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EXPLORATION OF SELF-REGULATION THROUGH ONLINE LEARNING

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Abstract

The purpose of this explorative research study was to better understand self-regulation in personal online learning modes. The study was situated within the context of the field of learning design and technologies, and more specifically in online learning at COVID-19 pandemic. The conceptual framework comprised of theories of online learning, meta-cognition, and self-regulation. The aim of this interpretive inquiry was to explore the question, how might self-regulation takes help in personal online learning? Fifteen master level students participated in three phases of data collecting that included written lived experience descriptions, think-aloud observations, and in-depth interviews. A post-intentional methodology that included a whole-parts-whole process, a postreflexive journal, and a post-intentional data analysis technique of chasing lines of flight was used to analyze and interpret the data, as well as interrogate the tentative manifestations. The findings included self-regulation and online learning complement to each other and surpass excellence in knowledge construction.

***Keywords*:** Self-regulation, Meta-cognition and Online Learning.

1. Introduction

In the COVID-19 pandemic era influence, the entire world includinghigher education in most of the countries isalready undergoing tremendous changes so as to fulfil the demands of learners and the higher education system. Along with this, the governments are strugglingtoo with how to cater to the need of diverse learner. The percentage of graduates with university degrees (or an equivalent qualification) has risen in many countries in the developed as well as developing world. So education has changedits mode from face to face learning to online instruction.

According to Harasim (2000), the first entirely online course was offered in 1981.Now in the present context, it is clear that online learning is not solely about distance learning. Its impact is much wider in all level of learner. Academic practice increasingly focuses on blended learning (also known as hybrid learning or augmented learning). This is also an independent lifelong learning process as this integrates online learning with classroom- and face-to-face-based activities. Although university education has always required a maximum of self-directed learning and online resources that processes can assist with helping a student to make progress on this difficulty journey. Campbell and Schwier (2014) recognized "*dynamic social and informal learning*" cropped up from social media and communication applications. They believed, "*opening online learning environments to incorporate informal and diverse social learning spaces offers fresh opportunities to instructional designers, and also challenges the dominant discourse of what is considered 'legitimate' learning, based on institutional control of accreditation and certification*". Learning is best when it is active, meaningful, retained over time, and transfers to a variety ofcontexts. A vitally important but often neglected aspect of learning is that oftenstudents have the requisite knowledge and skills for performing complex tasks butdo not use them; i. e, the skills remain inert. Sometimes this is because students are not motivated or confident to apply them, and

sometimes learner simply do notrecognize that the situation calls for use of particular knowledge and skills. That is, students may have declarative and procedural knowledge, but not the contextualor conditional knowledge needed for application and transfer (Hartman &Sternberg, 1993). Littlejohn et al. (2016) also emphasize that without motivations and goals, learners cannot shape their total conceptualization of a MOOC including their learning strategies. They highlight that learning in MOOCs cannot be sufficiently captured only by learning analytics, but requires thorough investigation of individuals' behaviour online – a reason that this study aims to address. Students in higher education are much more concerned about their own knowledge generation. Hencethey frequently check their achievement through self-evaluation or self-reflection. While self-directed students used self-regulation which is defined as *"agents of their own thinking"* by (Hacker 1998). In an online learning mode, learners think about their own thinking/cognitive processes like meta-cognitive knowledge component which is the most static and includes one's knowledge about cognition and strategies, as well as knowledge of task variables that influence cognition, and knowledge of self as a learner or thinker. Meta-cognitive judgments and monitoring are more process-oriented and involve such aspects as judging task difficulty, monitoring one's comprehension and learning, and assessing confidence. Self-regulation and control of cognition refer to planning, strategy selection, allocation of resources, and volitional control.

