Metacognition and Decision Making in Educational Administration: A Study of District Education Officers in the State of Uttar Pradesh

Dissertation

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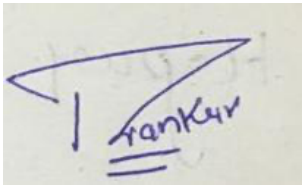
DECLARATION BY THE SCHOLAR

This is to certify that the M.Phil. Dissertation being submitted by me on the topic entitled 'Metacognition and Decision Making in Educational Administration: A Study of District Education officers in the State of Uttar Pradesh' has been completed under the guidance of Professor Vineeta Sirohi. It is declared that the present study has not previously formed the basis for the award of any Degree, Diploma, Associateship or Fellowship to this or any other University.



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This is to certify that the dissertation/thesis entitled 'Metacognition and Decision Making in Educational Administration: A Study of District Education officers in the State of Uttar Pradesh' is the work undertaken by Mr. Prankur Anand under my supervision and guidance as part of his M.Phil. degree in this Institute. To the best of my knowledge, this is the original work conducted by him and the dissertation may be sent for evaluation.

Supervisor's Signature
(Professor Vineeta Sirohi)

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List of Abbreviations and Acronyms

DIOS	District Inspector of Schools
BSA	Basic Shiksha Adhikari
DEO	District Education Officer
DSE	Directorate of School Education
IQ	Intelligence Quotient
WISC-R	Wechsler Intelligence Scale for Children-Revised
NCF	National Curriculum Framework
SCF	State Curriculum Framework
NEP	National Education Policy
MANOVA	Multivariate Analysis of Variance
ANOVA	Analysis of Variance
GIC	Government Inter College

CHAPTER 1

INTRODUCTION

1.0 Introduction

Decision-making is an important aspect of human life whether the decision is related to career, life, crucial policy decision or decision taken by administrators, even a sportsperson like a batsman/ batswoman in cricket has to decide on every shot selection, likewise a principal of a school has to decide for setting up of the time table. Thus it is not limited to any single discipline; it has palimpsest of different fields. Chester Bernard was the first one to use this term in the business world from public administration. In the contemporary world, it is studied in various subjects with different contexts like sociology, economics, legal studies, political science, psychology, etc. (Buchanan & Connell, 2006). Simon (1959) stated that in economics, decision-making helps to study consumers' rational choices for maximizing utility, goal setting of firms, and in game-theory. In legal studies, it explores judges decisions (Bornstein & Greene, 2011). It has a vast political science scope as it helps in policy decisions, bureaucratic decisions, and foreign policy decisions. In the same article, Simon (1959) portrayed the role of psychology in decision-making and explained how the study of behavior, motivation, personality, and cognitive processes helps determine consumers' rational decision-making. In general, decision making involves complex cognitive processes while analyzing and seeking different alternatives. Decision-makers, with their limited information processing capacity, use various heuristics to make decisions (Busenitz& Barney, 1997). Thus we can say it is not a mechanistic process, whereas it involves explicit cognitive function. Martinez (2006) pointed out that individuals have a cognitive structure to act and develop the capability to monitor cognitive processes. This monitoring and planning of cognitive processes are termed as 'metacognition' (Flavell, 1979). Recent developments have highlighted that metacognition plays a vital role in decision making of the individual as it helps in error monitoring in the decision-making process (Yeung & Summerfield, 2012), influence consumers' decision of brand selection (Lee &Shavitt, 2009), and helps in counterfactual analysis for making choices (Arora, Haynie, & Laurence, 2013). Moreover, in a business study, Mitchell, Shepherd, and Sharfman (2011) found that managers who have high metacognitive ability engage in more consistent decision-making than those with low metacognitive ability. However, development in decision making concerning metacognition is new, and there is a lot to study in this area. Literature suggests that only a few studies answered how metacognitive-strategy is useful in

decision making, rather they emphasized more on what it does and why it is important. While, decision-making in educational administration directly or indirectly affects functioning of the school, especially decisions of district inspector of schools and Basic Shiksha Adhikari in Uttar Pradesh play a vital role in optimizing schools' learning outcomes. Thus the growing importance of metacognition in decision making gives a gateway to study its role in DIOS and BSA decision-making. So the present study explored what, why, and how metacognitive strategy influences district education officers' decision-making.

1.1 Decision Making

Decision-making is a process that involves identification and defining of the problem, analyzing the difficulties in the existing situation, establishing a criteria for a satisfactory solution, develop plans, and executing the plan (with communicating, monitoring, and appraising) (Hoy & Miskel, 2005). It is traced back to the classical model of decision making, which focused upon optimization of alternatives and rationality of the individual, which later lead to the bounded rationality of decision making by Herbert Simon, where he realized every option is not possible to analyze (Hoy &Miskel, 2005). Many developments have been taken place in the row like the incrementalist view, organizational procedure view, political view, garbage can model, individual difference perspective, multiple perspectives, etc. Out of these models some favors logical, sequential step by step actions, some states that decision are pre-programmed routine thinking of people in an organization, others have given space to pluralists view in decision making (Turpin & Marais, 2004).

1.1.1 Models of Decision Making

a. Rational model of decision making

The rational model of decision-making adheres to the optimization of alternatives; it assumes decision-makers should know optimum alternatives by analyzing their outcomes, preferences for these outcomes, and selecting best-preferred consequences to make the decision (Turpin & Marais, 2004). So this model involves a preferential and consequential decision-making process; generally, it answers questions like what should be possible alternatives and their

possible outcomes, how these outcomes satisfy desired preference, and the decision based on the preference (Dahl, 1998). In layman's language, this approach advocates seeing every possible alternative, evaluating and comparing outcomes based on preference to make decisions.

b. Bounded Rationality model of decision making

The bounded rationality model is concerned with implementing and selecting satisfactory alternatives instead of optimizing the decision-making process (Simon, 1972). In 1947 Herbert Simon first termed the administrative model of decision-making. He stated that decision-makers might not make an optimal decision, so they have to go with satisfactory solutions instead of the best one (Hoy &Miskel, 2005). Hoy and Miskel (2005) highlighted that there are many reasons behind going with a satisfactory solution with analyzing limited alternatives those are as follows:

- Every resort is not possible to analyze because many things may not come into the mind of decision-makers and there are time constraints, for arriving at a decision.
- The second one is that predicting and evaluating every alternative for a future event is difficult.
- Every individual's information processing capacity is different, and many other factors may deviate from the organizational goals.

Thus Herbert Simon came up with bounded rationality of decision making in which the decision-maker decides with evaluating limited alternatives that are feasible for a particular context.

c. Incrementalist View

This model emphasizes step by step proceeding ahead and opens to modifying possible choices and preferences at every stage and looking for existing problems (Turpin & Marais, 2004). According to Shapiro (1965), possible choices and strategies modified according to situations encountered in every step. Behm (2007) used the term incrementalist decision-

making to define short-term decisions taken by the Australian government. This means incrementalist view instead of long term decision, helps to make decisions for short term according to the need of the situation. Thus, this decision-making model focuses on making decisions for the present without thinking much about long-term needs.

d. Organizational procedure view

This model of decision-making emphasized outcome-based standard operating procedures of the organization. It includes budget limitations, group norms, government orders, and routine organization thinking, which determines decisions (Huber, 1981). Huber (1981) also described that every unit involved in organization influences decisions. Simply it means that every organization has its own guidelines based on which groups of people or individuals decide. Hence, decision-making is a systematic process for maintaining the organization's status quo (Turpin & Marais, 2004).

e. Political View

According to Turpin and Marais (2004) political view of decision-making is governed by self-interest of the coalition rather than from what actually be good for the organization, it is a personal bargaining process governed by the agenda instead of rational choices. Parties involved in decision-making are always in contestation and make it a never-ending process, the defeated party always tries to win another round with their decisions. Thus, this decision-making model adheres to the consensus of the members involved rather than organizational need.

f. Garbage can model

This model sees choice opportunities, decision-maker, problems, and solutions as separate entities that form garbage cans (Turpin & Marais, 2004). Cohen, March and Olsen (1972) defined choice opportunities as garbage in which decision-makers of an organization dump problems and solutions. According to their research, it is the process of trial and error where

participants seek different alternatives, and once the decision is made, the garbage can is removed. Thus it is a pluralist decision-making process where the organization provides choice opportunities to different participants to analyze existing problems and solutions. This choice opportunity refers to a situation when an organization wants to decide for particular problems (Cohen, March & Olsen, 1972).

g. Individual differences perspective

This model emphasized personality, background, and decision-maker style to make choices using various methods (Turpin & Marais, 2004). It means decisions are widely influenced by personality and thinking of a particular individual rather than what organization thinks and tries to explain how the personality difference among individuals help to make various choices (Keen and Scott Morton, 1978).

h. Multiple Perspective model of decision making

Turpin and Marais (2004) write multiple perspective approach includes technical, organizational, and different people's views to make the decision. This model assumes one problem is an organ of another problem (Churchman, 1971). Mitroff and Linstone (1993) termed it as 'sweeping in' from a different perspective from various sources. Thus this model adheres to a plurality of information, views and source to make choices.

1.2 Theoretical framework

1.2.1 Metacognition

Metacognition evolved from the works of Flavell, in 1971.He first used the term 'metamemory' in which he described an ability of an individual to manage and monitor the contents of his own memory. Later in 1976, he used the term metacognition in the title of the paper, where he highlighted monitoring and regulating of cognition. An individual with conscious effort will be able to know where to use information in a particular situation, keep

current information for future use, and search different strategies for problem-solving (Nazarieh, 2016). It is defined as thinking about thinking or thinking over cognition (Flavell, 1979). Flavell (1979) worked on metacognition in which he described four components - 1) metacognitive knowledge, 2) metacognitive experience, 3) goals or tasks, 4) metacognitive strategies. According to him, metacognitive knowledge is a belief about what one can do like he cited an example of a girl who knows that she is good in arithmetic but not in geometry. Second, by metacognitive experience, he referred to cognitive experience, which arises in novel situations and demands conscious analysis. Third, by goals or task, he meant knowing about outcome which one believes to produce through certain cognitive processes. Fourth metacognitive strategy Flavell (1979) referred to monitoring and planning for ongoing tasks, which influence metacognitive knowledge to select between strategies and metacognitive experience to construct new or modify previous task. Brown (1978) described metacognition as a complex understanding of existing or new knowledge which can be seen with productive use and clear illustration of knowledge. In another study, Brown (1987) classified metacognition into knowledge about cognition, termed as metacognitive knowledge and regulation of cognition. Metacognitive knowledge is related to the awareness or knowing what the things, requirement, ability, and chances to perform a task, it is of having knowledge about what one has. Regulation of cognition refers to actions which help to constant monitoring of the ongoing process and provide abundance space to do the modification, simply a control/execution part of the task (Brown, 1987). Theories proposed by developmental psychologists like Jean Piaget's theory of cognitive development have the essence of metacognition. His theory states that everyone develops cognitive structures with schemas in it and learning can happen with reason, integrating assimilation, accommodation, and equilibration. In the formal operational stage of cognitive development child requires the ability to think about one's own thought that is thinking over thinking (Fox & Riconscente, 2008). Fox and Riconscente (2008) defined metacognition as a conscious activity for control attention and abstraction in socio-cultural theory of Lev Vygotsky. Martinez (2006) described metacognition as control and monitoring of thought and identified categories for elaborating its functioning-critical thinking, metacomprehension and metamemory, and problem-solving. He described critical thinking as a thinking activity in which a person evaluates ideas to check its quality, especially to determine that it make sense or not. In this

process a person adopts varied metacognitive standards for thinking critically as one can ask questions like - is the concept explained in a straightforward and concise manner, does one concept logically lead to another, does the message make sense, and is the idea logical, reasonable, and coherent? Second he grouped metamemory and metacomprehension together because both refer to understanding state of one's knowledge. Metamemory can be said as person's having control, monitoring, and knowledge of his memory functioning. On the other side metacomprehension is technique in which one can monitor, control, and have knowledge about comprehension during listening or reading. For example a student ask question to himself that is he able to comprehend whatever he is reading or just reading it without understanding anything, moreover he can make strategies to improve comprehension during reading. Lastly Martinez (2006) described problem-solving to elaborate functioning of metacognition. According to him the problem solving is the achievement of a target when the direction to that goal is unknown. To put it another way, it's what you do when you have no idea what you're doing. It linked with metacognition while asking questions to self like what is the goal, what will be the best way, and is my strategies are working. In layman's language in metacognition 'meta' refers thinking about itself and cognition refers to various mental processes, thus it is thinking about various mental processes.

1.2.2. Components of Metacognition

Components of metacognition are evolved from the works of several scholars such as (Flavell, 1979; Jacob & Paris, 1987; Schraw & Moshman; 1996; Brown, 1987). Components of metacognition describe what the process is and functioning of metacognition, in general it describes what thinking upon thinking involves. These components are as follows-

a) **Knowledge of cognition:** This metacognition component is basically having knowledge and belief about what and in which way variables and elements such as person, task, and strategy interact and function to influence the ongoing process and outcome of the cognitive structure (Flavell, 1979). Person variable refers to thinking about how one himself and other person process information. Second is the task variable that implies knowledge about the different nature of tasks and accordingly

implement demands of processing. Lastly, the strategy variable involves knowledge of different strategies and analyzes them to use wherever needed.

b) **Regulation of cognition:** This implies controlling of cognition using different strategies like planning to make progress, monitoring ongoing progress, and evaluating for future use **(**Jacob & Paris, 1987). Various metacognitive strategies help in planning, monitoring, and evaluating cognition like think aloud, visualization, self-administered checklist, journaling, portfolio registries, stem statement, self-questioning, etc (Fogarty, 1994). Think aloud is a method to express thoughts as soon as they occur in mind; it is used in metacognition to stop and explore the ongoing process of tasks such as learning, decision-making, etc., and ultimately helps in monitoring cognition (McKeown & Gentilucci, 2007). Here visualization is used as a strategy in which one is told to create physical, mental images through graphical representation of what comes to mind and trigger planning, monitoring, and evaluation of cognition (Pearson, Rademaker, & Tong, 2012). Another metacognitive strategy technique is journaling, which asks individuals to write down words of deepest thought that come to mind while performing an activity (Liuolienė & Metiūnienė, 2011). These are some examples of metacognition strategies that help to regulate cognition.

1.2.3. Theories of Metacognition

Metacognition theories are part of theories of mind but not restricted to cognitive theories (Schraw & Moshman, 1995).Theories of mind include various mental elements such as thoughts, feeling, intention, attitude and so on (Carruthers & Smith, 1996). Whereas, metacognition theories elaborate on the mind's cognitive facets (Schraw & Moshman, 1995). Further, Schraw & Moshman (1996) classified types of metacognition theories such as tacit, explicit informal, and explicit formal theories.

a) **Tacit Theory:** It stands for implicit knowledge of something and acts with a loose systematic structure. It is constructed gradually and helps to understand

metacognitive knowledge without being aware of the beliefs and influenced by the social and personal environment (Schraw & Moshman, 1995).

b) **Explicit Informal theory:** Schraw & Moshman (1996) placed this theory above tacit theory in the hierarchy as this individual has some assumptions and beliefs about the phenomenon but does not have a clear structure which is able to justify their beliefs. It is said that it has some explicit knowledge of metacognition. It gives an individual space to think intentionally on task performance and use this information in the future with some modification (Kuhn, Schauble, & Mila, 1992). The major development in this theory is the ability to differentiate between contents and structure of theory with practical observations that the theory is going to describe (Hergenhahn and Olson, 1993).

c) **Explicit Formal theory:** It involves well structured and systemized process for the phenomenon; it develops a deep understanding of performance, ability to interpret and examination of experienced/observable data (evidence), and ability to test and relate formal and empirical information (Schraw & Moshman, 1995). Hence, provide an explicit structure for regulating and understating of individual's cognition.

1.2.4. Jacob and Paris model of metacognition

Jacob & Paris (1987) proposed the model in which metacognition was composed of two dimensions: knowledge about cognition and regulation of cognition. Knowledge of cognition referred to control over cognition with three components, first was 'declarative knowledge,' the second was 'procedural knowledge,' and third was 'conditional knowledge.' Declarative knowledge refers to knowing what is in one's cognitive structure and what factors influence it. That means an individual eventually knows about his ability to do something. For example, Jacob & Paris (1987) elaborated a situation where a learner who is going to give an exam knows what knowledge he has and what things will affect his performance in the exam. Similarly, a decision-maker will know about his ability to make decisions and factors that influences its process. Procedural knowledge implies knowledge about how to proceed

further. Taking the above example, the learner will know how to prepare for a particular exam and which strategy will help him score good marks. Likewise, procedural knowledge enables decision-makers to think over how the decision will be taken and which strategy is required. Basically, they know about how the task of decision-making will be accomplished. Lastly, Conditional knowledge enables one to know why and when to use various cognitive actions. For example, this component will help decision-makers think over why and when to use which strategy in the decision-making process.

