

## Self-Efficacy and Self-Esteem as Determinants of Students' Interest in Introductory Technology in Anambra State, Nigeria

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### ABSTRACT

Despite the importance of introductory technology as vocational subjects and the basis of STEM education, students' interest in the subject is not encouraging as many students have erroneous conception of the subject. Given this situation, this study investigated the self-esteem and self-efficacy as determinants of students' interest in introductory technology. Anchored on social cognitive theory, the study adopted a factorial design and 2-Way analysis of variance as design and statistical tool to examine the effects of self-esteem and self-efficacy on students' interests in Introductory Technology. The sample of this study consist of 478 junior secondary II students (221 males, 257 females) whose ages ranged from 11 to 15yrs with a mean age of 12.50years and standard deviation of 1.20. Multi-stage sampling method was used in selecting the sample for the study. Data were collected with Interest Scale, Index of self-esteem scale and Self-efficacy scale. The result revealed that the observed mean difference in the students' interest in Introductory Technology among students with high and low self-esteem was significant at  $F(3, 478) = 15.9, p < .05$ . Also, the mean difference in the students' interest in Introductory Technology among students with high and low self-efficacy was significant at  $F(3, 478) = 12.0, p < .05$ . Equally findings revealed that there is interaction effect between self-esteem and self-efficacy on students' interest in Introductory Technology at  $F(3, 478) = 7.5, p < .05$ . Findings imply that that self-esteem and self-efficacy impacted students' interest in introductory technology subject. It is recommended that school management consider adoption of extra-curricular activities aimed at improving social skill competence of students to enhance students' self-esteem and self-efficacy.

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### Keywords:<sup>1</sup>

Interest, introductory technology, self-esteem, self-efficacy, social skill training, socialization, psychological wellbeing

### INTRODUCTION

Given that science and technology have continued to change how we live on earth and its advent has become the greatest source of strength to mankind and the alarming rate of unemployment, introductory technology was berthed as one of the skill-oriented subjects aimed at enabling the individual to acquire appropriate skills, abilities and competence to live in and contribute effectively to the development of his society (Okoye and Mbanefo, 2020;). These skills are critical for entrepreneurship activities and skill labor development (Ezeh and Etodike, 2017). Introductory technology popularly and usually shortened to "intro tech" and known as basic technology is an integrated subject which comprises of woodwork, metal work, building technology, auto mechanics, electrical electronics and technical drawing at their basic level (Okoye & Mbanefo, 2020). It is a subject that is offered at the junior secondary school level in Nigeria.

The importance of introductory technology cannot be overemphasized, and it is for this very reason that Federal Ministry of Education, Science and Technology (FMST, 1985) in their official gazette included the introductory technology among the basic subject for all junior secondary education in Nigeria. Although, the Federal government of Nigeria has been unable to actualize its mandates on skill training largely due to institutional and systematic corruption in the Nigerian public service (Ezeh & Etodike, 2016), skill-based education as would be guaranteed by basic technology remains the only hope of youth unemployment in Nigeria. The absence skill education has made white collar job the only option for employment with its attendant problems such as; increased retirement stress about civil servants (Ezeh et al., 2017), increasing sabotage behaviour in public service (Ezeh, et al., 2017), increasing Machiavellian traits (Madubueze et al., 2021) and workers' frustration (Chine et al., 2019). Introductory technology is introduced as a pre-vocational subject whose goal is to provide pre-vocational orientation for further training in technology, to provide basic technological literacy for everyday living, to stimulate creativity (FMST, 1985). In view of actualizing these salient goals, it is a prerequisite that individuals acquire appropriate skills, abilities and competence to live in and contribute effectively to the development of his society (Onu & Ekeyi, 2013).

Without advances in science and tech such as nurtured by basic technology, Nigeria as a nation might be left behind in the scientific and technological race; and may be unable to achieve national development, growth, and sustainability (Etodike et al., 2018). Consequently, the importance of basic technology and the need to introduce it early in life such as in the junior secondary schools is well captured in Government's

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educational purpose in all tiers of education; basic technology guarantees entrepreneurial emergence and typical solution to unemployment (Etodike et al., 2018) Considering that Nigeria has a young population, the skills and other engineering oriented work will be most beneficial to her in actualizing the potentials of the youths in STEM related courses at the tertiary level of education. This will reduce the dependence on white collar jobs and promote highly dependent workforce relying on technological knowledge and skills acquired at the secondary school level to further their careers.

