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# Meta-Cognition as a Predictor of Productive Learning Among Out-of-School Emerging Adults (15–25) Engaged in Mechanic Work in Buea Municipality, South West Region of Cameroon

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## Abstract

The study investigated “Meta-cognition as a determinant of productive learning among out-of-school emerging adults engaged in mechanic work in Buea Municipality”. The specific objective is; To ascertain the extent to which executive functioning impacts productive learning among out-of-school emerging adults engaged in mechanic work in Buea municipality. Methodologically, the research design used was experimental design and the type of design quasi-experimental research design and exploratory research design with the aid of a pretest and posttest. The population of the study was made up of all apprentices between the ages 15 to 25 in mechanic garages, and trainers. The target population were 26 apprentices and 4 trainers and the accessible population was 12 apprentices and 4 trainers. The study took place in Buea in Cameroon in two mechanic garages. The instruments used for data collection were questionnaire, observational checklist and interview guide. The procedure for data collection was through observing and training the expert on psycho-pedagogy skills who later trained the apprentice and they were later tested. Pretest and posttest were carried out. The study was carried out in two mechanic workshops. Each of the garages had experimental and control groups. The sampling technique was purposive sampling technique. Quantitative data were entered using EpiData Version 3.1 (EpiData Association, Odense Denmark, 2008) and analyzed using the Statistical Package for Social Sciences (SPSS) Standard version, Release 21.0 (IBM Inc. 2012). Data collected from the field were subjected to both descriptive and inferential statistics. For the descriptive data, frequency distribution tables and charts were used to present and describe the data obtained. Cohen’s d was used to compare assert significant difference of the inferential statistics. The findings were as follows; executive function should constantly be applied in mechanic garages by the trainers so that apprentice can gain knowledge, aptitude, competencies and become productive.

**Keywords :** Metacognition; executive functioning; productive learning; out of school emerging adults; mechanic work.

## Introduction

Metacognition entails that learners reflect with accuracy on their cognition [1]. Metacognition also requires planning, self-regulation of both cognition and affective or motivational states and allocation and other intellectual resources, executive functioning forms part of the construct. Carlson & Moses (2001) argue that executive functioning may be a prerequisite skill for the development of metacognition. Schraw & Moshman [1] posit that metacognitive development proceeds as follows; cognitive knowledge appears first with learners reflecting on their accuracy of the cognition an consolidation of this

skills, ability to regulate next with dramatic improvement in monitoring regulation and evaluation in the form of planning and finally, construction of metacognitive theories, these theories allow for the integration of cognitive knowledge and cognitive regulation, as learners construct their own theories, come to reflect on their own thinking and learning. Productive learning involves bringing in skills, strategies that makes learning fruitful among out of school emerging adults from the ages 15 to 25.

## Objective of the Study

### General Objective

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1. To determine the extent to which meta-cognition predicts productive learning among out-of-school emerging adults engaged in mechanic work in Buea Municipality

### Specific Objectives of the Study

Specifically, this study is intended:

1. To investigate the extent to which executive functioning impacts productive learning among out-of-school emerging adults engaged in mechanic work in Buea municipality

### Background to the Study

Metacognition is being aware of one's own cognitive structure and learning characteristics. According Flavell [2] metacognition is a system which organizes information, experiences, objectives and strategies. Metacognition refers also to thinking about thinking, generally covers various skills that are inter-related to thinking and learning which are critical thinking, reflective thinking, problem solving, executive functioning, and making of decisions in the process of problem solving. Furthermore, the main indicator of this study is executive functioning as an indicator of metacognition which consist of those capacities that enable a person to engage successfully in independent, purposive self-serving behaviour. The Executive functioning asks questions how and whether a person goes about doing something. The executive function is thus conceptualized as having four components; violation, planning, purposive action and effective performance which each involves a distinctive set of activity related behaviour. According to Tchombe [3], cognitive learning takes place through mutual reciprocity. This is determined via participation which is oriented by cultural belief about knowledge, parent-child expectations and aspirations.

Therefore, the skills and competencies learners employ for meaning making through shared activities have enormous impact on how learners make decisions which is held by understanding of the dynamics of their cognitive developmental sequence. Productive learning here is skill learning, learning through experience that solve real life problems. Emerging adults are young people between the ages 15 to 25 who are out of school and engaged in mechanic work as apprentices with their experts. According to Loh (2009) the implication in the lifecourse is evidenced in how young people conceive and define adult status today. According to him, in the African sub region in general and Cameroon in particular, the transition to adulthood is an arduous task characterized by several challenges.

### Statement of the Problem

The problematic in this study is productive learning. The researcher observed that most apprentices in the mechanic workshop turn out to be less skilful in solving problems in cars when cars have breakdowns especially when the expert is not around, especially thinking out of the box to resolve problems in breakdowns like removing the engine, and other complicated mechanic repairs. Literature Review

### Metacognition

Research activity in metacognition began with John Flavell who is considered to be the father of the field. Metacognition is a concept that has been refer to a variety of epistemological processes. Metacognition essentially means cognition about cognition; that is thoughts about thoughts, knowledge about knowledge. So, if metacognition involves perceiving remembering and so forth, then metacognition involves thinking about one's own perception, understanding, remembrance.

