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## SELF-REGULATED LEARNING IN DISTANCE EDUCATION TO FOSTER TWENTY- FIRST- CENTURY SKILLS

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### Abstract

This research aimed to fill the existing research gap by examining the relationship between SRL and the 21<sup>st</sup> Century skills in distance education, highlighting the significance of understanding how these competencies intersect to enhance remote learning outcomes. The research design of this study is a systematic literature review adopting George's (2008) model. The data were collected through assigning codes, developing themes, comparing and conducting close scrutiny of the codes and themes using 48 articles as secondary data sources. After the data were collected, qualitative analysis was done. The findings of this article have mainly addressed the positive light of twenty-first-century learning. The 21<sup>st</sup> Century skills fall into three categories: learning, literacy, and life skills. Students' SRL directly affects their self-efficacy towards distance learning, while other factors, such as readiness and motivation, are also very contributive. The component of self-regulation concerns students' active learning and taking a reflective role in their cognition, behaviour, emotions, and motivation of academic functioning to fulfill the requirement of twenty-first-century skills. Distance education potentially provides an environment that helps students manage their way of thinking in a way aligned with the 21<sup>st</sup> Century's needs. Furthermore, within Islamic studies, this research contributes to an emerging discourse on how SRL strategies can be tailored to cultivate critical Islamic perspectives and knowledge acquisition in online educational settings.

**Keywords:** self-regulated learning; distance education; twenty-first-century learning

### Abstrak

Penelitian ini bertujuan untuk mengisi kesenjangan penelitian yang ada dengan menguji hubungan antara SRL dan keterampilan abad ke-21 dalam konteks pendidikan jarak jauh, menyoroti pentingnya memahami bagaimana kompetensi-kompetensi ini berpotongan untuk meningkatkan hasil pembelajaran jarak jauh. Desain penelitian ini adalah tinjauan literatur sistematis yang mengadopsi model George (2008) dan data dikumpulkan melalui pemberian kode, pengembangan tema, perbandingan, dan melakukan pemeriksaan teliti terhadap kode dan tema menggunakan 48 artikel sebagai sumber data sekunder. Setelah data terkumpul, analisis kualitatif dilakukan. Temuan artikel ini sebagian besar mengarah pada pandangan positif tentang pembelajaran abad ke-21. Keterampilan abad ke-21 terbagi menjadi tiga kategori yaitu keterampilan belajar, keterampilan literasi, dan keterampilan kehidupan. SRL mahasiswa secara langsung memengaruhi efikasi diri mereka terhadap pembelajaran jarak jauh, sementara faktor-faktor lain seperti kesiapan dan motivasi mahasiswa juga sangat berkontribusi. Komponen pengaturan diri yang berpusat pada mahasiswa untuk melakukan pembelajaran aktif dan mengambil peran reflektif dalam kognisi, perilaku, emosi, dan motivasi fungsional akademik untuk memenuhi persyaratan keterampilan abad ke-21. Pendidikan jarak jauh berpotensi memberikan lingkungan yang membantu mahasiswa untuk mengelola cara berpikir mereka sesuai dengan kebutuhan abad ke-21. Selain itu, dalam bidang studi Islam, penelitian ini berkontribusi pada wacana yang muncul tentang bagaimana strategi SRL dapat disesuaikan untuk membudayakan pandangan Islam kritis dan pemerolehan pengetahuan dalam pengaturan pendidikan online.

**Kata kunci:** pembelajaran mandiri; pendidikan jarak jauh; pembelajaran abad ke-21

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## Introduction

As the number of students who join the distance learning courses expands, the learning strategies will also improve. The concept of self-regulation has existed in various research domains in which the implementation of distance learning creates challenges and confusion in making students understand that distance learning is as effective as conventional learning in a four-wall classroom (Rasheed, Kamsin, & Abdullah, 2020; Srichanyachon, 2013). Since students have full responsibility to work at their, the students might not accomplish one task at the same time as the other students. Thus, the element of student's control in their behaviour additionally turns into a significant piece of motivational beliefs and self-regulation of cognition (Boekaerts, 1992; Gomes et al., 2019; Kröner, Goussios, Schaitz, Streb, & Susic-Vasic, 2017; Morshedien & Hemmati, 2016). Self-regulated learning has been used as one of the strategies students use in distance education.

Self-regulation is an active process of cognitive and metacognitive regulatory processes an individual uses to achieve desired goals. In controlling one's learning, they set the objectives, monitoring and evaluating their cognition, effects and learning behaviour. Nilson (2013) describes self-regulated learning (SRL) as a comprehensive involvement of several brain regions not associated with cognitive skills. This argument suggests that individuals with varying levels of learning capacity have an equal opportunity to control their learning. SRL is influenced by metacognition, strategic activity, and willingness to learn rather than cognitive ability. Zimmerman (1998) introduced a three-phase model of SRL development. These phases are considered as the skilled and strategic processes that occur before, during, and after the learning process: forethought for preparation, performance control for monitoring, and self-reflection for evaluation. Students who can successfully pick up the course material and engage with it without being interrupted by other inconsequential content are those who have a better self-regulatory strategy in themselves (Boekaerts & Cascallar, 2006; Boekaerts & Corno, 2005; Lake & Holster, 2014; Mahayanti, Kusuma, & Wibawa, 2020; Munadi, Nata, Bahruddin, & Sa'diya, 2022). However, it can be seen that learners with lower self-regulation will most likely be unable to take part in class activities by any means which can influence their learning outcomes in the classroom (Denton, Montroy, Zucker, & Cannon, 2020; Hadwin, Järvelä, & Miller, 2019; Teng & Reynolds, 2019). Hence, self-regulatory cycles may play a bigger and more prominent role in distance learning than has recently been the situation in conventional face-to-face education (Barnard, Lan, To, Osland, & Lai, 2009). Curriculum, technology, and community in learning need to be re-evaluated to support self-regulation and retention, particularly in preparing the students for twenty-first-century challenges.

