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Developing Critical Thinking in Psychology: The Role of Cognitive Processes in Problem-Solving and Decision-Making

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Abstract

This research aims in understanding of cognitive processes in development of critical thinking whereby special focus is accorded to problem solving and decision making in the course of psychological study. Regarding quantitative data, we administered a structured questionnaire on 150 students of psychology course. It emerged that critical thinking, problem solving, and decision making enjoy a very high level of association with one another and that critical thinking predicted the two other skills significantly. Critical thinking score has direct relationship with over all problem solving ability, decision making ability etc with in the study participants. Therefore, one high-impact area highlighted by our work is to incorporate specific practice sessions that enhance these executive functions into psychology education. The findings presented within this research may be useful for better understanding cognitive development and its importance for current and future academic and occupational achievements.

Keywords: *Complexity, Understanding, Reasoning, Analyzing, Judgment, Learning, Psychology Course.*

Introduction

Problem solving is a major cognitive process in psychology whereby the recipient is able to assess, appraise and integrate information in order to make proper decisions. Critical thinking is a unique mode of thinking all together that includes a variety of cognitive operations like knowing, knowing how, knowing why, knowing what, knowing who, and knowing where on which the following cognitive operations are hinged: reasoning, analysis and problem solving all of which go into making a decision. The studies also provide evidence of the centrality of critical thinking in promoting higher level of understanding and better results in distinct psychological and actual life situations (Halpern, 2014). Critical thinking is a crucial component of psychology wherein both the students and practitioners can solve a problem and make sound decisions concerning prospective ethical issues as well as appraising and analyzing the data. Daily life scenarios present complicated problems that psychologists need to solve based on several reports. For example, in diagnosing mental health disorders or fashioning precise intercessions, rationality is used to appraise the fragments of information, compare possibilities, and anticipate consequences (Sternberg, 2018). However, the cultivation of the critical thinking aptitude still poses a challenge in the course of learning psychology among the students and the professional's behavioral health workforce hence the need to undertaker cognition specifics on critical thinking.

Problem Statement

Despite the proven value of critical thinking, the relationship between critical thinking and particular cognitive abilities for a successful problem and decision making in psychology remains a research question. While a fair amount of literature addresses the theoretical foundation of critical thinking, the analysis that focuses on its application in the given field remains rather limited. Similarly, there is great difficulty and uncertainty on how to incorporate critical thinking skills into the curricula of psychology (Paul & Elder, 2020). It means that there is concern as to the level of development of psychological literacy when it comes to application of critical thinking that psychology graduates have when discharging their functions.

Objectives

1) To enshrine the major aspects of cognition involved in critical thinking.
2) To assess how critical thinking is utilised in solving problems in psychological settings.
3) To identify possible approaches in the development of critical thinking skills in learning of psychology.

Research Questions

1) What are the psychological thought processes in critical thinking?
2) What role does critical thinking play with regard to problem solving and decision making?
3. How, in what ways and to what extent can critical thinking be promoted by educational interventions among learners taking psychology?

Theoretical Framework

This study is grounded on dual-process theories of cognition which hold that cognitive processes occur through two systems: System 1 which is fast and automatic and System 2 which is slow and controlled (Kahneman, 2011). This allows for the identification of a lens through which these systems can be examined as they happen during critical thinking tasks. The study also uses Halpern's model of critical thinking as a framework for the former includes metacognition and the ability to use thinking skills outside the given context (Halpern, 2014).

Literature Review

Critical thinking is one of the most researched subjects in psychology because of its eminent position in an individual's problem solving, decision making and personality development. This chapter provides brief overviews of previous published research concerning cognitive factors and critical thinking, with special attention paid to the theories, models, and issued related to psychology. It also considers ideas regarding this liberal education and how critical thinking is relevant to practice occur in psychology.

Critical Thinking Definitions and Frameworks

The common meaning of critical thinking is the capacity to make informed decisions after organizing information through analysis and evaluation. It includes deduction, analysis and evaluation, in as much as interpretation of contextual information. Paul and Elder (2020) referred to intellectual standards of critical thinking for clearer and accurate display of critical thinking to mean more than just critical problem solving which involves reflective and meta cognitive elements. The latest theories to rationalisation of critical thinking are the dual process theories of cognition like the System 1 and System 2 cognition as postulated by Kahneman (2011). The first ÚSystem is fast, the second ÚSystem is slow, but careful, critical thinking belongs to the second ÚSystem. Such an interchangeableness we find within critical thinking processes to emphasize the notion of cognitive complex.

Mental Operations in Critical Thinking

Reasoning: Deduction and Induction reasoning is integral to critical thinking as it deems it.Most skill in critical thinking is associated with reasoning. Deductive reasoning is good for the logical conclusions where as inductive reasoning is good for making conclusions from evidence (Evans, page 40). According to Johnson-Laird (2006), mental models used as important elements in reasoning since they allow people to run mental scenarios.

Memory and Attention: The impotance of WM and attention is evidenced in the fact that they are required to accomplish focus and information-processing during critical thinking processes (Baddeley, 2007). According to cognitive load theory it has been postulated that an individual working memory is capable of having a major impact on the amount of reasoning that he or she is capable of undertaking (Sweller et al., 2011). Likewise, in derived relation to contiguous information, selective attention assists in filtering out unnecessary, irrelevant information so that select important information can be processed by critical thinking (Posner & Petersen, 1990).

Metacognition: Self-regulation in critical thinking, achievable by thinking about thinking itself which is generally called metacognition (Flavell 1979). Research by Schraw and Dennison (1994) identified two components of metacognition: awareness of cognition and regulation of cognition which are incontoressible for sound decision making process.

