

Exploring Students' Self-Assessment to Increase Learning Outcomes in Teachers' Training Colleges in Cameroon

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Abstract: The main objective of this study is to explore students' self-assessment to increase students' learning outcomes in teacher training colleges in Meme and Fako Divisions. In-depth interviews and group discussions were used as instruments for data collection. Purposive sampling technique was employed in selecting the teacher training colleges used in the study and the participants. The sample size of the study constituted of 37 student-teachers for in-depth interviews and four group discussions made up of ten student-teachers each. The interviews and group discussions were analysed through content analysis, while focus group discussions were analysed following the procedure for analysing and reporting focus group results by Krueger (1998). The findings revealed that self-directed learning can be used to increase students' learning outcomes; self-designed project influences students' learning outcomes; self-reported assessment is linked with students' learning outcomes; and that knowledge of self is related with students' learning outcomes.

Keywords: self-assessment, self-directed learning, self-designed project, self-reported assessment, knowledge of self, learning outcomes; and group discussions.

Introduction

Education in general can hardly be successful without assessment. From informal to formal education, at some point there is always a need to assess how far the objectives have been attained. More often than not, assessment is done by professionals – mainly teachers – in the formal curriculum (Crawford, 2013), who measure the level at which the taught curriculum has been learnt. However, most schools have neglected self-assessment in favour of teacher-made-assessment.

According to Baumeister et al (2003) self-assessment is a case of assessment where learners are allowed to measure the level where they have met up with their pre-defined objectives of the learning programme. The notion of self-assessment goes with the fact that everyone increasingly has a goal for their life and with or without formal goals of the curriculum, learners have a reason why they go to school other than just scoring high grades and earning certificates of excellence. Nowadays, school should make a greater contribution to the cultivation of skills rather than focus mostly on knowledge acquisition. In this context, self-assessment of students is a very important goal for schools.

McNamara and Deane (1995) state that "although self-assessment may seem inappropriate at first sight and is highly neglected, it can yield accurate judgment of students' linguistic abilities, weaknesses, strengths, and improvement". Self-assessment is a great factor towards self-efficacy, which involves the learners' estimate of their capabilities and their likely success in a particular task.



Students with high expectations of their capabilities will tend to persist with tasks and put in greater effort than those with low self-perceptions (Deakin-Crick et al, 2007).

Achieving the outcomes of learning is one of the major educational motivators to learners at all levels of learning. Adam (2007) views learning outcomes as statements of what a learner is expected to know, understand and/or be able to demonstrate at the end of a period of learning. Adam (2007) stressed that in 21st-century education, learning outcomes are concerned with the achievements of the learner rather than the intentions of the teacher (expressed in the aims of a module or course).

The curriculum may require that the outcome of learning is that students obtain a certain certificate but behind the certificate individual students have different goals. The different individual goals of students can best be assessed through self-assessment. Different students want to attain different levels of skills so no unified assessment method can effectively assess their attainment. Contrarily, most assessment methods in education today do not focus on assessing the development abilities in the learners which best fulfil their learning outcomes. The learners most often pay attention to the tested curriculum so as to score high grades and end up with little progress in terms of individual attainment of skills. The outcomes of learning are reduced to the certificate obtained and not the actual development of transformative competencies and skills. It could be argued that this accounts for many of the unemployed graduates today.

Objectives of the Study

- 1) To explore the relationship between self-directed learning and learning outcomes in teachers' training colleges in Meme and Fako Divisions.
- 2) To find the influence of a self-designed project on learning outcomes in teacher training colleges in Meme and Fako Divisions.
- 3) To explore the link between self-reported assessment and learning outcomes in teacher training colleges in Meme and Fako Divisions.
- 4) To explore the relationship between knowledge of self and students' learning outcomes in Meme and Fako Divisions.

The Concept of Self-Assessment

Boud (1995) argues that the way in which self-assessment is implemented is critical to its acceptance by students. To Boud, the implementation process needs to include:

- A clear rationale: What are the purposes of this particular activity?
- Explicit procedures: Students need to know what is expected of them.
- Reassurance of a safe environment in which they can be honest about their own performance without the fear that they will expose information which can be used against them.
- Confidence that other students will do likewise, and that cheating or collusion will be detected and discouraged.

