are a large number of strategies studied by researchers which range from basic re-reading methods to more intricate approaches to synthesize knowledge. (Pressley, 2002; Wittrock & Association, 1986).

9.1 Three main categories of strategies- cognitive, metacognitive and management strategies

Cognitive strategies

These strategies help in the understanding of different domains. They help to understand how acquired information is used and is therefore domain or even task-specific (Pintrich, 1991). The three main subcategories of cognitive strategies are rehearsal, elaboration and organization strategies (Pintrich, 1991). Rehearsal refers to repeating material in order to help students to learn or remember. Elaboration strategies help students to assimilate new knowledge in relation to previously acquired knowledge. Making a summary and rephrasing are instances of this kind of strategy, and it is mostly used while reading. Organization strategies help students to establish connections between various elements to create meaningful components of information (Weinstein, Husman, & Dierking, 2000).

Metacognitive Strategies

These are higher order strategies that use cognitive approaches to help students regulate their learning. Schraw and Dennison (Schraw & Dennison, 1994) listed three phases of the learning process. These are planning, monitoring and evaluation. Planning strategies are used at the beginning of the learning process and comprise of goal setting. Monitoring strategies help one to continuously evaluate the learning process so that the approach to a learning task can be adjusted or changed. Evaluation strategies are used at the end of a task to analyse how students performed at the task and how effective their learning methods were.

Management strategies

These strategies are deployed to manage the features in the context which has a direct correlation to the learning process. These strategies are based on the theoretical framework given by Pintrich (Pintrich, 2000b), which refers to the effect of the context on the contextual features that influence learning (Pintrich, 2000b). The management of effort defines one's commitment and motivation to work towards one's goals even in the face of challenges (Pintrich, 1991). The management of peers refers to strategies that are based on a socio-constructive understanding of learning and focuses on learning and working in groups, and using reciprocal teaching to improve learning (Palinscar & Brown, 1984). The last category which is the management of environment refers to strategies which aid students to use the environment to one's advantage so that it can create the best possibility to learn.

9.2 Motivation and metacognitive knowledge

Along with the three strategies discussed here, motivation and knowledge are the two key components which help to improve the self-regulated learning of students. Motivation plays a key role in helping students to work towards their goals. Several factors like students' self-efficacy beliefs have a huge effect on how students attempt a given task (Pintrich, 1991). Task-value beliefs and goal orientation also influence a student to either involve in or refrain from strategy use (Garner, 1990; Hadwin & Winne, 1996). Knowledge is another important component in strategy training. Hattie and colleagues (Hattie, Biggs, & Purdie, 1996) suggested that for learning to be effective, one needs to have the context and knowledge about a learning task. Dignath and colleagues (Dignath et al., 2008) also considered metacognitive knowledge to be a vital component in training for strategy use.

9.3 Findings from three meta-analysis of learning strategies:

Meta-analysis by Dignath and colleagues

Many learning strategy interventions have been conducted to understand the instructions and applications of a learning strategy. The first meta-analysis was conducted by Hattie et al. (1996) where they reported positive effects when cognitive skills were taught directly. This effect was most evident when interventions were related to teaching skills for a particular task. The study also suggested that students who lacked the abilities and skills to perform did not gain a lot from these interventions. Dignath and colleagues (2008) conducted two follow-up meta-analyses on primary and secondary school

students, and used data from researches between 1992 to 2006 to study the effect of the features of learning on academic performance (Dignath & Büttner, 2008). They reported that for both school types, metacognitive reflection had a greater effect on strategy use by students. Dignath et al. (Dignath et al., 2008) also suggested that for primary school, both metacognitive and motivational strategies needed to be used whereas for secondary schools the focus of the intervention was on motivation or metacognitive reflection. It was also noted that working in a group negatively affected students in primary education but had a positive influence in secondary education. In relation to school subjects it was found that interventions in mathematics were more effective in primary school whereas for secondary school it was in reading or writing. Students' ability was not addressed in this study. Both the studies had a lot of unanswered questions and suggested scope for future research in the area. The main areas of interest were to see which strategies were most effective and which students benefit the most from strategy instruction (Dignath & Büttner, 2008).

Meta-analysis done by researchers has studied the effectiveness of various cognitive, metacognitive and motivational learning strategies. While planning interventions for students, it would be helpful to know which strategies make learning more effective. Student characteristics is another factor to consider while planning strategy intervention.

Some researchers argue that younger children do not have the cognition, knowledge or ability to regulate their own learning (Paris & Newman, 1990). However, other researchers are able to identify self-regulation abilities in Kindergarten students (Whitebread et al., 2009). Even with varying points of view, there is a general consensus that both metacognition and self-regulated learning develop as children grow older (Veenman & Spaans, 2005). Other factors of children's characteristics are their background and capability. Hattie et al. (1996) suggested that low achievers are not able to profit from a majority of interventions. New models of self-regulated learning could possibly re-assess the effect of student characteristics on their ability to self-regulate.

Meta-analysis by Donker and colleagues

Another meta-analysis conducted by Donker and colleagues (Donker et al., 2014) studied the effect of learning strategy instruction to improve learning in students. The research attempted to investigate which strategy had the highest effectiveness in enhancing academic performance of students at the primary and secondary levels. A total of 58 research studies were analysed, including 95 interventions of strategy instruction, which included 180 effect sizes. It was found that overall, students' academic performance improved through the instruction of learning strategies. The strategies

which were a part of this meta-analysis were: "cognitive, metacognitive, and management strategies, along with the impact of motivation aspects and metacognitive knowledge" (p. 1).

The findings suggested the most frequent use of metacognitive strategies, with emphasis on planning and monitoring. Among the cognitive strategies, elaboration was used the maximum whereas all management strategies along with motivational aspects were used much less. Though the analysis yielded results that were different from those suggested by previous researchers, it strongly suggested that a combination of strategies helped improve academic performance in children. The intervention had a significant effect on writing, science, mathematics and comprehensive reading, with the highest effect being in the subject area of writing. This could be due to the fact that on a general basis strategies for writing are not taught explicitly and hence any intervention produces a positive effect (Donker et al., 2014). The same effect was not seen in the area of comprehension.

The findings of the meta-analysis also suggest that when metacognitive knowledge components are added to the intervention, they help to improve academic performance (Donker et al., 2014). Metacognitive knowledge helps learners to understand how, when and why to use a strategy, thus making it more effective than plain instruction. Another strategy that produced significant effects is elaboration, whereas planning and goal orientation did not have any substantial results.

Student characteristics

Another important component that the meta-analysis investigated was the impact of students' characteristics. It studied four groups- averagely performing children, children from low socio-economic backgrounds, children with learning problems and needs, and gifted children and children from higher socio-economic backgrounds.

The analysis revealed the effectiveness of strategy use for all groups and there were no substantial differences while doing a comparison between different groups. This finding was different from an earlier finding by Hattie et al. (1996), who suggested that low-ability students did not benefit from the majority of interventions. The finding that all groups made equal progress in their learning through the learning strategy instruction, shows that children with learning disabilities and special needs respond in an equally positive manner to any kind of intervention. This finding supports the views given by previous researchers that strategies could be an effective way to address the various needs of children who were not able to perform at the expected levels (Graham & Harris, 2003).

The results from the meta-analysis gives hope to educators to include strategy intervention in their teaching to enhance the performance of students who face difficulties with learning.

While discussing the limitations of the meta-analysis, Donker and his colleagues (Donker et al., 2014) suggested that though there were no significant differences in the learning outcomes for students from different groups, there could be suggestions that students who faced learning challenges gained the most from learning strategy instruction. However, what would be interesting to research in the future could be to compare the strategy training provided to students with learning difficulties as compared with the regular students. One could also study which strategies were most effective in helping students with learning problems achieve academically.

