Internalizing *Self-Regulated Learning*: Metacognition and the Formation of Students' Character

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Abstract

The expansion of digital learning environments has transformed how students manage their learning processes, monitor academic progress, and develop personal responsibility. In this context, self-regulated learning (SRL) represents an important framework for understanding the relationship between metacognitive awareness, motivational processes, behavioral control, and character development. This article aims to analyze the conceptual relationship between self-regulated learning, metacognition, and students' character formation within digital learning ecosystems. The study employs a qualitative literature-based approach by synthesizing 20 scholarly references concerning SRL theory, online learning strategies, metacognitive development, learning independence, self-awareness, and academic behavior. The analysis is organized thematically around four dimensions: forethought and goal setting, performance monitoring, self-reflection, and the sociotechnical conditions that facilitate or constrain independent learning. The literature synthesis indicates that SRL can be understood as a cyclical learning process through which students formulate goals, select learning strategies, monitor their progress, evaluate outcomes, and adjust subsequent actions. Digital learning environments provide opportunities for autonomy and self-monitoring; however, these opportunities do not automatically produce metacognitive maturity or responsible learning behavior. Effective SRL development requires explicit instructional scaffolding, structured feedback, realistic goal setting, and opportunities for reflection. The article conceptualizes character development as a potential outcome of repeated self-regulatory practices rather than an automatic consequence of technology use. These findings provide a conceptual foundation for designing digital learning environments that integrate cognitive development, learner autonomy, and academic responsibility. Further empirical research using educational ethnography is needed to examine how these processes are enacted in students' everyday learning practices.

Keywords: *self-regulated learning; metacognition; character development; digital learning; learner autonomy*

1. INTRODUCTION

The digital transformation of education has changed how students access information, interact with learning resources, complete assignments, and manage their academic activities. Learning environments are no longer confined to the classroom and direct interaction with teachers; they now also encompass digital learning platforms, multimedia materials, learning-management systems, and a wide range of information resources that can be accessed independently. These changes open opportunities for students to develop learning autonomy, but they simultaneously demand a more complex capacity to manage attention, time, motivation, and academic responsibility.

In this situation, *self-regulated learning* (SRL) becomes a key concept for explaining how students take an active role in their own learning. Zimmerman (2002) argues that learners capable of regulating themselves do not merely receive information passively but actively set goals, apply learning strategies, monitor their progress, and evaluate the outcomes they achieve. Learning success is thus determined not only by the availability of resources or cognitive ability, but also by students' capacity to direct and control their own learning process.

Theoretically, SRL is closely tied to the social-cognitive perspective, which views learning as the product of reciprocal interaction among personal, behavioral, and environmental factors. Saragih (2024) situates self-regulation within social-cognitive theory, so that learning can be understood through the interplay among an individual's beliefs, the actions taken, and the environmental conditions that shape them. This perspective is relevant in digital ecosystems because students face many possibilities for organizing their learning while also contending with attentional distraction, the demands of multitasking, and differences in the ability to use technology productively.

SRL also has a metacognitive dimension that enables students to become aware of their own thinking. Metacognition helps individuals recognize what they have understood, choose appropriate strategies, identify difficulties, and change their approach when an initial strategy fails to produce progress. Kristanto and Pradana (2022) locate the development of SRL within the domain of metacognition as an important part of the learning process. This relationship indicates that learning autonomy cannot be reduced to completing tasks without the teacher's help; it must also include the ability to make learning decisions based on awareness of one's own conditions and needs.

Panadero's (2017) review shows that SRL comprises a range of theoretical models with differing emphases, yet all attend broadly to goals, cognitive strategies, motivation, monitoring, and reflection. This diversity matters because self-regulation does not operate as a single, free-standing skill. Rather, it is a multidimensional

process that involves thinking, the management of motivation, behavioral control, and responsiveness to the learning environment. In educational settings, this capacity needs to be developed through instructional designs that give students opportunities to practice making decisions and evaluating their own processes.

A number of studies also demonstrate the relevance of SRL in online learning environments. Through a systematic review of SRL strategies and academic achievement in online higher education, Broadbent and Poon (2015) position learning-management strategies as an important aspect of internet-based learning. Barnard et al. (2009) developed a measure of self-regulation suited to online and blended learning environments, while El-Rumi (2022) examines the development of SRL through online learning design. Together, these studies provide a basis for understanding that the success of digital learning is related to the interaction between students' self-regulatory capacity and the characteristics of the instructional design in use.

