The Importance of Autonomous, Self-Regulated Learning in Primary Initial Teacher Training

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This article grew from the author's doctoral study into the development of self-regulated learning (SRL) at the end of the primary school. A brief outline of SRL is included to provide the context for this article. The focus of learning in schools is seen as shifting from a knowledge-based focus to a skills-based curriculum as the role of the teacher adapts to the changing nature of education. Work on collaborative enquiry learning and the inclusion of learner voice are also factors in this paradigm shift in teaching. Much of the previous research in the area of self-regulation has focused on older learners. However, interest in developing SRL throughout the primary years of schooling is growing. Initially the study focused on considering the curriculum as the driver of the development of self-regulated learning. However, when analyzing the learner and teacher questionnaire results from a variety of schools it became apparent that the teacher-learner relationship was central to the initiation and support of autonomous learning irrespective of the curricula background of the school. The teacher's role is viewed as paramount in the development of self-regulated learning. This article moves to focus on the preparation teachers receive in their training to support them through facilitating learners to become self-regulated. Teacher education is seen as requiring the explicit teaching of self-regulation, autonomy, and the notion of lifelong learning at the heart of the courses offered to student teachers. Student teachers should be viewed as learning about self-regulation as lifelong learners themselves and teacher higher education practices need to change to reflect a more active and collaborative pedagogy. There is discussion of the more constructivist approaches teacher educators can utilize to engage their students, which includes instructing their teaching students in ways that reflect the strategies required for the students to employ with their classes.

Keywords: self-regulated learning (SRL), primary education, initial teacher training, teaching pedagogy, autonomy support

INTRODUCTION

In this article, self-regulation will be examined from a variety of perspectives: learner, student, teacher, university faculty, and lifelong learners. Self-regulation will be outlined initially through my doctoral study, which focused on the primary phase of education.

The emphasis shifts to teacher education and the importance of developing self-regulation in student teachers to support their learning in university and also to prepare them for their role as primary teachers with regard to developing self-regulatory practices with their future learners.

SELF-REGULATED LEARNING

"Self-regulated learning is - an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment."

(Pintrich, 2000, p. 453).

Self-regulatory, autonomous learning as a concept stems from motivational theories of learning (Skinner and Belmont, 1993; Schunk and Zimmerman, 1997; Schunk, 1999). Learning styles, metacognition and theories relating to the self are also influential in autonomous learning. Azevedo (2009) argues that learning utilizes numerous self-regulatory processes. He talks of planning knowledge activation, metacognitive monitoring, regulation and reflection. Schunk and Zimmerman (1997) directly linked motivation to the concept of self-regulation. Self-regulated learners are intrinsically motivated and autonomous individuals who are proactive in pursuing their own goals for their learning and who take control of the process of their learning.

Self-regulated learning (SRL) is an active, constructive process (Pintrich, 2000) and one that requires support, scaffolding, and explicit teaching as the individual's self-regulatory practices develop. Zimmerman (2002) believes self-regulated learners are more likely to succeed academically, as well as being more optimistic about their future, highlighting SRL's importance for lifelong learning Dignath (2008) found that children and young people possessing higher levels of SRL are more likely to succeed than those with lower levels are, demonstrating the crucial role that SRL plays in education. Learners with superior self-regulatory skills tend to be more motivated academically and demonstrate effective learning ability (Pintrich, 2003). Winne (1997) sees young learners as self-regulated when they are able to adapt their approaches to learning. Self-regulation is a skill that can be taught and learnt through "goal directed engagement." Learners who are taught self-regulatory skills and who are encouraged to evaluate their work through reflection and set learning goals can develop individual strategies that will prove to be successful in furthering their learning.