Numerous experts of the distance learning environment require learners to take more prominent liability for the learning interaction (Wolters & Hussain, 2014; Zimmerman & Schunk, 1989). They accept that SRL abilities are fundamental for accomplishment in these exceptionally self-autonomous learning, especially to prepare the students to obtain the twenty-first-century skills (Cho & Heron, 2015; Kennedy & Sundberg, 2020; Kim, Raza, & Seidman, 2021; Schunk & Zimmerman, 2010; Zimmerman & Schunk, 1989). The twenty-first-century skills consist of *learning skills*, *literacy skills*, and *life skills* (Trilling & Fadel, 2009). All these skills trigger the concept of transferring short-term memory to long-term memory (Scott, 2015).

The twenty-first-century learning demands create a powerful learning experience that leads to a deeper understanding of solving real-world problems (McDiarmid & Zhao, 2023; Martinez, 2021; Puspawati, et al., 2021; Sliwka, Klopsch, Beigel, & Tung, 2024). Students will be shaped into individuals with talents that will enable them to learn optimally, become optimal workers, and become members of a global community capable of surviving the difficulties of the twenty-first Century, with strong critical thinking abilities and the ability to comprehend problems swiftly. Individuals who are made are always intended to have inquiring, open-minded, and contemplative characteristics, a strong work ethic to be productive, and the capacity to set priorities, make goals, and track results. Being skilled in using continually changing work equipment allows them to keep their skills up to date with technological advancements.

In integrating theoretical frameworks proposed by Zimmerman (1988) in SRL and the concept of twenty-first-century skills into the narrative previously, the study's research questions are informed. Zimmerman's model provides a lens through which to examine the cognitive, metacognitive, and motivational processes involved in SRL, guiding investigation into how learners in distance education context regulate their learning behaviours to acquire twenty-first-century skills. Furthermore, the concept of twenty-first-century skills, encompassing critical thinking, communication, collaboration, and creativity, serves as a framework for assessing the outcomes of SRL practices within the context to remote learning environments. Thus, by integrating these theoretical perspectives, the research aims to: explore the roles of SRL for shaping twenty-first-century learning skills, literacy skills, and life skills.

## Method

This study was a systematic literature review that explored the roles of SRL for shaping twenty-first-century learning skills, literacy skills, and life skills. The research model used in this research was George's (2008) literature review model. This model was selected for its comprehensive approach, which aligns closely with this research's multifaceted objective. It facilitates an in-depth analysis of the complex relationship between SRL and twenty-first-century skills in distance education. This model's emphasis on identifying levels of analysis, factors influencing behaviour change, and contextual considerations provides a structured framework to systematically explore the literature, allowing for a nuanced understanding of the interplay between SRL and skill acquisition within diverse educational settings. By employing this model, the study was aimed to synthesise existing research and uncover underlying mechanisms and contextual factors crucial for informing effective pedagogical practices in modern digital learning environments.

The following diagram displayed George’s (2008) literature review model, as Ariantini et al. (2021) adapted.

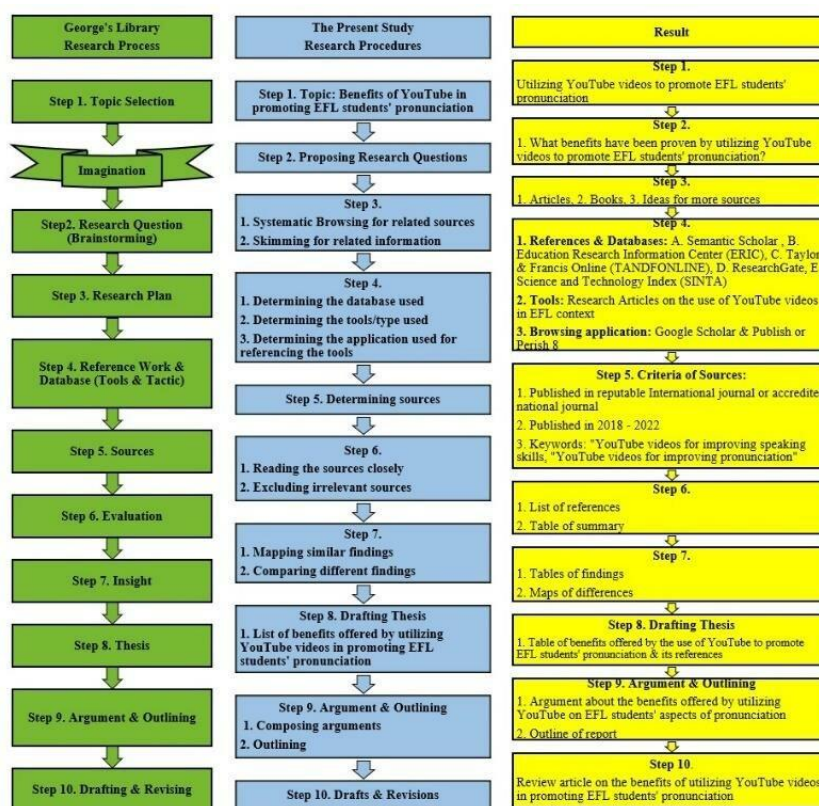


Figure 1. George’s (2008) model of literature review, as adapted by Ariantini et al. (2021)

The first step of the research was determining the topic and the research questions, namely the connection between self-regulated learning and how it is used for developing 21st-century skills in online learning. The next step was determining the secondary data source from previous research. The criteria for selecting the data source were research published in a reputable international journal indexed by Scopus and/or Web of Science, published in 2015-2020, and included in open-access research repositories such as ERIC, ResearchGate and Google Scholar. The keywords used for selecting the articles were ‘self-regulated learning’, ‘twenty-first-century skill’, ‘distance learning’, ‘learning skill’, ‘literacy skill’, ‘life skill’. After the articles were selected, they were reduced by selecting only articles containing data and information to answer the research questions. Of the 93 articles selected using the keywords, 45 were excluded, and 48 were included as the data source. The final 48 articles were made through a rigorous process involving the researchers independently assessing each article against the predetermined inclusion criteria, encompassing relevance to the research topic, publication in reputable journals, and inclusion in recognised repositories. Any discrepancies in article selection were resolved through consensus among the researchers, ensuring transparency and enhancing the credibility of the study’s data sources.

