

A Pivotal Stride towards Learner Autonomy: Utilising Language Learning Strategies in an ESL University

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ABSTRACT

Studies on English language learning strategies (ELLSs) predominantly emphasize their role in fostering learner autonomy (LA) in foreign language contexts, often overlooking their distinct application in English as a second language (ESL) scenario. Thus, this study addresses a significant gap in current literature regarding English Language Learning Strategies (ELLSs) in English as a Second Language (ESL) contexts, particularly in technical universities. Contrasting with the abundant research on English as a Foreign Language, this research focuses on the distinctive needs and strategies of ESL learners in fostering learner autonomy (LA). Employing a quantitative cross-sectional survey design, we examined 773 first-year students at a technical university in the 2022/2023 academic year. Participants were selected through stratified random sampling. The study utilized Oxford's Strategy Inventory for Language Learning (SILL) and Karabiyik's measures of LA, with data collection conducted via a Google form. A multiple regression analysis was applied to test the research model. Our findings indicate a significant positive impact of ELLSs on LA among ESL students. Among the six categories of ELLSs (memory, cognitive, compensation, metacognitive, affective, and social strategies), affective strategies showed the most substantial enhancement of LA. The study highlights the importance of affective strategies in promoting autonomous learning in ESL contexts, aligning with Constructivism theory.

1. Introduction

English language is widely regarded as one of the most adaptable and expressive in the world, a language with subtle verbal inflections that enables the writer to convey mood and emotion, as well as formulate ideas (Alege, 2018). English language is notable for its diversity and tendency to change. This has resulted in a wide variety of English forms in various contexts. Two of such are English as a second language and English as a foreign language. Irrespective of the English forms, prior research has put forward that learners within any of the two contexts utilise language learning strategies to acquire knowledge of the English language. Generally, language learning strategies are the specific behaviours learners employ in an effort to acquire another language. The significance of the strategies in the learning process cannot be overemphasised at an educational institution. In the context of the current study, language learning strategies are learning behaviours adopted by technical university students in the learning of English as a

second language (ESL). This technical university is one of Ghana's technical universities which were previously government-run Polytechnics and were recently turned into technical universities. The technical university students learn English as a generic Communication Skills course. They are mandated to perform better at speaking, listening, writing and reading. Consequently, they employ several learning strategies in learning the Communication Skills course.

A considerable amount of literature is devoted to delineating what a learning strategy is. Rubin (1975) defined language learning strategies as the techniques or devices a learner may employ to acquire knowledge. Oxford (1990) described language learning strategies as actions utilised by the learner to make learning easier, faster, interesting, more independent, more productive and more adaptable. Cohen and Chi (2002) refer to learning strategies as the cognitive and behavioural processes employed by learners with the intentional aim of enhancing their knowledge and comprehension of a second language.

Once the concept of learning strategies had been investigated and defined, the subsequent step involved the development of categories that were derived from the conceptualization of this concept. There are nearly a dozen classifications of language learning strategies (Mohammadi et al., 2015). For instance, O'malley et al. (1985) proposed a comprehensive framework that classifies learning strategies into three main groups, namely metacognitive, cognitive and social/affective. Rubin (1987) posited three distinct categories of strategies that exert an impact on language learning, either through direct (learning strategies) or indirect (communicative and social strategies) means. In contrast, Wenden (1991), categorised the strategies into two distinct groups: cognitive and self-management strategies.

Of all the different categorisations of strategies, Oxford's (1990) is believed to be the most comprehensive classification (Ellis, 1994; Mohammadi et al., 2015). Within Oxford's classification, a distinction was drawn between direct and indirect strategies. The direct encompass strategies that directly engage the target language, necessitating cognitive processing of the language (Mohammadi et al., 2015). The direct are memory, cognitive and compensation strategies. Memory strategies, often known as mnemonics, are strategies used to recall and transfer knowledge needed for future language use. Memorisation enables learners to retain crucial information gleaned from their studies. Cognitive strategies are used to assist learners in correctly manipulating the target language or task by utilising all of their processes. They include reasoning, analysis, and conclusion drawing. Compensation strategies are used by the learners to make up for their absence of vocabulary-based knowledge in the target language. These strategies enable learners with limited vocabularies to communicate in the target language through the linguistic cues (Kpeglo & Mortey, 2021).

The indirect strategies encompass behaviours that extend beyond just cognitive mechanisms, offering learners a means to effectively manage and organise their own learning process. By means of organising, assessing opportunities, focusing, managing fear, fostering cooperation and empathy and other techniques, these strategies indirectly assist language learning (Mohammadi et al., 2015). The indirect encompass metacognitive, affective and social strategies. Learners employ metacognitive to effectively manage the learning process through the deliberate engagement of cognitive processes such as attention, organisation, planning and evaluation. These strategies empower learners to exert authority over their own learning. Affective encompass a range of strategies that assist learners in effectively managing and controlling their emotions, attitudes and motives. Social refer to specific strategies that enable learners to engage in activities that provide opportunities for social interaction (Kpeglo & Mortey, 2021).

In relation to the concept of language learning strategies, learner autonomy emerges as a significant factor. As put forward by Bhattarai (2021), learner autonomy refers to the ability of a learner to take responsibility or take control of their own learning, such that the learner has the capacity to act in situations where the learner is fully responsible for all learning decisions and their implementation (Ting, 2015). To a large extent, the autonomous learner plays a proactive part in the learning process, developing ideas and taking advantage of learning opportunities rather than just reacting to the teacher's varied inputs (Nardo, 2017).

Based on the concepts of strategy use and learner autonomy, numerous studies have been conducted on the link between Oxford's language learning strategies and learner autonomy (Cheng et al., 2018; Iamudom & Tangkiengsirisin, 2020; Irgatoglu et al., 2022; Liu, 2015). As an instance, Ceylan (2015) investigated the language learning strategies employed by some Turkish university students and the correlation between these strategies and autonomous learning. The results revealed that these English learners employed memory, cognitive, compensation, metacognitive, affective, and social strategies. The results further revealed that the use of these strategies positively correlated with the learners' autonomy.

More so, Samaie et al. (2015) examined the associations between learner autonomy and language learning strategies. The participants in the study consisted of 150 Iranian EFL university students from Ilam Islamic Azad University, Ilam Payam-e-Noor University, and Ilam State University. The findings of Pearson Product-moment correlation analyses revealed a statistically significant positive correlation between autonomy and language learning strategies. In a study conducted by Liu (2015), the relationship between the utilisation of language learning strategies and the level of learner autonomy was investigated among a group of 150 university freshmen who were enrolled in English classrooms in central Taiwan. The study's conclusion was that the more strategies students employ, the more autonomous they may become

In the same vein, Cheng et al. (2018) assessed the link between English language learning strategy use and learner autonomy of 450 non-English major students as participants from three universities in Henan province, China. The findings reported that these learners utilised memory, cognitive, compensation, metacognitive, affective and social strategies in learning English. Pearson correlation results showed that the learners' use of these learning strategies had a positive link with their autonomous learning. Pearson correlation results reported positive correlations between language learning strategies and learner autonomy.