In the Indonesian education context, attention to SRL has also emerged in studies of distance learning, learning autonomy, self-awareness, and the development of metacognitive ability. Adam et al. (2022) examined SRL strategies in remote lecturing during the COVID-19 pandemic. Atmojo et al. (2020) investigated levels of SRL and self-awareness in science learning during the pandemic. Purwaningsih and Herwin (2020) linked self-regulation and discipline to the learning autonomy of primary-school students. These studies show that self-regulation can be situated across various levels and contexts of education, even though the characteristics of students and the demands of their learning differ.

Nevertheless, a conceptual issue warrants attention. Learning autonomy is often understood merely as the ability to complete tasks individually, finish work on time, or follow instruction without direct supervision. Such an understanding does not fully explain how students build awareness of their own thinking, weigh the consequences of academic actions, develop internal discipline, and take responsibility for the learning decisions they make. Yet these dimensions are bound up with the formation of character relevant to academic life.

This issue becomes more pressing when learning takes place within a digital ecosystem. Ease of access to information is not always accompanied by the ability to select information, manage time, sustain concentration, and evaluate the quality of learning outcomes. Kusuma (2023), for instance, raises the problem of self-regulation and academic dishonesty among students during online learning. That topic underscores the need to distinguish the ability to complete tasks independently from the ability to manage the academic process responsibly. Likewise, Anazifa et al. (2023) examined SRL by gender and disciplinary differences during online learning, giving

grounds to consider the diversity of student characteristics when understanding self-regulatory practice.

Against this background, the present study focuses on the relationship among the internalization of SRL, the development of metacognition, and the formation of students' character within digital learning ecosystems. Internalization in this article is understood as the process by which self-regulatory strategies that are initially supported by external direction gradually become consciously enacted learning habits. Character is not treated as an outcome that emerges automatically once students use technology, but as a possible developmental trajectory formed through repeated practice of goal setting, discipline, self-monitoring, reflection, and academic responsibility.

The conceptual novelty of this article lies in its attempt to connect three dimensions that are often discussed separately: SRL as a mechanism for managing learning, metacognition as awareness and control of the thinking process, and character formation as an orientation toward responsible behavior. This relationship is analyzed within the digital ecosystem, which affords learning autonomy while also introducing new challenges in the management of academic behavior.

Accordingly, this article aims to analyze how SRL can be understood as a process that supports the development of metacognition and the formation of students' character, to identify the instructional and environmental conditions relevant to internalizing self-regulation, and to formulate conceptual implications for the design of digital learning. The article is intended to contribute to the development of educational theory and practice oriented not only toward academic achievement but also toward cultivating learners who are reflective, autonomous, disciplined, and responsible.

2. METHOD

Research Design

This study adopts a qualitative approach with an integrative literature-review design. The approach was chosen to develop a conceptual understanding of the internalization of *self-regulated learning*, the development of metacognition, and the formation of students' character within digital learning ecosystems. Literature synthesis was used to identify relationships among concepts, compare the foci of prior research, and construct an interpretation that can serve as a basis for subsequent empirical work.

Because the study is conceptual rather than field-based, it does not present ethnographic empirical findings. Critical or educational ethnography is proposed as a follow-up design, to be pursued once data become available on students' learning

practices, social interaction, technology use, and the meaning they attach to self-regulation within particular educational contexts.

Data Sources

The conceptual data comprise 20 scholarly publications selected for their relevance to the study's focus. These references span theoretical work on SRL, self-regulation models, online learning strategies, the measurement of self-regulation, metacognition, learning autonomy, self-awareness, academic achievement, and academic behavior.

The literature includes Zimmerman (2002) and Panadero (2017) as theoretical foundations; Broadbent and Poon (2015), Barnard et al. (2009), and El-Rumi (2022) for the digital learning context; Dignath and Büttner (2008) for strategies to foster SRL; and a range of Indonesian studies examining learning autonomy, self-awareness, discipline, and self-regulation in both online and face-to-face learning.

Consistent with an integrative conceptual review rather than a systematic review, the corpus was assembled on the basis of topical relevance rather than an exhaustive, protocol-driven database search. The article therefore makes no claim to a systematic, fully replicable search procedure; this scope is appropriate to its aim of conceptual synthesis rather than the estimation of effects.