2. Review of Related Literature

A relatively recent and emerging area of research especially in the Indian context is online learning environments and teaching. Rakes & Dunn (2010) studied the impact of online graduate students' motivation and self-regulation on academic procrastination.This research was guided by one primary question: Are online graduate students' intrinsic motivation and use of effort regulation strategies predictive of procrastination? And they found that as intrinsic motivation to learn and effort regulation decrease, procrastination increases. Specific strategies for encouraging effort regulation and intrinsic motivation in online graduate students are presented. If learning is only happening between teacher and student with software in isolated environments, then socialization could get negatively affected. Wallance (2010) provides insights into social aspects of online teaching and learning such as the development of community, the social roles of teachers and students, and the creation of online presence. And also he focused on future research into how these social, personal, and interpersonal aspects relate to subject matter learning, the impact of differences in subject matter, and how students learn online. As Salmon (2000) points out, millions of words have been written about the technology and its potential, but not much about what the teachers and learners actually do online. Hibbert (2017) emphasise on what is it like to experience connectedness with people, ideas, information, and technologies in a personal learning network. To experience connectedness was to be motivated by the desire for safety and freedom, esteem through belonging, self-actualization, and being-in the-know. Rosenberg M. (2005) stated that e-learning is much more than e-training in his book "Beyond E-learning" .Affective and cognitive engagement of learners are equally important while learningonline. Baker's (2000) study showed that learners in synchronous online courses reported significantly higher instructor immediacy and presence.Lan Min and Lu Jingyan (2017) found that learners demanded more self-regulatory capability to carry on effective online learning. Online course instructors attempt to stimulate online learners' effective self-regulated learning (SRL) to support effective learning and enhance achievement. Knowing how the online learners learn in SRL loop will contribute to the effective course design and scaffolding. In this study, the learners from an edX MOOC were differentiated into more effective self-regulated learners (self-regulated learner) and less effective self-regulated learner based on the criteria of three SRL phases behavioural sequence patterns. The click stream data of 5764 learners was analyzed on macro-level behavioural learning sequence through ngram algorithm. Persistence and grade were compared among the different types of learners. The results showed us that more effective self-regulated learner persisted longer and performed better than less effective self-regulated learner on a significant level.Hofer, B. (2004) studied students' online searching for a simulated science assignment, investigated

through the use of think-aloud protocols. Exploring students' thought processes during online searching allows examination of personal epistemology not as a de-contextualized set of beliefs, but as an activated, situated aspect of cognition that influences the knowledge construction process.

3. Rationale of The Study

The present research has been conducted in the context of Covid-19 Pandemic affecting the face-to-face learning and teaching mode which very suddenly got converted into a completely online mode. This was an extremely new experience for teachers and students both especially south Asian countries like India where teachers and students are not much equipped with online learning. In the present study, the researcher tried to study whetherin online learning, students regulated their cognitive processes by using self-regulation and meta-cognitive strategies. Moreover in higher education, learners are expected to be self-motivated and having higher self-efficacy.

4. Research Question

1. How does (i.e., with what processes) a learner regulate his/her learning in online environment?
2. What is the association between learners' cognitive processes (meta-cognition used during learning) and online environment?

3. Theoretical Background of Self-regulation and Online Learning

Moore's transactional distance theory (Moore, 1973; Moore &Kearsley, 1996) provides an explanation for why the use of electronic communication tools may encourage interactions among learners and the instructor in an online environment. The theory stated that the quality of teaching and interactions among students and the instructor relates less to geographical separation and more to the structure of a course and the interactions that take place within it (Garrison & Cleveland-Innes, 2005; Lemak, Shin, Reed, & Montgomery, 2005; Moore &Kearsley, 1996). Moore (1973) saw distance education as a transaction and asserted that the physical separation in distance education leads to a psychological space of potential misunderstandings and a communication gap (i.e., transactional distance) between the instructor and the learner.