On the other hand, metacognition regulation helps to control cognition in which three components are described: planning, monitoring, and evaluation. Here planning refers to preparing a strategy before performing a task. Monitoring refers to the conscious supervision of every strategy and action while doing tasks. Finally, evaluation refers to analyzing each step of the task for the diagnosis of the whole process; it is just appraising the process and outcome. The present research would be based on Jacob & Paris (1987) model of metacognition regulation. The decision-maker will prepare a plan, sequence strategy, and allocate appropriate time before starting the task. Second, with the help of monitoring, decision-makers will be able to do modifications in the decision-making process and evaluation of the whole process enables decision-makers to diagnose shortcomings in the process.

1.3 Structure of district level school educational administration in Uttar Pradesh

School educational administration at the district level in Uttar Pradesh is divided into two parts: the department of secondary education (generally GICs up to 6-12th classes) and the basic education department (1-5 classes). The Department of secondary education is headed by District Inspector Schools (DIOS), and the Basic Education department is headed by Basic Education Officer popularly known as Basic Shiksha Adhikari (BSA). They both report to the joint director of the education of a particular Mandal. Block education officers assist basic education officers and the assistant director of education assists district Inspectors of Schools. Though in hierarchy, DIOS placed above the Basic Education Officers, whereas they don’t have the power to interfere in the matters of BSA.

1.3.1 Role of District Inspector of schools in the state of Uttar Pradesh

District Inspector of Schools in the state of Uttar Pradesh takes care the matters of secondary education (schools which have grades from 6^{th} to 10^{th} or to 12^{th}), his/her jurisdiction extends to government, government-aided and government recognized schools. The responsibilities of District Inspector of Schools includes inspection of schools, inspections of duties of teachers and other employees of Schools and Inter Colleges (11^{th} and $12^{th\ classes}$), disposal of financial matters, maintenance of confidential report of teachers, principals and non-teaching staffs, and distribution of the grant received for the payment of the salary for the employees of schools, etc. (Intermediate Act 1921, n.d. & Intermediate Act Amendment, 2007). Power of appointment and transfer of teachers and Principals vests in the hand of the Joint Director of Mandals. Thus the position of District Inspector Schools in Uttar Pradesh do not have much power to take decisions.

1.3.2 Role of Basic Shiksha Adhikari (BSA) in Uttar Pradesh

Basic Education officer have more powers in matters related to primary education than DIOS powers in matters related to secondary education. They give approval to various leaves to male & female recruits lower than their rank, take decisions in pensions, gratuity, etc. till Licentiates Teacher grade (LT), recruit 3^{rd} and 4^{th} class employees and take appropriate action against them, he/she has designated as first reporting officer in terms of confidential report for primary education. BSA is the head of the teacher selection committee, inspects teachers as well as principals and suggest punishments if required. Moreover, they arrange examination of junior high schools. They study the inspection report and take measures to solve the problems, take care of the transfers of Licentiates Teacher grade level teachers referred by Joint director, and give recognition to schools up-to primary level, etc. (Basic Education Act 1972, n.d.& Basic Education Act Amendment, 2000).

1.3.3 Decision making authority of District Inspector of Schools and Basic Shiksha Adhikari in the state of the Uttar Pradesh in routine matters

Decision-making authority in routine matters refers to those decisions which are assigned by the higher authority in which the District Inspector of Schools (DIOS) and Basic Shiksha Adhikari (BSA) do not have much say. They have to take many decisions in this context like policy implementation, giving assent to the transfers of teachers, releasing of funds for the infrastructure of schools, etc. (Intermediate Act 1921, n.d. & Intermediate Act Amendment, 2007)

1.3.4. Independent decision-making authority of District Inspector of Schools and Basic Shiksha Adhikari in the State of Uttar Pradesh

This decision-making authority enables both the officers to take the decisions on the basis of their reasoning. Like they can withhold salaries of teachers, take appropriate action against unrecognized schools, take the decision to resolve conflicts in management, take action against teachers and Principals, take decision when approached by Principals and Teachers regarding monitoring of schools, debar schools in board examination when found corrupt practices, etc. They are responsible for giving assent to the recruitment of the teachers who is claiming job as coparcener of died family member, they are responsible for monitoring teacher recruited by management in aided schools, they conduct teacher union and management elections and all annual confidential reports are submitted to him.

1.3.5 Role and function of District Education Officers in National Education Policy 2020

National Education Policy 2020 did not specifically describe the role and functions of district Education Officers (DEO). Though the document talked about delegation of power from Directorate of School Education to school complexes where the roles and function of DEOs can be seen. Document emphasized to form groups of school which will share different resources among themselves such as teachers, lab equipments, play grounds, etc. Here District Education Officers given a role to interact and help these school complexes to become semi-autonomous unit. Officers will facilitate them to innovate with curriculum and pedagogies in accordance with National Curriculum Framework (NCF) and State Curriculum

Framework (SCF). Moreover, District Education Officers are directed to work with Directorate of School Education to implement policies pertaining to setting standards (National Education Policy, 2020).

1.4 Rationale of the study

This is an adage in any organization that a good administrator brings out best from the employees; likewise, in the educational system, school administrator is there to improve the teaching-learning process so that the learners will be able to develop themselves as efficient beings for their livelihood, for contribution to human civilization and able to find the meaning of their life. The efficient and effective administration can achieve these education goals through the school Principal and other higher authorities who monitor schools like basic education officers, district education officers/district inspectors of schools. Decision making is one of the important components of administration and management, authority above the school principals like the District Education officers (District Inspectors of Schools in the case of U.P) Basic Shiksha Adhikari play a significant role in monitoring and inspecting schools of districts and in this process, they have to make many decisions regarding schools and other educational matters. There is a dearth of research in the area of decision making of District Inspector of Schools and Basic Shiksha Adhikari. On the other hand, it is significant to explore the improvement and development of inspection of schools, identify gaps in the monitoring system, and find out what criteria educational administrators use to make decisions.

However, it is important to see how District Education Officer will going to bear additional responsibilities proposed in National Education Policy 2020 such as facilitating innovation of curriculum and pedagogies in school complexes. Moreover, education in government schools is deteriorating day by day, so it is important to examine which type of decisions are taken by the District Inspector of Schools and Basic Shiksha Adhikari to improve government schools' conditions in Uttar Pradesh. Though metacognition is new to decision-making literature, it started its way in improving decision-makers' choices. Studies have highlighted the role of metacognition in decision making but focused mostly on ‘what’ and ‘why’ metacognition do in decision making, whereas ‘how’ component is still missing. Decision making of District

Education officers, particularly District Inspector of Schools and Basic Shiksha Adhikari are crucial for the investigation. Therefore, the present research proposed to study the role of metacognition in District Education Officers' decision-making and examine what and how metacognition plays a vital role in the decision-making process.

1.5 Statement of the problem

The problem in the present study is - Metacognition and Decision Making in Educational Administration: A Study of District Education Officers in the State of Uttar Pradesh.

1.6 Operational Definitions

a) **Metacognition:** Metacognition in this study is taken as regulation of cognition by the district education officers, including planning, monitoring, and evaluating cognition while making decisions.

b) **Planning:** In this study, planning for the regulation of cognition is defined as alternative choices and strategies thought of and prepared by district education officers before making decisions.

c) **Monitoring:** It refers to activities performed by district education officers like thinking upon the problem, analyzing every information source to prevent errors in decision making,

d) **Evaluation:** The diagnostic approach of district education officers relating to previously taken decision and using previous knowledge for eliminating shortcomings of present decision-making is considered evaluation.

e) **Decision-Making:** Decision-making refers to choices based on reasoning, made by the district education officers independently in matters related to school education in Uttar Pradesh.

f) **District Education Officers:** Education Officers of Uttar Pradesh who have authority to inspect and monitor functioning of schools (Government, Government-Aided, Government recognized) in a particular district.

g) **Basic Shiksha Adhikari (BSA):** Basic Shiksha Adhikari **(**BSA) is district education officer in Uttar Pradesh to monitor and inspect the functioning of primary education in a particular district.

h) **District Inspector of Schools (DIOS):** District Inspector of Schools (DIOS) in Uttar Pradesh is appointed to monitor and inspect the functioning of secondary education in particular district.

1.7 Research questions

- What is the decision making pattern of District Education officers of Schools in Uttar Pradesh**?**
- What is the role of metacognition in decision making pattern of District Education officers in Uttar Pradesh?
- How does metacognition work in decision making process?

1.8 Objectives of research

- To study the decision making patterns of District Education Officers of Schools in the State of Uttar Pradesh.
- To study the role of metacognition in decision making of District Education Officers in the state of Uttar Pradesh.
- To examine how metacognition works in the decision making of District Education Officers in the state of Uttar Pradesh.

1.9 Delimitation of the study

Every researcher has to delimit his or her study because everything can't be done in a study due to time constraint, availability of resources, etc. So keeping these aspects in mind, the present study was delimited as follows:

- The present study has only taken regulation of cognition, including planning, monitoring, and evaluation, leaving other parts of metacognition, knowledge of cognition because of lack of time.

- The data was collected through face-to-face interviews only on district education officers without including any other school education functionaries such as staff, principals, and teachers, etc. Although, due to the corona pandemic it was difficult to conduct face to face interviews with all the respondents.

CHAPTER 2

REVIEW OF LITERATURE

2.0 Review of literature

A review of literature is the systematic collection and explanation of applicable studies that address the research question. It provides an overview of previous research in the field as well as current hypotheses and theories. The analysis provides valuable context and information about justification for the study that was carried out. A review of the literature aids the researcher in developing a research strategy and also helps in identifying research gaps. The present study incorporates recent research studies on decision-making in educational administration, its relation with metacognition, and how district education officers work in different states and countries. This chapter summarizes the published and unpublished studies and observation in various journals by various researchers.

2.1 Decision-making in Educational Administration

Decision-making in educational administration involves various individual for quality education. The principals are the main decision-making authority in the school. Cross (1980) studied the decision-making patterns of school Principals. He did observation on nine Principals in Texas schools, USA, for two days, and at last, participants were asked to describe 5 critical problems they encountered. In this study, he categorized 5 sources from where Principals seek information. The seek information from subordinates (teaching staff, non-teaching staff, students, etc.), extra ordinate (persons who do not directly affiliate to school like parents), higher authority, peer (other Principals within the school system), and records. Most of the time, decisions were made based on information provided without any cross-checking. In 44 out of 86 cases, the problem was posed by the subordinates. In 54 times, decisions were made without any cross-check. The result indicates that Principals are in social isolation to decide, which means they decide within the school without having ample opportunity to interact with other school administrators. Second, the pace of decision is rapid for critical problems, and the pace of other problems was not addressed in this research. Literature reveals that Principals encounter approximately 100 problems per day, so it is difficult to say that each problem is addressed with deliberation and sequential steps. The third thing that is rightly emphasized above is that decision-making is usually dependent

upon information provided. It was found that in only one case Principal used records to make decisions, so there are chances to provide distorted information.

In another research, Weiss and Cambone (1994) studied the Principal's shared decision-making and explained how school reforms occur through the democratic decision. The data was collected through a longitudinal research method for five years on 12 high schools of United States. Six school Principals were following shared decision-making, and the rest were following the traditional unilateral decision-making pattern. This study highlighted that shared decision-making in school raises conflicts amongst staff members, and changes were much slower than those schools where unilateral decision-making patterns were practiced. Though it poses the question on the durability of decisions taken by unilateral decision-making pattern of schools. Principal in shared decision-making set up leads modest changes and gives limited choices to members (teaching staff) for participatory decision making. At last, the study concluded that shared decision-making is good for the school administration but with bounded alternatives. This study throws light on the decision pattern in the democratic setup of school and traditional school (where the Principal takes unilateral decisions). Hence, decision in shared decision-making setup is critically analyzed by every member of the decision committee, which gives more scope to alternatives. In contrast, in unilateral decision-making, the administrator decides by his own logic and intuition, which gives less scope to alternatives, so shared decision-making provides a broader range for decisions.

Ingersoll (1996) on the contrary, highlighted how decentralization of power from Principal to teachers reduces social conflict in the school environment. The researcher had taken the data from schools and staffing survey (SASS 1987-88) of the United States of America. Social conflict was described based on student staff conflict and conflict among staff. The study results show that private schools reported less teacher-student conflict than public schools, and as teachers get more autonomy in decision-making (autonomy related to pedagogical practices, selection of books, course design, etc.), the conflict between teachers and students was decreased. As far as the conflict within staff members is concerned, private schools and smaller schools' teachers are in cooperation with fellow teachers whereas public schools with

minority show strong teacher-principal relation. Further autonomy in decision making decreases conflict among staff and if autonomy is not given to teachers to make decision in the classroom then conflict between Principal and among staffs were increased. The above research has taken a different stand, where participatory decision-making is present conflict between Principal and staff is indicated On the other hand, conflict is reduced when decentralization of power was present, giving teachers the autonomy to make decisions. Thus, both contradict each other, although the different context in former decision-making authority is still in Principal's hand. In other decision-making, power is distributed among staff members.

Somech (2010) reviewed past research studies to explain varied results of participatory decision-making in schools on school outcomes, including teachers' productivity, innovation, and organizational citizenship behaviour and teachers' outcome, including impact on the strain and their job satisfaction. Investigator concludes with a remark distant relationship is due to context specification. At the same time, participatory decision-making in schools is a potential contributor regarding innovation and organizational citizenship behaviour but not with productivity for school outcomes. Further, for teachers' outcome, especially on their job satisfaction participatory decision-making had small effect and increasing strains on teachers. The study also highlighted the mediating effect of motivation vs. cognitive mechanism in influencing school and teachers' outcomes. In this context, the investigator has given future direction to explore cognitive mechanism's mediating role in participatory decision making in schools on school outcomes (teachers' innovation, productivity, and organizational citizenship behaviour) and motivation role in teachers' outcome (Job satisfaction and strain). Hence, according to this study, participatory decision-making on schools' productivity suggests to include participation of teachers and students in decision-making according to the situations where it is needed more, in place of applying it every time. The study also suggested to consider cognitive and motivation of teachers to apply participation.

Mager and Nowak (2012) reviewed empirical research studies to see students' participation in decision-making. The authors included 32 research papers with quantitative, qualitative as well as mixed methodologies. Student participation in councils, temporary school working

groups, and classroom decision-making was categorized. Thus studies were reviewed to define various effects of student participation in decision-making. Students' participation in decision-making in school affects their personality, such as developing life skills, self-esteem, democratic attitude, improving learning style, and develop awareness for their health benefits. However, some studies have shown negative effects on students, such as disappointment, frustration, stress, etc. Effects on teachers were also reviewed and were found to improve student-teacher relations, improvements in peer relations, and teacher-teacher relations. Moreover, effects on schools as an organization have also been seen, like improvements in facilities and influence on rules, policies, procedures, improvement in school ethos, etc. The study encouraged student participation in decision-making which helps to achieve the ultimate goals of education.

In India, Chopra (2020) conducted interviews and conducted focus group discussions with government secondary school teachers of Gurugram, Haryana, India, to explore their participation in decision-making. The findings highlight that all teacher participants agreed that the extent of administrative and management responsibilities they are engaged in beyond their teaching responsibilities affect their participation in school decision-making. These management and administrative roles grow in importance with the career progress of person. Teachers' roles in decision-making in government schools are related to the parent-teachers meeting, committee meetings, and in meetings related to curriculum development, renovation, and policies. They do not have much say in government decisions and reporting by teachers is only on paper. Findings also suggested that teachers' decisions are limited to only management of day-to-day activity in the classroom, such as teaching methodology, preparing for next-week teaching plans, etc. Further government forced decisions such as working for door-to-door surveys, polio awareness campaigns, election duties widely affected students' motivation for learning. The study indicates that decision-making in government schools follows a top-to-down decision-making approach that limits teachers' ability to lead for change and improvement, and students' voices are not taken into consideration in decision-making.

Studies accentuated around participatory decision-making approach involving different

players in educational administration. Scholars in this area encouraged decentralization of power at the school level, including students, teachers, and parents. Although some research shows this approach does not guarantee students' academic achievement and teachers' job satisfaction in every context. Thus participation in decision-making is a popular practice, but it should adhere to where and how to implement it.

2.2. Roles and Functions of District Education Officers

Plowright and Plowright (2011) studied the role of District Education Officials in supporting school leaders and teachers for school improvement in the district of South Africa. The investigators interviewed officials, teachers, and school principals to determine the role of DEOs and obstacles present in the functioning of educational administration. The study reported lack of facilities and resources for DEOs, and also they have to work in a limited environment where expectations are very high for managing and monitoring school administration. The administration was highly centralized and bureaucratic in nature, so delay in procedures was reported most of the time, as in one the instances it was noted that teacher for indiscipline act was charged after two years and till then he was permitted to teach peacefully. Besides this, due to lack of resources and unavailability of time, the district education officials were only monitoring schools that underperform instead of monitoring all schools. Further, they were forced to engage in other government activities like various paper work, meetings, elections, etc. They check the time table, teachers' attendance, and ask children about functioning of school. Hence there was limited opportunity to monitor the schools.