Meta-analysis by Dent and Koenka

Another meta-analysis was conducted by Dent and Koenka (2016) which considered the relationship between self-regulated learning strategies and academic success. Self-regulated learning plays a central role in academic performance and is one of the strongest predictors of achievement. It is therefore important to identify the self-regulated learning strategies that are most significant and the factors that help students to use them to improve performance on academic tasks. The meta-analysis used these two questions as a guideline and explored the link between academic performance and two main aspects of self-regulated learning: metacognitive process and the utilisation of cognitive strategies by students. The analysis aimed to explore important questions like: Do specific self-regulated learning strategies have a direct correlation with academic performance? Do some subjects have a higher correlation than others? Which self-regulated learning measure has the highest correlation with achievement? (Dent & Koenka, 2016).

Zimmerman (1986, 2002) suggests that high achieving students are likely to use self-regulated learning strategies more often and efficiently than their lower-achieving peers. Both cognitive and metacognitive strategies were studied as metacognitive processes help students to use learnt strategies more effectively. The meta-analysis integrated research by considering different theoretical perspectives on the topic (Cooper, 2015). With the help of this knowledge, two meta-analyses were conducted for the significant metacognitive processes of self-regulated learning and the cognitive strategies that are influenced by them (Dent & Koenka, 2016).

Dent and Koenka (2016) suggested that the overall correlation between the processes of self- regulated learning and academic performance was the highest for metacognitive processes. This suggests that determining when to use various cognitive strategies could be more significant than the frequency of their use by students. Among the metacognitive processes, planning had the greatest correlation with achievement. However, there was no significant impact on academic achievement when planning and goal setting were used in combination (Dent & Koenka, 2016). This suggests that goal setting may not have a very strong correlation with academic performance, though one also needs to consider that the mode of data collection for goal setting had a few shortcomings. The study also indicated high correlations for both comprehension monitoring and self-checking.

While studying cognitive strategies, it was observed that some strategies had a stronger association with achievement (Dent & Koenka, 2016). Deep processing strategies help learners to make links between concepts and their comprehension, which in turn improve academic performance (Garcia & Pintrich, 1994). Dent and Koenka (Dent & Koenka, 2016) suggested that students who used deep processing strategies instead of shallow processing ones, exhibited better achievement on academic tasks. Also, shallow processing strategies were found to have a negative correlation with achievement. This means that when students use strategies that are only aimed at rote learning, it might actually undermine their academic achievement. It is therefore important for students to apply the concepts that they have learnt for better understanding.

The research also found that elaboration, which is another kind of a shallow processing strategy, was positively correlated with achievement. This could be because elaboration as a single strategy could rely on other strategies which might have some effect on the overall assessment of data. Although deep processing strategies were anticipated to have a positive effect on academic performance, it was found that the effects were not significant in middle or elementary school. Assessments in these grades required effort and social behaviour (Eccles et al., 1993), more than deep processing of concepts, therefore it failed to have a significant impact on their performance (Brookhart, 1994; McMillan & Workman, 1998).

Dent and Koenka suggested that in both the meta-analyses, there was a strong correlation between self-regulated learning and academic performance for a few academic subjects as compared to others (Dent & Koenka, 2016). The correlation was considerably stronger in subjects like social studies and science than in math. This shows that performance on academic tasks in social studies and science improve through the use of self-regulation strategies. Both science and social studies therefore had a stronger correlation to academic performance than either math or english.

Students' Grade Level

Though the relationship between self-regulated learning and academic achievement has not been explored to an extent that one would expect, there are clear indicators to depict the correlation between performance on academic tasks and the use of cognitive and metacognitive strategies. While looking at students' grade level, the strongest correlation appeared from kindergarten to grade two, though there was a lack of coordination in the self-regulation of learning among younger children (Patrick, 1997). Since most of the assessments at this stage are informal, young children are unable to identify the need to learn or use these strategies (Brookhart, 1994; McMillan & Workman, 1998). This could be because in early elementary school, children are evaluated on their social behaviour, which becomes a significant element of classroom teaching and assessment (Patrick, 1997). Hence, students who are able to regulate their behaviour are considered more regulated than the others.

As students moved from grade three to grade five, the connection between metacognitive processes and academic performance became weaker. It again became stronger as children transitioned to middle school as learning takes centre stage at this point, requiring learners to use more strategies to attempt learning tasks. However, the meta-analysis further suggested that as students moved to high school, the correlation became significantly weaker. This may be due to the high expectations in terms of learning behaviour and students' first exposure to a variety of subjects, assessments, and other influences that affect achievement (Benner & Graham, 2009). As students moved to grades 11 and 12, it became suggestively stronger again, as tasks became more complex and students relied more on different strategies to deal with them. The use of cognitive strategies in high school helped children to progress in their academic performance as they are required to have a deeper conceptual understanding of learning tasks (Brookhart, 1994; Crooks, 1988; Eccles et al., 1993).

9.4 <u>Conclusions</u>

As curricula become more complex and the focus shifts from rote learning to a deeper understanding of concepts, it has become imperative for learners to be active participants in their own learning. A large amount of research done in the past focuses on strategy intervention that helps students with their learning. This not only helps students become more regulated and in control of challenging, new or complex tasks, but also helps them to become life-long learners.

As discussed above, most of the studies and the meta-analysis of recent literature have suggested a positive correlation between strategy intervention and academic achievement and motivation (Zimmerman & Bandura, 1994; Zimmerman & Schunk, 2001a). Though the three meta-analyses have highlighted different findings, it is very evident that SRL has a strong correlation with academic achievement. The use of both cognitive and metacognitive strategies positively influences the performance of students on academic tasks while learning. Of the metacognitive strategies, the first important one is metacognitive monitoring and control as it helps students to understand when they face challenges in learning tasks and when the use of strategies would be most beneficial (Patrick, Ryan, & Pintrich, 1999; Winne, 1995). Self-monitoring also leads to self-control, which helps students to adjust their method of approach to a task according to the internal feedback received (Pintrich, 2000b; Winne, 1995). Self-monitoring and self-control are also helpful for students who do not have enough skills for self-regulated learning to become involuntary (Winne, 1996). The other metacognitive strategy that is highly effective is planning. Strategic planning helps students to strategize their approach to a task by doing an analysis of its characteristics and utilising prior knowledge which would help them realise their goals (Winne, 1996). By analysing a task, students are able to understand its complexity and devise appropriate strategies to deal with them.

Of the cognitive strategies, deep processing strategies that improve comprehension and retention are more effective than other strategies based on rote learning. Deep processing strategies also help with information processing, thus ensuring a better and long term understanding of concepts. Elaboration and organisation are also deep processing strategies that help students to understand their learning and lead to greater autonomy while attempting related tasks (Dent & Koenka, 2016). Though reviewing as a strategy is not used much by students, it is an important strategy as it gives students more opportunities for reinforcing, integrating, and improving their understanding of learning resources (Dent & Koenka, 2016). The findings presented (Dent & Koenka, 2016) here suggested that goal-setting had a weaker correlation with academic performance. However, it is an important self-regulated learning skill as it helps to create a standard against which students can compare their performance (Boekaerts, 1996b). Setting goals encourages metacognitive monitoring and enables them to focus their energies and resources (Locke et al., 1981). .

There is still a gap in research on the efficient use of strategies, which strategies are most effective and how they can be used by teachers inside the classroom to help learners with varied abilities. A thorough analysis of the different studies helps us to understand the effectiveness of various components of strategy intervention so that they

can be a part of teacher training in schools. The next step, therefore, would be for teachers and researchers to collaborate on how these programs can be best implemented in the classroom.

Chapter 10- The role of Feedback in Enhancing Self-regulation Strategy use among Children

As teachers and educators interact with and assess learners in their classroom, they can easily identify the ones who are completely in charge of their own learning. These learners engage well in their learning and are most effective in understanding and dealing with the learning process. In other words, they can self-regulate their learning by setting their own goals, accessing resources that will help them work towards them, understanding which strategy would be most effective for a particular task and eventually monitor and evaluate their own performance. As they go through this entire process, they are able to adjust their goals or strategies based on the internal (from themselves) or external (from others) feedback that they receive. They therefore, use feedback as an effective tool to change or adapt their knowledge, skills, cognitive processing and strategy use as they gear themselves for successful learning.