Despite the importance of introductory technology in schools and real life, students' performance in the subject is not encouraging as much as their attitude towards the subject (Onu & Ekeyi, 2013). A close observation on the problem reveals that there is lackadaisical attitude towards this subject by students which may be signs for lack of interest (Okoye & Mbanefo, 2020). Without students' interest in the subject, they may never perform well. Consequently, this study contends that students' performance in intro tech will enhance if their interest in the subject is enhanced. It may therefore be of interest and value to educational research to ascertain factors which may be affecting students' interest in introductory technology.

Interest is an important variable in learning because when one becomes interested in an activity, one is more likely to be more deeply involved in the activity and thus achieve more (Okeke, 2008). According to Burnette, et al. (2020), interest is a critical factor in learning outcomes. People are often drawn to their interests, and they put in their best to actualize the dream of their interest for their personal happiness, recognition and honor. Interest is the feeling of wanting to know or learn about something or someone; it is the feeling of a person whose attention and concern or curiosity is particularly engaged on something (Phan & Ngu, 2018). For instance, Rowey (2009) posited that interest is subjective feeling of concentration and curiosity over something. Interest is a feeling someone has when one wants to give one's attention to something or be involved in something say learning. Thus, interest is a factor that can promote effective learning such that the higher the interest the higher the learning outcomes. Interest in this study portends eagerness to learn a set out task/activity for positive and near mastery of knowledge and skills related to the activity. Interest has a lot to do with mental activity (Ezeh et al., 2018) and therefore it is very important for classroom teachers to stimulate the interest of their students in the subject to increase their potentials to perform well.

In everyday life as well as in education, interest plays a critical role as it serves as intrinsic motivation which helps one to initiate actions. Students' interest in a subject hold so much power when a topic of a subject connects to what students like to do, and this engagement deepens as they willingly spend time thinking, dialoging and creating ideas in meaningful ways as is done in co-operative learning environment. Although, teachers' attitude (Ikwuka et al., 2020), instruction technique (Ikwuka, Etodike & Okoli), time management (Etodike et al., 2020), social media (Etodike and Ojiakor, 2018) and academic procrastination (Anierobi et al., 2021) could also affect students' learning outcomes in school. Thus, it hypothetically proven that that when has interest and is ready, then; engagement can occur. Readiness + Interest = Engagement. Renninger, et al., (2014) asserted that student's interest in learning increases when the teacher empowers students' voice to design personal learning products. For researcher, a higher level of activating interest is to have students propose their own ideas for engaging in their subjects.

Psychological capital has been linked to students' learning outcomes such as academic achievement (Anierobi et al., 2021); interest as a form of psychological capital is a major concept in learning only when learners have clear learning criteria and understand what they are expected to learn. When students understand the targets, they can effectively design their own products with coaching support from the teacher. Students are motivated by tasks that interest them. Learners are less daunted about tackling complex work with difficult obstacles if the topic interests them and if they have a voice on how to accomplish the work. Interest in the present study refers to motivation to attend introductory technology class, remain attentive in the class and participate in knowledge generation of content being taught and studied. It is the drive to participate actively in introductory technology classes, perform assignments, tests, and examinations. There are many factors associated with interest in learning; they may be intrinsic and extrinsic factors. The current study is interest in the intrinsic factors such as self-esteem and self-efficacy.

#### ***Self-Esteem***

Self-esteem refers to a person's overall evaluation of his or her own worth; and it encompasses beliefs such as "I am competent", emotions such as triumph, despair, pride or shame (Anierobi et al. 2021; Orth, et al.,

2018). It can also apply to a particular dimension such as "I believe I am a good writer and I feel proud of myself or I believe I am a good person and I am proud of that (Etodike, et al. 2017). It is also a stable sense of personal worth or worthiness and one's attitude towards oneself or one's opinion or evaluation of oneself, which may be positive (favorable or high), neutral, or negative (unfavorable or low) (Ryu & Kim, 2020). Self-esteem is also a set of attitudes and beliefs that a person brings with him or herself when facing challenges; it includes beliefs as to whether he or she can expect success or failure, how much effort should be put forth, whether failure at a task hurt or not and whether he or she will become more capable because of difficult experiences (Minev, et al., 2018).