In addition, [Alzubi \(2019\)](#) aimed to identify the types of language learning strategies utilised by 35 pre-university students in Saudi Arabia and how these strategies relate to the learners' autonomy. The findings reported that the learners utilised memory, cognitive, compensation, metacognitive, affective and social strategies in learning English, and that these strategies fostered their autonomous learning. Besides, [Iamudom and Tangkiengsirisin \(2020\)](#) examined the link between English language learning strategies and learner autonomy among 200 students in Thailand. The findings of correlation analysis revealed positive correlations between the two variables, and that the learners employ high level of ELLSs for autonomous learning.

Further [Irgatoğlu et al. \(2022\)](#) investigated the connection between English language learning strategies and learner autonomy among university students. An analysis of Pearson correlation revealed positive correlations between English language learning strategies and learner autonomy. Moreover, [Sulistiyo and Kamil \(2022\)](#) conducted a study to investigate the link between the utilisation of ELLSs and LA of Indonesian tertiary students. The findings of Pearson correlation revealed that the learners utilised memory, cognitive, compensation, metacognitive, affective and social strategies in learning English. The findings also revealed a positive correlation between the learners' use of these learning strategies and their autonomous learning.

To a large extent, it is worth noting that the majority of the studies on English language learning strategies (ELLSs) and learner autonomy (LA) are typically from Asian countries like China ([Cheng et al., 2018](#)), Taiwan ([Liu, 2015](#)), Indonesia ([Sulistiyo & Kamil, 2022](#)) and South Korea ([Taie, 2015](#)); some Middle-Eastern countries like Iran ([Samaie et al., 2015](#)) and Saudi Arabia ([Alzubi, 2019](#)); and some European countries like Turkey ([Ceylan, 2015](#)), and have yielded similar findings, indicating a positive relationship between the utilisation of ELLSs and LA.

Regardless of the importance of ELLSs in promoting LA, a large portion of these studies primarily concentrate on learning English as a foreign language (EFL) in a university context, while studies on English as a second language (ESL) are relatively underrepresented in current literature. Yet, the dynamics of EFL¹ differ significantly from those in

ESL² context ([Sekhar & Chakravorty, 2017](#); [Shrestha, 1983](#)). Moreover, within the limited number of studies available in an ESL context, there is a scarcity of research conducted on Ghana, particularly a technical university setting, despite research ([Aboagye et al., 2017](#)) indicating a decline in English achievement within a technical university setting. Since learner autonomy is essential for English language achievement ([Jiang & Peng, 2023](#)), studying the role of English language learning strategies in fostering learner autonomy will aid technical university students improve their English achievement. Against such a backdrop, this paper seeks to examine the effects of ELLSs on LA among learners in an ESL university context. It further seeks to examine the effect of the individual categories of ELLSs (memory, cognitive, compensation, metacognitive, affective and social strategies) on LA.

This study will make a substantial contribution to the expanding body of the link between ELLSs and LA. Though several works have been carried out on this link, the current study will indicate the key role of ELLSs and LA in an ESL context. Besides, this study will not only contribute to the literature in the ESL context, but also to the paucity of such research in the Ghanaian university context. The findings of this study will offer English learners, teachers, other stakeholders and education policy makers, knowledge on the potential and alternative ways to improve autonomous learning. For instance, if learners aim to become autonomous learners, they may need to self-evaluate their learning strategies and start using those that align with Oxford's learning strategies. Besides, if teachers aim to improve learner autonomy in their learners, they may choose to examine the learning strategies employed by their students in language learning in order to help learners adopt the appropriate learning strategies. Thus, this study will contribute knowledge that forms the basis for English language teachers to constantly educate their learners on the learning strategies to enhance their autonomous learning. Since learning strategies are teachable, this study will provide education policymakers with the knowledge of the appropriate learning strategies necessary to be incorporated into the English language teaching curriculum. This will aid students in acquiring the appropriate learning strategies required for autonomous language learning. In its entirety, this study will provide valuable insights for various

¹ EFL is taught within an academic setting, such as a school subject or at an adult level. The basic intent of teaching EFL is to equip students with the necessary skills to effectively comprehend and utilise the language in various contexts. These skills include reading literary and technical texts, comprehending spoken language through mediums such as radio and movies, and utilising English for communication purposes.

² On the other hand, it is an ESL is employed as a lingua franca among individuals who possess significantly different

native languages, such as in Ghana, or used as an instructional language at educational institutions, including Ghanaian technical universities [Marckwardt, A. H. \(1963\)](#). English as a second language and English as a foreign language. *PMLA*, 78(2), 25-28. <https://doi.org/10.2307/2699267> , [Rahman, T. \(2020\)](#). Pakistani English. *The handbook of Asian englishes*, 279-296. .

stakeholders involved in language education, including policy makers, curriculum developers, syllabus designers, researchers and ESL teachers. The study encourages these stakeholders to re-evaluate the importance of ELLSs in enhancing LA during the language learning process. By doing so, stakeholders can align their policies, curricula and syllabuses to effectively implement the findings that will emerge from this study.

1.1 Theoretical Foundation

The present study is underpinned by Piaget's (1972) Cognitive Constructivism and Lev Vygotsky's (1978) Social Constructivism. According to Piaget (1972), three fundamental processes contribute to children's cognitive development: assimilation, accommodation, and equilibrium. Assimilation is the process through which a learner incorporates new information into his or her current mental framework without altering it. Accommodation is the process whereby a learner modifies his or her mental framework in order to form a new mental image capable of accommodating new information. Equilibrium is the process whereby an individual learner strikes a balance between assimilation and accommodation between him or herself and the learning environment. Thus, Piaget established a learning system in which knowledge is assessed, processed, and created, which is tantamount to autonomous learning.

However, for Piaget's process of knowledge development to manifest, Lev Vygotsky's (1978) Social Constructivism needs to be considered. According to Vygotsky, autonomous learning is only possible with the assistance (metaphorically known as scaffolding) of "more capable others" (teachers, more capable peers, parents, or others) who offer assistance to the student. These more capable others assist the learner by guiding them to the zone of proximal development or ZPD (a distinct metaphor employed by Vygotsky). The ZPD is the difference between the learner's actual level of performance and the level of performance that could be achieved with the assistance of more capable individuals. The instructor, parent, or competent peer guides the student through the ZPD until optimal performance is achieved (in this context until the child becomes an autonomous learner). The more capable others can do this through social interaction involving some strategies.