Sitati et al. (2012) highlighted the leadership style of district education officers in Kenya through a descriptive survey taken from District Quality Assurance and Standards Officers. The study reported that the district education officers practiced an autocratic leadership style in most cases and made decisions without consulting staff or any other members. It was also found that leadership style and decision-making approach is totally dependent upon their personality traits; they are unable to delink their personality type with the role off work. The DEOs were assumed to be unsupportive and seldom created a motivating atmosphere for

their workers. In most Districts, the majority of DEOs were not dedicated to promoting quality assurance and standards programmes. Hence, district education officers' decision-making and leadership style was influenced by the communication gap present in the organization.

Bhayo, Yuyou, Zeng and Dong (2018) did a comparative study to see role of district education officers in quality education. The study was conducted in China and Pakistan districts, and they found that officials are aware of their roles and responsibilities for quality education. Officers in Pakistan perceived roles and responsibilities differently whereas in the China they were clear about their roles and responsibilities. The Chinese government acknowledged and focused on interventions suggested and made by the district officials to improve the quality of education. Whereas, in Pakistan District Education Officer does not gives any intervention for the improvement in quality of education. In China Interventions were made through in-service training to school heads and teachers. The school principals were trained in leadership whereas the teachers were trained in research. Continuous development programmes were organized at a fixed interval of time, and the district education officials organized school-based periodical research. On contrary it was observed that presence of red tapism in District Education administration in Pakistan. So the study concluded that district education administration in China is more structured than Pakistan.

2.3Metacognition in Education

The popular term metacognition has been contributed to education in many ways, mainly in the teaching-learning process. It gives insight to students on how to learn and teachers on how to teach. It is used across disciplines and by different individuals in varied contexts. Ozsoy (2011) studied the relationship of metacognition with fifth grader’s achievement in mathematics. He used metacognition skill and knowledge assessment of the Turkish version inventory (based on Turkish curricula) including both metacognition dimensions (regulation of cognition and knowledge of cognition). Knowledge of cognition consists of four components those were declarative knowledge, conditional knowledge, procedural knowledge, and prediction. The declarative knowledge component was assessed by asking

five easiest and five most difficult exercises of mathematics. Conditional knowledge was assessed by explaining why they found those exercises difficult or easy and procedural knowledge was evaluated by demonstrating how they solved the exercises. In 'prediction' evaluation, children were challenged to estimate whether they can succeed in the activity just by looking at the exercises without solving them. The second part of the research consisted of planning, monitoring, and evaluation of cognition (regulation of the cognition). Planning was assessed by directing children to put ten sequences required for calculation in order. Children were asked questions such as what kinds of errors you make while doing this type of exercise, and for evaluation, questions were asked like how would you help others with this kind of problem? The results of the study show a high positive relationship between metacognition with achievement in mathematics, and procedural knowledge, monitoring, and evaluation were essential predictors of achievement in mathematics.

Desoete, Roeyers, and Buysse (2001) studied metacognition and solving mathematical problems on 3rd-grade students possessing average Intelligence Quotient and students who have learning mathematics disabilities. In the first study, they divided the students into below average, average, and above average in mathematical problem-solving. The scores were correlated with students' metacognition, including knowledge of cognition (declarative, procedural, and conditional) and regulation of cognition (prediction, planning, monitoring, and evaluation). The difference in mathematics performance and metacognition was analysed using multivariate analysis of variance (MANOVA), which was found F= 7.78, whereas 42% metacognition was predicted by mathematical groups. It was found that students with a high score in mathematics performance also scored high on metacognition, but there was no difference between below average and average students on metacognition. In the second study, investigators replicated the metacognition component structure on mathematical learning disabilities. The study reported that students who have severe mathematical learning disabilities scored less in all the metacognition components.

Raoofi, Chan, Mukundan, & Rashid, (2014) studied the role of metacognition in the second language and foreign language learning. They employed two primary research questions first, related to the extent to which metacognition affects foreign and second language learning,

and the second one was to determine factors influences metacognition learning of students studying foreign and second language. Investigators used inclusion criteria that all the qualitative and quantitative research studies conducted on the primary data, which shows the role of metacognition in the second language and foreign language. With the help of coding procedures, the study suggests that metacognition training or intervention helped students increase their performance in learning the second language and foreign language. Educational level, language proficiency, first language strategy use and knowledge, and learning styles influence language to construct metacognition. They also observed that metacognition helps in reading and listening skills, whereas there is less literature on speaking and writing skills. Lastly, it was pointed out bilingualism enhances metacognition strategies in second language learning.

Azizi, Nemati, and Estahbanati (2017) with their descriptive survey research tried to determine the use of metacognitive awareness for writing strategies among Iranian English Foreign language learners aged 20-26. Investigators used the Friedman test to check the significant difference among participants for using metacognitive awareness of writing strategies. They were also interested in exploring the impact of metacognitive awareness of writing strategies on second language writing performance. They used the metacognition awareness of writing strategy questionnaire (including planning, monitoring, evaluation, and self-awareness) to assess metacognition and conducted an essay writing test to evaluate writing performance. The study reported a significant relationship between every dimension of metacognitive writing strategy with participants' writing performance. Further, through multiple regression analysis, it was found that self-awareness, monitoring, and planning did not predict participants' writing performance, whereas only evaluation strategy predicted their writing performance.

Conner (2007) investigated the use of metacognition by high school students of New Zealand to learn biology subjects' concepts. The study reported that, to some extent, every student using metacognition without knowing it. At the same time, high achievers were more aware of their strategies to using metacognition than low achievers. High achievers used self-questioning to learn the concepts of biology. However, teachers did scaffolding time-to-time

for enriching the learning of the students such as they were given tasks for identifying useful and less useful information. The students were encouraged to ask themselves what they wanted to know or do. Written cues and prompts were given as a checklist for preparing, researching, and writing essays, and prompt statements were included in journal bookmarks. Thus, the study highlighted that students who practiced these strategies scored higher marks than students who were less often or not using these strategies.

Peters & Kitsantas (2009) did an experimental study using metacognition prompts in learning science concepts on the intervention and control groups. It was hypothesized that metacognition prompts would increase content knowledge and knowledge about the nature of science in the experimental group. The study also determined the cognitive processes that were triggered by the intervention. The experiment was conducted on 162 students (including male and female) in the USA's mid-Atlantic region. Metacognition prompts intervention categorized in self–monitoring and self-evaluation. The former was done using checklists. Students were asked to tick 5-7 statements per lecture and were asked to draw graphs about what they understood to keep track of scientific processes' scope under consideration. On the other hand, self-evaluation takes three forms- questions about student work compatibility with scientific ways of learning, social feedback of student work through consensus on assumptions, and comparison of student work with the examples given in the intervention. Analysis of variance reported a significant difference between an experimental group and the control group for content knowledge 6.63 and 36.6 for nature of science, whereas Cohen's d effect size for content knowledge was 0.50 and 0.80 for nature of science. The findings of the study reported that the experimental group stopped rote memorizing in preparation for examination instead, they looked for interconnection of concepts. On the contrary, the control group was more dependent on answers and questions of classwork.

Wu and Pedersen (2011) compared two different metacognition scaffolds in science inquiry, teacher-based, and computer-assisted scaffolds, using 2×2 factorial design through quasi-experimental study. The study was conducted on total of 142 8th graders of two Texas middle schools divided into eight experimental intact classes (four each). Teacher-based metacognition scaffolds were given in the starting or at the end of the class. Computer-based

metacognition scaffold was in the form of a virtual lab with a story that included a video of the Kikai Caldera volcano's eruption, which ejected an estimated 65 million tons of sulfur dioxide ash particles into the atmosphere. Four scientists made contradictory assumptions about the eruption's immediate and long-term consequences given in a continuous and faded manner for the different experimental groups. The students were asked to play climatologists' roles and report the findings of volcanic eruption's effect along with performing various tasks. The teacher used to ask inquiry-based questions, which triggered metacognition. The findings of the study highlighted that the experimental groups that were intervened with computer-based continuous metacognition scaffold and the group that received early teacher-based metacognition scaffold performed better than other groups. At last, there was no significant difference found in the context of acquiring scientific knowledge.

In another context, Trainin and Swanson (2005) investigated the metacognition and cognitive performance of students with learning disabilities and without learning disabilities in colleges of South California. For assessing the cognitive part, they used word reading, working memory, semantic processing, processing speed, and general speed, whereas a questionnaire was used for metacognition. The study did not directly commented on weak reading skill linked with low metacognitive abilities because students both with learning disabilities and without learning disabilities indicated the same level of problem-solving on academic reading. However, it was reported that students with learning disabilities were not very good in terms of making strategies for writing papers, tests, or in learning lessons. Furthermore, metacognition benefitted the students with learning disabilities more than the normal students, as some students with learning disabilities who were using metacognition performed well in academics.

Montague (1992) in his experimental study, tried to find out the effect of metacognition and cognitive instruction on six students with learning disabilities in learning mathematics. These students were selected on the criteria that were- disorder in language processes, academic achievement would be below normal intellectual functioning, and Intelligence Quotient (IQ) scores should be 90 or more on Wechsler Intelligence Scale for Children-Revised (WISC-R). The researcher used an A-B-A-B experimental design in which A stands for baseline where

no treatment was given, researcher only tested the subjects. B stands for treatment period where researcher given experimental treatments to subjects. The subjects were divided into two groups for comparing the different instructions. The first phase was the baseline period of 4 months with pre and post-tests. The second phase of experiment was the treatment 1 followed by four-month of teaching and pre and post-tests. The third phase of experiment included treatment 2of 4-month of teaching with pre and post-tests. The last phase again consisted of baseline period where students were tested on pre and post-test. In treatment 1 for the first group, the investigator applied solely cognitive, and a combination of cognitive and metacognition instruction. The second group was observed with metacognition separately and with the combination of cognition and metacognition instruction. Cognitive instruction involved learning the names of the processes, such as paraphrasing, reading, computing, tasks, and descriptions. Metacognitive tasks included the activities such as SAY, ASK and CHECK. Further, in the second treatment, the researcher used cognitive strategies such as strategy application practice, strategy acquisition training, guided practice, demonstration, etc. The study concluded that subjects did not use problem-solving strategies on the pre-test, but after the treatments, they performed varied strategies to solve mathematics problems. The study also elaborated with interviews and observation that students can memorize the components and utilize metacognitive tasks such as self-questioning, self-monitoring, etc. Moreover, cognitive and metacognitive training helped the students with learning disabilities to perform better on solving a mathematical problem. It was observed that students were able to utilize varied strategies with this type of training. The researcher's intention was to apply the A-B-A design to see the intervention's longevity on the students with learning disabilities to maintain what they learned. Henceforth, it was reported that students failed to retain the use of metacognition and cognitive strategy for a long time. Thus the researcher advised to include these aspects in teaching the students with learning disabilities in schools so that they may benefit.

On the other population, metacognition was used in leadership practice as Watson and Hartman (2013) in their research study explained the role of metacognition in transformational leadership. For this, they studied transformational leaders and found out metacognitive practices followed by them. Concluding the research study they elaborated

that as metacognition plays essential role in monitoring one's cognition, therefore it is utilized for making transformational leadership more effective.

Black, Soto, and Spurlin (2006) described metacognition strategies to develop leadership in a person. In their study, they defined debriefing, think-aloud learning, mindfulness meditation, journaling, etc., as metacognitive strategies for leadership development. Debriefing involves setting aside time and resources to discuss how learning is progressing, what is working and what isn't, or what happened with a completed project or activity in terms of both the process and the results. Think aloud encourages leaders may become more conscious of their own and others' cognitive processes by verbally expressing thought processes during a task or activity. Overall the study reported that leaders could enrich leadership quality with metacognition.

Mango, Koshal, and Ouma (2019) studied the effect of meta-cognitive ability on developing leadership. A total of 314 MBA students of private universities in Kenya were selected as sample using the stratified random sampling technique, and the data collection was done by descriptive survey method. Metacognition was assessed by a standardized tool, whereas leadership was measured by the self-developed tool. Investigators employed regression analysis, Pearson correlation, and one-way ANOVA to draw inferences regarding the effect of meta-cognitive ability on leadership. The result of the study reported positive significant relation between meta-cognitive ability and leadership of the students with r 0.42. Analysis of variance indicated a substantial difference in the mean scores of participants with low metacognitive ability and high metacognitive ability in terms of leadership development. Lastly, the regression analysis highlighted meta-cognitive ability as a predictor of leadership development in the students. The study concluded that leader who thinks upon how and what to learn portrays high leadership quality.

Terlecki and McMahon (2018) compared the three different courses based on cognition, metacognition, and introduction to psychology in developing leadership in undergraduate students. The sample size for the study constituted 251 students of which 81% were females and 19% were males. Researchers applied pre-test and post-test of metacognition at the

starting and end of the three courses. They used standardized metacognition awareness inventory and Metacognition Rubric. Students enrolled in training with metacognition scored well in both the tests compared to other course instructions cognitive, and traditional introduction to psychology and their pre-test scores.

Robertson (2013) elaborated in his study about how educational leaders can use metacognition as learners to portray good leadership skills. In this article, he stated that professional learning could not be separated from self-awareness and personal learning. Transformational leadership provides learning opportunities that push leaders out of their current ways of knowing and being or out of their comfort zones which allow for reflection on new learning. The author of the article concluded that to promote an enriched learning environment, encouraging meta-cognitive thought processes test educational administrators' leadership on many levels, allowing them to comprehend and apply the new experiences and new learning to their leadership practice in schools. Moreover, the leader as a learner is a leader who understands how to learn from and transform through leadership practice.

2.4 Metacognition and Decision Making

Yeung and Summerfield (2012) studied metacognition in human decision-making, including confidence for decision and error monitoring. These two aspects are part of metacognition when making the decision. This paper highlighted that continuous monitoring on every step of the decision-making process helps to stop committing mistakes; actually, it helps in modification of processes involved in decision-making and ultimately increases the decision maker's decision making confidence. They corroborated studies done in metacognition and decision-making, which implies that more conscious effort at every decision-making stage improves decision quality. Thus we can say that if the educational administrators practice meta-cognitive strategies, then it enhance their decision quality through error monitoring and increase decision making confidence.

Wright (2002) in his article discussed about marketplace metacognition and the social intelligence of consumers. This study reflected on consumer decisions about buying goods.

Here, the researcher by marketplace metacognition referred to individuals' thinking upon various market-oriented things, especially the consumer's purchasing behavior. In general it indicates knowing the mental status of oneself and others to select the goods. Author described that marketplace metacognition enables consumer to understand the mental status of marketing agents to communicate their ideas. Finally the study highlighted that experience of consumer build marketplace metacognition, which impacts their purchasing of goods.

In consumer decision, Lee and Shavitt (2009) did experiments to see the impact of meta-cognitive experience on brand understanding while selecting products. They used cues that disturb the meta-cognitive thinking of participants while asking to list down characteristics of known brands (14 known brands listed). Participants were told to hold corrugators muscle (eyebrow muscle) and used as a disturbing cue in the first experiment, which was an obstacle to concentrate. In the second experiment, disturbing noise was produced from a nearby room, followed by an argument put forward before participants while asking to list down brands' characteristics. Through these experiments, they found that when they did not use cues for different brands, participants portrayed a good understanding of brands, but their understanding of brands reduced with disturbing cues. The researcher concluded that meta-cognitive experience helps in developing an understanding of brands while making decisions. In general, this study highlighted that when decision-makers think upon facts and analyse them carefully, they can make better decisions.

Schrift, Netzer and Kivetz (2011) highlighted that consumers mostly went for complex decision-making, which was drawn by seeking different alternatives. They argued that when alternatives are clear, the consumer does not like to buy. In complex decision-making, consumers' metacognition helps to think over different product options before deciding to buy. For example, while selecting jeans, one will go to different shops before buying from only one shop. Here metacognition of consumers helps to find the best jeans. Researchers hypothesized and empirically demonstrated in this article that, under predictable circumstances, consumers establish an introspective and pragmatic decision based upon their thinking pattern even though such a procedure is rationally unnecessary.

Arora, Haynie, and Laurence (2013) argued that with the help of meta-cognitive thinking, entrepreneurs could do counterfactual analysis through which they can analyze different alternatives based on the past decision with asking "what if I had done this?" This meta-cognitive strategy will help in present and future decision-making. The authors claimed that using meta-cognitive entrepreneurial behaviour to reflect on counterfactual thoughts to seek an opportunity is a meta-cognitive entrepreneurial behaviour. Individuals with greater metacognitive skills (metacognitive experience) were able to analyse alternatives of their past decisions to utilize in the current decision-making process.