These 48 articles were further critically read, from which themes of the previous studies’ findings were coded. The coding framework utilised a deductive approach, incorporating predefined categories derived from research objectives (SRL strategies and specific twenty-first-

century skills). Inter-coder reliability was assessed through Cohen's kappa coefficient, with periodic checks conducted to ensure consistency in coding interpretations among multiple coders. Discrepancies in coding were resolved through discussion among coders (researchers) to reconcile differences in interpretations, followed by consensus-driven revisions to the coding framework as needed, thereby bolstering the validity and reliability of the findings.

The findings of these previous studies were then categorised based on these codes to find the pattern of data and information for answering the research questions. The analytical approach systematically compares themes across studies to identify similarities, differences, and patterns. Through iterative data triangulation and thematic synthesis, commonalities and variations within and between themes were thoroughly examined to generate comprehensive insights into the relationship between SRL and twenty-first-century skills in the context of distance education.

## Results and Discussion

The results from the systematic literature review are discussed with a modified explanation, which explains the relationship of self-regulated learning to shaping 21st-century skills. The result explores (1) Self-regulated learning for shaping twenty-first-century learning skills, (2) Self-regulated learning for shaping twenty-first-century digital literacy skills, and (3) Self-regulated learning for shaping twenty-first-century life skills.

### Self-Regulated Learning for Shaping twenty-first-century Learning Skills

Learning skills are the first set of twenty-first-century skills, focusing on critical learning skills and innovation. This skill is regarded as one of the most required skills for global business. The learning skills are divided into three major parts, as Trilling and Fadel (2009) identified. The first is expert thinking skills, the second is complex communication skills, and the last is applied imagination and invention skills. Self-regulated learning is proven to shape learning skills as the process creates more independent learner which put values in themselves to regulate their learning. The interplay between cognitive, metacognitive and motivational aspects during learning in self-regulation and self-instruction training has been argued to positively affect children's learning skills (Albelbisi & Yusop, 2019; Brigg & Chik, 2000; El-Henawy, Dadour, Salem, & El-Bassuony, 2010; Panadero, Klug, & Järvelä, 2016). Figure 2 displays how self-regulated learning shapes twenty-first-century learning skills based on the experts.

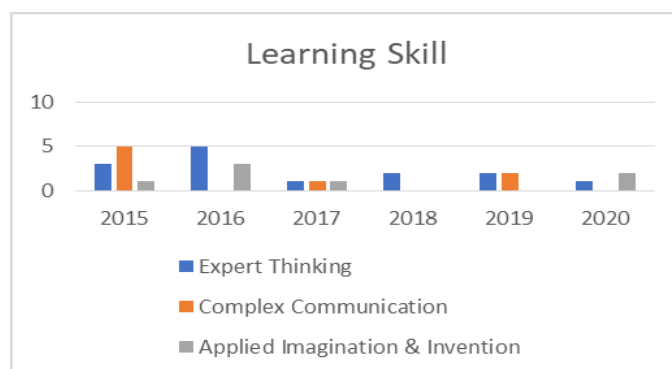


Figure 2. Self-regulated learning Shaping twenty-first-century Learning Skills

From Figure 2, it can be seen that three skill sets develop along with increasing students' self-regulated abilities in learning skills: expert thinking skills, complex communicating skills, and applied imagination and invention skills. The first skill pertains to advanced critical thinking capacity, the second involves complex communication skills, and the last focuses on practical creativity and innovation capabilities. Self-regulated learning has been demonstrated to enhance learning skills by fostering and instilling in learners the value of self-regulation. The interaction of cognitive, metacognitive, and motivational factors in self-regulation and self-instruction training is believed to enhance children's learning abilities.

### Self-Regulated Learning for Shaping Expert Thinking

Trilling and Fadel (2009) defined expert thinking as the requirement to become a self-reliant lifelong learner. They also mentioned a shift in how expert thinking is defined from time to time. In the twenty-first Century, the ability to ask and answer critical questions, critically evaluate other people's perspectives on a subject, inquire and solve problems, communicate and interact with others to learn, develop new information, and innovate has always been at the centre of learning skills. Critical thinking and problem-solving are the two fundamental components of expert thinking. Critical thinking is a mental process that involves thoroughly filtering information or opinions. Critical thinking helps define an issue and process data without prejudices by analysing the facts. Therefore, problem-solving is defined as a result of a strong influence of socio-cultural learning. Two aspects are implied by issue solving: first, an effort must be made to characterise the problem, and second, the solution must be designed to address the problem identified. They went on to explain how taxonomy bloom should be viewed as simultaneous cognitive development rather than sequential cognitive development. There are four dimensions of critical thinking and problem-solving skills, as Trilling and Fadel (2009) mentioned, where the students should be able to reason effectively, use systems thinking, make judgments and decisions, and solve problems. Previous studies have examined this strong relationship between self-regulated learning and the formation of four expert thinking dimensions in online learning.

Reason effectively becomes the first dimension of critical thinking skills like analysis, evaluation and synthesis. Various classifications of grading reasoning skills almost highlight the support of self-regulated learning. For example, a study by Azevedo and Gasevic (2019) discovered that students can develop self-regulated learning (SRL), which impacts learning, problem-solving, and reasoning through hybrid learning environments. Wise & Hsiao (2019) also found that the interplay between cognitive, affective, metacognitive, and social processes and their necessity requires self-regulated learning. In other words, students used self-regulated behaviour to make well-informed choices on which posts to devote their time and resources to, prompting them to affirm their preferred position with logic and proof (Zhou et al., 2020). Self-awareness is linked with reflective thinking and reasoning (Morshedian & Hemmati, 2016). Likewise, as students become self-regulated readers, they are engaged in problem-solving practices such as analysing situations, prioritising goals, making choices and decisions, and evaluating outcomes.