Data Collection and Analysis

Materials were organized by grouping the references according to their relevance to the study's focus, and the conceptual analysis was directed toward four principal themes.

First, the theoretical foundations of SRL, covering its definition, components, cyclical process, and the relationship among personal, behavioral, and environmental factors.

Second, metacognition and learning monitoring, covering awareness of the thinking process, strategy selection, comprehension monitoring, and the evaluation of learning outcomes.

Third, the internalization of self-regulation and character formation, covering autonomy, discipline, academic responsibility, motivation management, and self-reflection.

Fourth, the digital learning ecosystem, covering online learning design, independent learning strategies, feedback, technology use, and challenges to academic behavior.

The synthesis compared the conceptual focus of each group of sources, identified points of convergence and differences in emphasis, and then developed an interpretation of the relationship among self-regulation, metacognition, and

character formation. The final stage produced a conceptual framework describing the mechanism by which SRL is internalized in digital learning.

Trustworthiness and Analytical Limitations

Trustworthiness of the synthesis was supported by drawing on sources relevant to the review's focus, separating theoretical concepts from the authors' interpretation, and limiting claims to what the available information could support.

Because no interview, observation, or field documentation data were collected, the study cannot make claims about students' actual experience at a particular school or on a particular platform. Likewise, the relationship between the internalization of SRL and character formation presented here is a conceptual interpretation requiring empirical testing rather than a causal conclusion drawn from field data.

3. RESULTS

The results are presented as a thematic synthesis of the literature, focusing on the patterns of conceptual relationship that can be used to explain the internalization of SRL within digital learning ecosystems.

Self-Regulated Learning as a Cyclical Learning-Management Process

Synthesis of Zimmerman (2002) and Panadero (2017) indicates that SRL can be understood as an active, recurring process involving goal setting, strategy selection, monitoring of performance, and evaluation of learning outcomes. Self-regulation concerns not only students' ability to complete a task but also their ability to determine how the task will be done, to examine the effectiveness of the strategies used, and to make adjustments when obstacles arise.

Analytically, the SRL process can be grouped into three interrelated phases.

The first phase is planning (*forethought*). Here, students set learning goals, anticipate difficulties, organize their time, and choose strategies suited to the demands of the task.

The second phase is performance and monitoring (*performance*). Students execute their strategies, manage their attention, monitor their comprehension, and judge whether their activities support the attainment of their goals.

The third phase is reflection (*self-reflection*). Students evaluate outcomes, identify errors, consider the causes of success or failure, and refine their plans for subsequent learning.

These three phases show that learning success cannot be judged by final outcomes alone. The process leading to the outcome also deserves attention, including how students plan their activities, respond to difficulty, and revise their strategies. SRL thus provides a framework for linking observable learning behavior with the underlying cognitive and motivational processes.

This conceptual finding aligns with Broadbent and Poon's (2015) attention to self-regulatory strategies in online higher education and Barnard et al.'s (2009) focus on the measurement of self-regulation in online and blended learning environments. Both studies affirm the relevance of SRL in learning environments that require students to manage much of their academic activity independently.

Metacognition as a Mechanism for Monitoring and Controlling Learning

Synthesis of the literature indicates that metacognition is an important dimension of self-regulation because it enables students to observe, assess, and control their own thinking. Students who merely read the material may not understand their level of mastery. By contrast, students who engage in metacognitive monitoring try to recognize which parts of the material they have not yet grasped, check the accuracy of their answers, and choose alternative strategies when needed.

Kristanto and Pradana (2022) provide a relevant basis for discussing the development of SRL within the domain of metacognition. In this context, metacognitive awareness can be operationalized through reflective questions such as: What is my learning goal? Which part have I not yet understood? Which strategies have I used? And what evidence shows that I have mastered the material?

Metacognition must also be distinguished from mere awareness of the learning activity. Knowing that one is studying does not necessarily mean one can accurately judge the quality of one's understanding. Metacognitive regulation requires the ability to interpret information about the learning process and use it to make subsequent decisions.