This self-regulatory phase is composed of two major categories: task analysis processes and sources of self-motivation. Zimmerman, B. (2008) stated that because forethought is anticipatory, it depends on a number of key sources of self-motivation, such as self-efficacy perceptions, outcome expectations, intrinsic interest, and a learning goal orientation. A second important source of self-motivation and outcome expectancies refers to beliefs about the ultimate end of one's performance, such as receiving social recognition or obtaining a desirable employment position. Students' outcome expectations depend on their knowledge or awareness of various outcomes, such as potential salaries, quality of life, and social benefits of a profession. Although the positive effect of attractive outcomes is well established, these expectations also depend on self-efficacy beliefs. A third source of students' forethought phase motivation is their task interest or valuing. Weinstain, et al. (2000) explained that the model is described as strategic learning that demonstrates the relationships among students' learning strategy knowledge, learning strategy skills, and self-regulation, as well as other variables that significantly impact learning and achievement. Theirexplanation leads to an evolving focus on information processing research and models that emphasize that cognition is something that could be controlled through cognitive and meta-cognitive processes. One of the practical applications of these new information processing theories is in the area of memory strategies that could be used in educational settings. Research on mnemonics and advances in the understanding of associative networks pave the way for researchers to investigate different types of training that could be used to improve students' paired-associate learning. The model of what it means to be a learner is shifting from viewing the learner as a passive receptacle for knowledge to the leaner as an active, self-determined individual who processes information in complex ways. Third phase

is self-refection in this phase is composed of two categories of response: self-judgments and self-reactions. A key form of self-judgment is self-evaluation, which refers to comparisons of one's performance with a standard.

Self-regulation is both the glue and the engine that helps students manage their strategic learning on both a global and real-time levels. At the global level, this component includes using a systematic approach for learning, time managing on a macro level (over weeks, months, and years), using an instrumental approach to help seeking, and managing motivation for learning. At the real-time level, the elements include managing and reducing high anxiety, using meta-cognition to monitor learning success, monitoring and regulating the use of effective and efficient learning strategies, managing time on a micro level (during a task, over a few hours, or day by day), focusing attention, and maintaining concentration over time Zimmerman, (2008).

Self-regulated learning (or self-regulation) refers to the process whereby learners personally activated and sustain cognitions, affects, and behaviours that are systematically oriented toward the attainment of learning goals.

Online Learning

This is where information for online learning or to support face-to-face learning can be stored, and is the best place to store presentations, lecture notes, digitalized reading material and multimedia files. Students can access this information easily and print off what they wish or otherwise save and store the information electronically.

Self-regulation and Learning

The self-regulated student first analyzes the situation before he/she engages in goal-oriented information processing. He/she will orient himself/herself by glancing through tasks, instructions and resources. He/she will also specify the learning goals or even break them down into sub-goals and plan the learning process.

Self-regulation and Meta-cognition

The researcher attempts to find out what it is like to experience self-regulation with people, ideas, information, and technologies in a personal learning network? To experience self-regulation was to be motivated by the desire for explore and elaborate, monitor through practicing, self-reflection, and using procedural knowledge. To experience self-regulation was to learn through agency, setting goals, planning, monitoring, reciprocating, seeking and finding multiple perspectives, being surprised by serendipitous discoveries, and generating syntheses. To experience connectedness was to become, to evolve one's self-concept and identity through practice.

5. Research Methodology

5.1. Context

This study was situated within the personal online learning networks fifteen master level students from Education department, Delhi University, India. The phenomenon of being connected with and through people, ideas, and technologies in a mobile, online, and networked space resided in the lived experiences of the master students of education. The complexities and multiplicities of experiencing human connections and online learning/technologies could only be accessed through individuals who had experienced them.

5.2. Intervention Procedure

The data for this exploratory research were collected in three phases of data moments: lived experience descriptions, think-aloud observations, and in-depth interviews. In the first phase, participants were given guidelines for the written lived experience description (Van Manen, 1990) and asked to complete it within two weeks. In self-regulated processes, by contrast, engage the learner in asking "How do I know this?" One week after completing the lived experience descriptions, in the second phase, data were gathered using a written

protocol that guided the think-aloud method of observation in which a participant spoke her thoughts aloud while navigating her personal learning network during a recorded screen capture of an online video meeting. As individuals read, listen, experience, and learn, through online mode they are monitoring and judging self-regulation of knowing as affected by volition, interest, motivation, thinking dispositions, intellectual values, and beliefs: "Do I know what I need to know or do I need to know more?," "How will I go about this?" One week after the think-aloud observations, semi-structured interviews were conducted using an interview protocol. Additionally, throughout the three phases of data gathering, the researcher kept written analytic memos and a post-reflexive journal (Vagle, 2014), which included (1) moments when the researcher instinctively connected or disconnected with the data; (2) assumptions of normality; (3) beliefs, perceptions, perspectives, opinions that the researcher held; and (4) moments when the researcher was surprised by the data.