Oxford (1999) purports that Vygotsky's psychological work on self-regulation includes learning strategies. According to Vygotsky, self-regulation is "the process of planning, guiding, and monitoring one's own attention and conduct" (Berk & Winsler, 1995). Planning, directing, and monitoring, in addition to organizing and evaluating, are fundamental learning activities that educators refer to as metacognitive learning strategies.

The metacognitive strategies are internalized through social interaction with more competent persons in the surroundings. Similarly, the student internalizes cognitive learning processes such as analysis, synthesis, and evaluation, which Vygotsky refers to as "higher-order cognitive functions". Meanwhile, social engagement calls for what Oxford (1990) refers to as social learning strategies: asking questions, requesting assistance, and collaborating with others through language, or social speech. According to Vygotsky, social speech (talking with others) supports the development of egocentric speech (talking to oneself loudly), which in turn drives the development of inner speech (reflecting metacognitive strategies that guide action).

In addition to the three main groups of learning strategies (metacognitive, cognitive and social) just mentioned, Oxford (1990, 1996) recommended three more strategies (affective, compensatory and memory strategies) that may be used to foster autonomous language learning.

Applying the Constructivism theory as an organizing framework, the present study puts forward that knowledge development occurs when English as a second language learners absorb, adapt or equilibrate information from their learning environment or the broader world they inhabit. However, in order for knowledge to be developed, it is imperative to consider the utilisation of scaffolding, which assists the English learner in reaching their zone of proximal growth. As proposed by Vygotsky and Oxford, this can be accomplished by engaging in social interaction that involves the use learning strategies (memory, cognitive, metacognitive, compensation, affective and social strategies). When learning strategies help English language learners enter a zone of proximal development—where they can take charge of their English learning—they develop into autonomous learners.

1.2 Hypotheses Development and Conceptual Framework

Language learning strategies have been highlighted by researchers in the field of autonomous learning (Abdipoor & Gholami, 2016; Oxford, 2008; Sulistiyo & Kamil, 2022; Wenden, 1991) as relevant or even crucial components in the promotion of learner autonomy. Wenden (1991), for example, linked ELLSs to LA. He asserted that successful, expert or brilliant learners have mastered the art of learning. They have mastered the learning processes that allow them to confidently, flexibly, properly, and independently use these skills and information. As a result, they are self-sufficient. In support of this notion, Oxford (2008) asserted that learning strategies are predictors of learner autonomy. Furthermore, Abdipoor and Gholami (2016) stated that autonomous learners employ ELLSs more frequently than non-autonomous learners.

Despite the fact that findings of several empirical investigations (Cheng et al., 2018; Irgatoğlu et al., 2022; Samaie et al., 2015) have indicated a strong association between learner autonomy and the use of ELLSs, the correlations between the subcategories of ELLSs and LA are inconsistent. For instance, Samaie et al. (2015) analysed the correlations between ELLSs and LA among Iranian EFL university students majoring in English Language Teaching, English Language Translation, and English Language Literature from Ilam Islamic Azad University, Ilam Payam-e-Noor University, and Ilam State University. The findings from their study indicated that there was an overall positive correlation between ELLSs and LA. Specifically, the metacognitive strategy had the highest positive relationship with learner autonomy, followed by social, cognitive, memory, and affective, with compensation as the least correlated sub-variable. The highest correlation between learner autonomy and metacognitive strategy revealed that autonomous students have the ability to self-monitor, self-evaluate, set goals and objectives, seek practical opportunities and identify the purpose of a language task.

Similar results can be found in the work of Cheng et al. (2018). This study examined the relationship among ELLSs and LA of Chinese EFL Learners from three universities in Henan province, China. The findings showed that there existed a positive association between ELLSs and LA. In line with this, metacognitive was the category that had the highest correlation with learner autonomy, followed by cognitive, social, affective, memory, and compensation. This highest correlation was attributed to the fact that metacognitive strategy involves making learning plans, self-monitoring, and self-evaluation, thus, tends to have the greatest influence on learner autonomy.

Different from the above-mentioned results, Chen and Pan (2015) investigated ELLSs and LA among students in central Taiwan. The results indicated a positive correlation between the use of ELLSs and LA levels. The results also indicated that the participants had a medium level of English LA and used ELLSs seldom. The findings further revealed that the cognitive strategies were most correlated with LA, whereas the affective strategy was least correlated with LA.

Also, Liu (2015) examined the relationship between language learning strategy use and autonomy of university freshmen taking English classes in central Taiwan. The findings indicated that a positive correlation between ELLSs and LA. Yet, concerning

the categories of ELLSs, the cognitive strategies were highly correlated with learner autonomy. This was followed by metacognitive, social, memory, affective, and compensation. According to this study, the strong links between autonomy and the use of strategies in the cognitive and metacognitive categories seemed to establish the importance of learner reflection in the development of autonomy.

Furthermore, Iamudom and Tangkiengsirisin (2020) compared foreign school students and Thai public school students in a tutorial school to explore ELLSs and LA among Thai EFL learners. The results showed that Thai public-school students exhibited a higher level of LA and used ELLSs more than foreign school pupils. Students in Thai public schools primarily employed compensation strategies, whereas students in international schools primarily used cognitive strategies.

From the above review, ELLSs and LA were found to be tightly linked. That is, students become more autonomous language learners as they use learning strategies more frequently. Indeed, learning strategies and learner autonomy, particularly when used by well-informed students, put students at the centre of the L2 classroom (Weaver & Cohen, 1998), allowing them to make pedagogically sound decisions about their learning (Nunan, 1995).

In summary, there is a possible connection of memory, cognitive, compensation, metacognitive, affective, and social strategies with learner autonomy. It is rational then, as shown in Figure 1, to ascertain that even in a Ghanaian technical university context, memory, cognitive, compensation, metacognitive, affective, and social language learning strategies can enhance autonomous learning. Therefore, it is hypothesized that:

H1: Language learning strategies have a positive effect on Learner autonomy.

H1a: Memory strategies have a positive impact on Learner autonomy.

H1b: Cognitive strategies have a positive impact on Learner autonomy.

H1c: Compensation strategies have a positive impact on Learner autonomy.

H1d: Metacognitive strategies has a positive impact on Learner autonomy.

H1e: Affective strategies have a positive impact on Learner autonomy.

H1f: Social strategies have a positive impact on Learner Autonomy.