According to Andrade and Du (2007), self-assessment is a process of formative assessment during which students reflect on and evaluate the quality of their work and their learning, judge the degree to which they reflect explicitly on stated goals or criteria, identify strengths and weaknesses in their

work, and revise accordingly. McMillan and Hearn (2008) considered self-assessment to mean that students simply check off answers on a multiple-choice test and grade themselves but it involves much more than that. Self-assessment is more accurately defined as a process by which students monitor and evaluate the quality of their thinking and behaviour when learning and identify strategies that improve their understanding and skills. That is, self-assessment occurs when students judge their own work to improve their performance as they identify discrepancies between current and desired performance.

Harris and Brown (2018) emphasise that there are two main reasons that teachers should promote self-assessment within classes. Firstly, self-assessment is an integral part of self-regulated learning, and, secondly, student assessment without proper guidance and training varies considerably and may be poorly aligned with the curriculum's external standards. Student self-assessment in education includes a wide variety of mechanisms and techniques through which students describe and evaluate the quality of learning processes and its products (Panadero, Brown & Strijbos, 2016). Therefore, the various dimensions of self-assessment this study will focus on include self-directed learning assessment, self-designed project assessment, self-reported assessment and knowledge of self-assessment.

Self-Directed Learning: Knowles (1975) defined self-directed learning as students getting the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying the source, learning from someone and from learning materials, choosing and implementing appropriate learning strategies and evaluating learning outcomes. Tillema (2000) stated that, to be a self-directed learner is to have the ability to identify and achieve learning goals through the effective use of learning strategies and to understand, monitor, manage, evaluate, and reflect on one's own learning. Self-directed learning focuses on the process by which learners take control of their own learning, set their own learning goals to locate appropriate resources, decide on learning methods to use, and evaluate their own progress (Findley, 2009). It is essential for students to be self-directed learners in order to experience university, as well as lifelong learning, effectively (Lunyk-Child et al, 2001). Brockett and Hiemstra (1991) stated that students who exhibit more self-directed learning behaviours tend to perform better academically than students who do not.

Project-Based Learning (PBL): PBL is a model that organises learning around projects. According to the definitions found in PBL handbooks for teachers, projects are complex tasks, based on challenging questions or problems that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations (Thomas, Mergendoller, & Michaelson, 1999). Stewart (2007) argued that, modern learning approaches increasingly have fewer structured learning activities and more self-directed learning tasks guided through consultation with academics. Such tasks are predominately project/problem based, where the student is required to follow a freely guided road map to self-discovery while simultaneously achieving desired learning outcomes for a particular course.

Self-Reported Assessment (SRA): SRA is any test, measure, or survey that relies on the individuals' own report of their own symptoms, behaviours, beliefs, or attitudes. According to Azevedo (2015), self-reported assessment, in addition to classroom discourse, is the only proven approach that can be used for the measurement of cognitive, meta-cognitive, affective, and motivational constructs of student

engagement. This provides the rationale for making use of existing self-reporting instruments to interpret and triangulate findings obtained through the use of trace data.

Many large-scale assessments, like the National Survey of Student Engagement, use self-reported gains to measure learning outcomes on the part of university students. The challenge is that many researchers believe that self-reported gains are not valid measures of learning outcomes. They claim that self-reported gains lack convergent validity (Bowman, 2009).

Self-Knowledge: Self-knowledge may be understood as a perception every human has of themselves. It is a component of personality development that indicates who we are and how we fit into the world. Machargo (1991) perceives self-knowledge as a set of perceptions or reference points that subjects have about themselves; a set of characteristics, attributes, qualities and deficiencies, capacities and limits, values and relationships that individuals know to be descriptive of themselves and which they perceive as data concerning their identity. The above definition embraces issues including the set of knowledge and attitudes that we have about ourselves; the perceptions that individuals assign to themselves and characteristics or attributes that we use to describe ourselves (Manning, Bear & Minke, 2006). Self-knowledge, like any psychological construct, is relative and depends on some frame of reference. When students perceive themselves as the best in class, they tend to hold a positive self-knowledge of themselves (Acosta, 2007).