10.1 The Role and importance of Feedback

Butler and Winne (1995) provided a model of self-regulation in which they emphasised the significant role of feedback. Following a thorough examination of cognitive activities, they suggested that feedback acts as an agent that promotes self-regulated learning among students, motivating them to engage in self-regulated learning tasks (Butler & Winne, 1995). Other self-regulation models have also emphasised that both internal and external feedback are important factors for learning effectively (Drowns et al., 1991; Zimmerman et al., 2003). . The feedback given to learners is the most important aspect for any learning task. For instance, when teachers provide students constructive feedback during or after an activity, provide progress reports, make corrections in notebooks, they are giving intentional feedback to the student. As students interact with their environment during the learning process, they also receive unintentional feedback in terms of positive and negative outcomes. Most students are constantly seeking out signals from their environment as a form of feedback on how well they are doing, and may even be proactive in seeking or requesting feedback from others (Hawk & Shah, 2008). Through their self-regulated learning model, two researchers (Nicol & Macfarlane-Dick, 2006) suggested that feedback is instrumental in promoting self-regulation. They suggested that external feedback includes feedback by peers or teachers' remarks or corrections. Internal feedback is the student's constant monitoring and consciousness of results, and their assessment of their efforts, which in turn leads to the development of an internal self-regulatory process (2006).

Teachers provide a lot of feedback to the students through the teaching strategy 'scaffolding.' This can be done through a visual feedback such as presentations and visual cues or through verbal feedback like providing cues or giving explanations, aimed at helping the learner to bridge the difference between what he or she can do independently and the high demands of a learning task (Chung & Yuen, 2011). Vygotsky (1978) describes this strategy as a narrowing of the 'zone of proximal development' (ZPD). ZPD was defined by Vygotsky (1978) as the distance between the level of development that the student is at and the level that can be achieved through supervision from adults and peers. Feedback is a decisive aspect in progressing learning(Eggen & Kauchak, 2001). Hawk and Shah (2008) emphasise that teachers must relate with their students in a positive manner and offer them productive feedback regarding their progress and how they can learn effectively. Similarly, researchers emphasise the importance of external feedback and suggest that feedback should include giving clarity to the learner about the performance expected, helping students self-assess their learning, providing encouragement and motivation (Nicol & Macfarlane-Dick, 2006). This positive feedback given by the teacher helps students in goal setting, using learning strategies and managing their emotions. Feedback not only helps learners in thinking and strategy formulation, but also effects their feeling about themselves depending on the emotions they generate. As Butler and Winne (Butler & Winne, 1995) point out, the role of feedback in learning is facilitated by the learner's belief and knowledge. Prior experiences will have a huge role to play in how a learner interprets his success or failure. The learners' interpretation of external feedback therefore has a significant influence on the acquisition of self-regulation and self-efficacy (Chung & Yuen, 2011). Feedback enables students to understand their own learning process and it helps them to adapt or change the self-regulation strategies that they use to accomplish a given task. If students receive positive feedback regarding their performance on a task, they will continue the use of that self-regulation strategy, or change it if the feedback is not positive.

10.2 Feedback, strategy use and self-efficacy

Feedback is considered effective if it helps students to use self-regulated strategies targeted at improving academic performance (Nicol & Macfarlane-Dick, 2006). The students who work on the feedback provided to them are able to self-regulate their learning by being responsible for their learning process, doing a reflection of the quality of their work, and making changes to their learning according to the feedback received (Zimmerman, 2008). Though feedback is a crucial aspect of the learning process, Bourke (2014) suggested that it does not automatically translate into better strategy use, academic performance on future assessments, but positively influences the overall

learning outcomes. The emotions generated during the feedback also have a great influence on how it will be used in the future. Students who lack faith in their ability to perform optimally on future assessments are less likely to engage in self-regulation, causing a dip in future performance. However, when feedback induces confidence in students, they are most likely to use this feedback to regulate their learning. Butler and Winne (1995) proposed that learners do an integration of feedback received externally with their own internal perception regarding the quality of their work to produce a response that could drive them to perform better. Thus, if the purpose of feedback is to enhance performance, increase self-efficacy, and activate self-regulatory processes, it is important how it is perceived by students.

10.3 Students' use of feedback and how it effects their performance

Feedback is a very important determinant of student success. It not only assists students in becoming aware of their own strengths and weaknesses, but can also provide clues or hints about how students can improve (Hattie & Timperley, 2007).

However, feedback alone is not enough to guarantee that learners will use it to implement suitable learning strategies and better their academic performance (Hattie,1999). It is important to understand how feedback is understood and used by students (Bandura, 1986; Hattie & Timperley, 2007). This can be explained through the example that when provided negative feedback on a task, students with high self-efficacy will respond more favourably as compared to students with low self-efficacy who might try to evade such feedback (Hattie & Timperley, 2007). It is also found that high achieving students are most likely to use feedback to enable self-regulatory tasks, whereas low achieving students engaged in little self-regulation (Orsmond & Merry, 2013).

Different kinds and levels of feedback

Feedback is information provided by a mediator regarding features of one's performance or understanding (Hattie & Timperley, 2007). It can be generated internally by a person, but it is usually provided by the teacher or the environment (Butler & Winne, 1995). Hattie and Timperley (2007) identified four levels of feedback as that of task, process, self-regulation, and self. Whereas feedback related to task, process, and self-regulation benefit students in their learning, it is not so effective when it is focused on the self (Boekaerts & Corno, 2005). Hattie and Timperley (2007) also categorized feedback as being formative or summative, depending on when it is provided to the student during the learning process. Formative feedback is usually provided early enough in the learning process, whereas summative feedback is given towards the end and is usually in the form of marks or grades. Nevertheless, the most effective type of feedback is descriptive feedback commentary that recognizes the strength and weakness of the student, identify

difficulties, and make recommendations on the use of strategies (Lipnevich & Smith, 2009).

There are also four different levels of feedback as suggested by Hattie and Timperley's (2007) feedback model. Feedback at a person level involves telling a learner directly about his performance. Though it may be effective in the current situation, it may not be effective in the long run. Feedback at this level is usually broad and devoid of task-specific information, and may not provide information about students' specific task-related skills. It therefore makes it difficult for students to understand the gaps in their learning, identify their weaknesses and work on them. They may also begin to view their performance to be linked to their intelligence (Cleary, 2018). If they perform well and receive positive feedback, they associate it with their general ability or intelligence. However, they tend to do the same when their performance is not up to the mark and believe that intelligence is a fixed component. This generates a high level of anxiety, stress and feelings of helplessness while appearing for exams, tests and assessments. Cleary (2018) therefore emphasises the importance of three feedback levels which are aimed at helping students learn at an optimum level. These three levels are task outcome, task process, and SRL process. All these levels help direct the attention of the learner towards their learning activities, analyse their performance on that activity (task outcome feedback), understand how they performed the activity (task process feedback) and reflect on the self-regulatory skills that they used during that activity (SRL feedback).

Cleary (2018) describes task outcome feedback as corrective feedback which provides students with information on their performance on a task. This could be in the form of grades, corrections or statements provided by the teacher after an activity. Examples of corrective feedback include, 'You got 9 out of 10 correct on the quiz'; 'You did not provide an explanation of your answer to the mathematics problems'; 'I need to see more details to support your arguments in these paragraphs'. This category of feedback is very helpful as it helps students to understand where they faltered instead of making them feel that they lack knowledge about the topic (Hattie & Timperley, 2007). From an SRL perspective, task outcome feedback is very important because it helps students to answer the self-evaluation question, 'How did I perform on this learning activity?'. This further helps students to do a reflection of their own performance. However, it does not always guide students to improve themselves. To be able to do this, students need to understand what attributed to their success or failure, and the possible ways in which they can better their performance (Cleary, 2018). Students therefore need to understand their own approach to a task so that they are able to understand how they can attempt a task or activity differently in the future. That is, students need ideas and information that will nudge them to think differently about learning or completing an activity in the future.