Hayine, Shepherd, and Patzelt (2012) studied whether novice entrepreneurs with high meta-cognitive experience and knowledge adapt decision policies effectively on dynamic task compared to lower meta-cognitive experience and knowledge. The second agenda of the study was to answer whether novice entrepreneurs who received cognitive feedback adapt decision policies effectively on dynamic task compared to who received outcome-based feedback. Two hundred seventeen final-year undergraduate business students were selected as the study sample from different public universities of the USA. These subjects were included in the experiment for two parts in which investigators asked them to analyse problems and give their decision. The respondents were asked to decide on three attributes out of five (rarity, value, inimitability, limits on competition, relatedness) in the first part and on total five in the second part of the study. In the first part of the study, a total 17 profiles were given to the subjects on which they made their decision out of which later eight profiles were given computer-generated cognitive feedback. Furthermore, in the second part, participants were advised to decide based on five decision attributes. They made the decision on 65 profiles, including a complex model of cognitive feedback. The study's findings suggested a significant relationship between metacognitive knowledge and feedback, which enables novice entrepreneurs for cognitive adaptability. Participants who possessed high meta-cognitive ability, both knowledge and experience, used both feedbacks more effectively to make more accurate decisions. Another finding of the study highlighted that novice entrepreneurs with high meta-cognitive ability benefitted more from cognitive feedback.

Nambisan and Baron (2013) provided the framework for entrepreneurs' meta-cognitive

ability to identify important innovation and development of potential outside and within the innovation environment. Entrepreneurs' decision-making and choices relevant to compete for technology growth priorities will benefit from meta-cognitive skills. Entrepreneurs' need to make appropriate assessments of their capacity to fulfill both the obligations defined by the hub firm and those pertaining to their own company's continued success and formulate adaptive strategies for performing this complex task successfully. In other words, while meta-cognitive knowledge and awareness are undoubtedly adaptive and advantageous in a variety of contexts, the unique demands that ecosystem entrepreneurs face can make it much more vital for them to consider their own cognitive strengths and weaknesses, as well as their own set of knowledge and skills.

Robert, Shepherd, and Sharfman (2011) studied how metacognition effect erratic strategic decisions. The study was conducted on 64 CEOs selected randomly from 127 CEOs of technology firms who were asked to make 2048 decisions. Investigators made different situations and asked CEOs to make decisions on four decision attributes the potential value of an opportunity, knowledge relatedness, window opportunity, and the number of potential opportunity. Moreover, participants were asked to rate their probability of allocating resources to that opportunity on a nine-point Likert-type scale, with 'very unlikely' to invest in this opportunity at the bottom. They were also asked to assume that these decisions they were taking in terms of their firms. To see CEOs erratic strategic decision-making, investigators instructed them to make the same decision task twice. In between two same decision tasks, one distractor task was employed, including the decisions they have in their life. The study's findings suggested that managers with more meta-cognitive experience and those who work in more complex settings are less likely to make erratic strategic decisions. Thus metacognition helps to employ more consistent, accurate strategic decision-making.

Blume and Covin (2011) highlighted the role of metacognition in the intuitive decisions of entrepreneurs. He defined the level of meta-cognitive skill to develop entrepreneur schemas, which will lead to effective use of intuition to make decisions. In general meta-cognitive skills moderate the relationship between entrepreneurs' schemas and their use of intuition. They elaborated that conscious awareness about changes, conscious learning, and the

knowledge about patterns involve in the decision process construct the expert entrepreneurial schemas. Individuals' meta-cognitive capacity to focus and analyse thought processes can also help them determine when to make decisions based solely on their expert entrepreneurs' schemas versus when to collect more data as feedback to structured, explicit study. According to them, it helps to make multiple strategies and prioritize between rational decision and intuitive decision as per the situation's demand.

Staw and Boettger (1990) elaborated that metacognitive strategy and metacognitive knowledge enable the decision-maker to do task revision by providing an opportunity to regulate cognition by analyzing decision situations in multiple ways, more conscious effort to consider different alternatives, and learning and planning from present errors for future decisions.

Rosi, Vecchi and Cavallini (2019) developed a metacognitive strategy based training programme for improving decision-making in old adults. They highlighted the practice of metacognitive-strategy questions increases decision accuracy. Like for monitoring asking about sufficient information and additional information needed to make a decision. For evaluation asking who will be affected by my decision, giving weightage to different alternatives etc. Study also involved some specific metacognitive strategies like interactive imagery for monitoring the whole decision process. The study was conducted on 66 older adults aged between 60-81 years of the third-age university in Northern Italy. Researchers divided them into experimental and control groups, where metacognition-based instruction was given in the treatment group, and traditional strategy training was given to the control group. The experiment was divided into four training sessions for each group, meta-cognitive instruction was included in every session. In every session, participants have to answer eight metacognition strategy questions before deciding on every new decision problem. These strategic meta-cognitive questions help participants internalize the core elements of a structured decision-making process by guiding their thought. It enables one to evaluate the decision dilemma, employ multiple perspectives, seek varied possibilities and consequences of making the decision, and apply the best decision strategy. The study results reported that treatment with metacognition instruction increased more decision performance compared to

the control group. Metacognition helped adults to improve analytical processing, which they later in the study portrayed by heuristic responses.

Fogarty (1994) developed different metacognitive strategies for planning, monitoring, and evaluating teaching metacognition reflection to students. Such as self-administered checklist, journaling, portfolio registries, think-aloud, and stem statements were also helpful for students' decision-making process regarding their learning.

Colombo, Iannello, and Antonietti (2010) studied meta-cognitive knowledge about decision-making. The study was conducted on 85 adults from different professions, including doctors, managers, educationists, economists, unemployed housewives, etc., aged between 24-75 years. Investigators made a solomon questionnaire and asked varied decisions respondents were going to make, including how meta-cognitively aware people make decisions and use strategies. In the second section of the questionnaire, researchers evaluated indirect metacognition awareness by asking to make choices among different analogies as decision-makers. Lastly, in the third section, participants had to answer their conception about decision-making by identifying features for sound decision-making and defining processes that make a person a good decision-maker to assess their meta-cognitive knowledge of processes. The study's result highlighted that people with meta-cognitive knowledge can track, interpret, and report mental functions while making decisions. The study also said that level of expertise and profession guided meta-cognitive knowledge of the person, and it was identified when decision failure was observed. Furthermore, intuitive or analytical style of decision-making moderated the meta-cognitive knowledge of the participants. Though with reference to direct metacognitive awareness, intuitive decision-makers and decision-makers who used analytical decision-making style did not shown much differences. Whereas on indirect meta-cognitive awareness, intuitive decision-makers conceptualized decision-making as adventurous tasks and analytical people conceptualized it as well organized. Finally, the study suggested that people are generally aware of facets of decision-making processes that are important to their objectives, and they express meta-cognitive views that are similar to their own.

Turner (2016) had given metacognitive-strategy based instruction to students of business study to see its effect on their decision accuracy and elaborated think aloud and visualization help in planning, monitoring, and evaluating decision-makers cognition. A total of 90 students were selected as sample from four universities of Wellington. Out of these, 44 subjects were assigned to the control group, and 46 subjects were assigned to the experimental group. During the intervention, participants were asked to think aloud the question and its every step on which they needed to make a decision. In the second part, the experimental group was asked to read a short paragraph and visualize the conversation in their head before deciding. In contrast, the control group had to read and answer the question. In another part of the intervention, participants in the experimental group were asked to visualize and draw a concept map on the notebook before making decisions on the given task. On the contrary, control groups were left to make decisions by just reading instructions. The researcher intended to test three decision-making areas- memory retention, lateral thinking, and problem-solving with his intervention. Findings of the study suggested that participants who were going through intervention think-aloud were able to solve more problems in comparison to the control group, and they were able to monitor and reflect on learning in the decision-making process consciously. Furthermore, metacognitive strategy (think-aloud and visual imagery) helped in recalling more information indulged in decision-making. Lastly, the study revealed that these metacognitive strategies helped in thinking laterally, as the participants were able to develop more creative solutions than the control group.

Table 2.1. Summary of the literature review

Themes	Variables	Literature developed
Decision-making in educational administration	Shared decision-making, Decentralization of power, Unilateral decision-making, Pace of decision-	Decision-making in educational administration revolved around participatory decision-making. Whereas some studies pointed out slow progress in an organization with shared decision-making, but others said that it produces multiple ways. On the other hand, unilateral decisions lead to an

	making, Grounds of decision-making,	authoritative approach. Furthermore, teachers' participation in decision-making is a potential contributor to organizational citizenship behaviour and innovation in school. On the contrary, there is no direct impact on students' outcome. Loutcomesthe study also evaluated students' participation in decision-making, which highlighted the development of life skills, self-esteem, democratic attitude, improving learning style, etc. Whereas in some students, the negative effect was seen in terms of disappointment, frustration, stress, etc. Thus it is worth noting that decision-making could not be confined to any single approach, either participatory or unilateral; it should be based on context specification.
Roles and Functions of District Education Officers	Role and function in school improvement, Leadership style,	Research studies on roles and functions of district education officers are very limited. Though some studies pointed out lack of resources for DEOs, they work in a restricted environment, lack of time for school monitoring. The system is highly centralized and administrative in nature, and the practice that is followed is mostly autocratic leadership style etc. Thus it is essential to explore this area as it an important component of school administration.
Metacognition in Education	Learning outcome of students,(in	Abundant research studies are available for metacognition in education. Metacognition helped

	language, mathematics, science, social science) Learning disable achievement, teaching method, and Leadership styles.	students, teachers, and leaders in many ways as it is an important predictor of academic achievement. It makes the student aware of what they have learned, what they do not know, and how they will learn to produce good results. Metacognitive cues and prompts in the course of instruction helped students to link concepts. For leaders, it helps in solving problems involved in high-level executive leadership, communicating thought processes verbally during a task, leaders can become more aware of their own and others' cognitive processes. Thus, well-developed conscious control mental processes structure will help individuals in many ways, especially in teaching and learning and now it is expanding in other fields.
Metacognition and Decision-making	Confidence for decision-making, error monitoring, product judgment, decision accuracy, erratic decisions, and innovation.	Metacognition in decision-making can be seen mostly in business studies where researchers tried to highlight consumers' and entrepreneurs' thinking patterns to make decision. Studies pointed out that individuals who possessed high metacognitive ability understand problems more comprehensively. They plan varied alternatives, develop more creative solutions, etc., to make decisions. However, it isn't easy to determine the processes involved in using metacognition to display more accurate decisions. However, some research studies reported various metacognitive strategies such as think-aloud, visualization, journaling, debriefing, etc., to make decision-making more effective. These studies mostly involved experimental and descriptive survey methods to answer questions, whereas qualitative

		methods were used to explore processes that were missing. Hence metacognition in decision-making is confined to some areas, whereas it has great potential to make the decision-making process more effective.

2.5 Conclusion

This chapter has three aspects of past research studies- decision-making, metacognition, and district education officers. The inter-linkage between these aspects can be defined as studies in decision-making and educational administration, which gives us an idea about what type of studies are going on in decision-making. Moreover, studies related to district education officers tell us about their roles and functions. Metacognition in education outlines how the processes of thinking upon thinking helpful in teaching-learning processes. Moreover, metacognition and decision-making highlighted the role of metacognition in decision-making and provided an idea about how and why to include in current research. The studies in decision-making in educational administration highlighted the role of participatory decision-making in varied contexts. Studies conducted on district education officers highlights that in a centralized structure of educational administration, the style of leadership affects decision making tell us the centralized educational administration structure where their leadership style impacts decision-making even though very few research studies are available on them. Moreover, knowledge of cognition and regulation of cognition improves the teaching-learning process and decision accuracy.

CHAPTER 3

Methodology

3.0 Methodology

The methodology of research determines how to address the research problem in a systematic manner. It describes the importance of a specific approach adopted for the research purpose and reflects the reasoning behind the methods used by researchers in the context of a research study.

Thus the present chapter discusses and elaborates the research paradigm employed in the study and research design including procedure, size of sample, sampling techniques, data collection technique, data gathering, and analysis technique.

3.1 Paradigm

We can employ different methods for the study depending upon the objectives and base of the study whether qualitative or quantitative or mixed. Generally qualitative study leads to phenomenological paradigm and quantitative study leads to positivist paradigm, nowadays investigators also use mixed method for overcoming the limitations of quantitative and qualitative methods. In the present study researcher investigated metacognition and decision-making of District Education Officers based on phenomenological paradigm. The phenomenological paradigm aligned with qualitative research enables in-depth exploration and for this research it is constructed based on the literature, objectives and research questions. Substantially this paradigm focuses more on process rather than products. Thus the present study is aligned with qualitative research exploring District Education Officers views with qualitative techniques.

3.2 Qualitative Research

Qualitative research method is the subjective description of the data, collected through techniques such as interviews, observation, open-ended tools etc. and analysis through coding procedures. This method was involved because of the nature of the study as researcher wanted to answer decision-making pattern of the District Education Officers, role of the metacognition in their decision-making pattern and how metacognition works to facilitate decision-making. Qualitative research helps to answer these questions with in-depth exploration, collecting data through interviews. Moreover, the analysis of the data though coding procedure helps to fulfill the objective of the study.

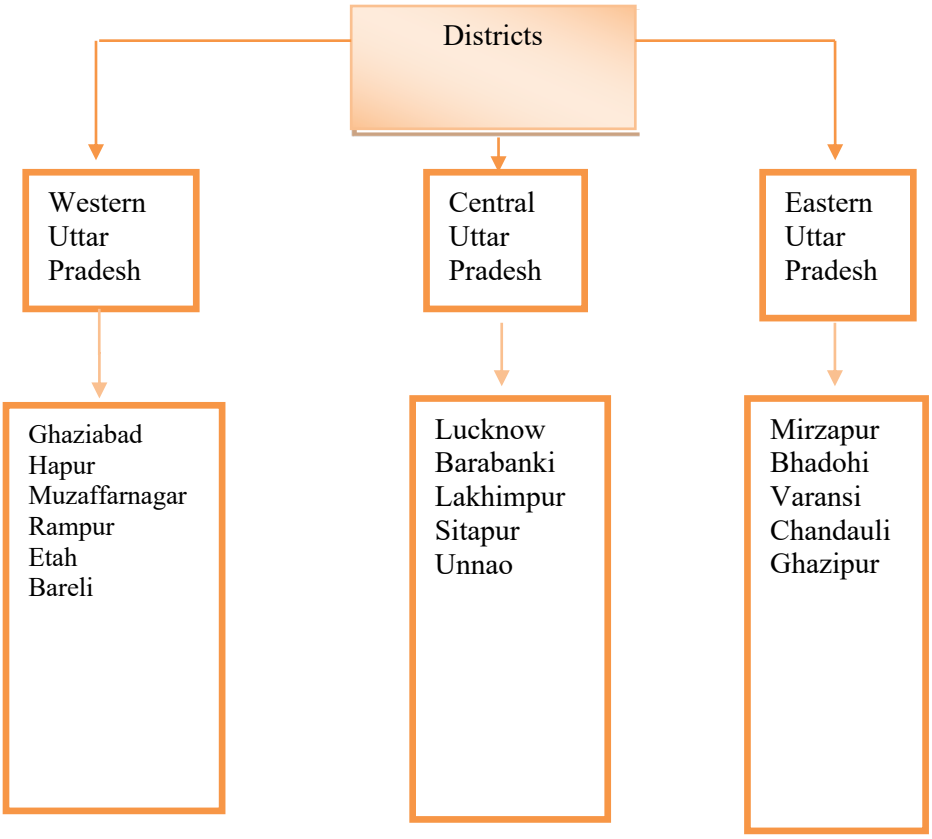
3.3 Sample of the study

Sample in a research is defined as the part of population on which researcher conduct the study. The present research is conducted on District Education Officers of Uttar Pradesh. In general it includes locale, size, and techniques through which sample is drawn which are as follows:

3.3.1 Locale of the study

Districts of Uttar Pradesh were selected purposively for the study including western, eastern, and central area of the state. The study was conducted based on the availability of appointments with the officers. A Total 16 districts were included in the study as follows:

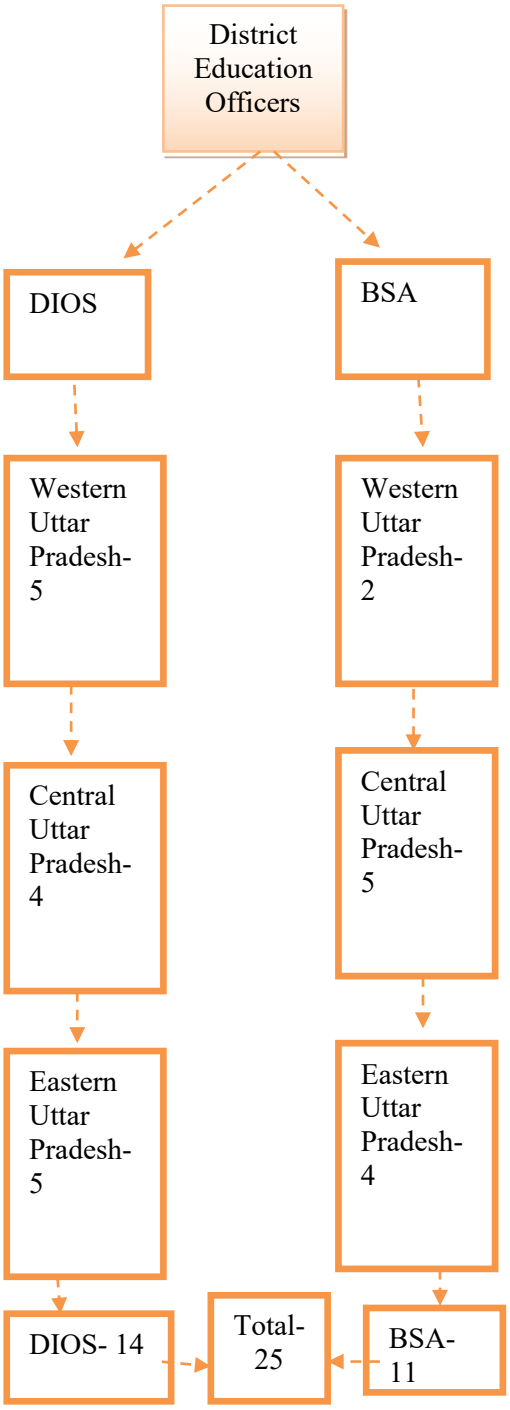
Figure 3.1: Locale of the study



3.3. 2 Sample Size of the study

The study was conducted on district education officers including District Inspector of Schools (DIOS) and Basic Shiksha Adhikari (BSA) in Uttar Pradesh. Total number of 25 District Education Officers were interviewed, 14 DIOS and 11 BSAs.