Systems thinking is a twenty-first-century skill in which you evaluate how different system parts work together. This skill is important as, in life, we must look at how different pieces of the

puzzle fit in order to make a whole puzzle. Most research on defining complex systems states that system thinking is the ability to evaluate how pieces of a whole interact to achieve overall consequences (Muis, Chevrier, & Singh, 2018; Zhou et al., 2020). The complex steps in self-regulated learning help the learner support students' competence in using their system thinking (Alvi & Gillies, 2015). A study by Quigley, Muijs and Stringer (2018) said that a number of processes, starting with activating past knowledge and progressing to individual practice before concluding with structured reflection, may be adapted to various subjects, ages, and contents. In SRL, systems thinking helps students develop the ability to value other people's ideas and perceive things from a different perspective (Ben-Eliyahu & Bernacki, 2015). Considering long and short-term implications of actions, recognising actions may have unintended consequences, detecting the circular structure of complex cause-and-effect interactions, and looking at things from different viewpoints and perspectives are all habits of systems thinkers. In dynamic learners, systems thinking creates long-term learning environments that develop lifelong learners.

A number of previous meta-analyses have investigated the influence of SRL on students in making judgments and decisions. For instance, students identify underlying assumptions, prejudices, and points of view and demonstrate how they undermine the peer's argument (Barak et al., 2016). Distance learning research has focused on learners' learning processes to generate necessary information, abilities, and manners through internet/computer-supported learning mediums. While attempting to develop knowledge in ICT-supported mediums, learners must access different prior knowledge about the source, analyse credibility, and question the validity and reliability of references (Pardo et al., 2016).

Problem-solving is the process of devising alternate courses of action based on logical assumptions and factual data while taking resources into account. The problem-solving process has two dimensions. Students must first be able to solve various unknown problems in both traditional and novel approaches, and they must also be able to recognise and ask key questions that clarify alternative points of view and lead to better answers. Panadero, Jonsson, and Botella (2017) show the importance of integrating planning with self-assessment-related processes, where students can offer experience in recognising the need to handle technical issues and anticipating needs and technology. Technology can be used as a tool to solve problems efficiently and effectively in both traditional and novel ways to tackle various types of odd situations. SRL continuously assess technical problems and their remedies by employing relevant solutions (Dörrenbächer & Perels, 2016).

Self-regulated learning is deliberately planning, monitoring, evaluating, and regulating one's learning to maximise it. It is a systematic procedure that entails the students' self-directedness by being thoughtful, reflective, and self-disciplined in learning. When describing the characteristics of meaningful learning using ICT, researchers emphasise the significance of embedding learning in authentic situations and challenges (Lajoie et al., 2015; Raes, Schellens, De Wever, & Benoit, 2016). This ensures that students can apply what they have learned in the classroom to real-life situations. Students' authentic learning experiences can be further enhanced by activities that assist students in generating personal meaning from their knowledge, particularly in finding personal applications of what they have learned.

## Self-Regulated Learning for Shaping Complex Communicating

Complex communication is built on successful information sharing via various categories, including visual, digital, spoken, and nonverbal interactions. However, understanding communication as a successful skill necessitates synthesising this multifaceted definition, which considers the interrelationships of the reading, writing, speaking, and listening subdomains, as well as the impact of technology and verbal and nonverbal proficiency in various situations and cultures. The message is clear, concise, and intentional, resulting in an accurate flow of information and ideas. Complex communication necessitates using abilities that go beyond those learned in school. Reading comprehension, speaking, and writing in English, as well as grammar and spelling, are all basic abilities. They begin to grasp how effective collaboration is linked to effective communication. Communication encourages critical thinking by allowing students to visualise their and others' thoughts. Students can see how creativity may be used to improve their communication. Communication and collaboration skills are the two characteristics of complex communication. Some studies proved that SRL could support students' communication and collaboration skills.

Communication skills involve listening, speaking, observing and empathising (Callaghan & Corbit, 2015). In distance learning, digital messages must be relevant and meaningful. Relationships can be improved online by learning how to talk well and communicating with other lecturers or classmates. Self-regulated learning allows students to effectively communicate their thoughts and ideas in various forms and circumstances by employing oral, written, and nonverbal communication skills (Wise & Hsiao, 2019). People are complex, and they bring various experiences, skill levels, and attitudes to the e-learning content. Understanding this and using the appropriate tactics is the foundation of effective communication in the e-learning process. Ben-Eliyahu and Bernacki (2015) stated that students may benefit from writing activities like journal writing to enact knowledge-production processes that result in deep understanding of subject matter, greater learning motivation, and long-term retention.

Collaboration is frequently identified as a critical student success ability required for performance in the classroom and in life in the twenty-first Century (Malmberg, Järvelä, Järvenoja, & Panadero, 2015). Trilling and Fadel (2009) mentioned that collaboration has three dimensions. In their study, Paraskeva, Alexiou, Souki, and Panoutsos (2017) suggest that deciding how the task or project is accomplished, collaborating with the group to assign roles or tasks, and planning and making group choices using negotiation or conflict-resolution skills are needed. SRL helps the students contribute to assisting one another, taking responsibility for work assignments, monitoring progress, and providing feedback (Panadero, Kirschner, Järvelä, Malmberg, & Järvenoja, 2015). Collaboration is also linked to other cognitive, interpersonal, and intrapersonal skills: effective collaboration demands communication skills, metacognition, and self-direction in SRL (Paans et al., 2019). According to the twenty-first-century skill movement, collaboration is a journey, not a final product.

Communication and collaboration entail building trust to work together to address challenges that no one person can solve. Furthermore, compassion and acceptance of diversity often vary across content areas. On the other hand, the substance and context of the collaboration and communication activity might greatly impact the students' capacity to transfer their skills



(Cho & Heron, 2015). As a result, because SRL is connected with other cognitive, interpersonal, and intrapersonal competencies, it can contribute significantly more effectively to complex communication skills.