Methods

Study Context

Cameroon maintains significant control over teacher education by running national examinations for entry into Initial Teacher Education (ITE) programmes and for graduation from the programme as a qualified and certified teacher (Lyonga, 2015). Presently, there are state-owned teacher training colleges in all Divisions in Cameroon and also a few private teacher training colleges owned by the Catholic, Presbyterian and Baptist Missions (MINESUP, 1995, 1998; Tchombe, 2001; Dembele, 2003 and Fonkeng, 2007).

Three teacher training colleges in Meme and Fako Divisions of the South West Region were purposefully selected for this study. The colleges were: Government Technical Teacher Training College (GTTTC), Kumba, Government Bilingual Teacher Training College (GBTTC), Kumba and Government Teacher Training College (GTTC), Buea. Due to the prevailing (on-going) socio-political crisis in the anglophone regions of Cameroon, the above purposefully selected teacher training colleges were the only few operational in the study area.

Table 1: Sampled participant per case study institution

Instruments	TTC A	TTC B	TTC C	Total
Interview	16 students	15 students	6 students	37 students
Group Discussion	2 groups	2 groups	—	4 groups

Key: TTC A = GTTTC, Kumba; TTC B = GBTTC, Kumba and TTC C = GTTC, Buea.

A combined total of 37 student-teachers were interviewed from the three case study institutions while two groups made up of ten student-teachers each were sampled through focus group discussion in Government Technical Teachers' Training College (GTTTC), Kumba and Government Bilingual Teachers Training College (GBTTC), Kumba, respectively. Through this sample size, critical participant characteristics were covered in order to promote representativeness of the population under study.

Instruments for Data Collection

The study made use of in-depth interviews and group discussions. The interview questions were formulated along the following four themes: self-directed learning and learning outcomes; self-designed project and learning outcomes; self-reported project and learning outcomes; and knowledge of self and students' learning outcomes.

Theme 'a' included questions exploring the link between self-directed learning and students' learning outcomes. It further looked at whether self-directed learning improves learning outcomes. Theme 'b' included questions exploring the relationship between self-designed project and students' learning outcomes. It also focused on how self-designed projects improve students' learning outcomes. Theme 'c' included questions on the relationship between self-reported assessment and students' learning outcomes. Theme 'd' involved questions that allowed the participants to give information about knowledge of self and students' learning outcomes. The interview guide was drafted based on the objectives of the study. Thirty seven (37) semi-structured in-depth interviews were conducted at TTC A (GTTTC, Kumba), TTC B (GBTTC, Kumba) and TTC C (GTTTC, Buea).

It was estimated that each interview should take approximately thirty (30) minutes. Although the duration depended on the respondent's willingness and the volume and depth of responses they wanted to provide. Questions to guide the group discussions were developed by the researcher to solicit insights and data on students' self-assessment and learning outcomes. The group discussion questions were focused on the same students' self-assessments strategies that might improve learning outcomes.

The interviews and group discussions were administered by taking them to the institutions and explaining them to the participants. Each instrument was accompanied by a cover letter assuring the respondents that the information needed from them would be treated confidentially and for research purposes only. Notes were taken during interviews while the group discussions were recorded. The interviews were done via the face-to-face technique and were then transcribed, and the process of content analysis (Patton, 1990) was utilised to examine the data. Meanwhile, the group discussions recorded were transformed to a text and were analysed following the procedure for analysing and reporting focus group results by Krueger (1998).

Characteristics of Study Participants

Participants of this study were student-teachers from the three selected teacher-training colleges in Meme and Fako Divisions of the South West Region of Cameroon, who voluntarily accepted to participate in the interview and group discussion sessions.