This kind of information provided by the teachers is called the process feedback. This is further differentiated into task process feedback and SRL process feedback. Cleary (2018) defines task process feedback as the use of strategies and procedures by students which have a direct link to learning. The SRL process feedback is defined by him as the categorization of task-related activities where students approach activities with a specific   mindset, implement strategy use and monitor their performance, and do a reflection of their learning process. SRL process feedback differs from task process feedback as it highlights how students manage, regulate, or direct their thoughts and behaviours during task completion. All forms of feedback are important to developing strategic and reflective learners. They are only different in terms of where they direct students' attention. Task outcome feedback helps students to focus their attention on their success or failure (self-evaluation), whereas task process feedback and SRL feedback help students to think about their behaviours and approaches to learning. The feedback provided by the teacher is therefore important as it affects the students' self-reflective thoughts.

10.4 How teachers can make feedback more effective

Cleary (2018) suggests that there are many ways in which feedback can be delivered effectively. In most instances it will be dependent on the student characteristics (e.g., performance level, self-efficacy), the nature of the task assigned (e.g., challenging vs. easy; short-term vs. long-term). However, only providing feedback is not enough. It is important for it to be effective in the sense that it is actually utilised by the learners to improve their performance on tasks.

However, most students don't use feedback effectively thus leading to a lot of disappointment and frustration among teachers. Students' unresponsiveness to feedback highlights an important feedback principle that the effectiveness of feedback is not judged by the level or type of feedback, or the way in which information is provided to the students; it is largely influenced by the thinking and understanding it generates among students and how they act on it. Dylan Wiliam, a feedback scholar, emphasised the importance of the student in the feedback process and stated that it was impossible to understand the process of feedback without focussing on the emotions it generates among students (Wiliam, 2012).

Good and effective feedback can help place students on a pathway of empowered strategic thinking and action. However, several factors influence the effectiveness of feedback, such as the way in which teachers provide feedback and also the beliefs, perceptions, and characteristics of students who receive it. It is important for teachers to

use feedback as a constant exchange of information between them and their students. They must prioritise things that they want students to think about as part of a learning activity and provide them feedback accordingly. They must also keep in mind their primary goals and objectives for providing feedback and then openly share these ideas with their students.

10.5 Encouraging the development of self-regulated learning skills through feedback

Feedback given by teachers is very important as it assists students to adapt their learning and enhance their performance on academic tasks. The students also play a significant role in the feedback generation process. Most of this is done through self-monitoring and self-observation which is a very important component of the SRL cyclic feedback loop (Cleary, 2018). Self-observation refers to "the internal process through which students gather information about their thoughts, behaviours, and performance" (p. 121). It helps them understand their own learning behaviour, like how they plan for an activity, how they manage time, the strategies they use while attempting a task etc. They are able to identify the "contextual factors that influence those behaviours" (p. 122) like their lack of attention, distraction from outside, and also their performance outcomes which helps them relook at their learning behaviours and change or adapt them to enhance their performance. The process of feedback is important because it enables students to produce more information than what is provided by the teachers (Cleary, 2018).

Though teaching self-monitoring to students may be time-consuming, it has many long-term benefits. Firstly, students become more independent in assessing their progress, thus letting go of their dependency on the teacher to provide them feedback for each task. As students track their own learning process, they attain more specific information than what could be provided to them by their teachers. Helping students self-monitor their own learning can also help develop their autonomy as it helps them become more responsible and competent (Cleary, 2018).

Second, self-monitoring helps to enhance student motivation as "it provides a more private space from which students can reflect on their behaviours and grades" (Cleary, 2018, p. 124). . If students perform poorly on an assignment, self-monitoring can help them deal with the pressures of the teacher's feedback as they can access their own progress. This is even more applicable to students with learning difficulties who may fall behind their peers on their performance. Self-monitoring can help these students deal with intense negative emotions like as embarrassment and shame, which may follow failure on academic tasks (Cleary, 2018). Finally, self-monitoring makes students more

aware of their own strengths and weaknesses, thus giving them clues about how they can improve themselves.

There are many ways in which students can monitor themselves as they learn. Two broad categories are;- performance outcomes related to completing a task and attaining good grades; and task behaviours which include use of strategies (Harris et al., 2005) . Helping students monitor their learning outcomes and the strategies they use are important in helping them understand and improve their learning.

Helping students to monitor outcomes helps students to understand where they stand in terms of their own learning. Once students understand their own learning outcomes, they are able to assess the strategies they have used and will eventually adapt and change them to improve their performance. One important technique introduced by researchers to help students to monitor their learning is graphing (Calhoon & Fuchs, 2003; Kitsantas & Zimmerman, 2006). Graphing is important as graphs present highly effective visual display of information which helps students to recognize tendencies or patterns in their learning over time (Timothy J. Cleary, 2018). They provide visual inputs to students so that they can recognize the patterns in their learning and becoming more actively involved in shaping their learning outcomes.

Monitoring processes helps students to monitor their behaviour and use of strategies while attempting learning tasks. Helping students "to THINK IN THE LANGUAGE OF STRATEGIES is a key aspect of SRL instruction" (Cleary, 2018, p. 126), and can be achieved by helping students monitor their learning processes. It helps students understand how they approach learning tasks and which strategies have been most effective for them. It also helps them seek strategies that will help them make academic gains.

Both self-monitoring and teacher feedback are important processes that enable the SRL process to breathe and flourish (Cleary, 2018). Without effective feedback, the self-regulated learning process will not be able to thrive. It creates student agency and independence, and helps them to eventually take that important step towards greater responsibility and ownership for their own success.

Chapter 11- Self-Regulation Skills and Strategies across the New Zealand curriculum and schools

11.1 Changes in the teaching methodology in New Zealand

The teaching and learning methodology in New Zealand has undergone a huge change in the past two decades. Before 2003, schools in New Zealand were expected to deliver a balanced curriculum and to assess every learner against a number of very specific achievement objectives. To keep up with this expectation, the curriculum delivery became very prescriptive and there was a huge emphasis on planning and assessment. The ERO (Education Review Office) report (1999) suggested that teachers spent a lot of time in order to meet these expectations and created paper-work and reports that had little educational value. This greatly curtailed the creativity of teachers and schools. Schools were not able to create programs that best suited their needs and were in compliance with the requirements of the community. The focus shifted towards the covering of the curriculum, instead of teaching and learning. Martin and Alderson (2007) referred to this as outcomes-based education (OBE), with little attention to the learning needs of the students. However, a reconsideration of National Administrative Guideline (Ministry of Education, 2001) provided schools with greater opportunity and space to incorporate learning and skill areas in the teaching process, thus bringing a pedagogical shift in the approach to teaching, making it more child-centred. Over the years, schools have become more creative and innovative in their delivery of the curriculum. The focus is now on encouraging students to become independent learners, share their goals and aspirations, and encourage them to self-assess their own achievement. Schools have now incorporated various learning theories like Gardner's Theory of Multiple Intelligences (Gardner & Hatch, 1989), Edward de Bono's thinking approaches (De Bono, 1985), Inquiry Learning (Bartlett, 2005) and Emotional Intelligence (Goleman, 1995) These days, schools also offer open and Innovative Learning Environments (ILE), which provide a collaborative, flexible space that can evolve to meet the needs of all the learners. It provides all learners with choices while learning, and enables better collaboration between the students and teachers. It allows students to work on their own, thus encouraging independent learning and helping them develop skills to collaborate and use different strategies to enhance their own learning, linking it very closely to the components involved in self-regulated learning.