Change in Focus Through Doctoral Research

The initial purpose of my doctoral study (Oates, 2017) was to ascertain whether the International Baccalaureate's (IB) Primary Years Programme (PYP) motivates pupils to become self-regulated learners. Questionnaires were given to 20 teachers and their 404 learners from 12 schools in eight countries. The schools were selected to have both IB and Non-IB schools and were principally opportunistic voluntary samples. There were five International Baccalaureate schools and seven others where Nigerian, Montessori, South African, and English school systems were involved. The IB schools were in Dubai, Denmark, Singapore, Vietnam, and Germany. The questionnaire for the children was developed, piloted, distributed, and analyzed. This Likert style questionnaire involved 12 "I" statements constructed using neutral terminology, so as not to favor any curriculum. There were four options for responses: Very True, Sort of

true, Not Very True, Not At All True. If all the statements were recorded as "Very True" this would indicate that the learner had developed a reasonable level of autonomy and was becoming self-regulatory in their learning. One of the statements was "I have learnt new skills and strategies to help me learn." The highest percentage (93%) from the questionnaire believed they had gained new methods and ways of working to support their self-regulated learning. The study found that overall 83.5% of the children surveyed attained a high total self-regulated learning score. Two sentence starters were also included to provide qualitative data regarding the children's view of learning. One was "Learning is…" and the second sentence starter was, "I would like to know more about…" The first sentence starter, proved to be the most interesting. The keywords from this sentence starter replies were arranged as word clouds, which showed through repetition the most used vocabulary to describe learning. These were organized by IB schools and Non-IB to see any differences between the results. In both word clouds the largest word was "fun." In the IB word cloud "collaborative" was regularly mentioned and "strategies" was larger than in the Non-IB word cloud. The Non-IB word cloud also included "tests" and "textbooks" highlighting pedagogical differences between the curriculum approaches. One of the IB pupils wrote, "Learning is… joy and a great opportunity in my perspective. Learning new skills and strategies is a very important part of learning and I feel I do it." A pupil from the international English National Curriculum school stated that, "Learning is …sometimes fun but mainly copying from the board." Statements made reflected the learning environment of the schools. For example a child from the South African school, which placed a great deal of emphasis on exams, wrote "Learning is ….something you learn to take a test."

Ten learners from one of the schools were interviewed as part of the study as well. These interviews involved the children looking at statements about learning and discussing them as well as suggesting their own ideas. One of the children described how she had learnt about herself, "It's just like you're unlocking something in yourself, and without people telling you what to do or friends giving ideas and then you have to do that idea. You're unlocking something you're unlocking yourself and learn more about yourself."

For the study written informed consent was obtained from the head teachers for the pupil questionnaires and written informed parental consent was obtained for the interviews. The study, including the consent procedures, was reviewed and approved by Durham University Ethics Committee. The Problem in Schools questionnaire (Deci et al., 1981) was provided for the teachers to identify autonomy supportive teachers and how they teach and motivate their classes. Reeve et al. (1999) critically evaluated this questionnaire in their research paper, conducting three studies that confirmed its validity. Examining the data and the published curricula backgrounds of the schools demonstrated that, although the IB's PYP does motivate pupils to become more self-regulated, other curricula schools also promote pupil self-regulation.

The focus of this study was curriculum based initially but over the course of writing the thesis the focus moved to the teacher

and the need for autonomy-supportive teachers to enable learners to be guided toward being autonomous and self-regulated. The driving force behind the development of independent learning focuses on the individual teacher and their autonomy-supportive teaching approach. My interest subsequently shifted toward initial teacher education and the explicit inclusion of SRL in the programmes of study.

It is Boekaerts' (1999) model (see **Figure 1**), which piqued my interest in this area of research initially, through the amalgamation of three different areas: learning styles, metacognition, and goal-directed theories of the self. Boekaerts (1999) also stresses the powerful importance of the learning environment. The culture of the learning environment, its leadership, ethos, and the community has an effect on the teachers, the learners, and their educational experience.

The model and the process of developing SRL in schools is a similar process at university for the student teachers, which will be outlined in a later section. The process of supporting learners in developing SRL in schools involves explicit instruction for the student teachers.