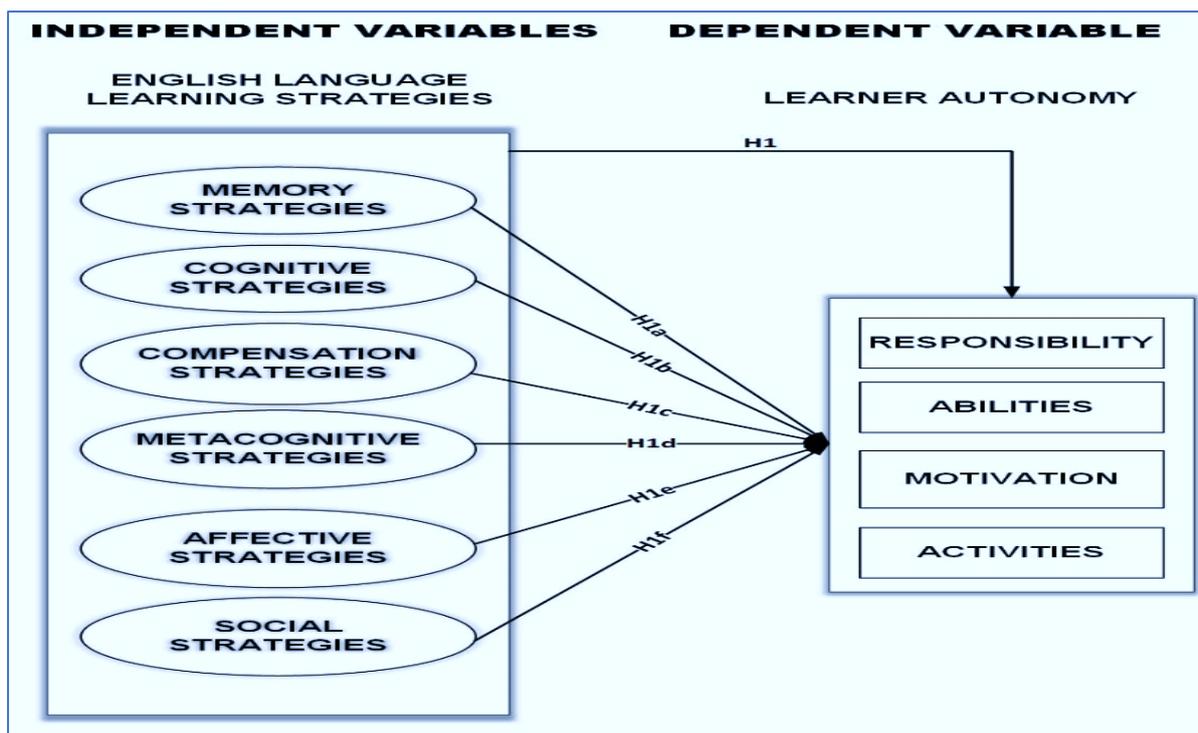


Figure 1.1 Conceptual Framework

2. Method

2.1 Design and Sampling

The researchers used a quantitative approach with cross-sectional survey. The sample was drawn from a technical university in Ghana. This technical university was chosen because the use of the English language by the students has deteriorated considerably over the years, as evidenced by their theses, exam scripts, course assignments, and occasionally their interactions with lecturers during contact hours. Questions on the factors involved in advancing English Language learning at the technical university have elicited subjectively divergent responses, prompting empirical research to validate some of these assertions. Data were collected from the 2022/2023 first-year students from the three academic programs (Diploma of Technology, Higher National Diploma, and Bachelor of Technology) because the first-year students were currently registered for the generic English Communication Skills course.

Preceding to the selection of the required sample, the total number of learners in the selected technical university was reviewed. The target population of 2326 first years was stratified into three strata: Diploma of Technology at 558, Higher National Diploma at 419, and Bachelor of Technology at 1349. Stratification was used to guarantee a comprehensive portrayal of the target population and to mitigate any potential sampling bias. The researchers utilised Yamane's formula for sample size calculation (Yamane, 1967) to determine the appropriate sample size for their study. With a confidence level of 95% and an error margin of

0.03, the calculated sample size was 752. Nonetheless, taking into account a non-response rate of 10%, the researchers ultimately determined that a sample size of 827 would be appropriate. This sample size aligns with the suggested minimum sample size for conducting multiple regression analyses (Jenkins & Quintana-Ascencio, 2020).

The proportionate allocation formula was applied to calculate the sample size for each stratum based on the population for each stratum (Danish & Rizvi, 2021):

$$nh = n \times \frac{Nh}{N}$$

where,

nh = sample size for a stratum,

n = calculated sample size

Nh = target population for a stratum

N = the overall population size,

Diploma of Technology = 198, Higher National Diploma = 149, and Bachelor of Technology = 480. Random sampling was then used to select the sample sizes from each stratum.

2.2 Data Collection and Ethical Considerations

The researchers sought approval from the selected technical university by explaining the importance of the study to the university management. Access to the lecture rooms was negotiated with the lecturers, who informed their students about the current study. First, briefing was held with the students to explain the significance of the study. Those that were willing to take part in the study (sample frame) provided their student identification numbers (ID) and phone numbers. The ID numbers were divided into three sub-

groups (Diploma of Technology, Higher National Diploma and Bachelor of Technology). The sample size for each subgroup was drawn from the sample frame using a lottery system based on the identification numbers. Sampled students were contacted and WhatsApp platforms were created for them. The researcher then met the sampled students based on their sub-groups in designated lecture rooms and a second briefing was given to re-explain the significance of the study and how to complete the web-based questionnaire. The researcher then administered the questionnaire to them via the WhatsApp platforms

Participants were assured of maximum protection of their rights and privacy in the study. They were assured of anonymity and confidentiality of the data, which is for research purposes only. They were not permitted to disclose their names or any personal information that could link them to the questionnaire. In addition, participants had the right to withdraw at any time with no penalty. However, they were assured that there will be no expected risks associated with participating in the study. Participants were expected

to willingly and voluntarily give their responses without any coercion or oppression from the researcher. Moreover, participants were informed that completing and submitting the questionnaire is considered informed consent for participation in the study.

2.3 Measurement Scales

2.3.1 Participants' Characteristics

The demographic profile included Gender (1 = Male, 2 = Female), Age (1 = Below 18 to 4 = 27 and above), and Program (1 = Diploma of Technology to 3 = Bachelor of Technology). These were used to characterize the study's sample. Thus, they were not included in the main results. Eight hundred and twenty-seven (827) first year students were approached to fill out the questionnaires for the study; however, 781 (94.43%) participated in the study. Eight participants were excluded due to incomplete responses. Therefore, 773 questionnaires were used for the data analyses. The result of the participants' characteristics is illustrated in [Table 2.1](#).