Figure 3.2: Sample size of the study



3.3.3 Sampling Technique

Purposive non - random sampling technique was used based on the availability and appointment with the officers. Researcher visited to 14 districts of Uttar Pradesh and approached 27 District Education Officers during January and February month of 2021.Out of these, 8 District Inspector of Schools and 7 Basic Shiksha Adhikari had given appointments. The second part of the study included telephonic interviews. The researcher telephoned 24 District Education Officers, out of which 6 District Inspector of Schools and 4 Basic Shiksha Adhikari responded, while rest of the respondents either refused or were not available. The sample was selected using a non-randomized sampling technique due to lack of time and resources, and non-availability of appointment with the District Education Officers.

3.4 Data Collection Procedure

The data collection were held in two parts, In the first part of the study researcher collected data through face to face interviews and in the second part data were collected through telephonic interviews. Although, due to the corona pandemic it was difficult to conduct face to face interviews with all the respondents. Moreover researcher used secondary sources to link with questions such as Intermediate Act 1921 and amended 2007 Act and Basic Education Act 1972 and Amended Act 2000. Further researcher also constructed an open ended questionnaire but due to busy schedule of officers and corona pandemic they did not returned it. Questions were asked based on the objectives and theoretical framework of the study. Every officer was asked a common question to narrate a situation where they made independent decisions. This question gave an idea about varied situations in which they have to make decisions. Further to draw out decision-making pattern of the District Education Officers questions were asked based on situations narrated by the officers. For example when an officer described a situation where a teacher was not going to school and placed somebody else for teaching, then questions relating to the source of information and the method of examining and cross checking the information was asked. In addition to these questions, the information on the criteria for making decision in the particular situation was also sought. Through these types of questions and narration of the varied situations

researcher was able to draw the basis of decision-making like source of information, consultation with others to make decisions and decision premise.

For the other objectives of the study like role of metacognition in the decision-making of the District Education Officers and for how metacognition works in decision-making of the District Education Officers, researcher included other questions like what measures officers had taken to teach students who do not have smartphones during corona pandemic This type of question gave an idea about their possible choices and strategies they plan before making a decision. For the other dimensions of the metacognition, it was explored whether they were making direct decision without thinking about the problem completely. Questions about who will be affected by their decision and how do they set priorities for different strategies and alternatives were also asked These questions were leading based on decision situation narrated by them, whereas the main focus of this part of the data collection was to link the theoretical framework of metacognition with decision situation.

3.4.1 Tools and Techniques used for the Data Collection

Researcher used semi-structured interview schedule and an open-ended questionnaire including decision-making and planning, monitoring, and evaluation dimension of the metacognition. Though District Education Officers did not respondent on open-ended questionnaire due to their busy schedules and corona pandemic, they participated in interviews.

a) a) **Open ended Questionnaire:** Initially researcher developed an open-ended questionnaire including decision-making and metacognition. This questionnaire consisted of total 5 questions, including planning, monitoring, and evaluation dimensions of metacognition relating to decision-making. The first question was about situations where District Education Officers made independent decisions based on their reasoning. Other questions included the planning dimension asking different strategies they make, the monitoring dimension including what they think of while making decisions, and the evaluation dimension had questions that elaborated their analysis to make more accurate decisions. However, as District Education Officers

did not return the questionnaire, the researcher visited Basic Shiksha Adhikari and District Inspector of Schools to conduct face-to-face interviews and telephoned them to conduct telephonic interviews.

b) **Interview Schedule:** The semi-structured interview schedule was made by the researcher to study the metacognition and decision-making pattern of District Education Officers. Initially researcher asked officers to narrate situations where they have taken decisions based on their reasoning. The decision-making pattern was drawn by linking the questions with the situations narrated by the officers. Further three dimensions of metacognition were included in the study- planning, monitoring, and evaluation. With respect to these dimensions of study, the researcher made an attempt to link questions with theoretical framework of the study. In which questions for planning dimension of metacognition was linked with what kinds of strategy District Education Officers make before making the decisions. For monitoring it was focused on how they use conscious supervision of every strategy and action while making decisions. Finally, evaluation refers to analyzing each step of the task for the diagnosis of the whole decision. These questions were in accordance with the situations narrated by the District Education Officer for making the decisions.

c) **Intermediate and Basic Education act of Uttar Pradesh:** Researcher also referred to Intermediate Act 1921and Intermediate Act Amendment 2007 of Uttar Pradesh as secondary source for asking questions and gaining relevant information from District Inspector of Schools and Basic Education Act 1972, and Basic Education Act Amendment 2000 in the case of Basic Shiksha Adhikari. These acts indicate what matters while District Inspector of Schools make decisions at secondary level and Basic Shiksha Adhikari at primary level.. Act empowers the District Inspector of Schools and Basic Shiksha Adhikari to make decisions in the matters like, indiscipline acts of teachers and principals, in improving quality of education, monitors confidential reports, etc. Further at secondary level act empowers the District Inspector of Schools to organize election of management and make decisions in related matters. Moreover, researcher used these acts to interpret the data.

3.5 Data analysis and interpretation

The first step in the analysis process, the researcher tried to create a manageable coding scheme to make sense of the massive interview data. The coding process was directed by Creswell (2014) six steps for data analysis, and Saldana (2021) overview of the coding process. Creswell (2014) outlines and describes six steps in a linear sequence, but he emphasizes that these six steps are "interactive in practice" when addressing data analysis. To begin, the recorded interviews were transcribed verbatim as soon as they were completed. The researcher did a prompt reading to see if the question asked were generating responses that were in accordance with the study's objectives and research questions as well as to see if any new insights were emerging. After completing the data collection, transcripts of the interviews were read again, with sentences, phrases, and keywords highlighted. The coding was divided into three stages. In the first stage of coding, the transcript of the interview was coded descriptively. The second stage of coding was used to look for concepts/ideas that were similar. The concepts/ideas that were similar were then grouped into categories. The researcher made a deliberate effort to avoid categorising data into distinct classes. The researcher made a deliberate effort not to leave something behind that didn't fit into any existing trends. Moreover, interpretation of the data for the present study was done on the basis of formulated objectives and research questions based coded themes and sub themes.

Table 3.1: Process of analyzing the Interview data

STEPS TO CODING DATA (Creswell, 2014; Saldana, 2021)	**Application to this Study**
Step1: Preparing and organizing the data	The interviews were word to word transcribed.
Step2: Reading of all collected data.	The data was carefully read, and any ambiguities were noted.

Step3: Starting with detailed analysis and coding process.	Re-read and listening again the recorded interviews, the data highlighting sentences and phrases that are important Themes were developed by combining the codes. The descriptive codes have been categorised.
Step4: Generating categories through coding process	The first stage coded data was examined to see whether there were any common themes, which were then grouped into a category.
Step 5: Preparing themes to present	Post Coding: Major themes were divided into two parts each.
Step 6: Interpreting the meaning of the data.	Objective wise themes were discussed and interpreted.

CHAPTER 4

Analysis and Interpretation of the Result

4.0 Overview

The current research focuses on decision-making and metacognition of the district education officers, the data was collected by interviewing district education officers, with an aim to investigate role and working of metacognition in decision-making of district education officers, as well as the pattern of their decision-making. The study is qualitative in nature. An in-depth information is obtained from the sources and the data is analysed using qualitative method. Officers were interviewed in person and over the phone, depending on their availability and convenience. They were introduced to the study and were requested to answer all of the questions. They were also assured that their personal details will be kept confidential. During interviews, numerical pseudonyms were used instead of names to maintain anonymity.

Interviews are considered to be a reliable source of qualitative knowledge, encouraging participants to focus on their impressions of the situation (Bloomberg & Volpe, 2018).Many scholars have reiterated the fact that various types of interviews used in research have their own advantages. Interviews allow researchers to dig deeper into their subject areas of interest. While interviews may be categorised as structured, semi-structured, or unstructured, they should be treated in the same way that casual discussions or conversations are treated. Data can be quantified using structured interviews. Whereas, semi-structured interviews permit researchers to deeply probe participants, it enables researchers to delve deeper into the minds of participants. Semi-structured interviews are usually long, lasting up to many hours. They are based on a number of open-ended questions and can be performed individually or in groups (DiCicco Bloom & Crabtree, 2006). In the present study, the researcher developed the interview questions based on planning, monitoring, and evaluation of cognition while making decisions, as well as the pattern of their decision making.

4.1 Exploring the Decision-Making Pattern of the District Education Officers (DIOS & BSA)

In this section, data generated from the interviews with District Education Officers were analyzed. Creswell (2014); Saldana (2021) coding process was used to analyze interview

data. The major focus was to explore on what basis and how do the District Education Officers make decisions to generate information regarding pattern of decision-making. Various questions were asked from the District Inspector of Schools (DIOS) and Basic Shiksha Adhikari (BSA). The information generated formed the basic themes, Origin of the problem, Initial response, and Decision premise by which decision-making patterns can be determined. This allowed for the emergence of several ways in which officers make decisions and indicate inter-relationship between these themes.

Origin of the problem theme was further categorized into problems reported by principals, teachers, staff, etc., termed as subordinates. The second category was formed based on the origin of problems generated outside the organization named stakeholders such as students, parents, etc. The third category for the origin of problem was made based on the problems observed by the officers themselves. Likewise, the second theme, Initial response, is categorized based on seeking information/consultation done by the officers with others to decide for a particular situation. It is categorized as consulting with stakeholders, consulting with subordinates, consulting records, and unilateral decisions. Third theme decision premise was categorized based on knowledge acquired by the officers which helped in decision-making such as job experience- knowledge acquired during a career which helped in decisions, organization acts and rules knowledge acquired by the rules, order, policies, and educational qualification- knowledge acquired during their degrees and course.

Table 4.1Origin of problem for the decision-making of district education officers

Themes	Category	Evidences from the data
Origin of the problem	Information given by Subordinates	"mere staff members ne mujhe bataya ki district ke kuch schools me teachers aur principals ki late se aane ki adat hai" (My staff members told me about the late coming habits of principals and teachers in some schools in district) "kayi schools ke principals ne bataya ki wo bacho ke online classes ka attendance record nhi

		de skte hai kyunki bht saare bacho ke ghar smartphone hi nhi hai" (Principals told that they are not able to provide attendance records of online classes because students do not have the smartphones in their houses.) "Teacher ne patra likh kr bataya ki aided school ka management niyukti nhi kr raha."(The teacher wrote a letter saying that the Aided School Management is not appointing him). "Principal ne teacher ki confidential report pe likha aur written me bhi diya ki falane teacher ka vyavhar girls student ke prati acha nhi hai" (Principal written on confidential report and on separate letter that one teacher's behavior is not good with girls students).
	Information given by Stakeholders	"Abhivak ne bola chote bachon ka school khol diya gaya hai ab bade bachon kabhi school kholiye ,bache offline padhna chahte hai par teachers unhe online padhne ke liye force kr rhe hai" (Parents of the student requested to open the schools for secondary students as primary students schools, students want to study offline but teachers are forcing them to study online). "Gao ke kuch logo ne mere pas phone karke

		shikayat ki ek teacher kisi aur ko apne jgah teaching ke liye rakha hai." (Some people of the village reported about a teacher that he/she is not going to school and placed somebody else for teaching). "Mritak shikhsak ki wife ne letter bhejh ke mujhe bataya,mai apne pati ki pehli patni hu, mai uski mrit ashrit naukri ki haqdar hu"(First wife of deceased teacher claimed for compensatory service through writing me letter).
	Self Observation	"Mere pas ek school ki confidential report aayi jisme maine ye paya ki Princpal ke comment area ki hand writing shesh content jo clerk bnata hai wo ek hi hai." (I found same handwriting of clerk section and Principal comments in confidential report of one school). "Mai ek school me gaya tha visit ke liye jaha science, math, english, hindi, social science, sanskrit, aadi Vishay pdhaye jate the, lekin sanskrit vishay ka koi teacher nhitha"(I visited to one school where science, math, english, hindi, social science, sanskrit etc. subjects were taught but there was no teacher for teaching sanskrit). "Mai ek gao ke kuch schools ke inspection pe gaya tha waha maine paya ki teaching ko leke kuch shikshak de-motivated hai." (I visited to one village's schools for inspection and found

		some teachers are very de-motivated towards teaching). "Ek school ke 5th class me maine paya ki kuch bache sadharan jod bhi nhi kar paa rahe." (In 5th class of one school I found some students are not able to do simple addition). "Kabhi-Kabhi mujhe ye jankari schools visit ke dauran bacho aur aas paas ke gao walo se puchne par pata chalti hai ki koi adhyapak ache se padhata hai ya nhi, ya fir principal aur adhyapak time pe school aate hai ya nhi." (During our visit sometimes we ask students and people living nearby about teaching of teachers and their punctuality of coming school).

Interpretation of table 4.1

In the above table origin of the problem is described on which district education officers, including Basic Shiksha Adhikari and District Inspector of schools, make decisions. Here, the origin of the problem is defined as where officers get to know about the problems and give a glimpse of the kind of problems that arise for decision making. This theme and its category helped to elicit the pattern of decision-making relating to other themes and categories. Subordinates to District Education Officers and Basic Shiksha Adhikari such as principals, teachers, clerical staff immediate to their office and Block education officers under BSAs are the main people who interact with officers. Simultaneously, it was observed that clerical staff attached to the office of DIOS and BSA had more opportunities for interaction. Most of the problems reported by subordinates were administrative in nature where management of aided schools refused to recruit teacher, indiscipline acts by teachers and principals including late coming to school and their behavior towards students. In

addition to this, during corona pandemic many cases reported by principals and teachers were of unavailability of smartphones in the houses of students, as a consequence, they were unable to record attendance. There was no reporting done by subordinates concerning the improvement of the quality of education, even though researcher directly asked about it from some BSA and DIOS.

Stakeholders such as students and parents report various problems on which officers have to decide. The parents mostly expressed the problems regarding corrupt practices of teachers, quality of education, indiscipline acts by teacher and principal, and during corona pandemic, parents also expressed their concern regarding the opening of schools because online teaching required ICT facilities, which they did not have. No student reported problem directly to officers. Furthermore, it was observed that DIOS has more power concerning aided schools, and also, it simultaneously imposes many critical situations for them. In one example, DIOS reported life threat in deciding the matter of aided school management he described ("adhiktar aided school ke management me takatwar log hote hai joki gunde bhi hote hai") mostly the members of the management are powerful and hooligans. In primary education, it is seen that people (parents of students) have more opportunity to interact with BSAs as they directly communicate through telephone and report about corrupt practices.