### Self-Regulated Learning for Shaping Students' Applied Imagination and Invention

Creativity and innovation is focused on guiding students to combine their thinking, knowledge, skills and values in imaginative ways to work in complex environments and solve various problems. Individuals and organisations need to secure a competitive advantage so that students are required to be creative in their approach to various situations and actions. Creativity and innovation can be gained through discovery: thinking creatively, working creatively with others, and implementing the innovations. Several researchers have studied how SRL impacts the way students think creatively, work creatively with others, and implement innovations.

Creative thinking (which goes hand in hand with critical thinking) is an important skill that allows you to see issues and situations in a new light. Creative thinking is a method of coming up with innovative or unconventional ideas that are not only based on previous or existing answers. Please make use of a variety of approaches for coming up with new ideas; come up with fresh, creative, and noteworthy thoughts (both incremental and radical concepts); and to expand and optimise creative efforts, students should develop, revise, analyse, and evaluate their ideas are all the dimension of creative thinking (Trilling & Fadel, 2009). Räisänen, Postareff, & Lindblom-Ylänne (2016) showed evidence of active use of co-regulation as a technique for enhancing the mind, thoughts and ideas that can go beyond what appear to be the problem's constraints. Creative thinking is a method for breaking through boundaries.

Work creatively with other means to develop collaboration and develop more efficient processes while also putting creativity into action to create innovative solutions to challenges. People with creative minds generally follow a process when coming up with a solution to a problem. Alvi and Gillies (2015) stated that learning in the twenty-first Century entails stretching, evolving, and being challenged by new ideas and perspectives. Şahin-Kızıl and Savran (2016) found that ICT tools regulate student language learning regarding culture and social connection. Students welcomed the rise in SRL since it provided them greater confidence in their capacity to finish the study tasks collaboratively because of their active conscious involvement.

Fresh ideas and new ways of looking at things are all examples of innovation (Erdüğan, 2020). Learning and creativity do not have to be limited to the four walls of our schools/classrooms. In truth, our ability to think creatively is often limited by the confines of our schools. This program also indicates promising new approaches to teach more general self-regulated learning components. In today's educational paradigm, encouraging pupils to take responsibility for their learning is a common refrain in building innovation (Paraskeva et al., 2017). The ongoing and rising intellectual and behavioural demands, limitations, and affordances that schools supply learners underline the importance of self-regulatory capacity as both preparation for and accomplishment influence the effectiveness of online learning (Zheng & Huang, 2016). When academic activities require continuous attention, when instruction is inadequate or unstructured, or when students are faced with competing goals, learning and self-management skills appear to be more crucial for students to adopt (Eitel et al., 2020).

Creativity is a multifaceted construct that includes cognitive variables, personality traits, family, educational components, and social and cultural factors. These dimensions interact depending on one's thinking and creative styles and are thus expressed and discovered in various ways. A critical factor in influencing an individual's ability to exhibit the talents found in self-regulated learning strategy.

### Self-Regulated Learning for Shaping twenty-first-century Literacy Skills

There are numerous reasons for students in the twenty-first Century to learn how to analyse, evaluate, use, manage, and supplement the vast amount of information and media available. With today's and future digital technology, students will have an unprecedented ability to think, discover, communicate, cooperate, and be creative. With all that power comes the need to master the skills to deal with massive amounts of data, media, and technology (Trilling & Fadel, 2009). In addition, digital literacy is divided into three dimensions: (1) Information literacy, (2) Media literacy and (3) Information and communication technology (ICT) literacy. Numerous studies have been conducted on how self-regulated learning impacts digital literacy. Figure 3 displays how self-regulated learning shapes twenty-first-century literacy skills based on the experts.

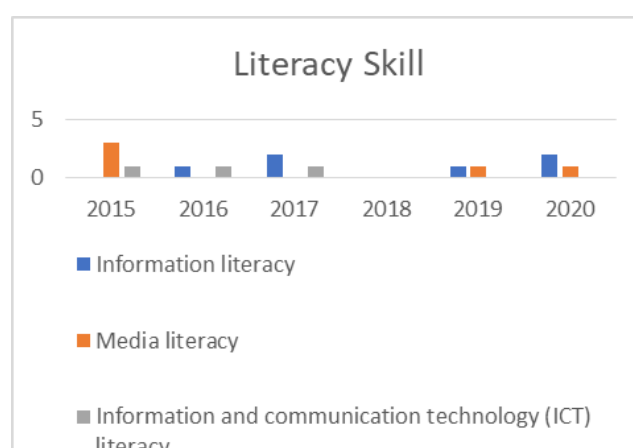


Figure 3. Self-regulated learning Shaping twenty-first-century Literacy Skills

From the findings of this research, it appears that the three dimensions of digital literacy are the focus of research as an impact on students' self-regulated learning abilities. Although not all dimensions of digital literacy are the focus of studies every year, there are at least two dimensions that experts regarding twenty-first-century skills always discuss. From 2019 to 2020, information and media literacy will be increasingly researched.

### Self-Regulated Learning for Shaping Students' Information Literacy

Students are encouraged to learn responsibly from the media and the internet and have confidence in their ability to assess and comprehend the information (Callan & Shim, 2019). SRL teaches students how to be ethical and wise information creators and consumers of information. In the twenty-first Century, it is a vital skill for students. Although sharing information can be easily obtained in person, students must understand that they cannot copy information from a source and claim it as their own. Information literacy has two dimensions: (1)

Access and evaluate information; (2) Use and manage information. Practitioners in various countries have put much work into defining information literacy. Much of this work has been done in an academic environment.