11.2 Key competencies and how they link to self-regulated learning strategies

In keeping up with the focus on the learner, the New Zealand Curriculum recognizes five important competencies which are thinking; using language, symbols and texts;

managing self; relating to others; and participating and contributing (MoE, 2017) . These competencies are more complex than skills and are used extensively as guidelines for educators. They use knowledge, attitudes and values in ways which lead to action (MoE, 2017). These competencies form the centre of the learning process and link closely to components of self-regulation. Students who can regulate their learning, are able to use these competencies along with all the other resources available to them. These include their own individual goals, resources like people around and the knowledge and skills available in the community, value systems, cultural tools like language and symbols, and the information obtained through different learning areas (MoE, 2017). As learners advance their skills in different competencies, they are also inspired to use them, understanding when and how to do so and why. A closer look at each of these competencies helps us to understand how they link closely to the components of self-regulation, and how they both eventually attempt to create independent, lifelong learners who actively participate in the learning process.

Thinking

The first competency, thinking, uses the creative, critical, and metacognitive processes to understand information, experiences, and ideas (MoE, 2017). . Learners can use these processes to advance their understanding and knowledge, make decisions, and guide their actions. Students who are competent thinkers and have good problem-solving abilities, are proactive in seeking, using, and creating knowledge. They can do a reflection of their own learning, use personal knowledge, are inquisitive, and challenge the foundations of hypothesis and perceptions. This key competency focuses on both critical and creative thinking, which are outcomes of the 'problem solving' skill. It also includes skills like discrimination, analysis, organisation, evaluation and synthesis (MoE, 2017).

Thinking and its link to Self-Regulated Learning

Students with good thinking competencies are able to actively seek, create and use knowledge. They are able to do a reflection of their own learning, and are able to involve themselves in the learning process by using their knowledge and intuitions, and asking questions (Cubitt, 2006).

Zohar and Schwartzer (2005) suggested that thinking competencies can be developed in students by first introducing them explicitly. Teachers have the opportunity to introduce a variety of thinking patterns and skills to their students. It enables the students to deal with difficult tasks by using different thinking tools and approaches. They are able to apply these thinking skills in a variety of contexts, thus becoming better equipped to work

independently. When teachers provide their students with feedback on their learning, they are able to assess the development of their thinking skills, thus involving themselves in their learning process. The role of the teacher is also important in developing this competency, specifically for students who face difficulties in their learning and are therefore unable to use these strategies on their own (Schagen & Hipkins, 2008). Perkins (1991) described the development of thinking competencies to be an active process which takes place when students become conscious of their existing patterns and strategies, and replace them with more effective ones. They are able to organise their own thinking in such a way that it makes the learning process more effective for them. The various steps involved during the acquisition of this key competency can also be seen in the Cyclical Model given by Zimmerman (2000). The first step of the model is the forethought phase in which students analyse the given task and plan to achieve the goals that have been set. This is followed by the performance phase in which the students utilize a number of strategies to attempt the given task and monitor their progress. The last stage is the self-reflection phase in which students make assessments of their performance. This is an important step as it decides how the students will approach learning tasks in future.

Using language, symbols, and text

This competency consists of working with and drawing meanings of the codes in which knowledge is stated. Languages and symbols are classifications that people use to represent and communicate information, experiences, and ideas. Language helps people to communicate through different forms of text like written, verbal, and visual; educational and creative; informal and formal; mathematical, scientific, and technological. An understanding of language and symbols helps students to communicate their experiences, knowledge and ideas. Students who have competence in the use of language, symbols and texts have a good understanding and usage of words, numbers, images, movement, and technology in a variety of contexts. This competency helps us understand how our perception of the world is created through language, and how we use language in multiple ways to accomplish various tasks. It includes aspects like giving and receiving information, ideas and feelings; using numeracy, literacy and information skills; adapting to new ideas and situations; and understanding a variety of social and cultural settings (MoE, 2017).

Using language, symbols, and text, and its link to Self-Regulated Learning

The knowledge of language, symbols and text by students is important in helping them become independent learners as it underpins all areas of learning. Students who have

competence in the use of language and symbols are able to use words, numbers, images and technology in a variety of contexts (Schagen & Hipkins, 2008). These students also have an understanding of how language and symbols affect other people and how they can be used to communicate with others more effectively (Cubitt, 20016). They therefore actively engage in the learning process and use language to build on new knowledge (Gilbert, 2005). They are able to use a variety of ways to convey ideas, assimilate information and understand concepts at a more deeper level. The use of language and symbols is of specific importance for children who have learning difficulties as they are able to not only have a better understanding of their learning, but are also able to use this to express ideas and contribute in classroom discussions.

Managing self

The third competency, managing self, is largely dependent on the students' motivation to pursue activities. Students who view themselves to be capable learners are able to manage themselves more effectively and are therefore more innovative, resourceful, dependable, and strong. They are able to set goals for themselves, create plans and strategies to work towards their goals and set high standards for themselves. Such students have an understanding of when to lead, when to follow, and when and how to work autonomously (MoE, 2017).

Managing Self and its link to self-regulated learning

The New Zealand curriculum talks about the importance of 'learning to learn' so that students develop learning autonomy and are able to self-regulate their own learning, which is also a component of the key competency- managing self. Though all of the key competencies are aimed at helping students become more aware of their learning and engage actively in the learning process, 'managing self' incorporates significant features of self-regulated learning. It is considered to be a competency which is a combination of skills, knowledge, attitudes and values which, along with metacognition, helps students in controlling and improving their own learning and develop learner identities. It incorporates skills required for setting long-term and short-term goals and working towards them, managing time, planning, monitoring and evaluating the self and taking control of one's learning, all of which are considered important for lifelong learning.

This competency is also closely linked with self-motivation, where students perceive themselves to be capable. Such students are resourceful, consistent and strong. They set individualised goals, make plans, manage their tasks, and set the bar high for themselves. They are also able to devise strategies to deal with difficult and challenging tasks, much like self-regulated learners.

Relating to others

Relating to others deals with the ability to interact with a large number of people in diverse contexts. Skills in this area helps students to engage themselves actively and meaningfully with others, understand different viewpoints, and are able to share experiences and ideas with others. They can work co-operatively with their peers and are willing to learn new things and take on new roles.

Relating to others and its link to self-regulated learning

Relating to others and working in collaborative environments enables students to understand their own learning patterns. They do so by listening to others, comparing their ideas with them, clarifying doubts and sharing their thinking. Different members of the group may have expertise in different areas and there is a lot that students can learn by observing and imitating the ones who perform better than them (Wells, 2002). This could help them understand the strategies used by their peers to solve their learning problems and may even try and imbibe the same. Sociocultural and situated learning theories suggest that interactions with others can play an important role in cognitive development as students learn new skills by observing others use them in actual contexts (Schagen & Hipkins, 2008). These can help students learn the skills and strategies to regulate their own learning.

Participating and contributing

This is the last of the key competencies and deals with being an active member of the community. Communities include the family, school, neighbourhood and whanau, and usually come together to learn, work or celebrate. A competency in this area includes the ability to be a contributing member of the group, make connections with others, and generate chances for others in the group. Students who engage themselves actively in the community have a good understanding of the significance of harmonizing rights, roles, and responsibilities and making contributions to the value of social, cultural, physical, and economic environments (MoE, 2017).

Participating and contributing and its link to self-regulated learning

This key competency is important as it establishes an in-depth understanding of the learning patterns used by students and their intrinsic motivation to share it with others. It helps students in developing the ability to assimilate their learning, devising strategies of

self-regulation and are eventually sharing it with others. The main goal of this competency is to enable students to intrinsically engage with others and to develop the dispositions for lifelong learning (Schagen & Hipkins, 2008).