The center of the model is concerned with the learner understanding how they learn, the way they learn and how they process information. The notion of learning how to learn is key in self-regulation. This charts the movement of learning as not being as concerned with the learning of facts as much about learning the skills required to learn. The middle layer is the regulation of the learning process. This is the ability of the learners to direct their own learning. For example, this involved a class of nine-year-old children selecting their own choice of explorer to research for their unit on Exploration. The outside layer of the model is concerned with the regulation of the self and goal setting. Boekaerts (1999) specifically references personally chosen goals. Self-regulated learners should be able to select and be committed to goals for their learning. This practice would need careful modeling, scaffolding, and instruction as effective goal setting is a skill, which would need to be developed by the pupils. This layer also includes strategies and reflection as truly self-regulated learners will have developed their own strategies for learning independently and will naturally reflect on the process of learning. Self-regulated learning embraces these three areas and links all of the three circles in the model. Unlike some models, there is not a sense of development through the layers, more a sense that a truly autonomous learner will have developed all three areas. In the Exploration unit the children learnt the skills involved in creating a presentation about their selected explorer to share with the class at the end of the unit. The skills of note taking were also explicitly taught and at the culmination of the unit the children gave their individual presentations and the rest of the class took notes. The summative assessment for this unit was a quiz on all the explorers in which the children could refer to their notes to answer the questions. After the unit there was a reflection completed individually by the learners who identified skills they excelled at as well as areas they needed to improve on in the next unit. These areas became their learning goals.

The process model (see **Figure 1**) has been adapted to reflect my doctoral focus on the primary phase of education. I have added an extra central emergent SRL area (see **Figure 2**)
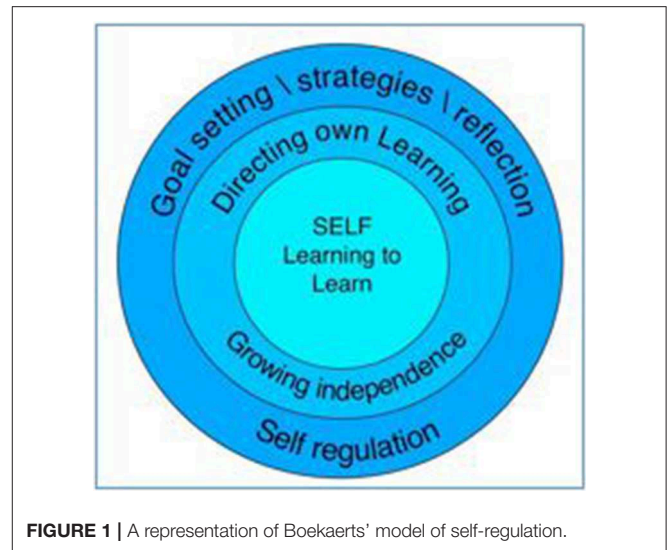

FIGURE 1 | A representation of Boekaerts' model of self-regulation.
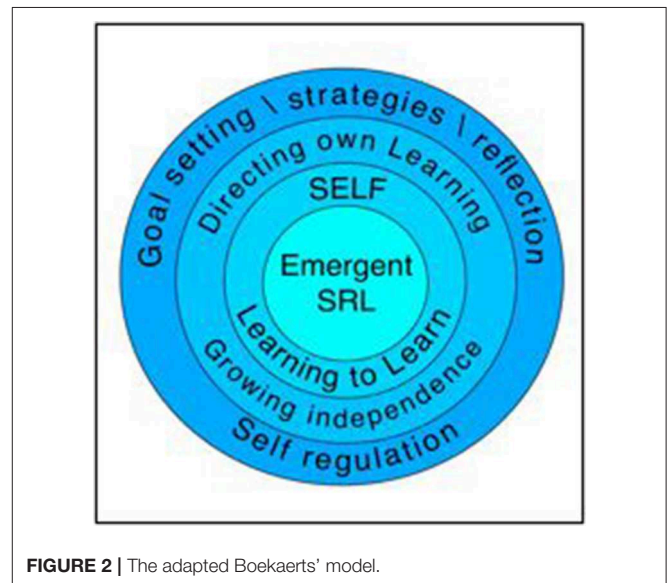