Table 2: Demographic characteristics of study participants

Demographic Characteristics	Category	Frequency	Percentage
Schools	GTTTC, Kumba	16 interviewees and two discussion groups with 10 members each (36 respondents)	46.7
	GBTTC, Kumba	15 interviewees and two discussion groups with 10 members each (35 respondents)	45.5
	GTTC, Buea	6 interviewees	7.7
Sex	Male	23	29.8
	Female	54	70.2
Age	17- 22	26	33.7
	23- 28	33	42.8
	29- 34	18	23.4
Class	Level three	37 (interviewees) Four group discussions with 10 members each	
Entry qualification	O/L (<i>Probatoire</i>)	32	41.6
	A/L(<i>Baccalaureat</i>)	45	58.4

Table 2 above shows that 37 interviewees and four group discussions with 10 members each, giving a total of 77 participants, were drawn from the sampled institutions. That is, 46.7% of the respondents came from GTTTC, Kumba, 45.5% of them fromGBTTC, Kumba and 7.7% from GTTC, Buea; 70.2% of the respondents were female while 29.8% of them were male; 33.7% of the respondents were within the age range of 17-22 years, 42.7% of them were within the age range of 23-28 years, while 23.4% were within the age range of 29-34 years. All the student-teachers who took part in the study were final-year students, that is, level three students preparing for graduation. For entry qualification, 41.6% of the respondents used O/L (*Probatoire*) while 58.4% of them used A/L (*Baccaluareat*) to enter the school.

Findings

Self-Directed Learning and Students Learning Outcomes

To explore the relationship between self-directed learning and students' learning outcomes in teacher training colleges in Meme and Fako Divisions, participants were asked to explain how self-directed learning related with students' learning outcomes and the following responses (Table 3) were produced.

Table 3: Relationship between self-directed learning and students learning outcome according to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea

Relationship between Self-Directed Learning and Students' Learning Outcomes	Responses		
	GTTTC, Kumba	GBTTC, Kumba	GTTC, Buea
Through self-directed learning your learning outcome is improve efficiently and effectively	TTC A = 3, 8, 9,12,13	TTC B = 8, 13, 14, 11, 4	TTC C = 2, 4
Self-directed learning enhance understanding and makes the learner improve in the field of study	TTC A = 5, 7, 11,	TTC B = 2, 10	TTC C = 2
Self-directed learning makes the learners more focus in their studies	TTC A 2, 3, 4, 6	TTC B = 1, 3, 7	TTC C = 5, 6
Self-directed learning makes the learner more conscious in his field of studies	TTC A = 4, 10	TTC B = 5, 6	TTC C = 3
Self-directed learning makes one to prepare and gain quality learning outcome	TTC A = 1	TTC B = 9, 12, 13	None (0)
Self-directed learning leads to proper organization of your studies	None (0)	None (0)	TTC C = 1
Self-directed learning promotes the ability to do research in order to succeed in school.	None (0)	TTC B = 3	None (0)

Key: TTC A = GTTTC, Kumba; TTC B = GBTTC, Kumba and TTC C = GTTC, Buea.

TTC A = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 are the sixteen respondents in GTTTC, Kumba. TTC B = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 are the fifteen respondents in GBTTC, Kumba and TTC C = 1, 2, 3, 4, 5 and 6 are the six respondents in GTTC, Buea.

According to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea the most apparent relationships between self-directed learning and students' learning outcomes, as in Table 3 above, are: through self-directed learning your learning outcome is improved efficiently and effectively; self-directed learning makes learners focus more on their studies; self-directed learning enhances understanding and makes learners improve in their field of study; and self-directed learning makes learners more conscious of their field of studies; self-directed learning makes one prepare and gain quality learning outcomes; and self-directed learning promotes the ability to do research in order to succeed in school. When asked through focus group discussion how self-directed learning relates to students' learning outcomes, participants came up with a number of ways through which this was done. The major frequent categories on how self-directed learning relates to students' learning outcomes as they emerged from the discussions were, self-directed learning (a) enhances goal achievement, (b) helps learners to set rules and regulations about their studies, (c) leads to proper organisation of studies, and (d) makes learners better plan and prepare for their studies. Infrequent

but important categories on how self-directed learning relates to students' learning outcomes as they emerged from the discussions were, self-directed learning: (a) helps students to manage their studies, (b) broadens students' understanding, and (c) promotes the ability to do research.