Implicit from the definitions of self-esteem is that it is seen as a stable sense of personal worth or worthiness; the experience of being competent to cope with the basic challenges of life and being worthy of happiness. It is the sum of self-confidence (a feeling of personal capacity) and self-respect (a feeling of personal worth). It exists because of the implicit judgment that every person makes about his or her ability to face life's challenges, on one hand, and his or her right to achieve happiness, on the other hand (Kumar & Varma, 2018). Self-esteem is the sum of attitudes which depend on perceptions, thoughts, evaluations, feelings and behavioral tendencies aimed toward us; it further includes the way we are and behave, and our body's and character's features (Ryu & Kim, 2020).

Operationally, self-esteem is an internal belief system that an individual possesses about oneself. It describes the judgments and evaluation that people make about their own worth and the feeling associated with those judgments. It reflects a person's overall evaluation or appraisal of his or her own worth. Therefore, self-esteem is defined in both descriptive and evaluative self-related dimensions. The relationship between self-esteem and learning interest is well documented. For instance, Ugwuanyi and Okeke (2020) identified self-esteem as one of the determinants of students' interest in STEM education in Nigeria. Also, Kumar and Varma (2018) found that there is relationship between academic interest and self-esteem. Furthermore, Weisskirch (2018) used self-esteem to explain learning strategies and estimated achievements in course grades. In the same vein, Fakolade and Bamidele (2017) found that self-esteem is one of the predictors of learning outcomes including sustained interest in learning tasks associated with STEM education. The evidence provided by the authors above is exemplary in understanding and explaining the impacts of self-esteem on secondary school students' interest in introductory technology subject.

### *Self-Efficacy*

Stakeholders in education including psychologists have studied self-efficacy from several perspectives, noting various paths in the development of self-efficacy; the dynamics of self-efficacy, and the consequences of the lack thereof in many different settings. Literally, self-efficacy means belief in capacity to initiate and sustain self-effects. Wang and Neihart, (2015) defined self-efficacy to be beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations. It is also the belief we have in our own abilities, specifically our ability to meet the challenges ahead of us and complete a task successfully. Blotnicky, et al., (2018) asserted that self-efficacy refers to individuals' belief or judgment in terms of their capability to succeed at or to carry out particular activities or tasks. According to Huang (2012), Self-efficacy is believed to be one of the imperative elements of self-beliefs, and also a determinant of academic achievement. Bandura was classical on the study of self-efficacy; for instance, Bandura (2000) conceptualized it as a belief in one's capability to mobilize the cognitive resources, motivation, and courses of action needed to meet task demands. According to him, it is the judgment that one forms about his or her ability to perform a task from a specific domain or with characteristics. Bandura (2000b) further defines self-efficacy as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Furthermore, it is understood that self-efficacy beliefs determine how people feel, think, motivate themselves and behave for example Bandura (2007) refers to self-efficacy in this perspective as beliefs about one's capabilities to learn or perform behaviors at designated levels. Bandura asserted that self-efficacy has to do with a person's attitude, abilities and cognitive skills comprising of what is known as the self-system. It is a person's belief in their ability to solve a problem, reach a goal, complete a task, and achieve what one set out to do. The self-system plays a major role on how the individual perceives situations and behaves in response to different situations. He described these beliefs as determinants of how the individual thinks, behaves and feels.

Perceptions of self-efficacy according to Alderman (2004) result from personal experiences and operationally, self-efficacy is equally seen as a generative capability by which resources and sub skills are orchestrated into successful performance. In the views of Huang, et al., (2019), self-efficacy refers to the individual belief or assessment of one's capability to cope with a particular situation. It is an essentially belief in an individual's own ability to control his/her own behavior, emotions, and motivations.