Just like self-regulated learning strategies, key competencies also need to be taught. Students develop higher-order 'thinking' skills by analysing and evaluating their own critical and creative thinking. This competency not only has a strong correlation to self-regulated learning, but is also an important one that needs to be taught to students who face learning difficulties. Perkins (2003) suggests that it is important to learn some specific strategies to organise thinking, but says that it is important that these must be easy to use by the students and also easy for the teacher to incorporate within classroom lessons. These strategies will help students in adopting and internalising the thinking process, and use them while learning independently. Another competency with a strong link to self-regulated learning is 'managing self'. Students who are able to manage themselves are able to set their own learning goals and work towards them (Schagen & Hipkins, 2008). They are aware of their own limitations and are able to devise appropriate strategies to achieve their goals. Learning to learn or self-regulated learning is an aspect of managing self. It brings together skills, knowledge, attitudes, along with motivational factors and metacognition to help learners become more autonomous in their ability to learn (Absolum, 2006). The key competency of 'participating and contributing' is also an important one as it provides students with a focus to plan meaningful action to share their learning and brings all the other key competencies together. The Shared Self-Regulation of Learning or the SSRL model given by Hadwin, Järvelä, and Miller (Hadwin et al., 2011), also talks about the importance of collaborative work. They suggest that collaboration has several advantages for learning and helps students to utilize appropriate strategies, plan, reflect and adapt to other students in the group.

The whole idea of developing key competencies is built on the notion of lifelong learning. Just like competence in one area does not ensure competence in another, the key competencies need to be built throughout life (Hipkins, 2006). A curriculum that concentrates on the development of the key competencies will be relevant even beyond school as it would create lifelong learning gains (Hipkins, 2006).

11.3 <u>Implementing key competencies within the classroom</u>

The key competencies build on the metacognitive, cognitive and skills aspect of learning. The implementation of these competencies within the classroom will require some adaptation. At the micro-level, students need to be provided with the resources required

to attempt learning tasks, along with help through strategies like scaffolding, keeping the key competency at the centre of the learning task. They should be provided with prospects to learn and initiate self-directed learning (Hipkins, 2006). This resonates closely to providing opportunities and direction to students to self-regulate their own learning. At the meso-level, teachers will need to plan learning tasks aimed at building the key competencies among students (Hipkins, 2006). They need to become a part of the curriculum delivery model and teachers need to be prepared to incorporate them in their day to day classroom planning. The macro-level will involve the school community who need to ensure that the key competencies are a part of the vision and principles of the school. The school leaders, policy makers, parents and whanau must collectively involve themselves to build the key competencies through activities planned in school and at home. The aim is to help students gain the skills to make them independent and lifelong learners.

11.4 <u>Autonomy in learning within New Zealand Schools</u>

Along with the key competencies, the New Zealand curriculum encourages learners to reflect on their own learning so that they are able to understand the learning pattens, take responsibility for their own learning and play a role in classroom decision-making (MoE, 2017). Students are able to be more productive in their learning "if it is reflective, intentional, and collaborative, practices which may not come naturally but can be taught and can lead to pupils taking responsibility for their own learning" (Black et al., 2004, p. 126). Hattie (2009) suggests that there is a high positive impact to students' learning when they set goals that challenge them and provide them opportunities for directing, evaluating and redirecting their learning, and receive effective feedback from their friends, teachers and parents which helps them gain a better understanding of their own learning process. Self-efficacy or a learners' belief in themselves is also considered an important factor that predicts whether a learner will be able to use strategies to enhance their learning (Artlet, Baumert, Julius-McElvany, & Peschar, 2003). Students who understand their own learning patterns are able to make the most of the choices available to them in school. They are also able to utilise feedback provided by teachers and whanau to set future goals and decide on the next steps in their learning. "Empowering students to become more self-directed learners and helping teachers and parents further develop these skills in their children can significantly increase students' motivation and achievement in school" (Cleary & Zimmerman, 2004, p. 549). The New Zealand teaching process lays a lot of emphasis on understanding the language, culture, abilities or disabilities, and prior experiences of students as it helps them decide on the best approach to teaching them effectively. Such understanding helps them to support the

Māori and Pasifika learners, and those with special education needs. Inclusive classrooms and close collaboration between the teachers, students, and whānau is helpful in supporting and guiding all students in the learning process.

11.5 Study of the school charter and vision statements of five schools in Auckland

Given the parallels between SRL and the key competencies, and their importance in guiding the learning process of students, I wanted to understand how these were incorporated within the New Zealand classrooms. The easiest way to do this was to study the school charter and strategic plan of schools to see if they included reference to SRL, at least implicitly, in their policy documents and curriculum delivery plans. The charter is the key planning document that lists the school's objectives and targets for the year. It lays the guidelines to set teaching and learning programs and activities in the school. The charter establishes the mission, aim, objectives, directions and targets of the board that gives effect to the government's National Administration Guidelines (NAG) (Education, 2019), and the priorities outlined by the board. Under the National Administration Guidelines (NAG 2a) (Education, 2019), the board needs to develop a strategic plan which explains how they are working on the NAG guidelines through their policies and programme planning. A school charter must include all annual and long-term plans, specifically the strategic plan required by NAG 2(a). The Ministry of Education requires that all boards must prepare and maintain a charter for the school, outlining key areas of focus along with short-term and long-term plans. All aims and targets included in the charter should be evidence-based and must include the strategic plan. It is a statutory requirement to make the school's annual report available to the public on an internet site.

In order to identify the key areas of focus and understand if there was an emphasis by schools to develop key competencies and encourage independence in learning, I decided to study the charter of different schools. To understand the vision of different schools to encourage strategy and skill teaching in the classroom, I conducted a school discourse analysis whereby I studied the written text available on their websites. Discourse analysis is a qualitative research technique and it helped me understand how the key competencies were incorporated in the curriculum by studying the school principles, charter and strategic plan available on their public domain. The aim was to study the school charter of five random primary and intermediate schools across Auckland.

Although I set out to choose five random schools for my study, I realised that most of the school websites did not have enough data available on their websites. There was not enough information regarding their strategic plan and how the key competencies are incorporated to create greater autonomy while learning. In order to obtain a diverse range of data and gain complete insight into the information presented by schools, I decided to use the method of purposive sampling. This method is a judgmental or selective sampling method that allows the researcher to reach a targeted sample quickly. I thereby continued to go through the websites of various schools till I found five schools that could provide a range of data for my research. The schools that I researched were all primary and intermediate schools with a range of decile ratings. Since the focus was the study of the school charter and plan, I did not limit my search to any one area and continued searching through the websites of all schools in Auckland till I found five schools for the study.

School A

Vision, Principles and Strategic Plan

School A talks about a balanced curriculum with a focus on the basics of literacy and numeracy, while providing opportunities to learners to develop creativity, use higher-level thinking skills for inquiry and develop effective communication skills. Both the school's baseline data and the strategic plan focus on the importance of e-learning and the use of digital devices. The school encourages an environment where learners can make responsible choices, promote respect for one another and are highly engaged in differentiated learning programmes. The strategic plan also emphasises the development of personalised learning across the curriculum. The annual improvement plan for reading and writing ensures that students understand the purpose of writing and are explicitly taught a range of tools to plan their writing.

Curriculum links to key competencies and components of self-regulated learning

The strategic plan keeps student learning at the centre and encourages them to be confident in their ability to learn, see themselves as active participants and engage purposefully in learning. They are taught the skills of learning, thus hinting on components of metacognition. Teachers break learning into steps and share the success criteria with the students. They discuss and display exemplars that show expectations at this level, thus making feedback explicit and effective. They also give students the opportunity for effective self, peer and teacher feedback and feedforward, along with proofreading and editing skills, all of which are highly effective in building self-regulation among children. Students are highly engaged in differentiated learning programmes. Teachers design programmes which are receptive to the individual needs of students.

They are taught the skills of learning and this is reflected in learning outcomes and high levels of student achievement.

The annual improvement plan for reading and writing explicitly teaches students to use a range of tools to plan their tasks. They break learning tasks into steps, and discuss and display exemplars that show expectations at this level. The teachers provide daily modelling and provide explicit skills of rereading, proofreading and editing. Two more self-regulated skills that the school focuses on are goal setting and reflection. They encourage students to set weekly goals and evaluate these realistically. They also help them to reflect on their learning while making new goals. Many components of self-regulated learning like goal setting, imagery, scaffolding, elaboration, reflection and feedback are implicitly mentioned in the charter. The aim is to create student autonomy in learning and help them work towards their goals.