Access and evaluate information is defined as the ability to access, evaluate, apply, and manage information effectively and use information sources responsibly and successfully (Trilling & Fadel, 2009). The environment provides the material and informational resources necessary to accomplish goals. In distance learning, issues may arise, such as the availability of computer hardware and software, internet access, and text-based and asynchronous communication (Kuo, Tseng, & Kuo, 2020). Cho, Kim, and Choi (2017) stated that when sophisticated mobile devices become common in modern culture, the Internet transcends time and location limitations and becomes a ubiquitous learning tool. They also added that SRL plays a vital role in the framework of a community of inquiry, very likely affecting the formation of a positive online learning community. Yot-domínguez & Marcelo (2017) stated that a higher level of intentionality and cognitive complexity, such as monitoring and self-assessment, are examples of more complicated SRL strategies. Evaluation is vital when using web sources for research tasks, but viewing websites is also important. Furthermore, the student should demonstrate an ability to utilise search engines correctly and understand difficulties associated with web-based activities such as plagiarism (Abegglen, Burns, & Sinfield, 2016).

Using and managing information seemed to foster students' interest in the course topics and raise their awareness of the importance of the course information as it applies to their homework (Barak et al., 2016). Conversations about using sources without plagiarism should be included in teaching information literacy. Landrum (2020) found that students' confidence regarding their ability to use online learning platforms can be seen in how they use citations and properly reference sources in reports. Students should learn how to write a bibliography to indicate the sources used in their research. SRL promotes ethical media, which requires students to pay attention to details and information.

Self-regulated learning (SRL) helps students design tasks successfully while monitoring and evaluating the influence of the search results on the needed learning (Kuo et al., 2020). Everyone has free access to digital information, so it must be authentic and legitimate. With SRL, students can see themselves as a feeder or a source.

### **Self-Regulated Learning for Shaping Students' Media Literacy**

Trilling & Fadel (2009) defined media literacy as twenty-first-century approach to education. It provides a framework for accessing, analysing, evaluating, creating, and participating in messages in many formats, such as print, video, and the Internet. Media literacy fosters a grasp of the media's role in society and the critical inquiry and self-expression abilities required of democratic individuals. Media literacy has two dimensions. They analyse media and create media products.

Analysing media is the simplest way to execute, and media analysis should be one of the first media literacy skills introduced in the classroom (Valencia-Vallejo et al., 2019). Student self-regulated learning is utilised to extend pupils' understanding of a society where media engagement in learning is prevalent (Wolverton, Guidry Hollier, & Lanier, 2020). Self-regulated

learning simultaneously affects students in creating general knowledge about norms and improves social coordination as individuals are more readily receptive to information (Alvi & Gillies, 2015).

Creating media products allows students to gain technical knowledge and skills using previously gained knowledge and processes associated with examining, exploring, and producing media products (Azevedo, 2015). Personal management and communication are two of the most critical attitudes in creative media production. SRL underpins productive processes and tools in innovative media production, such as responding to requests and feedback, preparation, and idea generation (Ben-Eliyahu & Bernacki, 2015).

Media texts are constructed in the same way as buildings and roadways are. The key to understanding this notion is determining who built the message, with what materials, and to what effect. Audiences have a role in interpreting media messages since each audience member brings a unique set of life experiences to the message. Age, gender, education, and cultural upbringing will all result in different interpretations.

### **Self-Regulated Learning for Shaping Students' Information and Communication Technology (ICT) Literacy**

ICT gives rise to distance learning opportunities and develops self-regulated learning. Technologies may aid in the development of this self-regulation cycle. Simultaneously, in technology-based learning experiences, SRL is critical (Lee et al., 2015). As demonstrated by Zhao's study (2016), the relationship between SRL techniques and technology can be casual. Several researches have examined the application of technology.

Students demonstrate a high level of self-regulation when selecting information tools, as publicising their work exposes them to the "risk" of others critiquing their work (Cho et al., 2017). They emphasised that the environment requires the understanding that SRL is not confined to the individual sphere but can be acquired collectively (collective self-regulation). Putting modern technology to effective use allows students to continue their learning by providing opportunities for them. Digital communication technology has made it simpler and faster to link people worldwide.

SRL study outlines the methods of students' responsibility and how students are motivated to use sources that help them. One of the primary characteristics of SRL is that the student begins his or her quest based on personal initiative, perseverance, and adaptable skills (Cleary & Zimmerman, 2001). Finally, encouraging self-regulation learning provides opportunities worth exploring while integrating literacy skills into the real learning process.

### **Self-Regulated Learning for Shaping twenty-first-century Life Skills**

The term "life skills" is commonly used to refer to any of the abilities required to deal well with life's problems. Trilling & Fadel (2009) divide life skills into five categories: (1) Flexibility and Adaptability; (2) Initiative and Self-Direction; (3) Social and Cross-Cultural Interaction; (4) Productivity and Accountability; (5) Leadership and Responsibility. Research on this phenomenon has been established in numerous areas of knowledge, including education,

economics, and other multidisciplinary interests. Figure 4 displays how self-regulated learning shapes twenty-first-century life skills based on the experts.

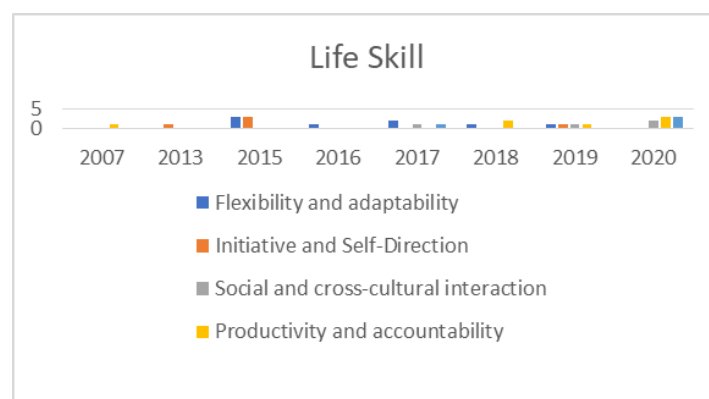


Figure 4. Self-regulated learning Shaping twenty-first-century Life Skill

### Self-Regulated Learning for Shaping Students' Flexibility and Adaptability

A variety of internal and external influences shape flexibility and adaptability. Age, ethnicity, and gender may influence adaptability. In addition, one's sense of flexibility is influenced by the accumulation of education, tenure in a working environment, experience in learning, and perceived learning (Zhao, 2016). The two dimensions of flexibility and adaptability are (1) adapt to change and (2) be flexible. The research below shows how self-regulated learning has shaped one's ability to adapt and be flexible in distance learning.