Although gaps exist in literature regarding the influence of self-efficacy on students' interest in subjects, there is extensive studies which have buttressed the typical importance of self-efficacy on learning outcomes. For instance, Blotnick, et al., (2018) found associations between self-efficacy and career interests of students whereas Hauang, et al., (2019) found association between self-efficacy and math anxiety as a learning outcome. Also, Utari and Sukidjo (2020) associated entrepreneurial interest and self-efficacy. Grigg, et al., (2018) equally confirmed the positive relationship between students' mathematics self-efficacy and interest. In Nigeria, Bekomson, et al. (2020) found that there is association between interest in extracurricular activities and self-efficacy of senior secondary school students in Cross River State, Nigeria. Recently, Nuutila, et al. (2021) found mutual relationships between the levels of and changes in interest, self-efficacy, and perceived difficulty during task engagement.

### ***Social Cognitive Learning Theory***

Social cognitive learning theory championed by Bandura (2008) is a learning theory based on the ideas that people learn by watching what others do, and that human thinking processes are central to understanding personality. This theory provides a framework for understanding, predicting, and changing human behavior. His approach emphasized on cognitive and information-processing capabilities that facilitate social behavior. The main tenets of Bandura's theory of social cognitive learning as enumerated by Boeree, (2008) are that: (1) people learn by observing others, (2) the same set of stimuli may provoke different responses from different people, or from the same people at different times, (3) the world and a person's behavior are interconnected and (4) personality is an interaction between three factors: the environment, behavior, and a person's psychological or cognitive processes. In social cognitive theory, Bandura emphasized the major role cognition plays in encoding and performing behaviors. The theory provides explanations to the motivation factor in human behavior and hence provides a balance view in the relationship between self-efficacy as an internally motivated construct and students' interests in their subjects as a learning outcome.

In this model, behavior, cognition and other personal factors and environmental events all operate as interacting determinants of each other in goal directed behaviour which in this study is interest in learning as regards students' subject. The nature of persons is then defined within this triadic perspective of behavior, cognition, and motivating factors. Consequently, there is a continuous interplay between the self-generated and the external sources of influence; people create guides for their behavior, self-motivators for courses of action and then respond within their abilities.

Based on literature gaps on internal factors which energize students' interests in introductory technology subject, the aim of this study is to explore self-efficacy and self-esteem as determinants of students' interest in introductory technology in Anambra State, Nigeria. Specifically, the study will ascertain whether:

1. There is significant difference between students with high and low self-esteem in students' interest in Introductory Technology
2. There is significant difference between students with high and low self-efficacy in students' interest in Introductory Technology
3. There is interaction effect of self-esteem and self-efficacy on students' interest in Introductory Technology.

## **METHOD**

Being a survey study, the design for the study is factorial design which employed 2-Way analysis of variance as statistical tool to examine the effects of self-esteem and self-efficacy on students' interests in Introductory Technology.

### **Sample**

The sample of this study consist of 478 junior secondary II students (221 males, 257 females) whose ages ranged from 11 to 15 years with a mean age of 12.50 years and standard deviation of 1.20. Multi-stage

sampling method was used in selecting the sample for the study. The first stage, purposive was used to select the class level (JS II) while systematic was used to select the schools. Finally simple randomization was utilized to select the actual participants of the study. All schools sampled were co-educational schools.

### **Measures**

The standardized instruments for data collection were Interest scale, Index of self-esteem scale and Self-efficacy scale. The IS scale is a 29-item interest scale developed by the researcher using Introductory curriculum. It has 4-point response options of strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD). The participants were required to indicate their degree of agreement or disagreement to the number of statements about civic education. For the scale, strongly agree, agree, disagree and strongly disagree has the scores 4, 3, 2 and 1 for positive response items and 1, 2, 3, 4, for negative response items. Sample items include: "I like taking part in Introductory technology lessons", and "Introductory technology topics are difficult to understand". "In all, maximum points possible for the 29 items was 116 points i.e. 29 multiplied by 4 possible points whereas the minimum possible points a student can score was 29 points i.e. 29 multiplied by 1. All items in the likert scale questionnaire are to be responded to.