### Executive Functioning

Executive functioning includes responsible processes, for directing focus, managing and integrating cognitive functions related to everyday life tasks as well as new and complex problems. Executive functioning as used in this study describes a set of mental processes that helps connect past experience with present action through critical thinking. It involves thinking out of the box in order to solve a problem. Executive function is used in when the following activities are being performed that is planning, organizing, strategizing and paying attention to and remembering details.

### Productive Learning

sees productive learning as learning through human development.

Productive learning is learning on the basis of productive activity in social serious situation, learning on the basis of experience by being able to achieve something important in one's environment. Productive learning involves active and inquiry learning or integrating creativity, competencies, fostering learners' ability to think critically and learn autonomously based on constructivism in order that learners produce creative things based on problem solving method.

### The Concept of Mechanic Work

Mechanic work is a trade craftsmanship. Mechanic work involves application of specific knowledge in the design, selection, construction, operation and maintenance of automobiles. Mechanic work is geared to test, diagnose, service and completely maintain faults relating to the

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conventional automobile assembly like vehicles of different brands. Theoretical review

### Vygotsky Socio-Cultural Theory (1896-1934)

Vygotsky believed that individual development could not be understood without reference to the social and cultural context within which such development is embedded. He states that using activity mediators, the human being is able to modify the environment and this is her way of interacting with nature. Hence, Zone of Proximal Development is actually the gap between actual competence level (what problem level a learner is able to independently solve), and the potential development level (what problem level could she solve with guidance from a tutor). It supports a representation of intellectual development based on continuity.

### Transformative Learning Theory by Mezirow (1978)

According to Mezirow [4] transformative learning is the process of making meaning from our experiences through reflection, critical reflection and critical self-reflection. Meaning according to Mezirow means making sense of the day to dayness of our experiences. He eventually names this process perspective transformation to reflect change within the core and central meaning structures. Perspectives are made up of sets of beliefs, values and assumptions that we have acquired through our life's experiences.

## Method

### Research Design

The researcher used a triangulation approach, where the researcher used both qualitative and quantitative research methods to collect data. An experimental design was used in this study supported with an exploratory sequential design. The type of experimental design was a quasi-experimental design which was chosen to identify an intervention effect using an experimental group and control group to ascertain treatment effects on experimental group, through pre-test and post-test. The procedures employed tests causal effect (XY) and test causal hypothesis. Starting by ensuring through a pre-test that the two groups are comparable and with a post-test repeating the pre-test including researcher constructed test to ensure change in design.

### Instrument for Data Collection

The following methods were used to gather information from the correspondence. A questionnaire of 5 items per objective were conducted, an observational checklist and an interview guide was also designed that had statements from the following measures, coaching, scaffolding, executive functioning and productive learning measured

the following; aptitude, mastery experience, attitude, discipline, knowledge, skills and competency development as seen in the appendices. A lesson note was prepared for mechanic work for the intervention with the used of the experiential learning as a teaching method.

### Findings

Research hypothesis three: There is no significant relationship between executive functioning and productive learning among out-of-school emerging adults engaged in mechanic work in Buea Municipality. (Cohen's  $d$ ): If the theoretical effect size is smaller than the calculated one, we then reject the hypothesis that the means are not significantly different at 90% power and at 95% CL with cohort sample 3 and a total sample size 6 as it is the case in our study context. As for the total score in executive functioning for mechanic in the experimental group, the mean at pretest was 9.5 and rose to 11.5 at posttest and this increase was significant (negative Cohen's  $d$ ). In fact, the theoretical effect size is smaller than the calculated one, we then reject the hypothesis that the means are not different. This therefore implies that there was a significant progression from pre-test to post-test. The significant improvement in productive learning score was as the result of improvement in executive functioning because such improvement was not obtained in the control group where no significant improvement was realized in coaching from pretest to posttest.

The hypothesis here stated is then accepted.

### Executive Functioning and Productive Learning among Out-Of-School Emerging Adults Engaged In Mechanic Work

There was no significant difference between the two workshops for both masters and mechanics. As for the total score in executive functioning for mechanic in the experimental group, the mean at pretest was average and rose to at posttest and this increase was significant. This therefore implies that there was a significant progression from pre-test to post-test. This matches with Flavell [5] metacognitive theory who referred to metacognition theory as thinking about your own thinking. The root "meta" means "beyond", so the term refers to "beyond thinking" [6-15].

### Conclusion

To conclude, thinking out of the box enable out of school emerging adults to reflect, think critically and work positively towards a positive growth mind, that makes them gain skills, aptitude, knowledge, competencies, and are able to repair cars and engaged in car maintenance to solve car breakdowns [15-23].

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