FIGURE 2 | The adapted Boekaerts' model.

reflecting a level of explicit instruction and scaffolding in order for younger learners to develop their self-regulatory practice. Vygotsky (1986) believed that metacognition is not realized in children until adolescence. He alleged that children could master the rules for directing their own attention, thought, and behavior but that this mastery does not become fully conscious until the children are able to think about the rules themselves, which means thinking about their own thinking. However, Perry's later research (1998) examined young children's self-regulatory practices when writing. She found that they are indeed capable of managing their own learning. Perry (1998) reported that the seven and 8 year olds in her study displayed an awareness of their own thinking processes and were able to stay focused on the task in hand, therefore younger learners would respond to self-regulatory instruction.

In this section, reference will be made to the Metacognition and Self-Regulated Learning Guidance Report (2018) from

the (Education Endowment Foundation, 2018). This document provides a number of recommendations for a teaching framework for primary aged children to learn metacognitive and SRL skills, strategies, and practices, a number of these recommendations fit with the areas of the adapted model.

Emergent SRL

In my revised model the new "Emergent Self-Regulation Learning" core is where the skills, strategies, and practices essential to the development of autonomous learners are initiated, modeled, and explicitly taught by the teacher. The model is viewed from the center to the outside as growing independence for the learner and diminishing support from the teacher as self-regulation increases, this is developmental and not age-related. The teacher models the process of note taking for example using a mind map, then the children practice this format. Over the course of a few weeks, the teacher demonstrates a number of different note-taking methods and the children practice them. The practice sessions are purposeful and involve gaining research information related to the Explorers theme. In the summative assessment the children may select the method they found the most effective. Recommendation 2 (Education Endowment Foundation, 2018) includes the explicit teaching of metacognitive strategies and how the pupils can plan, monitor, and evaluate their own learning. Reflection with peers or as a whole class can help the individual learner consider the purpose of note taking and enable them to ascertain their preference as to the format.

Self

The next layer of the model is concerned with the regulation of processing modes. This relates to the learner understanding how they learn, their learning styles, and how they process information. This reflective dimension of self-regulated learning relates to the pupils knowing themselves in relation to their learning and which strategies work best for them, this understanding aids their autonomous learning ability. Recommendation 1 (Education Endowment Foundation, 2018) encourages teachers to develop their pupils' understanding of themselves as learners through awareness of their strengths and areas for development. As mentioned previously reflective practice supports the learners in identifying their future learning goals.

The role of the teacher is not obvious in this model, but with the focus of the research being on primary age children, the teacher's role in facilitating and supporting self-regulated learning practice is paramount. Part of this would be developing a supportive classroom environment using, for example learning walls to support independent learning as well as the use of talking partners to enable the learners to discuss and confirm their understanding. The teacher develops co-constructed expectations for behavior, noise level, and classroom routines also supports the children's self-regulatory learning. Even before this stage of learning how to learn, explicit teaching would scaffold the development of self-regulation in younger pupils. The responsibility for learning shifts to the learner and the role of the teacher is more supportive becoming less of the traditional "sage on the stage," (King, 1993). This charts the

movement of learning for the pupil as not being as concerned with the learning of facts as much about learning the skills required to learn for themselves. Learning to learn is essential in the development of a self-regulated, autonomous learner. Teaching the skills of researching, developing critical and creative thinking, communication skills, and social and self-management abilities is key for learners today (OECD, 2018).