Index of Self-Esteem (ISE) was adopted as instrument for data collection. ISE was developed by Hudson (1982) to measure the level of self-esteem/self-concept. ISE is a 25-item inventory, and they are written on a 5-point scale of rarely or none of the time, a little of the time, some of the time, a good part of the time, most or all of the time which are rated 1,2,3,4 and 5 respectively for disagree strongly, disagree moderately, neither agree nor disagree, agree moderately, agree strongly. Sample items include: "I think I have a good sense of humor", "I feel that I am a likeable person" and "I feel I get pushed around more than others". It was adapted for Nigerian sample after several years of research by re-standardizing it in order to enhance its suitability and relevance for Nigerians (Onighaiye, 1996). However, the researcher ascertained its reliability among the sample and a Cronbach alpha reliability coefficient of .73 was obtained. The guidelines which were provided by the instruments on administration, scoring and analysis of the scale were strictly adhered to.

The Self-Efficacy Scale (SES) was developed by Sherer, Madduz, Mercandante, Prentice-Dunn, Jacobs and Rogers in 1982 to measure self-perceived competence and effectiveness in work performance and efficacy in handling social relationships. It was adapted for the use of professionals in Nigeria after several years of research by re-standardizing it in order to enhance its suitability and relevance for Nigerians (Ayodele, 1998). SES is a 30-item inventory, and it was written on a 5-point scale of disagree strongly, disagree moderately, neither agree nor disagree, agree moderately, agree strongly which are rated 1,2,3,4,5 respectively. Sample items include: "I can always manage to solve difficult problems if I try hard enough", "I can solve most problems if I invest the necessary effort", and "If I am in trouble, I can usually think of a solution." Self-Efficacy Scale (SES) has been re-validated in Nigeria for use in research by Ayodele (1998) who obtained a concurrent validity co-efficient of Self-Efficacy Scale (SES) of 0.23 by correlating SES with Mathematics Anxiety Rating Scale. However, the researcher ascertained its reliability among the sample and a Cronbach alpha reliability coefficient of 0.75 was obtained. The researcher monitored and coordinated all survey with the aid of research assistants recruited for the purpose.

## FINDINGS

Table 1: Mean Interest scores of high and low self-esteem students on Introductory Technology

Descriptive Statistics				
Self-esteem	Self-efficacy	Mean	Std. Deviation	N
High	High SE	98.268	1.1529	60
	Low SE	82.170	1.2108	174
	Total SE	90.121	1.1527	234
Low	High SE	90.602	1.4893	87
	Low SE	85.054	1.3190	147
	Total SE	87.342	1.4255	234
Total	High SE	94.405	1.0266	147
	Low SE	83.320	1.6255	331
	Total SE	88.554	1.37627	478

Data on Table 1 indicates students who are high on self-esteem and self-efficacy had the most interest in introductory technology subject at  $M = 98.27$  whereas those with low self-esteem and self-efficacy had the least interest in introductory technology at  $M = 85.05$ . The findings imply that there is initial difference among the groups on interest in introductory technology. Further analysis was required to ascertain if these initial observed differences reached significant proportions.

Table 2: Two-Way ANOVA on the effect of self-esteem and self-efficacy on students' interests in Introductory Technology

Source	Type I Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	2474.234 <sup>a</sup>	3	361.802	5.462	.001
Intercept	426412.558	1	426412.558	5165.180	.000
Self-esteem	1346.304	1	1346.304	15.879	.000
Self-Efficacy	1290.383	1	1290.383	12.021	.001
Self-esteem*Self-efficacy	631.927	1	631.927	7.47	.023
Error	5668.011	475	49.743		
Total	341263.000	478			
Corrected Total	4848.246	477			