Research has included in-depth interview of participants who were using online (synchronous and asynchronous) mode of learning in which monitoring the learning process of the students was based on following points:

1. Monitoring correspondence between learners' pre-existing domain knowledge and the learning resources
2. Monitoring correspondence between learner's emerging understanding and the learning resources
3. Monitoring efficacy of learning strategies, given learner's expectations of learning results and actual learning results
4. Monitoring learner's emerging understanding
5. Monitoring fit between learning results and previously set goals for learning result
6. Monitoring the task condition of time
7. Monitoring appropriateness of current learning content given learner's existing learning goals, both current and overall learning goals
8. Monitoring appropriateness of available learning content given learner's existing learning goals

5.3. Data analysis

Online Learning aids activities and mode of interaction were decided e.g. Zoom or Google meet. A Google classroom was created for reading material distributions prior to the actual work. Instructor used meta-cognitive strategies in three steps a. Readiness b. Actual practice/ Self-performance c. Reflection.

a. Readiness

- Instruction was given through instructor analysis and planning beforestudents start to learn. Students should first prepare themselves.
- Orientation, about 2 min: What is the task and what resources are available?
- Get a general idea of the learning material. Skim over the structure and some pages to get an overview about type and amount of information
- What do you already know about the content? Have you read this content before (Use of KWL chart).What is it entirely new to you?
- Try to remember similar learning situations and how you handled them
- Goal setting, about 2 min: What do I want to learn and understand?
- Write down your learning goals, You may even break them down into sub goals
- Planning, about 2 min: How do I proceed? How long and in which sequence am I going to study the topics? How will I check my understanding?
- Write down your plan including sequence and time
- Write down how you will check your progress at the end of learning

b. Actual practice/ Performance task

- Learning aids during work: Studying phase

- You are in the middle of studying. Pause for a moment and consider the following points.
- Monitoring and Regulation Do I approach my goals? Did I understand the contents so far? Do I have to alter my course of action?
- Mention your plan and goals you initially defined
- Check your understanding through think aloud strategies. Debrief content or Summarize, write down important concepts and re-read difficult parts. Explore more information in between 5 min break. Trying to elaborate and confirmed about the way others think.
- Your goals and schedule may need to be specified or modified (self-monitoring)
- Use therefore your notes and add your changes

c. Reflection

- Search for relevant information where can I find the information? Browse the menu
- Check whether the information you find on a card is really relevant according to your learning goals and analysing and critically evaluating conceptsthrough
- Reflection after work: Final check when completing your work, you should take a few minutes to self-evaluate your progress.
- Self-evaluation, about 5 min: Did I approach my goals? Can I remember, explain and apply what I learned?
- Check your understanding at the end of learning. Mention your goals and task
- Recap the most important parts in your own words and create a diagram or a list of content
- If in doubt, study the difficult parts again.

6. Conclusion

On the basis of in-depth interviews conducted at the end of the study, and self-observation has done by more than half (n = 12) of the learners reported that they felt disturbed and interrupted in their learning while regulating their knowledge. Initially they did not know in advance that they would be getting instructed during learning. After few classes they got used to regulate their own cognition and self-regulate more in the area of planning and evaluation as compare to monitoring. Monitoring phase was more challenging for many learners. Few learners revealed that at the monitoring stage, they start over thinking about evaluation and became judgemental about them-selves and a few were ready to go back and reset goal and then explore more through online mode. Learner stared using more procedural knowledge along with declarative and conditioning. Self-regulating strategies assist learners to used think aloud strategy to elaborate the content in online presentation. Learner enjoyed online learning with self-regulation. The reason behind was instant checking knowledge through online mode (quick exploring and elaboration freedom were enjoy as compare to face to face interaction). Lived experiences descriptions and post reflective journals learner highlighted, that initially there was impact of the teacher centre education system which make them more dependent on teachers however online learning regulated more towards self- dependency, enhances their self-efficacy and self-esteem too.