Directing Own Learning Toward Independent SRL

Moving outward in the model the next layer looks at how guided practice and scaffolded learning paves the way for more independent learning, leading to more independent practice (Recommendation 6, Education Endowment Foundation, 2018). As the pupil becomes more self-regulated, they will be able to monitor their own progress, independently reflecting on their work and the strategies they have used, setting goals for their further development. Recommendation 6 from the Education Endowment Foundation (2018) also highlights the need for timely and effective feedback and strategies for the pupils to be able to judge how effectively they are learning. Involving the learners in developing rubrics for assessment supports their understanding of the task set. In a unit in mathematics 8 year olds worked with teacher guidance to put together a rubric for an instructive poster regarding shape they were to create which was then peer and self-assessed using the agreed rubric.

The NEU (2019) cites interventions in the area of metacognition and self-regulation as improving children's progress by 7 months through being taught and modeled with the learners (See also Evidence Summaries: Education Endowment Foundation, 2018).

Teachers in Schools

Darby (2005) saw the teacher as the determining factor in the pupils' enjoyment of and engagement in their learning. She highlighted the pivotal influence of the teacher with regard to the engagement of the learners. The autonomy-supportive teacher models self-regulatory practices for their class. They can also demonstrate how failures and mistakes can lead to learning. The teacher's passion and excitement for their subject can be infectious increasing the children's motivation to learn. If the children are excited to learn they will try out new strategies and experiment with their ideas more independently when they have the optimal environment created by their teacher. Sierens et al. (2009) found that autonomy support on the part of the teacher cultivates pupils' interest and advances their intrinsic motivation. Richardson et al. (2014) explained how an autonomy-supportive teacher could motivate pupils through topic choice and use of technology, to developing more self-directed research projects.

The teacher has the ability to create the opportunity for autonomous learning through their approach to their teaching and the development of a learner-centered classroom environment. One such approach is learning through enquiry. In a number of primary schools, you will find enquiry-based work in science and through cross-curricular themes. Brand and Moore (2011) worked with a teacher professional development model in schools, where the "teachers as learners" were supported in their exploration of enquiry teaching in science by a network of peers

and research facilitators. The teachers initiated more enquiry-based approaches in their science teaching and found that this approach increased interest and motivation in science and also had an effect in other areas of the curriculum.

Engaging the pupils in more learner-led investigations and collaborative research inquiries develops autonomy. Kerry (2011) writing about cross-curricular teaching discusses how the move away from a subject-based approach was linked to more focus on skills and processes across a range of disciplines. The teaching emphasis was shifted from didactic teaching (King, 1993, "sage on the stage") to more self-directed learning on the part of the children. In a unit on Egypt with 8 year olds the children decided to put on a play for the culmination of their research on Ancient Egypt. One boy, who wanted to make a spear for the Pharaoh's guard, researched the types of spear heads there were at that time and then conducted a survey of the class, before making the most popular spear head for the guard. That level of detail was not planned for the unit but the children when inspired and motivated work very independently, guiding their own learning journey.

Self-regulated learning plays a part in the enquiry approach as the learners are taught and supported through the skills required, moving toward (Banchi and Bell, 2008) "independently generated enquiry." Banchi and Bell (2008) suggest a continuum of enquiry learning, which was particularly referencing science education, however the four stages of the continuum are relevant for other subject areas and cross-curricular themes. The continuum starts with the more teacher supported "confirmation enquiry," reinforcing a previously introduced idea and focusing on skills development. "Structured enquiry" is still teacher supported initially in the investigation. "Guided enquiry" has the research question provided and the investigation is more independent. The continuum provides development of self-regulated learning moving from more explicitly scaffolded learning to an independently generated enquiry led by the learners.

SRL in Teacher Education Programmes

How can providers of teacher education in higher education support trainee teachers to be more self-regulated in their learning and encourage them to teach their classes to be more self-regulated too?

As my practice as a member of the education faculty is developing, more sessions in my area of curriculum studies and mathematics education have been designed to include self-regulatory practices, particularly planning, formative assessment, and reflective practice. Together with a colleague we are examining the students' resilience as learners and self-regulation is included as one aspect of this area of research.