Table 2.1. Demographic Characteristics of Respondents

Variables	Characteristics	Frequency	Percent (%)
Gender	Male	472	61.06
	Female	301	38.94
	Total	773	100.00
Age	Below 18 years	30	3.9
	18-22 years	443	57.3
	23-26 year	180	23.3
	27 and above	120	15.5
	Total	773	100.00
Program of study	Diploma of Technology	186	24.06
	Higher National Diploma	139	17.98
	Bachelor of Technology	448	57.96
	Total	773	100.00

The result shows more than half of the respondents were males. This indeed attests to the fact that tertiary education in Ghana is dominated by males ([Christel, 2020](#)). The results of the analysis of the age of respondents indicated that the majority of the respondents fell within the ages of 18-22 years. From the perspective of the program of study, the results indicated that the majority of the respondents were pursuing a Bachelor of Technology Degree, while the least number of respondents were pursuing Higher National Diploma (HND).

2.3.2 Language Learning Strategies

The measures of ELLSs were developed from [Oxford's \(1990\)](#) Strategy Inventory for Language Learning (SILL). SILL has been employed in countless studies on ELLSs ([Almusharraf & Bailey, 2021](#); [Alrashidi, 2022](#); [Aziz & Shah, 2020](#); [Cheng et al., 2018](#); [Habók & Magyar, 2018](#); [Rubaai et al., 2019](#); [Samaie et al., 2015](#)) and has been proven to have appropriate reliability and validity. This is a 50-item inventory that uses a five-point Likert scale ranging from 1 = never or

almost never true of me to 5 = always or almost always true of me. The constructs are Memory strategies, Cognitive strategies, Compensation strategies, Metacognitive strategies, Affective strategies, and Social strategies. Thus, the scale entails 6 subscales: memory strategies (9 items), cognitive strategies (14 items), compensation strategies (6 items), metacognitive strategies (9 items), affective strategies (6 items), and social strategies (6 items). Oxford's SILL indicated an excellent measure of reliability within ESL contexts (Cronbach's α ranged from 0.86 to 0.91) (Mohammadi & Alizadeh, 2014). In the current study, the wording of the scale was modified to align with the purpose of this study and the SILL scale, as applied in this study, showed an appropriate internal consistency (Cronbach's $\alpha = 0.931$)

2.3.3 Learner Autonomy

The measures of LA were adapted from the work of Karabiyik (2008). In the present study, language learning strategies are considered as the independent variable; hence the last construct in this scale, which measures general strategies was not applied. Thus, four constructs: Responsibility, Abilities, Motivation, and Activities were used to measure LA. Responsibility is a 14-item scale with a 5-point Likert response ranging from 1 = Completely the teacher's to 5 = Completely mine. Abilities is a 10-item scale with a 5-point Likert response ranging from 1 = Very Poor to 5 = Very Good. Motivation is a 1-item scale with a 5-point Likert response ranging from 1 = Not all Motivated to 5 = Highly Motivated. Activities is a 20-item scale with a 4-point Likert response ranging from 1 = Never to 4 = Frequently. Karabiyik (2008) indicated an appropriate measure of reliability (Cronbach's $\alpha = 0.888$). In our study, the questionnaire's wording was modified and the Cronbach's α of 0.962 demonstrated appropriate internal consistency

2.4 Data analysis

The researchers employed a multiple regression model to access the proposed research model. They employed Statistical Package for Social Sciences (SPSS) v. 23 to perform the analyses. Multiple regression is a statistical method for analysing the connection between a number of independent variables and one dependent variable. The regression model aims to use the independent variables to predict a dependent variable (Trunfio et al., 2022).

Multiple regression analysis enables researchers to evaluate the strength of the connection between an outcome (the dependent variable) and multiple predictor variables, as well as the significance of each predictor in the relationship, often while controlling for the influence of other predictors. Because this research involves multiple independent variables, multiple regression was employed to test the strength between the outcome (learner autonomy) and the multiple predictor variables (ELLSs) as well as the significance of each predictor (each category of ELLSs) on learner autonomy.

3. Results

3.1 Effect of English Language Learning Strategies on Learner Autonomy

The objective of this section is to provide a resolution to the first research objective and subsequently the main hypothesis (*H1*). The results of the multiple regression analysis is presented in two-folds: the model summary and the regression coefficients. The model summary does not provide resolution to the first research objective. It presents outcomes that illustrate the extent to which the data is aptly suited to address the research question. In contrast, the regression coefficients provides a resolution to the first research objective and, by extension, the main hypothesis.

3.1.1 Model Summary of the Effect of ELLSs on LA

The model summary provides a concise overview of the correlation that exists between the independent variable (ELLSs) and the dependent variable (LA). Correlation entails quantifying the degree of correlation or connection between two (or more) variables in order to ascertain whether they exhibit a positive, negative or insignificant relationship. If there is a positive correlation between two variables, it implies that as the value of one variable increases or decreases, the value of the other variable also increases or decreases correspondingly. On the contrary, if there is a negative correlation between two variables, it implies that as the value of one variable increases, the value of the other variable decreases, or vice versa (Obilor & Amadi, 2018).

The outcome of a correlation analysis yields a correlation coefficient that spans the range of -1 to +1. A correlation coefficient of +1 signifies a perfect positive correlation between the variables under investigation. Conversely, a correlation coefficient of -1 indicates a perfect negative correlation. On the other hand, a correlation coefficient of 0 suggests the absence of a correlation between the variables (Gogtay & Thatte, 2017). Additionally, correlation coefficient below 0.40, regardless of its positive or negative direction, is categorised as low. On the other hand, a correlation coefficient ranging from 0.40 to 0.60 is deemed moderate, while a correlation value exceeding 0.60 is classified as high (Obilor & Amadi, 2018). The model summary also presents the R-square value which explains the extent to which the independent variable explains the dependent variable. The R-square value is often given as a percentage and falls between 0 and 1 (Ozili, 2023). The results are presented in Appendix Table 1.

As shown in Appendix Table 1, there is a high positive correlation between ELLSs and LA, with a correlation coefficient of $R = 0.711$. This indicates autonomous learning rises in tandem with the use of ELLS. Again, as shown in Table 2, the value of the R-square (0.505) implies that 50.5% of the variation in LA is explained by ELLSs, while 49.5% of the

variation in LA can be attributed to other variables which are not included in the present study. It could be seen that the R-square value falls within the acceptable threshold. Adjusted R-squared is a modified variant of R-squared that has been adjusted for the number of independent variables in the model. The adjusted R squared value only considers those independent variables that actually affect the dependent variable. In this study, the adjusted R-square value of 0.504 implies

that 50.4% of the changes that take place in LA are because of the independent variable (ELLSs) used in the model.

3.1.2 Regression Coefficient

The first objective was to examine the effect of ELLSs on LA. The results are presented in Figure 3.1.