Nevertheless, District Education Officers themselves observe and come to know about problems while inspecting schools. They learnt about the problems while signing confidential reports and during their inspection of schools. During their visits, they invigilate teachers' identity records to check whether the recruited school teacher is teaching or somebody else is performing the duty, check students' notebooks to monitor course completion and interact with students. This is the main work assigned to DIOS and BSA to inspect and be vigilant towards everything for smooth functioning of education system at school level.

Table 4.2 Initial Response for the decision-making of district education officers

Themes	Category	Evidences of the data
Initial Response to decision-making	Consulted stakeholders	"bacho se bat krk maine dekha ki jis teacher ki shikayat ayi thi kya wo sach hai" (I interacted with students to verify complaint against teacher was right or not)

		"gao ke logo se baat krk pucha ki ye teacher gao me rehta hai aur school jata hai taki ye pata chal jaye kahi usne kisi aur ko to nhi lga rakha apni jgh" (I interacted with people of villages to find out whether the teacher is living in village and go to school for teaching). "bacho se prashn karke ye confirm kiya ki jis teacher ke bare me kaha ja raha hai ki wo acha nhi padhata ye kis had tak sahi hai." (It was confirmed by questioning the children that the teacher who is not teaching well is right to what extent).
	Consulted subordinates	"Maine khand shkhsa adhikariyo ki baithak bulake unse sujhav maange ki aisi parishthithi ko monitor krne me kya-kya upay kiye ja skta hai jb adhyapak apne jagah dusre vyakti ko vidyalaya me laga ke kr ghar baith jate hai "(I called meeting of block education officers and asked suggestion to tackle the situation where a teacher placed another person in school instead of himself). "Kam results laane wale vidyayalayon ke pradhanadhyapak ki meeting bulvayi aur shikshan me kya dikkat aa rhi ispe charcha karke yeh nirnay liya ki ravivar ke din in bacho ke liye alag se upcharatmak kakshaye chalayi jaye" (I called meeting of the Principals of schools with low scores and discussed the situation of

		teaching and learning and directed to open schools on Sunday for remedial classes). "Corona mahamari me padhai sthagit ho gyi thi aur humare bacho ke ghar smartphones bhi nhi the to humne principals aur teacher ke sath meeting krk ek team bnayi jisme humne teachers ke video lectures bnawaye aur use NCERT bhej ke total 17 videos ko swayam prabha channels pe chalwayaa gya."(in the corona pandemic when teaching learning was stopped and there was no smartphones in the homes of students, we made a team of teachers and principals after meeting with principals to make videos which had been sent to NCERT also and 17 videos got selected and were broadcasted on swyamprabha channel). "Humne Principals aur block education officers se meeting krk ye nirnay liya ki pichde jile me de-motivated teachers ko workshop aur ache teacher ke model presentation se motivate kiyajaye." (We conducted meeting with Principals and block education officers to motivate the de-motivated teachers through workshops and model presentations of well performing teachers).

	Consulted Records	"Maine ek school ki purani confidential reports handwriting match krne ke liye dekhi jisse mujhe pata chala ki principal change hone ke baat bhi principal coment area ki handwriting same hai" (I saw an old Confidential Report of a school to match the handwriting which showed that even after the Principal was changed, the handwriting in the Confidential Reports was the same). "Maine Sanskrit ka teacher ek school me na hone ki sthithi me saare maujood teachers ke graduation subjects dekhe, aur jisne bhi sanskrit pehle ya dusre varsh me kiya tha unhe padhane ka nirdesh Principal dvara dilaya."(I directed teachers through Principal who have Sanskrit as a subject in 1st or 2nd year of graduation, when there was no Sanskrit teacher in school after looking their graduation marksheets).
	Unilateral decision	"maine tatkalik nirdesh diye notice jari karne ka ki district ke sabhi government schools me teachers aur principals 9:40 -9:50am tak aa jayenge iske bad aane walo ko absent mana jayega." (I directed to issue notice for government schools in the district instructing that teachers and principals should reach schools between 9:40-9:50 am failing which absent will

		be marked). "Maine local vigilant committee ko confidential report me handwriting same hone ki jaanch saunpne ka nirnay liya." (I decided to give the responsibility of investigating the matter of handwriting in the confidential report, to local vigilant committee) **(Regarding directing other teacher for teaching Sanskrit)-** iss Vishay me mujhe kisi se discussion krne ki avyashakta nhi thi, kyunki itne level ka decision swyam liya ja skta hai." (I did not need to consult anyone in this matter, because this decision could be taken by myself). " Ek purva DIOS jo ki retire ho gye hai unhone btaya mujhe ki court ne aided school ke management election par rok lagayi hui thi parantu kuch management ke gundo ne bandook ke dum se kuch dastavej ke upar sign karaya, aisi sthithi me hume tatkalik self-decision lena hota hai."(Former DIOS told me about a situation where court issued stay order on the election of aided school management, but some hooligans belonging to management forced him on gun point to sign some documents, in this kind of situation we have to take instant decisions)."

Interpretation of table 4.2

In the above table, it is defined that how district education officers were making decisions. They make decisions by consulting different individuals, records or taking unilateral decision. Matters like the indiscipline act of teachers and principals were verified by interacting with students, parents, and community. In most of the situations, they reported that while interacting and questioning students, much of the information about the teaching and behavior of teachers could be extracted. Moreover, interaction with people of the village, helped in identifying the teachers who placed another person in school. Officers also reported that this type of news spreads quickly in the village so you can identify and monitor the schools. Although they assured that this corrupt practice was in the past, and they have controlled now, but on practical grounds it is still a matter of investigation. Most of the cases in which district education officers consult stakeholders were the indiscipline act of teachers, punctuality of teachers and principals, and their quality of teaching.

The subordinates of district education officers, including block education officers, BSAs and teachers, principals, and clerical staff associated with DIOS and BSA, were consulted in varied situations for making decisions. At the level of primary education, Basic Shiksha Adhikari make plans in consultation with block education officers to make decisions regarding motivating teachers of remote areas, in matters where teachers are involved in corrupt practices, etc. Whereas DIOS at secondary level consult Principals of schools regarding improving quality of education in non-performing schools, form committees for investigating indiscipline acts, etc. In the corona pandemic, remote areas were deprived of teaching-learning through online facilities. Some officers took the initiative in consultation with Principals and other subordinates to form groups who made video lectures. These lectures were broadcasted on swamphrabha and egyandarshan channels as people don't have smartphones.

District education officers also reviewed records to make decisions but in very few situations, such as while examining previous confidential records of a school to verify the person who is writing it, and in the situation where officer reviewed the educational qualification of

teachers to direct teacher for teaching Sanskrit subject. Further, they looked at attendance records, copies of students, curricular planning, to make decisions.

However, district education officers take unilateral decisions, especially at the secondary level. District Inspector of Schools in one situation, issued notice to adhere to the timings of schools, reflect that they are allowed to issue notices that fall under their authority (Intermediate Act amended, 2007). They were vigilant and made decisions and directed teachers for teaching subjects which they studied in graduation in the case where there was no teacher in that particular subject. Officer also apprised the researcher about the delay in appointment of teachers or teacher transfers through government recruitment process, so they take this type of decision independently by examining their educational qualification. Nonetheless, there are situations where some anarchic element of society creates pressure on them to make decisions where they have to make an immediate decision; further, they reported that these practices have declined during the past few decades.

Table 4.3 Decision premise on which district education officers made decisions

Themes	Category	Evidences from the Data
Decision Premise	Job experience	"Mere itne saal ke career se seekha ki decision A,B,C,D pe depend krta hai.A for avoid, B for bypass, C for confuse, and D for Decide. Iska matalab hai aapko ye gun aane chahiye decision lene ke liye, ki kb avoid krna hai, kb bypass krna hai, kb confuse krna hai aur kb turant nirnay dena hai". (I have learned through my career that decision is dependent upon A,B,C,D. A- avoid, B-bypass, C- confuse, D- decide, which means we have to acquire skills of when to avoid, bypass, confuse or take immediate decisions). " mera career ka anubhav mujhe pichle nirnay me ki gyi glti ko doharane se rokta hai." (My job experience stops me to repeating the mistake

		which I did in previous decision).
	Educational qualification	"mai Ph.D. kiya hua hu mere yah tak padhne se mere sochne samajhne ki kshamta kaafi badhi **mental ability** increase hui jisse aaj mjhe decision lene me madat milti hai". (I did Ph.D.in my life and this increased my thinking ability **mental ability** which is helping me to take decisions today).
	Organization Acts & Rules	"Hum madhyamik shiskha adhiniyam 1921 aur iska sanshodhit adhiniyam 2007 ko dekh kr nirnay lete hai." (We follow intermediate act 1921 and its amended act 2007 to make decisions). "Ek vyakti teacher ke pad pe 2016 me regular hua jbki wo 2002 se temporary teacher ke taur pe kaam kr rha tha, iss stithi me humne use sanshodhit madhyamik shikhsa adhiniyam 2007 ko dekh kr nirnay liya ki wo new pension scheme me shamil hai." (A person who was working from 2002 as temporary teacher and get regularized in 2016, in that situation we looked into act amended in 2007 and directed to include this person in new pension scheme). "Ek matter aided school ka seniority ke basis pe promotion ka aya jisme do vyakti ek hi saal me

		niyukt hue the to uss condition me madhyamik shikhsa adhiniyam ke antargat date of birth, alphabet ke aadhar pr unka promotion kiya jata hai." (A matter came for promotion of teachers on the basis of seniority from aided schools in which two teachers were appointed in the same year, so we comply with the criteria for promotion given in the act such as date of birth, alphabetical order).

Interpretation of table 4.3

The above table reveals the criteria on which the District Education Officers make decisions. In most of the cases, job experience of officers helped in making the decision. They expressed how job experience helped monitor their decision and prevent them from repeating a mistake. Job experience works as a panacea in situations where external pressure affects or interferes with the decision-making process. One of the DIOS elaborated A, B, C, D (avoid, bypass, confuse, and decide) of decision which he developed in his career. He described this method as very useful when there is political pressure. Simultaneously, educational qualification increased their mental ability to make decisions, as reported by one of the participants. Further, in most of the cases, it was found that District Education officers, including BSA and DIOS complies with acts and rules of organization to make decisions. In matters related to promotion based on seniority, appointment based on compensatory services, applying pension schemes, etc. the decisions were made in compliance with the Intermediate act 1921, amended act 2007, basic education act 1972 and amended act 2000.

4.2 Discussion

The decision-making pattern of the District Education Officers can be identified by understanding the interrelationship of the above themes and categories. Origin of problem describes from where the problem originated and who report it to the District Education Officers (DIOS & BSA).It was found that problem were reported by subordinates,

stakeholders, or observed by the officer himself through inspection or reviewing records. Subordinates such as clerical staffs attached to the office of District Education Officers reported problems related to late coming of teachers and principals. Principals generally in meetings, writing letter to officers and through confidential reports raise issues related to indiscipline acts of teachers and issues related to recruitment process in aided schools on which District Education Officer take action with their reasoning. Subordinates did not report any problems related to quality of education, they generally reports problems pertaining to administrative issues. Problems were also reported by the stakeholders usually people residing nearby schools raise issues such as corrupt practices, indiscipline acts, and quality of education. Moreover officers by self-observation notices problems related to quality of education, corrupt practices, indiscipline acts of teachers and principals, etc.

Second theme the initial response to decision-making describes to whom officers consults to make decisions on above problems. The study revealed that officers cross checks with stakeholders when officer wanted to confirm teaching quality of a teacher, corrupt practices by teacher and principals, and indiscipline acts of teachers. They consult with subordinates when they want to develop strategies for improving quality of education, tackling issues related to corrupt practices, organizes classes in corona pandemic, etc. They review records such as confidential report, an attendance register, and teacher mark sheets to direct the teaching of specific subjects. Moreover, in several cases they takes unilateral decisions, like in present research it was found that officer took unilateral decisions without consulting anyone. These cases when officer issued notice for coming on time to the school, to take up the matter of confidential report to local vigilant committee, and while instructing a teacher to teach particular subject.

Further decision premise is on which basis officers are making the decision, is their job experience helping to decide, is their educational qualification helps to decide, or rules and regulation of organization help decide in above matters. It was found that most of the decision was based on organization acts and rules like District Inspector of School based decision on Intermediate Act 1992 and Amended Intermediate Act 2007 Uttar Pradesh. In contrast, Basic Shiksha Adhikari based their decision on Basic Education Act 1972 and the Amended Basic Education Act 2000 Uttar Pradesh. Their job experience plays important role especially in situations where they have to make decisions immediately.

Moreover it was observed that Basic Shiksha Adhikari more often consult with his subordinates (Block Education Officers, Principals, and other staff) which is due to the decentralized structure at the primary level. In contrast District Inspector of Schools often makes unilateral decision due to the centralized structure of secondary education. However, participatory decision-making at both levels may not be generalized because officers make decisions based on the context of the problem. The second finding suggests that the personality traits of particular officers influenced their decision-making patterns. Stakeholders were consulted for the verification of acts of teachers and principals. In contrast, records were referred to when the situation demanded, so there were no fixed criteria on which they cross-checked the records but in some cases were common, like while checking teachers and principals attendance record, confidential report, etc. They based their decision on job experience in every case whereas administrative matters like recruitment, pension-related issues were based on the acts and rules of the Uttar Pradesh government. Lastly, officers' educational qualifications helped indirectly to decide but the not alone basis for making the decision.

4.3 Role of metacognition in decision-making of District Education Officers

This section focused on elaborating the role of metacognition in District Education Officers' decision-making, including Basic Shiksha Adhikari and District Inspector of Schools. To elaborate what is the role of metacognition, regulation of cognition was divided into broader themes planning, monitoring, and evaluation based on the model (Jacob and Paris, 1987). Further to answer this objective the interviewed data was analyzed and grouped into categories such as for planning was categorized in possible choices and strategies made by the officers, where possible choices mean thinking about different alternatives for decision-making and strategy means planning for various ways to make the decision. Monitoring was categorized in understanding the problem completely and the opportunity given for modification. Understanding the problem completely refers to thinking over thinking of District Education Officers about problem without making immediate decisions and opportunity for modification refers to space they have given to them for making different choices, instead of sticking to one decision. Lastly, evaluation was categorized in priority and

effect of the decision where priority refers to the officers' analysis to form preferences and effect of the decision highlight their analysis on the consequence of the decision. The main focus of this objective is to bring out product that can be achieved by the metacognition making decision more accurate.

4.4 How metacognition work in decision-making of District Education Officers

Likewise second objective, to answer third objective metacognition dimension is divided into three themes: planning, monitoring, and evaluation based on the model (Jacob and Paris, 1987). These themes were further divided into the same categories possible choices and strategy, the opportunity for modification and understanding problem completely, and priority and effect of the decision. The only difference here is determining how planning, monitoring, and evaluation dimension work in the decision-making process of District Education Officer. Possible choices and strategy category was interpreted as what things officer does which enabled them to make alternatives. Second opportunity for modification and understanding the problem completely category was interpreted as what things officers do to monitor the decision process. Third, the priority and effect of decision category was interpreted as how officers select the best possible alternative. The main focus of this objective is to bring out the process of metacognition involved in the decision-making of officers.

Table 4.4 Role of metacognition and how it works in decision-making of District Education Officers

Themes	Category	Evidences from the data
Planning	Possible choices & strategy	"Humne corona pandemic me teachers ke video lecture banvaye, PPt banvaye, panchayat bhavan me DM ke madhyam se jaha wireless set laga tha waha gao ke bachon ko bula ke pdhai karai." (We made video lectures of teachers, ppt in corona pandemic and with the help of DM arranged classes for village students in

		panchayat bhawan). "Humne dekha ki bht se bacho ke ghar me smartphone nhi hai to iss cheez ko dhyan me rakhte hue humne yeh strategy taiyar kiya ki agar hum T.V ke madhyam se pahuche to padhai karai ja skti hai kyunki T.V to lagbhag har ghar me hota hai." (We found that many houses of students do not have smartphones, so we planned strategy that if we reach students with T.V then we will able to teach them as almost everyone has T.V in their houses). "Maine Principals, teachers se meeting krk ye faisla kiya ki local channels pe video prasarit kiya ja skta hai." (I decided to use local channels for broadcasting video lectures of teacher with consulting Principals and teachers).
Monitoring	Opportunity for modification & understanding Problem completely	"Teacher ke late paye jane par tatkalik nirnay lene se pehle maine ye janane ki koshish ki uski late aane ki kya wajah ho skti hai." (I tried to find out the reason when teacher was caught late in school before taking immediate decision). "Cofidential report pe sign krne se pehle maine ye dekha ki har cheez achi kyu likhi hai, agar har cheez itni achi hai to iss school ki performance kharab kyu hai."(Before signing on confidential report I thought why everything written is good, if every aspect is that good then why this school is not well perfoming).