Atmojo et al. (2020) examined SRL and self-awareness in science learning during the COVID-19 pandemic. Within the frame of this article, that focus is relevant for showing the importance of attending to self-awareness as part of learning management. Nonetheless, self-awareness and SRL remain distinct constructs, and it would be inaccurate to treat them as identical without adequate conceptual explanation and measurement.

Overall, this synthesis positions metacognition as the mechanism bridging learning experience and strategy improvement. When students can monitor their comprehension and evaluate their academic actions, learning has a greater chance of progressing from activity that merely follows instructions to activity that is consciously planned and controlled.

The Internalization of SRL and the Formation of Academic Character

The synthesis shows that the relationship between SRL and character can be explained through the habituation of repeated regulatory behavior. Goal setting can support an orientation toward responsibility; time management is linked to the habituation of discipline; self-monitoring can help students recognize mismatches

between plan and action; and reflection can encourage more conscious self-evaluation.

Purwaningsih and Herwin (2020) discuss the relationship of self-regulation and discipline to the learning autonomy of primary-school students. Wangid (2004) positions SRL as an approach to improving learning achievement, a link also observed by Yulianti et al. (2016), who examine SRL in relation to learning outcomes. Hidayat (2012) studies *goal setting* and *self-monitoring* in the mastery of motor skills and the intrinsic motivation of primary-school students, while Ikhwanuddin et al. (2018) address the use of an SRL module to improve learning achievement.

These references span the dimensions of learning outcomes, discipline, goal setting, self-monitoring, and instructional support. In this synthesis, those dimensions are understood as components that may support the formation of consistent academic behavior. Academic achievement, discipline, and character are, however, distinct outcomes. An improvement in grades does not by itself demonstrate the development of moral responsibility, just as adherence to a schedule does not always indicate self-regulation that has been internalized.

This distinction matters for interpreting character. Students may submit assignments on time because of teacher supervision yet remain unable to manage their time independently once supervision diminishes. Conversely, students who have developed self-regulation may continue to carry out their learning plans because they understand their goals and responsibilities, even without direct supervision. This example is a conceptual illustration distinguishing external compliance from more autonomous self-regulation, not a report of actual observation.

Kusuma (2023) raises the relationship between SRL and academic dishonesty among students during online learning. This source opens space to discuss academic responsibility as an aspect that cannot be reduced to the ability to manage time or complete tasks. Character-oriented internalization of SRL needs to encompass ethical decisions, such as completing work through one's own effort, using sources responsibly, and acknowledging the limits of one's understanding.

Character formation within the SRL framework should therefore be understood as a possible developmental trajectory that requires practice, environmental support, reflection, and the reinforcement of academic norms. SRL can provide a mechanism for managing behavior, while the ethical direction of that behavior is also shaped by values, school culture, the example set by teachers, and academic rules.

The Digital Ecosystem as a Space of Opportunity and Challenge for Self-Regulation

Digital learning provides broader access to materials, flexibility of time, and the opportunity to arrange the sequence of learning activities. That flexibility, however, demands the ability to make decisions without always receiving direct guidance. When schedules, materials, and activities are not fully controlled by the teacher, the

responsibility to initiate activity, sustain concentration, and evaluate progress becomes increasingly important.

Broadbent and Poon (2015) address SRL strategies in online higher education, while Barnard et al. (2009) focus on measuring self-regulation in online and blended learning. El-Rumi (2022) positions online learning design as a context for developing SRL. Taken together, these can be synthesized to show that self-regulation should be understood as the product of an interaction between students' capacity and the organization of the learning environment.

In the Indonesian education context, Adam et al. (2022) examined SRL strategies in remote lecturing during the pandemic. Cahyawati and Gunarto (2020) studied students' perceptions of online learning in the same period. Kaleka et al. (2023) addressed learning autonomy in online science learning at the junior secondary (madrasah tsanawiyah) level, while Sari (2019) examined the implementation of SRL by vocational high-school students. These studies illustrate the breadth of contexts relevant to examining self-regulation, from secondary to higher education.

The experience of digital learning cannot, however, be assumed to be uniform. Anazifa et al. (2023) specifically address gender and disciplinary differences in SRL during online learning. This is a reminder that a strategy effective for one group of students may not yield the same results for another. Task characteristics, digital experience, learning needs, and social support all need to be considered when designing interventions.