Those with a greater SRL appear more adaptive (Karabenick & Zusho, 2015). The study from McCardle & Hadwin (2015) showed that although everybody in shifting learning is stressed, those who believe their abilities provide them with additional possibilities regard themselves as better prepared and ready to adapt. Those who do not regulate their learning may feel less adaptive. Rogat and Adams-Wiggins (2015) found that students' cognitive complexity should increase due to increased education, enhancing their capacity to handle changing circumstances in ways that align with their regulatory moves' overarching goals. Personal adaptability may be enhanced as a result of self-regulated learning. The SRL approach affects students' behaviours and performance; these behaviours are considered adaptable if they contribute to successful performance (Winne, 2019).

Strawser, Kerckmar and Pennell (2017) defined flexibility as the ability to change, including meta-competency and personal identity. On the other hand, a lack of SRL may have a detrimental impact on personal flexibility. Inflexible students may limit the developmental opportunities provided through exposure to more diverse learning media, as in Chen's (2018) study. The student's subject and interest frequently determine flexibility. Flexibility can refer to either a reactive or proactive approach. Students' flexibility at distance learning refers to an employee's underlying potential, drawn from cognitive, affective, and behavioural resources. It may be used to effectively modify and/or anticipate task-related demands (Cirino et al., 2017).

In conclusion, the research suggests numerous ways and concepts for behavioural adaptability and flexibility. The SRL technique may be necessary for successful distance learning adaptation. For example, in some situations, withholding a response or avoiding a situation may

be more adaptable than entering the situation, speaking up, or proactively attempting to change it. As a result, contextual elements should be considered while evaluating the efficiency of certain response tendencies.

### **Self-Regulated Learning for Shaping Students' Initiative and Self-Direction**

Initiative and self-direction entail initiating or seeking out ways to assist and complete work without being led by others. There are three dimensions of initiative and self-direction: managing goals and time, working independently and being self-directed learners (Trilling & Fadel, 2009). Previous studies have examined the role of SRL in shaping students' initiative and self-direction.

Goals and time roots are essential in effective time management, which has a direct impact on a person's productivity. These phenomena include procrastination, interruptions, and a lack of discipline. Procrastination frequently begins with a distraction from work, followed by a lack of discipline in maintaining attention on the initial task (Wang et al., 2013). Time management entails assigning time to tasks that will aid in achieving objectives. Monitoring, creating goals, prioritising, planning, delegating, and analysing time spent are all methods for time management, often seen in SRL's strategies. Tsai (2015) found that students can finish the essay faster if they divide chores into manageable chunks and schedule time.

Students' self-regulated learning produces more effective mastery of content, stimulates informational and professional interests, and develops creative and initiative activity. Schoor, Narciss, and Körndle (2015) claimed that the social comes into play in the different social modes of regulation and to anchor social modes of regulation concerning self-regulated learning. Students' independent work in higher education institutions is an important educational function that enables them to develop a system of fundamental subject and scientific knowledge.

Self-directed learning has risen to prominence in the fields of learning and education. It proposes that with more assistance and encouragement, people may become more self-directed and maintain more self-autonomy (Teng & Reynolds, 2019). Self-directed learning improves one's total skill level in the twenty-first Century. Individuals employ technologies to carry out a variety of tasks and responsibilities. Malmberg et al. (2015) found that when students are obliged to work on a project, they will seek advice from their bosses on how to begin the project, enhancing their knowledge and understanding. This action commonly happens in SRL strategies. Incorporating Islamic perspectives into the discussion, Al-Munajjid (n.d.) emphasised the importance of self-regulation in personal development, mentioning, "Self-discipline is essential for achieving success in this world and the hereafter).

Instructors at all school stages must encourage students to participate in decision-making processes. Decisions must be made about implementing teaching-learning methods, instructional strategies, the application of teaching-learning resources, and other tasks and activities that will help students learn more effectively.

### **Self-Regulated Learning for Shaping Students' Social and Cross-Cultural Interaction**

In social and cross-cultural interaction in today's increasingly global environment, learning to deal with people from different cultures is becoming increasingly crucial. Respecting cultural differences means working well with people from various socioeconomic and cultural

backgrounds. SRL helps to respond to varied ideas and values with an open mind (Wise & Hsiao, 2019). Utilise social and cultural diversity to generate new ideas and improve job quality and innovation. Social and cross-cultural interaction has two dimensions, as stated by Trilling and Fadel (2009), such as (1) interacting effectively with others and (2) working effectively in diverse teams. Several studies described SRL in the context of distance learning that fosters students' social and cross-cultural interaction skills. Furthermore, in discussing interpersonal and social skills, Philips (2003) emphasised the Islamic principle of mutual respect, stating "Islam encourages believers to maintain good manners and treat others with kindness and respect, fostering harmonious interpersonal relationships".

Interacting effectively with others is defined as reciprocity in acts and responses in various relationships, including verbal and nonverbal, conscious and unconscious, enduring and causative (Cho et al., 2017). Facilitating verbal and nonverbal engagement and communication with others when social rules and relationships are developed, communicated, or modified involves transforming inert knowledge or information (Carter et al., 2020). The concept of interaction has been extended to distant learning contexts, where different types of technology provide a wide range of mediation.

Working effectively in diverse teams has numerous advantages. It allows people to tap into more abilities and experiences that a diverse workforce offers. It also encourages innovative thinking and more flexibility. Doo and Bonk (2020) stated that in their study, diverse groups are also more effective at detecting and solving problems, which is especially crucial for teamwork. The association between self-efficacy and learning engagement, as well as the relationship between self-regulation and learning engagement, was mediated by social presence.