Self-Designed Project and Students Learning Outcomes

To find out the influence of the self-designed project on students' learning outcomes in teacher training colleges in Meme and Fako Divisions, participants were asked to explain how the self-designed projects relate to students learning outcomes and the following responses (Table 4) were produced.

Table 4: The influences of self-designed project on students learning outcomes according to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea

The Influences of Self-Designed Project on Students' Learning Outcomes	Responses		
	GTTTC, Kumba	GBTTC, Kumba	GTTC, Buea
Self-designed projects improves grade and performance in school	TTC A = 2, 6, 10, 11,	None (0)	TTC C = 2, 3, 4, 5
Self-designed projects improve skills and lead to discovering of new knowledge	TTC A = 10, 6, 7	TTC B = 1, 8, 11, 13	None (0)
It improves self-motivation and ownership of knowledge	TTC A = 1, 3	TTC B = 4, 6, 3	None (0)
Self-designed projects makes the learners creative	None (0)	TTC B = 2, 5, 7, 9, 10, 3, 15	None (0)
Self-designed project makes learners to discover their talents	None (0)	TTC B = 14	None (0)
Self-designed project provokes the ability to do research in learners	TTC A = 4, 5	TTC B = 12	None (0)

Key: TTC A = GTTTC, Kumba; TTC B = GBTTC, Kumba and TTC C = GTTC, Buea.

TTC A = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 are the sixteen respondents in GTTTC, Kumba. TTC B = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 are the fifteen respondents in GBTTC, Kumba and TTC C = 1, 2, 3, 4, 5 and 6 are the six respondents in GTTC, Buea.

According to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea the most evident influences of self-designed projects on students' learning outcomes were, self-designed projects improve grade and performance in school; make the learners creative; improve skills and lead to the discovering of new knowledge; and improve self-motivation and ownership of knowledge. Self-designed projects help learners to discover their talents and provoke the ability to do research in learners. Participants came up with a number of ways through which the self-designed project is related to students' learning outcomes. The major frequent categories on how self-designed projects influence students' learning outcomes as they emerged from the discussions were, self-designed projects: (a) enhance efficiency and effectiveness; (b) increase students' thinking capacity; (c) promote creativity in learners; and (d) improves critical thinking skills. Infrequent but important categories on how self-designed projects influence students' learning outcomes as emerged from the discussions

were, self-designed projects: (a) develop the ability to do research on learners; and (b) improve learners' performance in school.

Self-reported Assessment and Students' Learning Outcomes

To explore the link between self-reported assessment and students' learning outcomes in teacher training colleges in Meme and Fako Divisions, participants were asked to explain how self-reported assessment relates to students' learning outcomes and the following responses (Table 5) were produced.

Table 5: The links of self-reported assessment on students learning outcome according to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea

The Link of Self-Reported Assessment on Students' Learning Outcomes	Responses		
	GTTTC, Kumba	GBTTC, Kumba	GTTC, Buea
With self-reported assessment one can know her strength and weaknesses and also the level of understanding	TTC A = 6, 12, 13,	TTC B = 6	TTC C = 3
It helps the students to study more after assessing themselves	TTC A = 6, 11, 16	TTC B = 14	None (0)
It enhance efficiency and improve skills of learning in students	TTC A = 4	TTC B = 1, 3, 9, 10, 11, 12, 13	TTC C = 2
It makes us to know if the learning objectives are attained	TTC A = 1, 2	TTC B = 1, 3	None (0)
It helps to develop problem solving skills in learners	TTC A = 7	TTC B = 5, 11, 15	None (0)
Self-reported assessment helps students to organise themselves	None (0)	None (0)	TTC C = 4

Key: TTC A = GTTTC, Kumba; TTC B = GBTTC, Kumba and TTC C = GTTC, Buea.

TTC A = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 are the sixteen respondents in GTTTC, Kumba. TTC B = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 are the fifteen respondents in GBTTC, Kumba and TTC C = 1, 2, 3, 4, 5 and 6 are the six respondents in GTTC, Buea.