Learning support for children who face learning difficulties

Teachers acknowledge the learning needs of each child and design programmes accordingly. The school encourages all students to strive for their full potential, recognising and addressing individual differences. It provides opportunities to extend and enhance learning for more able students and to accelerate learning for those with identified learning needs as well as new learners of English.

School B

Vision, Principles and Strategic Plan

As I went through the documentation and plans listed by School B, I found that the principles suggest that the curriculum encourages and provides opportunities for all learners to explore their wonderings. It gives and creates opportunities for learners to learn from and with each other, and it helps the learners to grow their capacity through the Key Competencies. The curriculum helps to build connections through and across all learning areas and their life both now and in the future. The school encourages knowledge and learning needs to be continually used in new situations across different contexts for new purposes. The school emphasises the 4Cs which are capability, curiosity, connectedness and collaboration.

Curriculum links to key competencies and components of self-regulated learning

The most important component of the website of School B is their Learning Model which addresses the key question- Why are you learning this? A question like this helps

students ask questions related to learning and also evaluate where they stand, helping them take the first step towards self-regulation. Each piece has 'action words' to help describe some of the learning that can be associated with a particular piece and it allows the school to have a language of learning that is consistent. They are koru puzzle pieces so that they can be used in a variety of ways to support both the teaching and learning process. Each learner will decide where they start on the koru wheel- and they can use it as a puzzle to piece together their learning process for a learning adventure, this could be a pathway or cycle depending on the purpose of learning. Teachers help all learners to use this model to plan their next steps until they can do so independently. It is a unique way to help students understand their own learning process and decide on their entry points, future goals and become more independent in pursuing those goals. This is a good way to help students take responsibility of their learning and is a model that is being used by a few other schools too.

The strategic plan encourages educators to support learners to develop their understanding of how they learn and what can help them in their learning. There is also a strong focus on developing curiosity among students using teaching as inquiry to ensure 'if there is a better way, we will find it'. The inquiry focus is self-directed and based on learner interest, thus allowing them to set their own goals, make choices, manage and organise themselves, and reflect on their learning, helping them regulate their own learning process. Key competencies form a part of the curriculum planning and are deeply embedded in all activities and tasks.

Learning support for children who face learning difficulties

The Innovative Learning Environment provides each student with spaces where they can make their own choices, while being supported by their teachers. Each child has an individualised learning pathway, allowing their own entry and exit points. Teachers help students with learning difficulties to make their own goals, and support them with strategies like scaffolding, imagery, elaboration, visualisation and modelling. They use several key self-regulation strategies to help students with their learning. They encourage students to be involved in their own learning progressions, constantly evaluating their learning processes with the help of the teachers.

School C

Vision, Principles and Strategic Plan

The Charter of School C focuses on understanding and appreciating cultural diversity. The school has built an environment that encourages students to be culturally responsive. The focus of the curriculum is on building learning focused relationships

between the teachers and students. Cultural responsiveness is valued and teachers are motivated to ensure that their classrooms and other learning places reflect and value the diversity of their learners.

Curriculum links to key competencies and components of self-regulated learning

The school has set up a Montessori Academy with the aim of providing and promoting a learning system inspired by the Montessori philosophy. It helps to nurture a lifelong love of learning through self-discovery. The aim of the school is to work towards the overall development of the child and introduce activities that help in the development of cognition, emotions, physical and social skills. Children at the Montessori Academy work, learn and progress at their own pace and have individualised learning plans. However, the Montessori is only limited to two classrooms and there is no information on how the school endeavours to build learning skills and strategies among other children. There is little or no emphasis on independence to learn or how students are motivated to achieve their goals. Though the school mentions the presence of a Montessori system, there are no clear links to any self-regulation strategies that will be implemented in the classroom to help students attain their goals.

Learning support for children who face learning difficulties

The website of School C mentions that the school provides an inclusive environment to all students and addresses their diverse needs. Any further details about how the school plans to do so are not available on the school website.

School D
Vision, Principles and Strategic Plan

The school has referred to the New Zealand Curriculum (NZC) and used it as the guiding document for teaching and learning. It is working towards the implementation of all facets of the curriculum through a strong and integrated programme. Within each class, learning is organised in a way that works to meet the needs of the individuals within it. The school extensively lists out eight learning areas: English, the arts, health and physical education, learning languages, mathematics and statistics, science, social sciences, and technology. The learning acquired by students in each area forms a part of their general education and sets a foundation for later specialisation. Like the key competencies, this learning is considered to be significant in its own self and also because it opens the pathway for new learning. The school vision emphasises that learning must be based on

the natural connections that exist between learning areas and which link these areas to the values and key competencies.

Curriculum links to key competencies and components of self-regulated learning

The key competencies form the crux of the vision and principles of the school. The school reinforces the fact that people use the key competencies to live, learn, work, and contribute as active members of their communities. Competencies are more composite than skills and use knowledge, attitudes, and values in ways that lead to action. They are not separate or stand-alone and are the key to learning in every area.

The school strategic plan discusses each key competency in detail and it is an important component of all their curriculum planning. They encourage their students to use these competencies along with the other resources accessible to them. As they advance in their acquisition of the competencies, proactive students are also motivated to use them, understanding when and how to do so and why.

Learning support for children who face learning difficulties

The school ethos promotes inclusion of all students within the classroom and supports them through the skills and strategies required for learning. Though there is no explicit mention of any self-regulation strategies in the school charter or action plan, the school places a lot of emphasis on the acquisition of key competencies. This is important as most of the key competencies have a direct link to self-regulated learning strategies.

School E

Vision, Principles and Strategic Plan

The school aims to create a happy, supportive and safe environment that encourages the development of self-assured and responsible individuals. They endeavour to mentor and support students so that they are able to achieve their personal best in behaviour, efforts, performance and social interactions. The school acknowledges and appreciates cultural diversity among students and encourages them to respect each other.

Curriculum links to key competencies and components of self-regulated learning

School E lists two important aspects related to learning in their vision and charter. The first one is learning to be confident, self-managing and resilient. They plan to achieve this by fostering a happy, supportive and safe environment that encourages the development of confident and responsible individuals. The school guides and supports children to work towards achieving their personal best in behaviour, effort, achievement

and social relationships. The second aspect covered by them is learning to learn in areas of communication, collaboration, critical thinking and creativity. The school aims to do this by providing quality learning programmes that enable children to become lifelong learners and achieve personal excellence. The school will provide learning experiences, which build on children's previous and current learning and life experience. They will foster learning through a partnership between home, school and the wider community. The first aspect connects to the key competency 'self-managing' mentioned in the New Zealand curriculum and the second one involves various components of self-regulation.

Learning support for children who face learning difficulties

The school lists out details about cultural diversity but learning differences does not form a part of the school vision, principles or charter.

11.6 Conclusions

A close study of the vision, principles and charter of the five schools suggests that many schools lay a lot of emphasis on equipping children with the required strategies to learn so that learning becomes more effective, meaningful and pleasurable for the students. They plan to create lifelong learners who will be able to set goals for themselves and device strategies to enhance their classroom performance. Many schools now use inquiry-based learning in the classroom to enable students to develop valuable skills and strategies for learning. An inquiry-based learning approach creates an environment that is conducive to learning and provides students with opportunities to be actively involved in the learning process. It encourages students to participate actively in investigations, using the required skills and strategies, and to integrate knowledge to develop a deeper understanding of concepts.

According to a report provided by the Ministry of Education (MOE, 2007), the five key competencies have been created as a reference point for schools that can help them create their learning plans, school charter and culture. The basis of these reforms within the New Zealand curriculum is to help students develop skills to view themselves as competent learners and understand that their success is dependent on their own effort and strategy, and are therefore able to involve themselves in planning for their success. However, not all schools had references to the key competencies or self-regulated learning in their charter, vision or strategic plan. There was little or no mention of how independence in learning was being promoted. Hence, there is a huge variation between the planning and vision of different schools which will make the learning experience of students very different as they move from one school to the other. There is a need to

develop clearer policies and action plans in schools in terms of their strategic planning so that all schools can use the key competencies as the foundation for their plan. As mentioned earlier, the key competencies link very closely to the components of self-regulated learning and will be an important step in building independence and autonomy among students as they pursue their academic goals.