		"Jaanch committee ki report agar Principal ke khilaf hai to bhi nirnay lene se pehle ek bar ye socha jata hai ki usko sudharne ke kya kya upay kiye ja skte hai". (If the invigilating committee report is against the Principal then also we think upon measures which can improve him). "Kisi teacher ki shikayat hone par ki wo acha nhi pdha raha tb tatkalik nirnay lene ke bajaye ye samjhane ki koshish krta hu ki aisi dikkat use kyu aa rhi hai." (If there is complaint about a teacher who is not teaching well, then I try to find out why he is it so, instead of taking concluding decisions).
Evaluation	Priority & effect of decision	"Maine un teacher ko variyata di Sanskrit padhane ki jinke pas Sanskrit ek subject graduation me tha kyunki aisa na karna aur kisi se bhi pdha dene se bacho ki learning ke liye acha nhi hota." (I had given priority to the teacher who had Sanskrit as a subject in graduation and not anyone because it will affect students' learning). "nirnay lene se pehle mai ye sochta hu ki mere nirnay ka public pe kya asar padega." (Before taking decision I think over what will be the effect of it on public). "mai nirnay lene ke liye teen cheezo ko variyata deta hu kartavya, niyam, aur mamle ki

		pramanikta." (I prioritize my decision on three things duty, rules and authenticity of the matter).

Interpretation of table 4.4

In the above table role of metacognition and how it works in decision-making patterns is described. It was so formed by interrelating every theme and category. It was found that District education officers during pandemic have to come up with different alternatives because in the state of Uttar Pradesh there were regions where students reported that they don't have smartphones. They analyzed the situation and concluded that most of the houses had television, so I was decided to develop strategies for teaching students through this medium. Else make video lectures, ppts, and arrange classes in panchayat Bhawan with broadcasting on local channels. These strategies and alternatives reflect their thinking over thinking upon different alternatives and varied ways for making decisions.

District Education Officers made statements about thinking over the problem without making immediate decisions in many situations. Even in unilateral decisions, they stop and think cross-check with records and made decisions. In matters like teachers and principals on coming late, signing the confidential report, investigating committee reports, etc., were some examples where District Education Officers tried to understand the problem completely without making immediate decisions and thought of chances to prevent mistakes.

Nevertheless, some of the situations reported by the District Education Officers where they analyzed preferences and gave a thought about consequences of their decisions. For example, while directing one of the teachers to teach Sanskrit in school where there was no teacher of that subject, the officer analysed first whom to give the preference to teach and the consequence of the particular decision on students. He described that preference should be given to the teacher who had Sanskrit as one of his graduation subjects. He mentioned that if he directs a person who does not know the subject, it is unjust to the students. Thus it reflects his thinking over preference and consequence and the decision. Moreover, he was aware of one more consequence of an alternative: if he leaves the matter totally to the recruitment process, it will take lots of time, and in between, students will face problems.

4.5 Discussion

The role of metacognition in the decision-making of District Education Officers was found in many ways. It was observed that they were using metacognition without knowing it in varied situations and contexts in which they have authority to make decisions. Likewise, their decision-making pattern, using metacognition, depends on their personality traits, which is a matter of further investigation. In this study researcher examined the role of metacognition in the decision-making of District Education Officers including BSA and DIOS, in the following ways- It enabled District Education Officers to form varied ways for planning in a novel situation, enabled them to prevent mistakes, provide space to do modifications in the ongoing decision-making process, and help to prioritize various alternatives.

Further, the researcher found how metacognition works in the decision-making process to give the above role of metacognition. It is so when District Education Officers think upon different alternatives and ways, stop and think upon problem before making concluding decision, ask about understanding problem completely, think upon sufficient information, analyze consequence of each alternative, and with asking about who will get affected with my decision in what ways.

Below the figure 4.1 depicts the role of each dimension (planning, monitoring and evaluation) of metacognition and how these dimensions work in District Education Officers' decision-making. It was found that planning dimension of metacognition enable different ways for District education officers to plan in a novel situation. Further when they decided during the corona pandemic to arrange classes in panchayat bhawan, made video lectures and broadcasted it on local channels, highlight their thinking of different alternatives which answers how planning dimension work in decision-making of officers. In general when District Education Officers think and analysed different alternatives for the particular problem, they enabled different ways of planning in novel situation.

Second monitoring dimension enabled the decision-maker to prevent mistakes before

committing it and provide space to modify the ongoing decision process. The result of the study shows that when officers tried to find out the reason before deciding on the late coming of teachers, bad teaching complaints, giving a chance for improvement, etc., indicated monitoring aspects of metacognition where they stopped and think, asked himself that I understand problem completely, and thought upon sufficient information. This answers how monitoring dimension of metacognition work in the officers' decision-making. In general District Education Officers monitors their ongoing decision-making process before making immediate decisions.

The third dimension of metacognition evaluation dimension of metacognition enables the District Education Officers to prioritize among different alternatives. It was found that when officers analyzed consequences of each alternative and asked who will get affected with my decision, they certainly evaluated the decision. For example in one of the situation District Inspector of School asked himself that what will be the consequence if I direct non Sanskrit background teacher to teach the subject and also how students will learn If I wait for government recruitment process. Thus he analysed the consequences of each alternatives before making the decision. This answers how evaluation dimension work in the decision-making of District Education Officers.

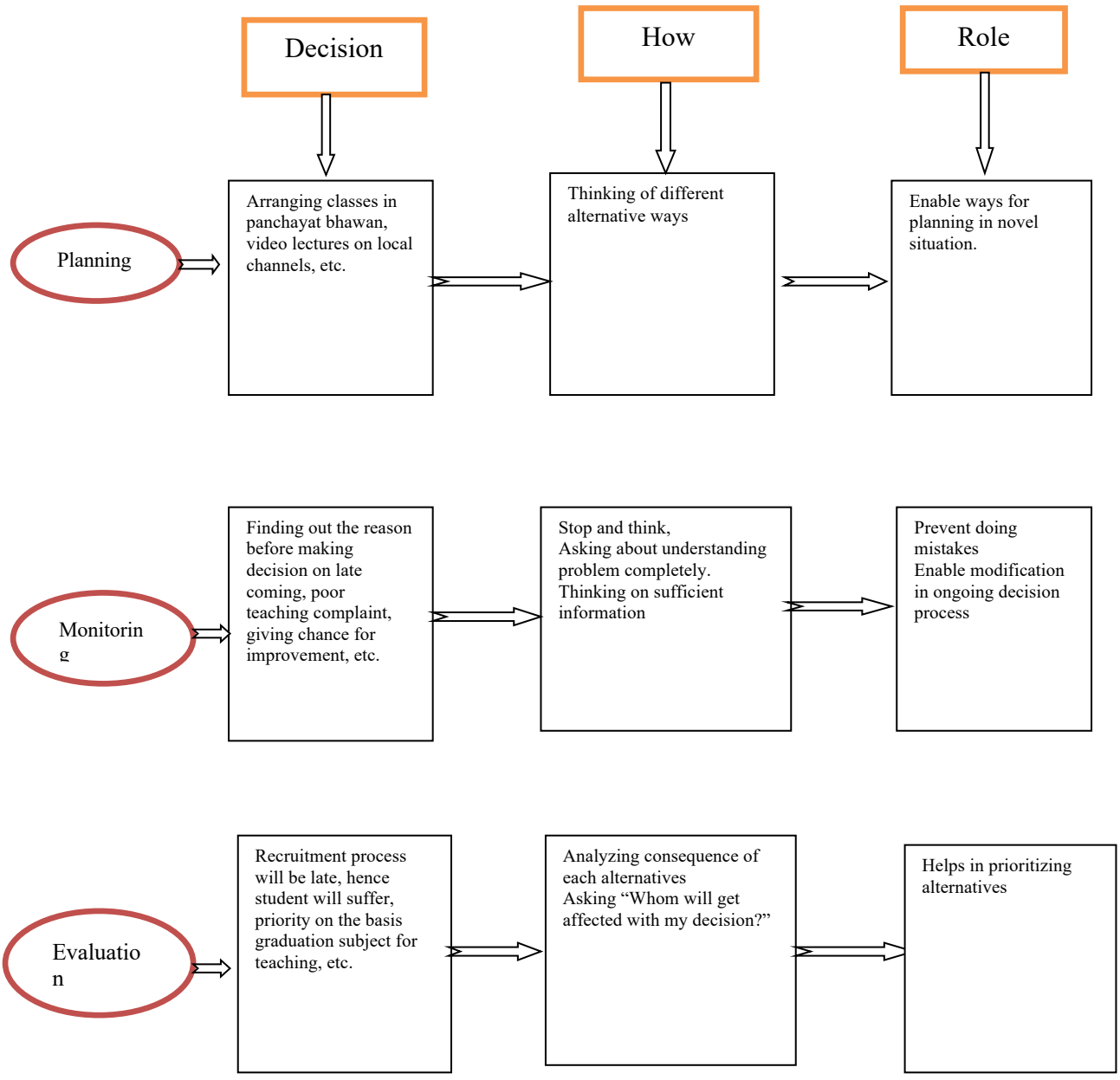


Figure 4.1 Metacognition in decision-making pattern of District Education

4.6 Conclusion

The present study finds out the District Education Officers' decision-making pattern in the state of Uttar Pradesh. The pattern was so formed based on interrelation between the themes-origin of the problem, initial response to decision-making, and decision premise. It was found that at the primary level due to the decentralized administrative structure, Basic Shiksha Adhikari most often consults the block education officers and other subordinates to make decisions, whereas at the secondary level District Inspector of Schools most often takes unilateral decisions. Officers at both the level adheres to the acts and rules of Uttar Pradesh government to make choices. Participatory decision-making at both the level was dependent on the context, and it may not be appropriate to generalize that they are following the participatory or unilateral decisions. Wherever District Education Officers were confident of taking decisions independently, they went ahead taking decisions without consulting anyone. However, it was observed that their personality traits influenced their decision-making pattern. Problems were posed by anyone including subordinates, stakeholders, or identified themselves by observing during inspection but verified or consulted from a different source. For instance, they verified from stakeholders and records to decide upon indiscipline act, behavior, syllabus completion, corrupt practices, and teaching quality of a particular teacher. These decisions were based on their job experience, educational qualification, and organization Act & Rules. However, educational qualification of officers indirectly helped them to make decisions as they stated that it increases their mental ability. Discussion with subordinates was observed in the matters relating to developing strategies to stop corrupt practices, steps in corona pandemic for teaching-learning, steps to encourage de-motivated teachers, measures to improve scores of non-performing schools. These decisions were based mostly on the job experience and educational qualification. Records were seen in some of the cases where decisions were made unilaterally. Unilateral decisions were based on particular individuals' thinking patterns governed mostly by educational qualification, job experience, and clauses of the organization's acts and rules. However, there are some exceptional cases where an officer's job experience plays a significant role, like the case of an anarchic element involved and forced to make decisions. Overall, District Education Officers at both the level

(primary and secondary) made the decision based on the originating source of the problem (stakeholder, subordinates, and self-observation), the initial response (verified from stakeholders, consulted with subordinates, looking for records, and unilateral decision), and decision premise (job experience, educational qualification, and organization acts and rules).

On the other hand officers without knowing officers using the metacognition to make decisions, it was found that planning dimension of metacognition helps them to make plans in novel situations. Situations where officers think of different strategies such as broadcasting classes on local channels, identifying students who have the students in the vicinity and allotting them to consult students nearby who do not have the smartphones, and arrangements of classes in panchayat bhavan during corona pandemic were the examples where officer think of varied strategies. This analyzing and making of different strategies enabled officer to come up with multiple ways to make decision in a novel situation. Further, monitoring dimension of metacognition enabled officers to modify ongoing decision-making process and to prevent mistakes in decision-making. District Education Officers before making decisions immediately think on every possibility and try to find out the reasons and try to understand problem completely. In such cases officers stop and think, ask himself that "am I understanding the problem completely and think about sufficient information"? Moreover, the evaluation dimension of the metacognition helps officers to prioritize alternatives. The findings of the study revealed that officers analyze consequences of each alternatives and think of who will get effected with particular consequence. This metacognition dimension enables officers to select best possible alternative to make decision. Hence the role of metacognition officers' decision-making is to make plans in novel situations, provide space to modify ongoing decision-making process, prevent mistakes and helps to prioritize alternatives. Further, when they thought about possible choices and strategies, tried to understand problems completely while stop and think, and analyzed consequences answers how metacognition works in District Education Officers' decision-making.

CHAPTER 5

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Discussion

5.0 Discussion

The results of the study indicate the pattern of decision-making of the District Education Officers, including Basic Shiksha Adhikari and District Inspector of Schools. In Uttar Pradesh, powers of District Education Officer at both the level primary and secondary is limited, though they frequently make independent decisions in varied situations like late coming of teachers, principals, corrupt practices of schools, indiscipline acts of teachers, the appointment of temporary teachers for particular subjects. The decision-making pattern of the District Education Officers in this study can be understood by three themes -from where the problem originated, to whom consulted before making a decision, and what are the premises of their decision.

It was found that generally problems were originated or reported by subordinates, stakeholders, or observed by the officer himself. Subordinates in most of the cases reported administrative issues, and no problems were reported pertaining to the quality of education. These administrative issues included late coming of teachers, indiscipline acts of teachers reported by principals through confidential report, issues related to recruitment process in aided schools and the like. On the other side stakeholders and by self-observation, officers get to know every problem, whether administrative or related to quality of education. Stakeholders reported problems of corrupt practices in the schools such as recruited teacher gives money to a person for teaching in place of him, problems related to a teacher not teaching good, parents requested to open school in corona pandemic, etc. On the other hand, officers themselves observed problems during their visits to the schools and reviewing records. They observed false information in confidential reports submitted by the principals, non-availability of the teachers for teaching particular subject, de-motivation of teachers towards teaching; students were not able to perform simple addition, etc. In a similar kind of study on school principals' decision-making researcher found that subordinates in 51% cases reported problem and stakeholders reported only 18 % problems (Cross, 1980). However, in the present study it was observed that problems reported to District Education Officers in Uttar Pradesh are dependent on context; there are no clear criteria to identify who reports

most of the problems.

The second theme to whom they consult to make decisions depends on the individual personality and thinking pattern of the particular officers. Sitati et al. (2012) reported that decision-making approach is totally dependent upon District Education Officers' personality traits and they are unable to delink their personality type with the role off work. On the other side school principals make decisions based on information provided by the subordinates without doing cross-check (Cross, 1980). In the present it was observed that District Education Officers verified from the students during their visits to the school, when the people of vicinity reported problems related to quality of education and indiscipline act of teachers. Officers consulted both people of village and students of the school when they found corrupt practices. It was also found that they consulted subordinates to generate more ideas to make the decisions. Like in situation to develop strategies to tackle the problem where teachers appointed another person to teach in their place when some schools were found under performing, to organize classes in corona pandemic for remote areas, etc. Officers also consulted records like confidential report, attendance register, and mark sheets of teacher to direct teaching particular subjects. Further they had taken unilateral decisions to issue notice for coming on time in schools, to take up the matter of confidential report to local vigilant committee, directing a teacher to teach a particular subject, and in exceptional cases where they have to make immediate decisions. Moreover, participatory decision-making provides opportunity to seek varied alternatives and enhance chances of making more accurate decisions (Weiss & Cambone, 1994; Ingersoll, 1996; Somech, 2010; Mager & Nowak; 2012).Basic Shiksha Adhikari at the primary level consulted subordinates and stakeholders more to make decisions as compared to the District Inspector of School at the secondary level. This variation is due to the structural differences at both the level, as at the primary level administrative setup is decentralized, and at the secondary level, it is more centralized. So the participation in decision-making of District Education Officers is more in comparison secondary level.

The third theme decision premise tells us that District Education Officers at both the level base their decision on acts and rules of Uttar Pradesh government (Basic Education act at

primary level and Intermediate act at secondary level). Although job experience plays a vital role in their decision-making, particularly in exceptional situations, their educational qualifications only helped to enrich their mental ability, not directly helped to make decisions. Hence, the decision-making pattern of the District Education Officers was dependent upon the individual personality which is in compliance with study of (Sitati et al., 2012). They consult records, stakeholders, and subordinates wherever needed, according to the situation. Sometimes, they used to make the immediate decision without verifying with others, which shows their authoritative decision-making approach. At last, it was also found that clerical staff immediate to Basic Shiksha Adhikari and District Inspector of Schools was more influential in officers' decisions.

The study also highlighted the role of metacognition in the decision-making of the District Education Officers. Planning, monitoring, and evaluation dimensions of the metacognition categorized in sub-themes such as possible choices and strategy, opportunity for modification and understanding problem completely, and priority, and effect of the decision. These themes and categories elaborated the role of metacognition and how it works in the decision-making pattern of District Education Officers.