According to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea the most obvious link to self-reported assessment on students' learning outcomes are, self-reported assessment: enhances efficiency and improves skills of learning in students; one can know their strength and weaknesses and also their level of understanding; helps students to study more after assessing themselves; and helps to develop problem solving skills in learners.

When asked through the group discussions how self-reported assessment relates to students' learning outcomes, participants came up with a number of ways through which self-reported assessment was related to students' learning outcomes. The major frequent categories on how self-reported assessment was linked to students' learning outcomes as they emerged from the discussions were, self-reported assessment: (a) helps students to know their strengths and weaknesses; (b) increases problem-solving skills; (c) promotes mastery of subject matter; and (d) makes students aware their

lapses. Infrequent but important categories on how self-reported assessment is linked to students' learning outcomes as they emerged from the discussions were, self-reported assessment: (a) helps learners to set rules for themselves; (b) encourages research; and (c) encourages self-evaluation in order to improve skills and ability.

Knowledge of Self and Students Learning Outcomes

To explore the relationship between knowledge of self and students' learning outcomes in Meme and Fako Divisions, participants were asked to explain how knowledge of self relates to students' learning outcomes and the following responses (Table 6) were generated.

Table 6: The relationship of knowledge of self with students learning outcome according to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea

The Relationship of Knowledge of Self with Students' Learning Outcomes	Responses		
	GTTTC, Kumba	GBTTC, Kumba	GTTC, Buea
Knowledge of self helps students to identify their skills and develop them	TTC A = 11, 12, 15	TTC B = 7, 13	TTC C = 1
Knowledge of self makes students to know their strength and weaknesses	TTC A = 1, 4, 6	TTC B = 1, 5, 8, 10, 12, 14,	TTC C = 2, 3, 6
Knowledge of self builds positive self-esteem in learners	TTC A = 2,	TTC B = 4, 9	None (0)
It help learners to make choices in the field of studies	TTC A = 5,	TTC B = 6, 11	None (0)
It help learners to know their competencies	TTC A = 7	None (0)	TTC C = 4

Key: TTC A = GTTTC, Kumba; TTC B = GBTTC, Kumba and TTC C = GTTC, Buea.

TTC A = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 are the sixteen respondents in GTTTC, Kumba. TTC B = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 are the fifteen respondents in GBTTC, Kumba and TTC C = 1, 2, 3, 4, 5 and 6 are the six respondents in GTTC, Buea.

According to respondents from GTTTC, Kumba, GBTTC, Kumba and GTTC, Buea the most apparent relationship between knowledge of self and students' learning outcomes were, knowledge of self: helping students know their strengths and weaknesses; helping students to identify their skills and develop them; building positive self-esteem in learners; helping learners to make choices in their field of studies and helping learners to know their competencies.

When asked through the group discussions how knowledge of self relates to students' learning outcomes, participants suggested a number of ways this might take place. The major frequent categories on how knowledge of self relates to students learning outcomes as they emerged from the discussions were, knowledge of self: (a) encourages learners to work harder; (b) helps learners to know their position in class and maintain it; (c) helps learners to know whether they are slow or fast learners; and (d) also helps students to make academic choices. Infrequent but important categories on how knowledge of self is related with students' learning outcome as they emerged from the discussions were, knowledge of self: (a) helping learners know what they are capable of doing; and (b) helping learners to discover their skills.

Discussion, Conclusion and Recommendations

The findings of this study depict that self-directed learning influences students' learning outcomes. This relationship was illustrated through a number of ways; through self-directed learning your learning outcome is improved efficiently and effectively; self-directed learning makes learners more focused in their studies; self-directed learning enhances understanding and makes learners improve in their field of study; and self-directed learning makes learners more conscious in their field of studies; self-directed learning makes one prepare and gain quality learning outcomes; and self-directed learning promotes the ability to do research in order to succeed in school. There is convincing evidence that people who take the initiative to learn themselves tend to learn more and better than those who fail to do so. According to Surry & Robinson (2001), the development of basic skills such as self-directed learning is the foremost priority of experts in educational technology.