From this synthesis, the digital ecosystem can be understood as an environment that enables the strengthening of self-regulation when it provides clear learning goals, structured stages of activity, meaningful feedback, and space for reflection. Conversely, an environment that offers only materials and deadlines without support for learning strategies risks placing the entire burden of learning management on students before those skills have adequately developed.

Thematic Synthesis and a Conceptual Framework for the Internalization of SRL

To integrate the results of the analysis, the relationships among the themes are summarized in the following table.

Table 1

Thematic Synthesis of the Internalization of Self-Regulated Learning

Theme	Key mechanism	Implication for learning
Self-regulation	Goal setting, strategy selection, behavioral control	Students gain opportunities to manage the learning process actively
Metacognition	Comprehension monitoring, strategy evaluation, reflection	Students can recognize difficulties and revise strategies
Internalization	Repeated practice, reduced reliance on external direction	Learning strategies may become more autonomous habits

Academic character	Discipline, responsibility, integrity, perseverance	Self-regulatory practice is directed toward responsible learning behavior
Digital ecosystem	Flexibility, feedback, access to materials, instructional support	Technology functions as a supportive environment, not an automatic determinant of success

On the basis of this synthesis, the internalization of SRL can be formulated as a process that moves from instructional support toward self-monitoring, reflection, and increasingly autonomous learning management. In this process, students are required not only to execute strategies but also to understand the reasons for using them, to assess their effectiveness, and to weigh the consequences of their academic actions.

This conceptual framework is not intended as a tested causal model. It is the product of organizing ideas from the available literature in order to describe potential mechanisms that warrant further investigation.

4. DISCUSSION

Repositioning SRL from a Study Skill to a Process of Self-Formation

The synthesis shows that SRL needs to be understood more broadly than as a technical skill for completing tasks. Within Zimmerman's (2002) framework, self-regulation involves goal-directed activity, consciously selected strategies, and evaluation of the results of one's actions. Panadero's (2017) perspective further helps explain that SRL is a multidimensional concept that can be understood through a variety of theoretical models.

The principal conceptual contribution of this article lies in construing SRL as a process of self-formation through learning activity. Goal setting, time management, comprehension monitoring, and reflection serve not only to improve academic efficiency but can also become contexts for cultivating personal responsibility. Even so, this process cannot be regarded as a mechanism that automatically produces positive character.

Character formation requires an account of the values underlying behavior. Discipline, for example, may arise from obedience to commands, fear of sanctions, or awareness of the importance of managing time. These three forms of behavior may look alike in their observable results yet differ in motivation and in the degree of autonomy involved. Research on the internalization of SRL therefore needs to attend not only to observable behavior but also to the reasons students make decisions and how they make sense of academic responsibility.

In this sense, internalization refers to a possible shift from behavior regulated predominantly by external parties toward regulation grounded increasingly in an understanding of goals, self-monitoring, and personal evaluation. This interpretation

extends the discussion of SRL into the domain of character formation without equating cognitive regulation with moral development as a whole.

Metacognition as a Bridge between Learning Experience and Behavioral Change

Metacognition holds an important position because it enables students to treat their learning experience as material for evaluation and improvement. Without metacognitive monitoring, students may repeat the same strategy even when it is ineffective, misjudge their mastery of the material, or regard task completion as sufficient evidence that learning has succeeded.

Kristanto and Pradana (2022) provide a basis for locating metacognition within the development of SRL, while Zimmerman (2002) emphasizes the role of self-regulatory processes in active learning. These two perspectives can be combined through the idea that awareness of the thinking process helps students choose actions better aligned with their learning goals.

The pedagogical implication is the need to develop activities that explicitly ask students to articulate their thinking process. Teachers can ask students to write down their learning goals before beginning a task, note the difficulties they encounter during the process, explain the strategies they use, and reflect on the changes they will make on the next occasion.

Such activities need to be designed as part of learning rather than as mere additional administration. Reflection that is too general—such as simply stating that learning went well or was difficult—may not yet help students identify effective strategies. Reflective questions need to direct students toward concrete evidence, such as the parts of the material not yet understood, the types of recurring errors, or the changes in strategy that helped solve a problem.

Metacognition thus functions not only as the ability to know one's learning condition but also as a basis for decision-making. This relationship is important for the internalization of SRL because sustained autonomy requires the ability to correct one's actions without always waiting for the teacher's direction.