a. R Squared = .438 (Adjusted R Squared = .412),

Data analysis in Table 2 reveal that the observed mean difference in the students' interest in Introductory Technology among students with high and low self-esteem was significant at  $F(3, 478) = 15.9$ ,  $p < .05$ . The p-value ( $p \leq .000$ ) is less than 0.05. Thus, hypothesis I which stated that there is significant difference between students with high and low self-esteem in students' interest in Introductory Technology was confirmed. Also, the observed mean difference in the students' interest in Introductory Technology among students with high and low self-efficacy was also significant at  $F(3, 478) = 12.0$ ,  $p < .05$ . The p-value ( $p \leq .001$ ) is less than 0.05. Thus, hypothesis II which stated that there is significant difference between students with high and low self-efficacy in students' interest in Introductory Technology was also confirmed. Thirdly, the data equally revealed that there is interaction effect between self-esteem and self-efficacy on students' interest in Introductory Technology at  $F(3, 478) = 7.5$ ,  $p < .05$ . The p-value ( $p \leq .023$ ) is less than 0.05. Thus, hypothesis III which stated that there is interaction effect of self-esteem and self-efficacy on students' interest in Introductory Technology was equally confirmed. Findings imply that that self-esteem and self-efficacy impacted students' interest in Introductory Technology subject.

## CONCLUSION, DISCUSSION and SUGGESTION

After analysis of data, the result revealed that both self-esteem and self-efficacy impacted students' interest in Introductory Technology among JS II students in Anambra State. The study evaluated the effects of social skill training and self-efficacy on body image of junior secondary students. After analysis of data, the result of hypothesis I indicated that students with high self-esteem has high interest in Introductory Technology when compared with their counterparts with low self-esteem. This finding imply that self-esteem is impacts the level of students' interests in the subject. This is supported by Fakolade and Bamidele's (2017) finding that self-esteem is a predictor of learning outcome in mathematics including interest in the subject. In the same vein, Ugwuanyi and Okeke (2020) identified self-esteem as one of the determinants of students' interest in STEM subjects. Their finding supports the paradigm that higher esteems will lead to higher interest in subject of focus. Furthermore, Weisskirch (2018) found that self-esteem was associated with learning attitudes among college students.

The second hypothesis which confirmed that self-efficacy impacted students' interest in Introductory Technology was empirically supported too. For example, Huang, et al. (2019) associated math self-efficacy with science career interest among middle school students. Also, Blotnick, et al. (2018) found significant correlation between math self-efficacy and career interests. These empirical supports are in line with Phan and Ngu (2018) findings that psychological factors influence a wide range of academic learning which is an indication that belief and trust in ones' capacity towards a particular course or subject such as in self-efficacy is one of the leading prerequisites for developing interest in learning that subject.

In the third hypothesis, interaction effect of self-esteem and self-efficacy was equally ascertained, an indication that psychological factors impact learning. This is supported by the empirical evidence in Burnette, et al. (2020) which found that growth mindset is associated with academic interest and consequence performance, just as Kumar and Varma (2018) found that self-esteem has relationship with academic interest and other academic behavior. Consider also, that Grigg, et al., (2018) findings equally proved the relationship between self-efficacy and academic interest to be positive. In view of these, the findings of the study have helped in closing some gaps in literature at the same time providing support for the model of this study.

From the findings, the implications are that internal dispositions and convictions are crucial elements of goal-directed behavior including sustaining interest on a task such as interest in Introductory Technology; it is therefore important to motivate intrinsic factors of behavior. Without proper and convincing internal motivation, there will be learning difficulties and poor learning outcomes. The limitations are based on the light that many students have diverse learning problems and challenges in accordance to their peculiar backgrounds; perhaps low self-efficacy and self-esteem were symptoms of a greater learning problem. The researcher made efforts to limit the students' problem only to the academic and school setting. Considering the implications of the study and the limitations, it is recommended that since internal motivation and other psychological paradigms are crucial to learning outcomes and hence should be provided through counseling, intentional programs aimed at providing guidance and counseling for struggling students. Schools' management may consider adopting extra-curricular activities aimed at improving social skill competence of students to improve students' self-esteem and self-efficacy.

In conclusion, students' interests in subjects are important as they influence learning outcomes. The study findings confirmed that self-esteem and self-efficacy are some of the determinants of students' interest. It is important that these aspects of internal motivations ben enhanced among students to improve learning outcomes such as interest, and performance. In view of the findings, stakeholders should emphasize proper socialization to improve students' psychological wellbeing which will invariably lead to enhanced interest in Introductory Technology and other subjects of interest.

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