In one module, the students write a reflection on two sequences of lesson plans that they have taught. To prepare for this assignment the sessions with the students focus on reflective practice for themselves and also where reflection would benefit their future teaching in schools. Just as in school the student teacher would use children's words to aid understanding, we deconstruct the assignment criteria and rewrite them together to assist the students' comprehension of what aspects of lesson planning, theoretical, and pedagogical approaches require referencing in the written assignment.

Formative assessment is an area we explore in assessment for learning in schools and as university faculty we also use formative assessment in our modules, looking at examples of lesson plans and assessing them as well as working within curriculum subject areas developing sequences of lessons and sharing them with peers for feedback. Nicol and Macfarlane-Dick (2006) reference principles of good feedback, including the classification of what good performance is in terms of goals, criteria, and expectations of the task or assignment.

The developmental models below are shaped by the stages outlined in my adapted model of Boekaerts' (1999) framework (**Figure 2**) and suggest the development of inclusion of SRL within the programme to support teaching students in the growth of their own self-regulatory behavior at university (**Figure 3**) as well as teaching SRL in their future classes in schools (**Figure 4**).

Emergent SRL

We are often not aware of the individual backgrounds of the students we are teaching as to their independence and skill set with regard to learning and studying. Räisänen et al. (2018) notes that the transition to university is challenging for many students. There is evidence that the first year is a crucial time for the students. Brinkworth et al. (2009) found that making a successful transition is not only related to academic ability, but also depends on the students' capability to make a quick modification to a new learning environment that requires more autonomy and individual responsibility than expected.

In their first year, students can be introduced to the notion of self-regulation as a key support for their development as a student in university and as a lifelong learner. Lectures, seminars, workshops, and tutorials outline, through explicit teaching, the relevant study skills, supportive strategies and reflective practices for the students. Reflective practices are particularly relevant for teachers. Schön (1983) talks of two types of reflective practices for teachers, reflection-on-action and reflection-in-action. He suggests that reflection-in-action is a concept that celebrates the art of teaching, in that it allows for continual interpretation, investigation, and reflective conversation with oneself about the teaching situation whilst utilizing the information gained from past experiences to inform and guide new actions.