Critical Thinking in Problem-Solving and Decision-Making: Everyday practices include problem-solving or decision making, where it means that an individual will assess options and what will happen as result. The onus of problem-solving according to Newell and Simon (1972) stored program theory is based of heuristics and algorithms. Gigerenzer und Gaissmaier (2011) budgeted furthermore heuristics in decision-making and noted that following rules simplify complex tasks but can also incorporate the bias.

Education Techniques for Critical Thinking

Inquiry-Based Learning: Science and mathematics inquiry learning promotes student questions, solutions identification, and the evaluation of the result (Hmelo-Silver et al., 2007). This approach is as a result in concordance with the socio-cultural theory postulated by Vygotsky (1978) which places premier importance to interaction and scaffolding.

Problem-Based Learning (PBL): Critical thinking skills are very essential when learning and that for this reason PBL is very common in teaching psychology. PBL education engagement demonstrates real-world issues, ensuring that students learn in groups and critically evaluate concepts (Barrows & Tamblyn, 1980). Strobel and van Barneveld from a meta-analysis meta-analysis in 2009 concluded that PBL enhances the learners' critical thinking and problem solving skills more than any traditional approach to learning.

Cognitive Training Programs: In particular, the use of the programs aimed at the development of cognitive skills including the ability to reason and to metacognize has been proved effective from the standpoint of critical thinking improvement. For instance, Feuerstein's Instrumental Enrichment Program aims at the specific and known cognitive skills to improve problem solving (Feuerstein et al., 1980).

Barriers to Critical Thinking Development: Nevertheless, several challenges define the manner in which critical thinking skills is a hindrance: Some of these are Cognitive Biases (Tversky & Kahneman, 1974), Emotional Interference (LeDoux, 1996) and the fact that critical thinking is not normally taught in school (Ennis, 1993). To mitigate these barriers, special efforts and favorable learning climate must be made.

Implications for Psychological Practice: Enhancing critical thinking has a dramatic impact on practice implications of psychology. Blended critical thinking skills are helpful to practitioners as they consider the current cases and their experiences to develop efficient approaches to intercession and relating new evidence (Sternberg, 2018). Ethical decision making is made through critical thinking which help the Psychologists maintain [ETHOS] Ethical Standard.

Methods

It was therefore the research findings of our study which adopted a quantitative method in an attempt to establish the amount of insight that may be attributed to the cognitive processes in shape of the critical thinking skills which psychology student's develop in the area of problem solving and decision making. The study involved 150 participants, which include only undergraduate and graduate students in psychology with ages of 18 to 30 years from different universities. Respondents were recruited using the accidental sampling technique to increase variability in the academic level and cognitive capacity. Information was obtained through self-administered questionnaires adapted to assess critical thinking, problem solving, and decision criterion. The questionnaire consisted of ratio and interval-level items, such as Likert scales and situational judgments where respondents predicted and assessed information. Data analysis was done by using statistical package SPSS, employing both descriptive and inferential statistics to test hypothesis.

Results and Discussion

This chapter comprises the study results derived from 150 participants which have been subjected to data analysis. Everything is presented in tables in order to show the link between the cognitive processes, critical thinking, problem solving skills and decision making abilities.

Table 1: Descriptive Statistics of Participants

Variable	Mean	Standard Deviation	Minimum	Maximum
Age (years)	22.5	2.9	18	30
Critical Thinking Score	72.4	8.3	50	90
Problem-solving Score	68.7	9.1	45	85
Decision-making Score	70.2	7.8	52	88

The respondents portrayed moderate to high ability to think critically, solve problems and make decisions, but the most critical thinking.

Table 2: Correlation Between Critical Thinking and Cognitive Processes

Variables	Correlation Coefficient (r)	Significance (p-value)
Critical Thinking & Problem-solving	0.75	<0.001
Critical Thinking & Decision-making	0.69	<0.001
Problem-solving & Decision-making	0.72	<0.001

Positive correlation coefficients between critical thinking abilities and problem solving and decision making abilities where found which indicate positive relationship between these cognitive processes.

Table 3: Regression Analysis Predicting Decision-Making Skills

Predictor Variable	Beta Coefficient	t-value	p-value
Critical Thinking	0.58	6.82	<0.001
Problem-solvin	0.44	5.09	<0.001

Critical thinking and problem-solving are considered as statistical significant predictors of decision-making, though critical thinking has slightly higher impact as evaluated through the line of regression equation.

Discussion

Consequently, cognitive processes play the critical role in promoting selected aspects of learning that include critical thinking, problem-solving and decision-making. Critical thinking and problem-solving CTT results showed that the higher critical thinking participants were effective in the particular problem-solving and decision-making. The positive correlations mean that, in order to improve the cognition, efforts should be made to improve critical thinking. The regression results indicate that critical thinking is the better determinant of decision-making than the problem-solving skills hence the need for sort out interventions to promote of critical thinking skills. Therefore, these outcomes confirm the study aims and provide significant data regarding the cognition development in the sphere of psychology, as well as in training and utilization processes.

Conclusion

On the area of content, this research explored the cognitive contribution in critical thinking development with reference to problem solving and decision making in psychology. The analysis of the results revealed fairly high correlations between these cognitive skills and the most prominent among them was critical thinking that predicted successful problem solving and decision making. Recent critical thinking scores were higher among participants and signified improved ability in evaluating complex situations and making the right decision affirming the significance of these skills in psychological education and practice. This research shows the imperative role of specialized training to enhance and enhance cognitive and mental functions to improve every person and their career. These findings give some

starting points that can be leveraged in direction of pursuing research on improving the important thinking capability and delineating its use in distinctive psychological domains.

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