7. Discussion

Zimmerman and his colleagues (2008) developed a methodology for assessing most meta-cognitive and motivational processes of SRL during ongoing efforts to learn. Practically learners are conditioned with face to face interaction as online earning was having only one motive; to get information or reference material.No matter how well presented or represented, many subjects are difficult to learn on one's own without discussion, feedback, encouragement, or explanation from or with a knowledgeable other. These meta-cognitive processes include goal setting, self-monitoring, and self-

evaluative feedback loops. Motivational feelings and beliefs refer to self-regulated learners' display of personal initiative, perseverance, and adaptive skills. Researchers may be unable to observe the learners' psychological states or cognitive thinking. However, behaviourally, self-regulation refers to specific beneficial actions, such as record keeping, environmental structuring, and help-seeking, which are observable. Present research focuses on self-regulation and control of cognition and online learning. When a learner set goals for highest achievement score, then the learner becomes more focused and regulates activities while learning. The learner wasestablishing what he or she wants to accomplish, deciding if the goal is to outperform classmates or to master the content presented. Additionally, the learner determines if he or she possesses the skills, desire, and time to successfully attain the established goals. The two variables of interest in this phase for the current study were self-efficacy and achievement goal orientation.Learning and comprehension tasks to meta-cognitively reflect on such questions as "Do I know this?" Related epistemological processes, by contrast, engage the learner in asking "How do I know this?" Deci, E, et al(1996) intrinsic motivation and fully internalized extrinsic motivation are positively associated with high quality learning and personal adjustment; andmaintaining intrinsic motivation and internalizing extrinsic motivation are facilitated by social contexts that allow satisfaction of the basic psychological needs for autonomy, competence, and relatedness. Such contexts are ones that are characterized by the provision of choice, optimal challenge, informational feedback, interpersonal involvement, and acknowledgment of feelings. As suggested by Thiede (1999), "*a new focus for meta-cognitive training may be to teach students to discriminate between what they know versus what they don't know*".Research by Son and Metcalfe (2005) demonstrated that some low JOLs are made rather quickly—too quickly for retrieval to be attempted. This suggests that JOLs are made in two stages, the first being a quick evaluation of whether one recognizes the cue or not and the second being a target retrieval attempt that can be used to inform the JOL further.During task performance a learner must also use several effective learning strategies for accomplishing the task such as coordinating several informational sources (e.g., text, diagram, animations), generating hypotheses, extracting relevant information from the resources, re-reading, making inferences, summarizing, and re-representing the topic based on one's emerging understanding by taking notes and drawing. Lastly, the learner must continuously adjust during learning by handling task difficulties and demands such as monitoring one's progress towards goals, and modifying the amount of time and effort necessary to complete the learning task.The second challenge resulting from this change is primarily about knowledge management. Knowledge management refers to not just the setting up of an information system and the transmission of information, but how information is converted into knowledge and that knowledge used to good effect. Moreover it is equally challenging face to face interaction. Knowledge is more abstract in quality than information. The third challenge follows on from the other two. Higher education staff and students need new IT and information skills. Especially countries which are densely populated like India where teacher and student ratio is huge are inclined more towards online learning. Moreover changing technologies and the increasing availability of online communication provides higher education with some important opportunities for responding to the challenges of a rapidly expanding HE sector. The increase in staff to student ratios has led to changes in learning and teaching methods. The creative use of technology, user friendly devices and good access to online information is one creative resource that can assist diverse learner in the new difficult learning environment of mass higher education. Children are growing up with a culture that associates technology with communication from the time of admission, content and learning. Many young people arrive at university with a high level of IT experience and skills, and are ready to adapt and whole heartedly accept this to the demands of self-directed and self-regulated learning.

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