The Role of Instructional Design in the Internalization of Self-Regulation

Learning autonomy should not be construed as transferring the entire responsibility for learning to students. Through a meta-analysis of interventions to foster SRL at the primary and secondary levels, Dignath and Büttner (2008) provide a basis for treating learning support as a crucial matter in the development of self-regulation.

In line with this, El-Rumi (2022) treats online learning design as a context for developing SRL, and Ikhwanuddin et al. (2018) highlight the use of a module to support self-regulation and learning attainment. These sources can be used to

develop the argument that learning environments need to provide a structure that allows students to practice managing their learning process gradually.

Instructional design that supports SRL can include several elements. First, learning goals need to be stated clearly so that students understand the results to be achieved. Second, tasks can be divided into stages that allow progress to be monitored. Third, teachers need to provide feedback that helps students understand their errors and improve their strategies. Fourth, reflection needs to be incorporated to encourage evaluation of the learning process. Fifth, external support can be reduced gradually as students demonstrate the ability to manage tasks more independently.

This gradual approach is important because students do not always have the same readiness to manage time, regulate motivation, or judge their understanding. Students not yet accustomed to self-regulation may need a more structured schedule, reminders, examples of strategies, and direct guidance. Conversely, students already able to monitor their progress independently can be given greater latitude to choose strategies and determine the sequence of their activities.

In this respect, the success of an instructional design is determined not only by how much freedom is granted but also by the fit between the level of autonomy demanded and the support available. Learning autonomy needs to be developed through guided experience, not assumed to be already possessed by all students from the outset.

The Digital Ecosystem and the Challenge of Academic Responsibility

Digital learning creates conditions that allow students to organize their learning activities more flexibly. Flexibility, however, does not always mean ease. Students must determine when to begin an activity, how to allocate their time, which resources to use, and when to seek help. These challenges make SRL relevant as a framework for understanding the digital learning experience.

Broadbent and Poon (2015) and Barnard et al. (2009) provide a basis for discussing strategies and the measurement of self-regulation in online environments. Adam et al. (2022) extend that relevance to the context of remote lecturing during the COVID-19 pandemic, while Cahyawati and Gunarto (2020) highlight students' perceptions of online learning. Together, this literature supports the importance of considering both students' experience and the instructional design when discussing the success of digital learning.

Self-regulation in digital environments cannot, however, be assessed solely on the basis of the speed of task completion, the frequency of platform access, or adherence to deadlines. Such indicators need to be complemented by information about the quality of learning strategies, comprehension of the material, the ability to evaluate progress, and academic responsibility.

Kusuma (2023) raises the problem of academic dishonesty in online learning. That source is relevant for broadening the discussion from learning efficiency to academic integrity. Students may use technology to help them understand the material, but such use needs to be accompanied by the ability to distinguish assistance that supports learning from actions that remove responsibility for one's own work.

Developing SRL within the digital ecosystem therefore needs to integrate digital literacy, academic ethics, and metacognitive skills. Students need guidance on using information sources, citing references, verifying information, and recognizing the limits of permissible technological assistance for a given task. Such steps not only reduce the risk of academic misconduct but also help students understand that learning autonomy includes responsibility for both the process and the results of their work.

The Relevance of Social Context and Student Diversity

SRL does not take place in a space separate from the social environment. Self-efficacy, prior learning experience, task demands, teacher support, and group norms can all influence how students organize their academic activities. The social-cognitive perspective discussed by Saragih (2024) provides a basis for understanding the interrelationship among these personal, behavioral, and environmental factors.

Anazifa et al. (2023) address gender and disciplinary differences in SRL during online learning. Kaleka et al. (2023) discuss learning autonomy in online science learning in the junior secondary (madrasah tsanawiyah) context, while Sari (2019) examines SRL among vocational high-school students. Purwaningsih and Herwin (2020) focus on primary-school students. This diversity of foci shows the need to avoid assuming that self-regulatory strategies take the same form and require the same support at every educational level.

The implication is that designs for developing SRL need to consider age, task characteristics, digital experience, and the social conditions of learning. Primary-school students, for example, may need more concrete help in constructing a schedule and recognizing progress. Students at higher levels, meanwhile, can be guided to evaluate strategies, compare sources, and make more complex learning decisions.

These differences do not mean that one group is inherently more capable of self-regulation than another. Rather, differences in context should be treated as a basis for designing appropriate learning support and testing its effectiveness empirically.