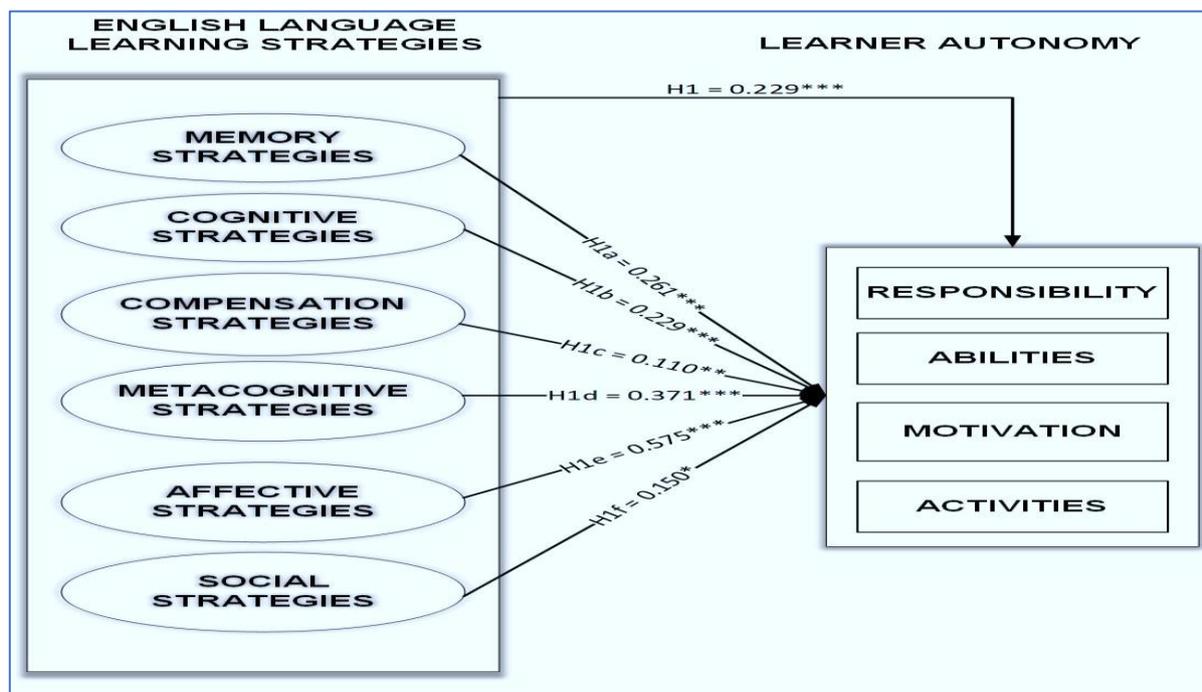


Figure 3.1. Effect of ELLs on Learner Autonomy

Effect is significant at *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. *** represents a significant level of 0.001; ** represents a significant level of 0.01; * represents a significant level of 0.05

Hypothesis 1 tested the positive the effect of ELLSs on LA. The findings of the study indicate that ELLSs have a significant and positive impact on LA among the technical university learners ($\beta = 0.229$), with a statistically significant level of $p = 0.000$ which is below the recommended significant levels. The finding demonstrates that a one-unit rise in ELLSs is associated with a corresponding improvement of 0.229 in LA. Thus, the main Hypothesis (H_1), which states that “have a positive effect on Learner autonomy” is accepted. As the learners' language learning strategies improves, their ability to learn autonomously also improves. It seems the Technical University learners demonstrate a significant utilisation of language learning strategies to enhance their autonomous learning. Thus, the proper implementation of these strategies allows students to acquire the English language more easily, quickly, efficiently, and autonomously (Oxford, 1990).

3.2 Effects of Each of the Six Categories of Language Learning Strategies on Learner Autonomy

The objective of this section is to provide a resolution to the second research objective and subsequently the hypotheses ($H1a-f$). Multiple regression analysis was performed to examine the individual effects of the six categories of ELLSs (memory, cognitive, compensation, metacognitive, affective and social) on LA. This analysis is presented in two-folds: the model summary and the regression coefficients. The model summary does not provide the actual result to objective two. It provides evidence of the data's suitability for responding to the second research objective. Thus, it summarises the correlation that exist among the independent variables (memory, cognitive, compensation, metacognitive, affective and social) and dependent variable (learner autonomy). It also presents results of the R-square value which explains the extent the independent variables explain the dependent variable. This is presented in Appendix Table 2.

3.2.1 Model Summary

Appendix Table 2 presents a summary of the correlation between the use of Memory, Cognitive, Compensation, Metacognitive, Affective, Social Strategies and Learner autonomy. As shown in Appendix Table 2, there is a strong positive correlation ($R = 0.750$) between memory, cognitive, compensation, metacognitive, affective, social learning strategies, and LA. In other words, memory, cognitive, compensation, metacognitive, affective, social learning strategies increase in tandem with LA.

The value of the R-square (0.563) implies that 56.3% of the variation in learner autonomy is explained by all the independent variables in the study, while 43.7% of the variation in learner autonomy can be attributed to other variables which are not included in the present study. This shows the R-square value falls within the acceptable threshold. Adjusted R-square is a modified variant of R-squared that has been adjusted for the number of independent variables in the model. The adjusted R squared value only considers those independent variables that actually affect the dependent variable. In this study, the adjusted R-square value of .559 implies that 55.9% of the changes that take place in learner autonomy are because of the six independent variables (memory, cognitive, compensation, metacognitive, affective, and social strategies) used in the model.

3.2.2 Regression Coefficients

The second objective was to examine the individual effects of the six categories of ELLSs (memory, cognitive, compensation, metacognitive, affective, and social) on LA. Hypotheses 1a to 1f (**H1a-f**) tested the effects of memory, cognitive, compensation, metacognitive, affective, and social strategies on learner autonomy. The standardized coefficient for the effect of memory strategies on learner autonomy is $\beta = 0.261$, with a statistically significant level of $p = 0.000$ which is below the significant level of $p < 0.001$. This indicates a positive effect of memory strategies on LA. The finding revealed that a percentage change in memory strategies will lead to a corresponding improvement of 0.261 in

LA. Based on the results, the hypothesis **H1a** is accepted. Also, as could be seen from the results, cognitive strategies positively influence LA with a beta value of 0.229, and significant level of $p = 0.000$, below the threshold of $p < 0.001$. The finding revealed that when there is a unit increase in cognitive strategies, LA will improve by 0.229. This provided support for **H1b**. Regarding the effect of compensation strategies on LA, the results indicated a positive effect with a beta value of 0.110 at a significant level of $p = 0.008$, which is below the threshold of $p < 0.01$. Thus, the researcher accepted **H1c**. When examining metacognitive strategies, it was observed that they have a statistically significant positive impact on LA ($\beta = 0.371$), with a significance level of $p < 0.001$. This indicates that a unit increase in metacognitive strategies will lead to an increase of 0.371 in LA.