Self

The students' understanding of themselves as lifelong learners relates to the changing nature of teaching where there are often new initiatives and alterations to the curriculum or new approaches to learning. Gaining a depth of individual knowledge of the way that they learn best supports the students in developing the skills and knowledge required to be outstanding practitioners in the future. University and schools can be seen as communities of practice (Lave and Wenger, 1991), a concept that was developed further by Wiliam's (2009) "Teacher Learning Communities." Students can be asked as a collective community of learners to work together as collaborative learners. Sharing understanding of their reading and discussing ideas regarding teaching can be supportive practices for the students. In the future I aim to further encourage students to work together in peer support groups to aid their learning and development.
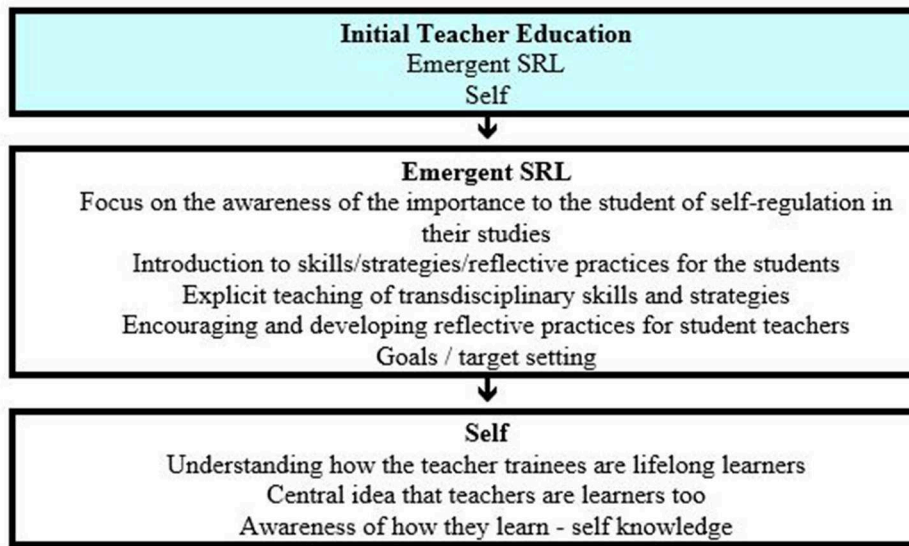
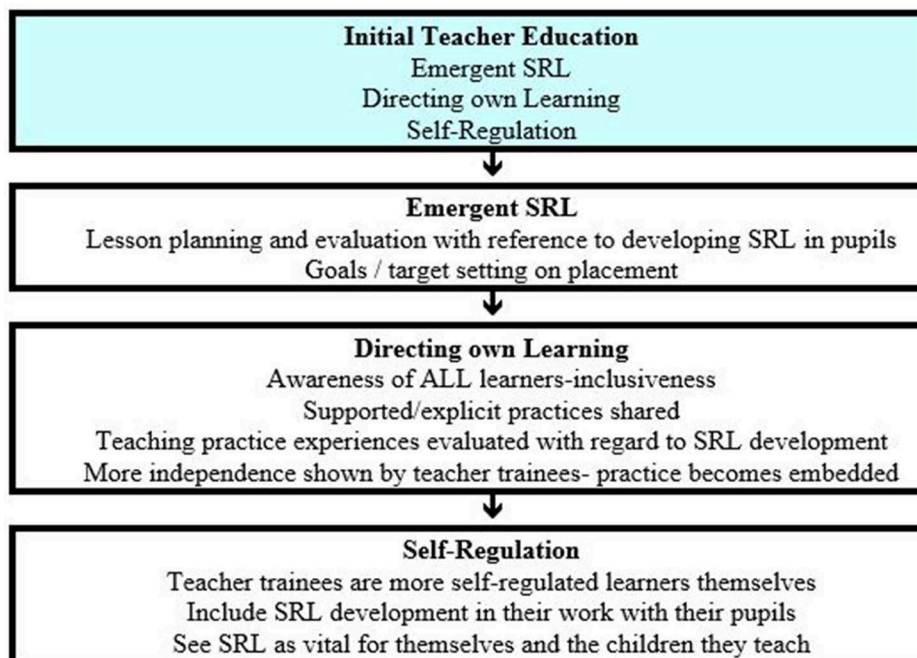**FIGURE 3 |** Boekaerts' adapted model framing initial teacher education.

FIGURE 4 | Boekaerts' adapted model framing teacher trainees SRL in schools.

EMERGENT SRL

How Can SRL Practices Support Teaching Students in Their Own Teaching in Schools?

As students begin to involved with school placements they will engage with planning lessons for groups of children and are evaluated through self and peer assessments. Students set targets when on teaching practice and could be encouraged to set more general goals as well in relation to their own learning and specific assignment preparation. A series of questions could be provided to guide the students' reflective practice. Sitzmann and Ely (2010) looked at the effect of self-regulatory question prompts on students over the course of a programme. These

questions prompted reflection and assessment of study skills and performance. The programme leaders also informed the students that their success on the course was under their control. This is an interesting notion and one that is important to acknowledge with regard to self-regulation and accepting individual responsibility for one's learning and development.