Methodological Implications: The Value of Educational Ethnography

This literature synthesis yields a conceptual framework that can be developed through field research. If the main focus of a study is the internalization of SRL as a

social practice and a process of meaning-making, educational or critical ethnography can be a relevant approach.

Ethnography allows researchers to examine how self-regulation is enacted in everyday practice, how students understand autonomy, and how the rules and habits of the educational environment shape learning decisions. With a critical approach, a study can also question whether the demand for autonomy in digital learning is matched by adequate access to technology, study time, and support.

Further research could use observation of learning activities, in-depth interviews with students and teachers, analysis of reflective journals, and learning documents. Such data could be used to compare the self-regulation that students report with the practice they actually carry out. For example, students might state that they have drawn up a schedule, while observation and reflection data could reveal how that schedule is applied, altered, or abandoned in the face of obstacles.

In such an approach, research findings should not be predetermined by the assumption that technology increases or decreases autonomy. Rather, researchers need to leave room for findings that reveal the complex relationships among students, technology, teachers, peers, and academic norms.

Limitations and Future Research Agenda

This article has a principal limitation in that it was composed through conceptual synthesis of the cited references, without a documented systematic search procedure and without primary empirical data. It therefore cannot explain the process of internalizing SRL on the basis of students' direct experience, nor can it confirm a causal relationship between self-regulation and character formation.

A further limitation concerns the diversity of the research contexts cited. The references span primary education, secondary school, higher education, science learning, vocational education, and online learning during the pandemic. Findings from those contexts cannot simply be generalized to all students or all types of digital learning platform.

Future research could deepen this framework in three directions. First, educational ethnography to reveal how students make sense of and practice self-regulation in everyday learning. Second, longitudinal study to trace changes in learning strategies, self-reflection, and academic responsibility over time. Third, intervention research to test whether an instructional design that integrates goal setting, self-monitoring, and reflection produces better SRL development than a design without such support.

Through this agenda, the study of SRL can be advanced from conceptual explanation toward a deeper empirical understanding of the relationships among cognitive processes, social practice, the digital environment, and the formation of academic character.

5. CONCLUSION

On the basis of the literature synthesis, self-regulated learning (SRL) can be understood as a process of managing learning that involves goal setting, strategy selection, progress monitoring, and reflection on learning outcomes. This process is conceptually linked to the development of metacognition because it enables students to recognize their level of understanding, evaluate the effectiveness of the strategies they use, and determine corrective actions independently. SRL is thus relevant not only for supporting academic achievement but also as a potential foundation for developing students' autonomy and responsibility within digital learning ecosystems.

The internalization of SRL can be understood as a gradual process in which learning strategies initially supported by the teacher's direction develop into increasingly autonomous self-regulatory practice. Goal setting, time management, self-monitoring, and reflection provide opportunities for students to habituate disciplined, persistent, and responsible behavior. Even so, character formation cannot be regarded as an automatic consequence of applying SRL or using digital technology. Its development also requires the example set by teachers, the reinforcement of ethical values, social support, and a learning environment that affords space for conscious decision-making and reflection.

Digital learning ecosystems offer opportunities to strengthen self-regulation through flexible access, the availability of learning resources, progress monitoring, and feedback. These opportunities, however, need to be supported by an instructional design that is structured and suited to students' needs. Teachers need to integrate goal setting, metacognitive strategies, self-evaluation, and the habituation of academic responsibility into learning activities. This approach is important so that learning autonomy is understood not merely as the ability to complete tasks without supervision but as the ability to manage the learning process consciously, reflectively, and responsibly.

Conceptually, this article affirms the importance of integrating SRL, metacognition, and character formation in the development of digital learning. That contribution still requires empirical testing because the study rests on literature synthesis rather than direct observation of students' learning practice. Future research is therefore advised to use an educational or critical ethnographic approach through observation, in-depth interviews, and analysis of learning documentation to reveal how students make sense of, apply, and internalize self-regulation in everyday academic life. Further research also needs to explore the role of teachers, school culture, student characteristics, and technology design in shaping autonomous and responsible learning practice. With such empirical grounding, the development of SRL is expected to contribute more measurably to learning oriented not only toward

academic achievement but also toward students' metacognitive and character development.

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