Thus, **H1d** was accepted. When examining affective strategies, it was observed that they have a statistically significant positive impact on LA ($\beta = 0.575$, $p < 0.001$). This indicates that a unit increase in affective strategies will lead to an increase of 0.371 in LA. Thus, **H1e** was accepted. The findings further revealed a positive effect of social strategies on LA with a beta value of 0.150 at a significant level of $p = 0.026$, which is below the threshold of $p < 0.05$. The findings revealed that when there is a unit increase in social strategies, LA will improve by 0.150. Based on the results, the researcher accepted **H1f**. Overall, the results indicate that affective strategies had the most impact on the learners' autonomy, followed by metacognitive, memory, cognitive and social strategies.

Compensation strategies had the least impact on the learners' autonomous learning. Probably, the learners' capability to regulate their emotions and their drive to learn are likely to be the primary factors that contribute to their development as autonomous learners. Yet, apparently, relying on linguistic cues may not significantly aid the learners in achieving autonomy. These findings diverge from a study conducted by [Chen and Pan \(2015\)](#) that suggested affective strategies had the least impact on autonomous learning. A summary of the proposed hypotheses is presented in Table 3.1.

Table 3.1 Summary of Hypotheses Testing of the Effects of Language Learning Strategies

Hypotheses	Hypotheses Description	Results
H1	Language Learning Strategies have positive impacts on Learner Autonomy	Supported
H1a	Memory Strategies has positive impact on Learner Autonomy	Supported
H1b	Cognitive Strategies has positive impact on Learner Autonomy	Supported
H1c	Compensation Strategies has positive impact on Learner Autonomy	Supported
H1d	Metacognitive Strategies has positive impact on Learner Autonomy	Supported

Hypotheses	Hypotheses Description	Results
H1e	Affective Strategies has positive impact on Learner Autonomy	Supported
H1f	Social Strategies has positive impact on Learner Autonomy	Supported

4. Discussion

This present study examined the effect of English language learning strategies (ELLSs) on Learner Autonomy (LA) of the students of a Technical University. It further determined the individual effects of the six categories of ELLSs (Memory, Cognitive, Compensation, Metacognitive, Affective and Social) on LA.

Regarding the first objective, this study demonstrated a statistically significant positive effect of ELLSs on LA. The results that language learning strategies can have significant impact on learner autonomy are re-echoed in the findings of previous literature (Ansari & Natalia, 2020; Iamudom & Tangkiengsirisin, 2020; Liu, 2015), which concluded that the effective use of a learning strategy was the key to developing students' autonomous learning ability. As stated previously, autonomy is not necessarily an innate ability, it can be developed (Basri, 2023; Holec, 1979). To facilitate the acquisition of learner autonomy, it is necessary to consider the significance of strategies. In the literature, learning strategies are regarded as the central factor that guides and shapes the learning behaviour of ESL learners to make them autonomous learners. Several researchers (Liu, 2015; Oxford, 1999; Wenden, 1991) viewed language learning strategies as approaches to control and manage learning, i.e., to implement autonomy in learning. These studies have indicated that learning strategies can be utilised to foster learner autonomy.

In the present study, one plausible explanation for the positive effect of ELLSs on LA is due to the learners' level of knowledge of the English language and the control they have over their own learning as university students. Apparently, these learners use the learning strategy of linking their prior knowledge of English to new knowledge they are exposed. This, in turn, enhances better comprehension of the English language (Priebe et al., 2012). Consequently, such better comprehension leads to their control over their learning of the English, reducing their reliance on constant teacher support to comprehend newly acquired knowledge. Some scholars have put forward that the level of knowledge is a significant factor in predicting self-directed learning (Lapidow & Walker, 2022; Yang et al., 2018). That is, a high level of knowledge can lead to high level of control over one's learning, which in turn can foster learner autonomy. In a recent study conducted by Khulaifayah et al. (2021), the authors examined the phenomenon of autonomous learning among students enrolled in the English language department at a private university in Indonesia. The findings of the study revealed that

learners' perspectives strongly suggest that knowledge plays a crucial role in fostering their independence and self-directedness in the learning process.

Another plausible explanation for the positive effect of ELLSs on LA is due to the fact the technical university students make extensive use of ELLSs to aid in the learning and application of English language knowledge that they absorb, retain, and recall, which in turn, fosters LA. More so, the extensive use of these strategies may be attributable to the fact that they are university students who are required to take Communication Skills in English. Opposed to students who enrol in English classes for self-improvement or enjoyment, these students learn English to pass their programme and enhance their academic achievement and professional expertise.

This motivates them to take control over their learning so they will be able to pass through their programme successfully. Indeed, fear of failing the course and not graduating from the programme could be a key impetus for students to employ these strategies to enhance their autonomous learning in an effort to acquire English proficiency. This result is in line with previous studies conducted in different contexts which revealed the positive role of the use of the English language learning strategies in promoting learner autonomy (Rezalou & Altay, 2022; Sulistiyo & Kamil, 2022; Yu, 2020).

Overall, it appears that the technical university learners use a high proportion of language learning strategies to aid in their autonomy of learning. The findings revealed that the students' autonomous learning is due to the use of learning strategies, as the correct use of learning strategies enables the learners to acquire the English language more readily, rapidly, effectively, and independently (Oxford, 1990).

With regard to the second objective, the results confirmed positive effects of memory, cognitive, compensation, metacognitive, affective and social strategies on LA. In other words, these six categories foster autonomous learning of university students. These findings are in line with past studies, mostly conducted in the ESL context, that have established a link of memory, cognitive, compensation, metacognitive, affective and social strategies with LA (Cheng et al., 2018; Irgatoğlu et al., 2022; Samaie et al., 2015). However, it is worth noting that the majority of these studies established only the correlations between the strategies and learner autonomy. In contrast, the present study employed multiple regression analysis to demonstrate that memory, cognitive, compensation, metacognitive, affective and

social strategies are not only related with learner autonomy but also improve LA.

The positive role of memory strategies in augmenting LA could be attributed to the fact that the students of technical university use the memory strategies in memorising and recovering new information. The students sometimes employ these strategies in order to memorise words and bring them to mind when it is necessary to utilise them. Memory strategies allow students to retrieve their previously acquired knowledge and serve as effective mental tools. Learning in this way helps the students become autonomous in their English learning. This finding provides support for prior studies which indicated that there is a positive relationship between memory strategies and learner autonomy (Jianfeng et al., 2018; Samaie et al., 2015). Nonetheless, in the present study, memory strategies are the third most influential of the six categories on learner autonomy, which contradicts some prior studies conducted on the link between memory strategies and learner autonomy (Irgatoglu et al., 2022; Jianfeng et al., 2018). It is worthy to note that most of these studies were conducted in an EFL context. Thus, this result opens up an insight into the use of memory strategies in an ESL context.