The findings of this objective portray that a self-designed project influences students' learning outcomes. This influence is seen through the following ways — self-designed projects: improve grade and performance in school; make learners creative; improve skills, lead to discovering new knowledge; and improve self-motivation and ownership of knowledge. A self-designed project helps learners to: discover their talents; provokes ability to do research in learners; and increases students' thinking capacity. This result is in accordance with Stewart (2007) who argued that modern learning approaches increasingly have fewer structured learning activities and more self-directed learning tasks guided through consultation with academics. Such tasks are predominately project/problem based, where the student is required to follow a freely guided road map to self-discovery while simultaneously achieving the desired learning outcomes for a particular course. Project-Based Learning (PBL) is a model that organises learning around projects. Projects are complex tasks, based on challenging questions or problems that involve students in design, problem-solving, decision making, or investigative activities, give students the opportunity to work relatively autonomously over extended periods of time and culminate in realistic products or presentations (Thomas, Mergendoller, & Michaelson, 1999).

During our explorations our findings indicated that self-reported assessment is linked with students' learning outcomes. The link between self-reported assessment and students' learning outcomes is explained in a number of ways: it enhances efficiency and improves skills of learning in students; it allows one to know one's strength and weaknesses and also one's level of understanding; it helps students to study more after assessing themselves; and it helps to develop problem-solving skills in learners. Self-reported assessment helps students to know if the learning objectives were attained and helps them to be organised. These findings are in agreement with Boud (1995) who emphasised that self-assessment, with its emphasis on student responsibility and making judgments, is a necessary skill for lifelong learning. Engaging students in the formulation of criteria for self-assessment tasks helps them to deepen their understanding of what constitutes quality outcomes in a specified area.

Our findings also indicate that knowledge of self is related with students' learning outcomes. This relationship is demonstrated through the following ways — knowledge of self: helps students to know their strengths and weaknesses; helps students to identify their skills and develop them; builds positive self-esteem in learners; helps learners to make choices in their field of studies; helps learners to know their competencies; and helps learners to know their position in class and maintain it.

These findings are in congruence with Crawford (2013) who found that students' self-knowledge influences their academic performance. To become effective learners, young people need to develop a strong sense of self-worth and confidence in their abilities. They need to learn to take responsibility for their own learning and performance and demonstrate persistence and resilience in the face of obstacles or setbacks.

With regard to academic self-knowledge, Manning et al (2006) posit that it has two levels which relate to how well we do in school or how well we learn. While the first level deals with the general academic self-knowledge of how good one is in all subjects, the other has to do with a set of specific content related to self-knowledge that describes how good one is in mathematics, science, social studies and the English language. Self-knowledge like any psychological construct is relative and depends on some frame of reference.

Nowadays, school should make a greater contribution to the cultivation of skills rather than focus only on knowledge so that learners can make progress and improve. In this context, the self-assessment of students is a very important goal for school (Papanthymou & Darra, 2019). There is need for a progressive assessment of the learning process to determine the extent to which instructional objectives are being attained. This is contingent on the different assessment strategies selected by educators for this purpose that can enhance the achievement of the goals of education. Self-assessment techniques will allow the learners to assess and conclude by themselves that they are either achieving much or less according to the expected outcomes they had for themselves.

Based on the findings of the study, the following recommendations were envisaged. The Ministry of Secondary Education (in-charge of teachers' training colleges in Cameroon) should provide adequate educational technologies that will enable learners to study on their own. This should be done by providing multi-media centres and well equipped libraries that will enable learners to self-direct their learning, design projects on their own and do self-assessments. Principals of teacher training colleges should give priority to the provision of basic resources such as teaching staff and libraries, as well as science and computer laboratories. The availability of these resources in school will enable learners to cultivate the habit of working on their own and assessing the progress of their studies. Strategies should also be designed to encourage learners to direct their own learning, design projects and do self-assessment. This could be achieved through take-home assignments and exercises given in class. The competence-based approach of teaching, which places the learner at the centre of the teaching-learning process, should be rigorously encouraged.

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