The results of this study agree, implying that including SRL in content can aid in stimulating students' attention and motivate them to learn. Furthermore, online information relevant to students' personal experiences may aid in increasing student participation in course content.

### **Self-Regulated Learning for Shaping Students' Productivity and Accountability**

Prioritising, planning, and utilising knowledge and abilities to make decisions that produce quality results in an ever-changing environment is what productivity is all about (Trilling & Fadel, 2009). Personal accountability is taking responsibility for one's thoughts, habits, actions, and results (Valli & Buese, 2007). Individuals and groups show initiative, self-direction, and personal responsibility to give value to the world. To fulfil productivity expectations, individuals exhibit accountability through effective time management, optimal resource allocation, personal integrity, and self-monitoring (Harris et al., 2020). At all levels, individuals and teams acknowledge the interconnectivity of their actions. Productivity and accountability have two dimensions: managing projects and producing results.

Setting a schedule is only one aspect of project management. It is the concept of sticking to your plans and completing chores even if no one looks over your shoulder. This is the part that many entrepreneurs refer to as a "grind". Managing projects in SRL reflects progress and achieves goals (Lourenco & Ferreira, 2019). In creative cooperation, it is where the real work happens. Students start by defining goals based on the big picture of their goals. Garcia, Falkner and Vivian (2018) summarised that students must clearly understand where they are heading and

their final product as this sense of purpose will guide their goal-setting. Students begin to develop goals if they clearly understand what they are doing and where they are heading (Zeng & Goh, 2018).

Produce results rooted in the concept that hard work and dedication have a moral advantage and an intrinsic quality or value to enhance character and individual abilities (Bubou & Job, 2020). SRL is about accepting responsibility for outcomes rather than assuming they are not their fault. Barker, Wendel, and Richmond (1999) stated that taking ownership is taking the initiative to bring something to the attention of the appropriate individuals when you perceive something is critical to attaining goals. If taking initiative is about taking action, accountability is about following through and doing what you said you would do. In the study from Yu, Wang, and Spector (2020), the students realise that the outcomes of their job are important to other team members and not wanting to disappoint them as it triggers different levels of learning engagement. It is a set of ideals centred on the significance of work and shown through the will to work hard. Individuals who are under pressure to perform a large number of tasks in a short amount of time may multitask in the hopes of accomplishing more in less time.

Make accountability and productivity a part of students' learning by having them discuss ideas and agree on what accountability means in the workplace, and then use that as a foundation for making accountability an organisational priority.

### **Self-Regulated Learning for Shaping Students' Leadership and Responsibility Skills**

Leadership and responsibility utilise the strengths of others to attain common goals and coach and develop others using interpersonal skills (Trilling & Fadel, 2009). The person can assess and regulate his or her and others' emotions, lead and inspire people using empathetic abilities, and organise, prioritise, and delegate tasks. To become a responsible person, one must make conscious decisions and engage in activities that strive to develop oneself and/or others. A responsible individual, above all, accepts the consequences of his or her actions and decisions. The dimensions of leadership and responsibility are (1) Guiding and leading others and (2) Being responsible to others. SRL has impacted these dimensions, as described by several studies.

Guide and lead others with good self-discipline, which means one can regulate their emotions and reactions to situations and other people (Jaradat & Ajlouni, 2020). They do not have outbreaks of rage or make fast decisions. Students frequently take their teachers' assessments of their work as their, which means that teachers can significantly impact a student's willingness to persevere or give up on a task. Furthermore, (2020) added that creating a culture that values mistakes as opportunities to grow is critical. Genuinely identifying areas for development allows for growth, and including positive input does not imply that we are only delivering positive feedback.

People avoid taking responsibility for various reasons, including laziness or a fear of failure, as well as a sensation of being overwhelmed by the scope of a problem or situation. Whatever the cause, if people refuse to accept responsibility, they will fail in their employment, their teams, and their personal growth. Denton et al. (2020) found that SRL must be embedded in reading intervention to help learners face difficulties. Learners who self-regulate their learning analyse and



act on relationships between cognitive and metacognitive processing results across a timeline of events (Winne, 2017).

Through their passion and drive to explore unlimited possibilities, a twenty-first-century leader inspires and motivates others. SRL had a tremendous advantage in business and life due to its cultural beliefs since it could spot chances everywhere - prospects that others did not notice.

## Conclusion

The twenty-first-century learning no longer creates a "one-fits-all" lesson but a personalised learning experience. The approach is habitual learning, which students are not forced to do. Independent learning gives students the freedom to choose their way of learning at their pace since self-regulated learning is a learning process to organise oneself in ideas, change habits, attention, and actions that can be taken to help maintain and improve learning outcomes (Ben-Eliyahu & Bernacki, 2015; Bernard et al., 2004; Molenaar & Järvelä, 2014). Students must develop self-motivation and self-discipline. The reflection on a learning cycle prompts the improvement of academic accomplishment (Hallinger & Heck, 2010) and more profound processing. It is essential to note the technology-based activities in the online classroom; motivation for this activity was a concern for equality of provision and a desire to engage students with meaningful, genuinely educational experiences. In order to achieve twenty-first-century learning goals, four elements of tasks allow students to explore their competence, let them do autonomous learning, cultivate interest, and make them believe in doing things with their abilities and skills (König, Jäger-biela, Glutsch, & Jäger-biela, 2020).

The study emphasises the importance of self-regulated learning (SRL) in educational curricula for student development. Educators may use these data to develop instructional practices that enhance student autonomy and confidence. Policymakers can argue for incorporating SRL into educational programmes to suit the demands of today's work economy. Institutions can provide professional development to teachers to help them improve their usage of SRL approaches. SRL follows Islamic ideals, emphasising self-discipline and the pursuit of knowledge. However, merging SRL with Islamic beliefs may provide difficulties. Further investigation from an Islamic perspective might reveal this synergy. Furthermore, investigating faith-based treatments within SRL frameworks may improve learning results while upholding Islamic principles and fostering a more inclusive educational approach.

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