Analysis, Discussion and Future Research Implications

The journey through researching the concept of self-regulated learning has been a very enlightening one for me. It has not only deepened my understanding of the concept but reaffirmed my initial thought that it could be the key to helping students with learning difficulties in the classroom. The past few years have seen a huge surge in research into the concept of self-regulated learning as it is considered an important aspect of student academic performance and achievement in the classroom. Though there have been multiple definitions of the concept, the key identifying area has been of making the student an active player in his own learning.

Discussion from the literature review

A vast amount of research into the process of self-regulated learning suggests that it has a high correlation to academic achievement. The most positive takeaway from the literature review of self-regulated learning is that it is a concept that can be taught to students to help them become academically successful. Systematic strategy instruction will equip students with strategies and skills, specifically those students who lack the ability to learn these automatically. The task of the teacher is the most important and they need to talk in the language of strategies to help their students understand how and where to use them (Cleary, 2018). They must provide explicit instruction and structured opportunities to students to practice using strategies.

Students should be provided with enough choices, independence to choose their own ways to present information or a differentiation in the methods of assessment. They must be involved in the evaluation of their own work or provided with effective feedback so that they gain an understanding of their own learning process, and how they can improve it. However, very few teachers provide an environment for independent learning among students (Zimmerman, Bonner and Kovach, 1996). Most teachers are not able to help students build a positive perception of their self-efficacy and are therefore unable to encourage, motivate and guide them to make efforts to improve their performance. There are also a large number of students who are passive participants in their own learning and who appear to lack the will and skill to achieve academically (Cleary, 2018). It is important for teachers and educators to use systematic approaches to teach skills and strategies to students which will help them understand and enhance their own learning. The first step in doing this would be to incorporate self-regulated learning strategies in the vision and policy of the school. A study of the school charter of various schools in New Zealand implied that there is not a lot of emphasis on building independence in learning among students. Though a few schools mentioned the use of self-regulated

learning strategies like imagery, scaffolding, goal setting, elaboration, reflection and feedback as an important part of the teaching learning process, most schools did not emphasise that through their school charter. The key competencies that have been prescribed by the Ministry of Education also did not feature in the strategic plan of most schools, thus suggesting that there is a dearth of understanding of the importance of strategy intervention in the classroom and how it can build students' autonomy.

This thesis provides a critical analysis of the literature on SRL and the importance of strategy intervention to improve academic performance. It focuses on understanding the importance of systematic strategy instruction, knowing which strategies have the highest correlation with academic performance, models of SRL that can be used by teachers in the classroom, and how teachers can promote SRL for students with learning difficulties in the classroom. The study aims at contributing to the literature in the field of SRL by conceptualising the key aspects of SRL as research questions. It specifically focuses on linking the importance of SRL strategy use and the impact of instructional intervention on the performance of students with learning difficulties. By making explicit connections between SRL and key competencies used within the New Zealand curriculum framework, it attempts to create new insights and ideas. The research also provides insights on how SRL strategies and key competencies can be incorporated within the school charter and strategic plan of schools in New Zealand. This will be an important step towards building independence and autonomy among students as they pursue their academic goals.

Implications for future research and action

Through extensive review of the literature, I realised that there is a lot of research available on self-regulated learning. However, there is very little research that specifically studies self-regulation in the context of learning difficulties. Most of such research is either linked to knowledge acquisition in Math or ICT (Information Communication Technology), thus leaving out a large majority of students who might not pursue these subjects. There is a need to extensively research how students with learning difficulties can benefit from the use of strategies. More research is also required to evaluate the impact of instructional intervention on the performance of students with learning difficulties.

Most of my teaching career as a special needs teacher and the head of special needs, has been working with students with learning difficulties. Being extensively involved in teaching skills and concepts to these students in inclusive classrooms in India and New Zealand, I have deduced that they lack an understanding of the skills required to pursue learning tasks. As I worked closely with students across all ages and a variety of

curricula, I witnessed that their lack of strategy use impedes their academic performance and they are usually not able to keep up with their goals. These learners lack self-esteem, confidence in their abilities and find it difficult to deal with the pressures of the classroom. Self-regulated learning strategies could help these students considerably so that they can approach new and challenging tasks without getting overwhelmed. As discussed in previous chapters, students with learning difficulties lack the knowledge of effective SRL strategies to help them with their learning tasks. It is therefore important that strategy instruction is an inbuilt part of the teaching process. An important step would be to include components of the New Zealand curriculum, specifically the key competencies in the school charter. A charter is a key planning document that sets out a school's objectives and targets. It acts as a guide for teaching and learning programmes, and the activities of the school. For the purpose of collecting a range of data, many school charters were studied. It was found that most schools do not mention the key competencies in their vision, principles and action plan. There is no or little mention of how students would be encouraged to become independent in their learning, acquire the necessary abilities and skills, and how students who face learning difficulties will be supported through strategy intervention. Creating an alignment between the New Zealand Curriculum values and the vision and principles of schools, is an important step in creating shared values and a strategic vision. It will help incorporate the processes for teaching and learning, and the inclusion of key competencies within the school teaching process will help students gain more autonomy in their learning. It will help them self-regulate their learning, understand the learning process and become more responsible for their learning outcomes.

This could be achieved by designing a module of learning that includes components of self-regulated learning skills and is incorporated in the curriculum delivery design. The module will connect with key models of learning and provide teachers with a framework to incorporate SRL strategy instruction in their curriculum planning and delivery. It will specifically be aimed at students with learning difficulties where the introduction of these strategies will be intentional and done through explicit instruction to build strategic components. The learning module will provide a step by step guideline on how each component of SRL can be incorporated in the teaching process. The first step in this direction is to identify strategies that are effective in improving academic performance. The key strategies that are effective in helping students and can be used specifically with students with learning difficulties include self-monitoring (to help monitor their progress at regular intervals); planning (to help students self-regulate their learning before engaging in a learning task); time management (to help with completion of tasks and assignments); self-instruction (to help direct their attention and resources); imagery (to help with visualisation of concepts for better understanding and internalisation); goal

setting (to help set targets which can challenge them and help improve feelings of efficacy upon completion); and deep processing strategies (to improve comprehension and retention of concepts). Zimmerman's cyclical model will be used as a guideline to introduce the strategies as his model coincides with the phases that precede, guide and come after learning. It will help to guide teachers to incorporate strategy intervention during the different phases of learning. Effective teacher feedback will be built at every step so that students are able to understand and use the messages given by the teacher. It will help students to analyse their own learning process to help them to strategically plan their thinking and action for future tasks. The module could be a very useful and effective tool to help students with learning difficulties who either lack the required cognitive and metacognitive abilities and self-regulated learning skills, or are too overwhelmed to use them.

As New Zealand embraces the Innovative Learning Environments, the learning module could be incorporated in the inquiry method of teaching. The first of the ILE's seven principles is 'learners at the centre'. In the innovative learning environments, the learner is considered to be the core member and the learning environment is shaped around the needs of the learner, encouraging their active engagement. Learners are encouraged to take part in the decision-making process and student agency is considered important in helping them voice their needs. A learning module that equips students with the required strategies will help them take more responsibility for themselves as learners, and will motivate them to find the best ways to improve their performance. The learning module could underpin the key competencies, along with other resources, to make learning more meaningful. It will also guide teachers to create classrooms where learners have opportunities to challenge themselves, to reflect on their own learning and take ownership of their learning outcomes. Once teachers get equipped with the skills for strategy instruction, students of all ages and capabilities can benefit from it.

The New Zealand Ministry of Education believes in an ever-emerging dynamic approach to designing the curriculum, and the incorporation of a learning model pinned in classroom research will be a crucial step in helping students become independent lifelong learners.

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