Directing Own Learning

Enabling the students to independently discuss and analyse their individual experiences and observations on teaching practice with their [peers supports their awareness of the wide range of different school situations and the individual learners that exist. The students can also consider how they scaffold SRL practice for the children they teach. Setting the context for learning in a real life situation supported the children's learning in mathematics and led to more meaningful, learner initiated work. For example, the teacher of a class of 7 year olds discussed with the children why they were finding out about addition and subtraction. The ideas raised by the children led to a unit on money where the children made their own class money, shop, bank, even asking for credit cards. Their final celebration of this unit engaged them in making items for a market stall and then buying them with the class money they had earned through completing classroom "jobs." The children recorded their transactions using the addition and subtraction strategies they had learnt.

Self-Regulation

Ultimately, the students' self-regulatory practices become embedded in their practice and in their approach to their learning and their teaching with pupils in schools. What approaches would support the student teachers' development of self-regulated learning strategies?

Approaches for Staff and Students

University faculty scaffold practices in their teaching, which students then adopt for their own self-regulated learning and further utilize in their own practice when they become teachers. Cassidy (2011) examined SRL in higher education, particularly how aspects of SRL can be improved through teaching and learning strategies. Student self-monitoring and self-evaluation were seen as important factors in SRL development. Building in opportunities for self-reflection with prompt questions through the modules would aid students in assessing their learning as well as seeing how reflective practice supports pupils in schools. Modeling effective strategies and the use of explicit guidance were also emphasized as part of an enabling learning environment. At university and on placement the student teachers will experience practical sessions where they have good teaching practice modeled to them. Teaching is viewed here, as more process orientated and student involvement is paramount in the planning and delivery of these sessions.

Feedback to university staff provides information on what was successful as well as areas for development. For example, the idea of a "one-minute paper" on the session written at the end of a session can provide useful feedback for the lecturer. This active learning technique is believed to have been initiated by Charles Schwartz, a physics professor at the University of California in the early 1980s (Stead, 2005). The potential for this short piece of writing is for students to answer two questions: firstly regarding what they have learnt and secondly outlining any unanswered questions. This allows the university faculty to quickly assess their taught sessions and informs them of any misunderstandings as well as any required learning needs. Nicol (2006) discussed how improving assessment and feedback could enhance the learning experience in particular for first year students through SRL. If students feel in control of their learning on the course they are more motivated academically and are more likely to experience success in their study and assignments (Yorke and Longden, 2004).

CONCLUSION

Self-regulation is seen as important in the development of lifelong learning skills for all (Luftnegger et al., 2012), motivation toward learning (McCombs and Marzano, 1990; Schunk and Zimmerman, 1997), and reflective practices (Schön, 1983; Azevedo, 2009; Sitzmann and Ely, 2010). In this article, self-regulated learning has been developed from my doctoral study looking at learners' SRL and their teachers' support, to student teachers' SRL and the ways that teacher education programmes can develop more self-regulatory skills and strategies for the student teachers to utilize themselves, as well as take into their practice in their own classrooms in the future.

Expectations, explicit teaching and modeling of self-regulatory practices will develop students' motivation toward their own learning. (Heikkia and Lonka, 2006) study (2006) suggested that university faculty need to consciously promote a positive learning environment and SRL for their students.

The adverb here is important, as often our intentions do not match our actions. If we consciously build the learning environment through collaborative work, develop self-regulatory practices, engage in interventions and support when required, we can promote meaningful engagement and successful learning for our student teachers in university, as well as through self-regulated teaching for children in schools.

In conclusion, as Karamarski et al. (2013) stated our goal should be the empowerment of teachers to develop SRL learners. Introducing more explicit teaching of self-regulatory practices, strategies, and skills would benefit our student teachers in their own development both as self-regulated lifelong learners and as practitioners in schools where SRL skills and strategies support their teaching and develop autonomous, self-regulated learners in their classrooms.

Self-regulated learning is vital for everybody. In teacher education the faculty need to explicitly teach, model, and practice the relevant skills and strategies so all learners in primary schools are set onto their successful path of lifelong learning by self-regulated and autonomy supportive teachers.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this manuscript will be made available by the authors, without undue reservation, to any qualified researcher.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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