The planning dimension of metacognition enabled the District Inspector of schools and Basic Shiksha Adhikari to come up with varied strategies in novel situations. It was found that officers planned and thought of strategies to make decisions in new situations. Rosi, Vecchi and Cavallini (2019) highlighted that planning dimension of metacognition helped to seek varied possibilities for making decision. Similarly it was found that during corona pandemic officers thought of possible alternatives to organize classes for the students who do not have the smartphones, like making up of video lectures and broadcasting it on local T.V channels. In another situation Basic Shiksha Adhikari thought of strategies to stop corrupt practices of teachers. These are some examples of different situation where it has been seen officers come up with varied strategies in novel situation. Moreover, it also answers how planning dimension work in decision-making of District Education Officers as they think of multiple alternatives and ways in the planning dimension of metacognition which enabled them to come up with varied strategies in novel situations. The strategic meta-cognitive thinking

helps decision maker to internalize the core elements of a structured decision-making process by guiding their thought (Colombo, Iannello, & Antonietti, 2010).

Secondly, the role of monitoring dimension of metacognition is found to enable officers to prevent making mistakes and to modify the ongoing decision process. In general, it means that every time officers did not make decisions immediately. They monitored the situation carefully, which enabled them to make modifications and prevent mistakes.Continuous monitoring on every step of the decision-making process helps to stop committing mistakes and helps in modification of processes involved in decision-making which ultimately increases the quality of decision (Yeung & Summerfield, 2012). Align to this, the present study revealed that in some situations officers tried to find out the reason behind late coming of teachers before giving punishment or making immediate decision. In another situation District Inspector of School before signing on confidential report submitted by clerk of a particular aided school tried to find out why everything is written good about teaching and learning, infrastructure, attendance record of teachers and principals, etc. in same handwriting even in the section where clerk have to write and in the section where principals have to give comments. Further in an instance, an officer narrated a situation where he before giving immediate decision, tried to find out the reason why a teacher is not teaching good and what measures should be taken to improve his teaching. These situations highlights where officer stop and think, ask himself "Am I understanding the problem completely and think about sufficient information?" This shows how monitoring dimension works in District Education Officers decision-making which is in congruence with the findings of the previous studies by Rosi, et al., (2019); Colombo, et al., (2010); Turner, (2016) highlighting that in monitoring dimension of metacognition one asks about sufficient information and additional information needed to make a decision.

Finally, the role of evaluation dimension of metacognition is to help officers to give preferences among different alternatives in their decision-making. In general District Education Officers analysed alternatives to select best one to make decision along the same lines as Lee and Shavitt (2009) reported that decision-maker evaluates less favourable to more favourable choices to select best one). In one situation District Inspector of Schools

while directing a teacher to teach Sanskrit subject where there was no teacher in school, he analysed consequences of alternative. Officer in that problem asked himself “What will be the impact on students’ learning if I direct non Sanskrit background teacher to teach Sanskrit?” And “what will be the effect on learning of students if I leave the matter to recruitment process of government which usually takes lot of time?”. In an instance, Basic Shiksha Adhikari reported that he prioritizes his decision on duty, rules and authenticity of the matter and his decisions’ impact on public. These were situations where officers analysed the consequence of each alternative and asked who will get affected by their decision, which shows how evaluation dimension of metacognition works in decision-making of District Education Officers. Rosi et al.(2019)found that in evaluation decision-maker gives weightage to different alternatives so that they can select best possible one which will improve decision accuracy.

5.1 Conclusion

The pattern of decision-making of District Education Officer is based on three themes origin of the problem, initial response to decision-making, and decision premise. Problems were posed by subordinates, stakeholders, or identified themselves by observing during inspection but verified or consulted from a different source. For instance, they verified from stakeholders and records to decide upon indiscipline act, behavior, syllabus completion, corrupt practices, and teaching quality of a particular teacher. These decisions were based on their job experience, educational qualification, and organization Act & Rules. However, educational qualification of officers indirectly helped them to make decisions as they stated that it increases their mental ability. Discussion with subordinates was observed in the matters relating to developing strategies to stop corrupt practices, steps in corona pandemic for teaching-learning, steps to encourage de-motivated teachers, measures to improve scores of non-performing schools. These decisions were based mostly on the job experience and educational qualification. Unilateral decisions were based on particular individuals’ thinking patterns governed mostly by educational qualification, job experience, and clauses of the organization's acts and rules. Further the role of metacognition in the decision-making of the District Education Officers is to enable them to plan different strategies in a novel situation,

prevent making mistakes, provide opportunities to make modification in an ongoing process, and help to prioritize among various alternatives. Moreover, metacognition works in decision-making in the following manner. When officers think of different alternatives and ways, stop and think on problem before making immediate decision, ask about understanding problem completely, think about sufficient information, analyze consequence of each alternatives, and with asking about who will get affected with my decision in what ways.

CHAPTER 6

Conclusion

6.0 Conclusion

This research has added to the growing body of literature on metacognition and decision-making of District Education Officers by providing a number of insights into the decision-making capacity at the level of school administration, focusing on the use of metacognitive strategies. The study highlights the decision-making pattern of District Inspector of Schools and Basic Shiksha Adhikari in the state of Uttar Pradesh. The findings of the study indicate that the district education officers makes decisions through consultation with stakeholders and subordinates in and sometimes also make unilateral decisions depending upon the context of situations and their own personality. Generally, they make decisions based on Uttar Pradesh government's acts and rules and the experience they have gained throughout their career. They consulted stakeholders when they found corrupt practices in schools, to find reason behind why teacher is not teaching well, to check whether teacher completes syllabus on time or not, to interrogate matters related to indiscipline acts done by teachers and principal, etc. Officers consult with subordinates usually in matters like issues related to recruitment process of teachers in aided schools, to make strategies to overcoming corrupt practices, improving quality of education, etc. Moreover they based decisions on acts in every matter as officers reported that no decision will be beyond acts of Uttar Pradesh. In spite of this their job experience played vital role especially in the situation where they have to make immediate decisions. For example, an officer reported life threat to sign a document on which his job experience helped him to decide. He also made statement about A,B,C,D of the decision-making (avoid, bypass, confuse, decide) which indicates the role of job experience in decision-making .The study also revealed that Basic Shiksha Adhikari more often consults subordinates than District Inspector of Schools, which may be due to the decentralized structure of school administration at primary level as compared to more centralized structure of administration at the secondary level. On the other side, metacognition has the potential to increase decision accuracy. It was found that the planning, monitoring, and evaluation dimensions of metacognition enables the District Education Officers to think on multiple alternatives, monitor the decision-making process, and select best possible alternatives. This research highlighted that District Education Officers use metacognition unknowingly, which enables them to make decisions in different ways.

6.1 Major findings of the study

Major findings of the study are discussed based on the theoretical framework and objectives of the study.

The decision-making pattern of the District Education Officers in Uttar Pradesh was found that they make decisions on problems reported by subordinates, stakeholders and the problems they themselves observe. Subordinates generally reports administrative problems such as late coming of teachers and principals, issues related to recruitment process in aided schools, indiscipline acts reported by principals by confidential report, etc. Moreover, stakeholders report problems related to corrupt practices of teachers and principals, issues related to quality of teaching, and problems where teachers are not taking their classes. Further officers themselves observe several problems on which they make decisions during their visits to schools and while reviewing records, such as poor quality of teaching, wrong reporting through confidential report, de-motivation of teachers towards teaching, etc.

To make decisions on these above problems reported by different sources, District Education Officers consults with subordinates (Block Education Officer (BEO), Principals of schools, and clerical staffs attached to their offices), cross-check with stakeholders (people residing near the schools and students), consulted records or make unilateral decisions. It is difficult to categorize on which problem they consult others and on which problem they make unilateral decisions. This is because in the present study it was found that some officers on similar problem consulted with subordinates to make decision, some officers cross checked with stakeholders, and some officers with reviewing records made unilateral decisions. For example, in a situation where schools were underperforming, an officer called meeting of principals to develop strategies for improving teaching standards in schools. In similar kind of situation another officer instructed schools for organizing remedial classes on holidays without consulting anyone. Thus, it indicates the role of personality traits and thinking pattern of officers in their decision-making. However, it was found that Basic Shiksha Adhikari more often consults Block Education Officers due to the decentralized structure of administration at primary level. Whereas, District Inspector of Schools more often make unilateral decisions because of the centralized structure of administration at the secondary

level. Moreover, clerical staffs attached to the office of District Education Officers have more possibility of influencing their decisions.

The second objective of the study is the role of metacognition in decision-making of District Education Officer. It was found that planning dimension of metacognition enable officers to make different strategies in novel situation. In an instance District Inspector of School think of strategies to overcome corrupt practices of schools. He planned that untrue information of busy in meeting with District Magistrate or with any other will be given and in place that he will visit schools all of sudden. Moreover, he made aware people nearby school to inform him via mobile phone about corrupt practices of school, he even set up grievance box in every village where people can complaint without displaying their identity. Second monitoring dimension enable officers to prevent mistakes and modify ongoing process. For example an officer before deciding on giving punishment, organized ten day workshop for a teacher who is not able teaches well. Actually in this situation committee has found that teacher is unable to teach well and recommended his transfer in remote belt, but the officer given one more chance while thinking on what was the reason behind that the teacher is not teaching well. Third the evaluation dimension of metacognition enables officer to prioritize alternatives to select best one. In a situation Basic Shiksha Adhikari evaluated the consequences of different alternatives.

The third objective of the study is how metacognition works in decision-making of District Education Officers. Planning dimension helps to devise different ways to make decisions. For example Officers think of different strategies and possible choices to organize classes for students who do not have smartphones during corona pandemic. Thus thinking of possible choices by District Education Officers indicates working of planning dimension of metacognition in their decision-making. Although it may not be generalized for all District Education Officers at both the level primary and secondary, as some officers stated that they do not make plans and some described clearly the strategies and possible choices they made for decision. However, role of planning dimension of metacognition is to enable officers to make varied strategies in novel situation and thinking of possible choices to make decision shows it’s working in their decision-making. District Education Officers monitors decision

process in some cases before deciding immediately. Like in a situation an officer tried to find out the reason behind late coming of the teacher and tried to understand the problem completely as to why a teacher is not teaching well. Though in some cases officers do not tried to understand problem completely or tried to find out the reason and made decision immediately. Like in a similar situation where clerical staff of District Inspector of School reported about late coming of teachers, he immediately issued the notice directing principals and teachers to come on time. However, it was found that officers in these situations stop and think, ask themselves that “Am I understanding the problem completely and think about sufficient information?” This shows how monitoring dimension works in District Education Officers’ decision-making. Further District Education Officers weighed the pros and cons of various options before making a decision. In general they evaluate alternatives before making the decision. There were many instances where officers think of consequences of alternatives. For example, before directing a teacher to teach a specific subject, a District Inspector of Schools considers the consequences, as he asks himself, "What would be the effect on students' learning if I direct a non-Sanskrit background teacher to teach Sanskrit?" And what impact would it have on students' learning if I leave the matter to the government's recruitment process which normally takes lots of time? Here officers analyzes the consequence of each alternative and ask who will get affected with their decision. This shows how evaluation dimension of metacognition works in decision-making of District Education Officers.

6.2 Implications

This study suggests some measures of metacognition to decision-making in educational administration at different levels. It guides District Education Officers to increase decision accuracy by using metacognition more consciously. With the help of the planning dimension of metacognition, District Education Officers can make plans for their decision-making. By including monitoring, they can make the decision process more preventive, and through evaluation, they can analyse different alternatives before implementing it. Thus, it may help in developing the managerial skills of the educational administrators by including metacognition components. The implication of the study does not limit to only District Education Officers, but Principals and other educational administrative officials can utilise

metacognition as a strategy to make decisions at different levels. Educationists and policymakers may think of including metacognition in different educational administration training programmes. Moreover, this study provides the base for metacognition and decision-making in educational administration as District Education Officers' decision-making is unexplored, so this study will provide a way to go for further investigation in the field like replicating the study and including other dimensions in the study.

6.3 Suggestion for further research

The present research area is unexplored, and every research cannot study all the variables related to the area under investigation, because of limited time and resources. If one tries to include everything in one study, it leads to complexities. So research gives suggestions and scope for further study.

The present research also gives suggestions for further research as follows:

- It was found that District Education Officers' personality influences their decision-making pattern which is not studied in the present study, so it is suggested to investigate different personality traits of District Education Officers and their decision-making patterns.
- It was also found that the personality traits of officers influence the use of metacognition which is the matter for further investigation.
- To conduct a study to see decision-making of District Education Officers with high and low metacognitive ability.. This dimension will enrich more understanding about the impact of metacognition on the decision-making of District Education Officers. In the present study, it was found that some officers plan, monitor and evaluate decision process well, but some were not able to do that. Thus these variables can be explored further.
- Only regulation of cognition, including planning, monitoring, and evaluation, was studied in the present research, so it is suggested to conduct research on knowledge of cognition, including declarative knowledge, conditional knowledge, and procedural knowledge with the decision-making of District Education Officers.
- The present study employed only qualitative methodology, so mixed method approach may also be used for such research.

- It is suggested to undertake an experimental study to see the effectiveness of metacognition in the decision-making of District Education Officers.
- There are very few studies on metacognition and decision-making of District Education Officers, so a study may be conducted on different states for comparative research.
- The present research only focused on District Education Officers. It is suggested to include other members of an educational system like clerical staffs, teachers, principals, and stakeholders to look at different aspects of officers' decision-making.
- The present study did not clarify the difference between the decision-making patterns of District Inspector of Schools at the secondary level and Basic Shiksha Adhikari at the primary level due to lack of data obtained, hence, a study may be undertaken to examine the difference in the decision making patterns at both the levels of education.

6.4 Limitations

The findings of current study demonstrate a connection between metacognition and decision-making capacity. The results are most relevant to a research sample of Uttar Pradesh District Education Officers. However, a number of limitations raises the question of whether or not these results can be generalised. These limitations are as follows:

a) **Challenges during corona pandemic:** The present research was undertaken taken during corona pandemic when collecting data from the primary source was quite difficult. However, the researcher visited 14 districts of Uttar Pradesh but many District Education Officers did not give appointments due to pandemic situation.

b) **Challenges to collect data through open ended questionnaire:** District Education Officers are usually busy in attending different meetings of the government in Uttar Pradesh. So many of them refused to fill the open ended questionnaire and others did not return it to the researcher. Only one District Inspector of Schools responded to the open ended questionnaire and another asked the researcher to fill the questionnaire while he narrated the answers.

c) **Time Restriction:** Time constraints did not allow the researcher to include declarative knowledge, conditional knowledge, and procedural knowledge dimensions of metacognition. Further researcher was not able to apply different measuring tools of metacognition and decision-making for quantitative data. Researcher was able to collect data through only interviews.

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Appendices

Questionnaire
Metacognition and Decision Making

Section A

1. Age:……
2. Gender:…….
3. Name of posting District……
4. Years of experience as District Inspector of Schools……

Section B

1. Describe any two situations in which you made the decision and found it most challenging and why as District Inspector of Schools.

किन्ही दो स्थितियों का वर्णन करें जिसमें आपने निर्णय लिया औरजिला विद्यालय निरीक्षक के रूप में सबसे अधिक चुनौतीपूर्ण पाया और क्यों |

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b. ……

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2. While making above decision, did you ask yourself "I understand the problem completely"? Yes/No…….

उपरोक्त निर्णय लेते समय, क्या आपने खुद से पूछा था कि मैं समस्या को पूरी तरह"से समझता/समझती हूँ"? हाँनहीं/.....

a. If yes, then describe what did you understand about the problem?

यदि हाँ, तो वर्णन करें कि आपने समस्या के बारे में क्या समझा?

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3. **While making the above decision, did you think "I have all the necessary information"? Yes/No ……**

   उपरोक्त निर्णय लेते समय, क्या आपने सोचा था, "मेरे पास सभी आवश्यक जानकारीहै".....|

   a. If yes, then **describe what were the sources of information?**

   यदि हाँ, तो वर्णन करें कि सूचना के स्रोत क्या थे?.....

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b. If No, then describe how did you make the decisions?

यदि नहीं, तो वर्णन करें कि आपने निर्णय कैसे लिए?

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4. **Did you think about possible choices before making the above decisions? Yes/No**

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क्या आपने उपरोक्त निर्णय लेने से पहले संभावित विकल्पों के बारे में सोचा था? हाँ/ नही.....

a. **If yes, then describe which knowledge had helped you to arrive at possible choices?**

यदि हाँ, तो वर्णन करें कि आप के किस ज्ञान ने आपको संभावित विकल्पों तक पहुँचने में मदद की है?

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5. **Did you think about any strategy to make the above decisions? Yes/ No……**

   क्या आपने उपरोक्त निर्णय लेने के लिए किसी रणनीति के बारे में सोचा था?

   a. **If yes, then describe what kind of strategies you planned to make the decisions?**

      यदि हाँ, तो वर्णन करें कि निर्णय लेने के लिए आपने किस तरह की रणनीति बनाई?

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