More so, the findings indicated that cognitive strategies have a positive effect on LA. Cognitive strategies enable students to comprehend and create knowledge in a language by providing them with opportunities to practise, summarise, reason deductively and analyse (Azizah & Soraya, 2023; Oxford, 1990). In the present study, it would appear that the cognitive strategies help the students to understand and produce the English language by engaging in English language drills, repetitions, reviews, translations, transfers, as well as reasoning and analysis. This, in turn, helps them to become autonomous students. Similar results are found in the past studies (Chen & Pan, 2015; Cheng et al., 2018), which have shown a positive relationship between cognitive strategies and learner autonomy. In the present study, cognitive strategies are the fourth most influential of the six categories on learner autonomy, contrary to Shang and Kou's (2015) research on the multiple regression analysis of learning strategies and learner autonomy in an EFL context. According to their study, cognitive strategies are the second most influential of the six categories on learner autonomy.

In addition, the positive role of compensation strategies in fostering LA could be attributed to the fact that the technical university students use the compensation strategies in compensating for a dearth of vocabulary by using linguistics cues to predict meanings or by inventing words using linguistics cues to guess meanings. Several challenges may arise while the students learn a language, and compensating strategies assist the students of in overcoming these challenges. The students use 'intelligent guessing' to expedite their learning, which may help them become

autonomous. This matches with findings of some previous studies like Jianfeng et al. (2018) and Samaie et al. (2015). In the present study, the study's findings indicate that compensation strategies have the least impact on learner autonomy. This contradicts the study of Iamudom and Tangkiengsirisin (2020) on the link between compensation strategies and learner autonomy within the context of EFL. Their study found that Thai EFL students in a Thai public school mostly make use of compensation strategies for autonomous learning.

Also, the findings indicated that metacognitive strategies have a positive effect on LA. Subsequently, most studies have shown that to achieve learner autonomy, students need to make use of mostly metacognitive strategies. Metacognitive strategies are the strategies through which students process their cognition during learning (Oxford, 1990). Metacognitive strategies correspond to higher executive skills such as planning, monitoring and self-evaluation (O'malley et al., 1990). These strategies are also employed to organise and self-direct language learning (Rubin, 1987), which results in autonomous learning. However, in the present study, the findings indicated that metacognitive strategies are the second most influential of the six categories on learner autonomy. This finding contradicts some studies on the relationship between language learning strategies and learner autonomy (Chetin & Mede, 2022; Samaie et al., 2015; Sulistiyo & Kamil, 2022). These studies reported that to achieve learner autonomy, students need to predominantly make use of metacognitive. Yet, it is worth mentioning that these studies were conducted in EFL contexts such as China, Saudi Arabia, Turkey, and others, while the present study was conducted in an ESL context. Thus, this opens an avenue to clarify whether different language learning strategies are needed for autonomous learning within an ESL university context. After all, the use of English in these two contexts is different.

Similarly, the findings indicated that affective strategies have a positive effect on LA. The findings of this current research confirm Rubin's (1987) assertion that the use of affective learning strategies improves students' ability to work autonomously without the presence of the teacher. Apparently, the students have the ability of reducing their anxiety through gradual relaxation, self-encouragement, and self-assessment. The students' ability to manage their emotions or feelings in the learning process of English; their motivation towards the learning of English, and their self-assessment of their feeling towards learning English aid them to develop self-directed learning or become autonomous students. Similarly, as emphasised in the works of Jianfeng et al. (2018) and Chetin and Mede (2022), there is a positive link between affective learning strategies and learner autonomy. Despite the significance of these strategies in fostering learner autonomy in the present study,

studies examining the role of affective learning strategies in autonomous learning remain on the periphery of the current body of research. Indeed, a thorough review has revealed that there is yet to indicate a study that shows that affective strategies positively impact learner autonomy. The majority of the previous studies concentrate on the effect of affective factors on learner autonomy (Hosseini et al., 2023; Qian, 2022). Therefore, additional research is required to establish that in an ESL context, specifically a university setting in Ghana, affective learning strategies may be the most effective at fostering autonomous learning.

Moreover, the majority of the studies on affective strategies and learner autonomy indicate a correlation and not an effect, and even at that, the results of these studies have shown that affective strategies are not the strategies that strongly correlate with learner autonomy. For instance, the study of Chen and Pan (2015) discovered that affective methods were the fifth most correlated with learner autonomy. Jianfeng et al.'s (2018) study also revealed that affective strategies were the fourth most correlated with learner autonomy. It is important to acknowledge that in the current study, affective strategies are the most influential of the six categories on learner autonomy.

Furthermore, the positive role of social strategies in fostering LA could be attributed to the fact that the students learn the English by communicating with others. According to Chamot (1987), social strategies are the collaborative skills that language students develop when interacting with their peers or significant others to address errors and retain feedback in order to increase their proficiency in the English language. Therefore, social strategies will serve as the foundation for the activities involving interaction and communication. The findings in the present study provide support for prior studies that have indicated a positive correlation of social learning strategies with learner autonomy (Koç & Koç, 2016). The findings in the present study show that the social strategies do not only positively correlate with learner autonomy but also positively influence learner autonomy. Besides, the findings indicated that social strategies are the fifth most influential of the six categories on learner autonomy among technical university students. Apparently, despite the fact that some students appear to use learning strategies they are not entirely aware of the significance of using social learning strategies for autonomous learning. Similar finding is found in the study of Koç and Koç (2016) conducted among Turkish university English language students. Their findings indicated that due to lack of knowledge of social learning strategies, the students rarely used social strategies for autonomous learning.

In its entirety, of all the categories of the language learning strategies, the affective strategies have the highest effect on learner autonomy, followed by metacognitive, memory, cognitive, social and

compensation strategies. The results illustrate the two broad categories of language acquisition strategies proposed by Oxford (1990), namely direct and indirect. In studying English, indirect learning strategies aid the students in becoming more autonomous than direct ones, as indicated by the projections of the results.

The use of affective strategies appears to contribute the most to the prediction of learner autonomy among the university students due to having the greatest impact on learner autonomy. Affective strategies alone could predict 57.5% of the variance in autonomy. Overall, the use of affective strategies functioned as a significant and powerful predictor of autonomy in learning English as a second language. Perhaps, the capacity of students to control their feelings during the English learning process, their drive towards English learning, and their own evaluation of their feelings towards English learning help them develop self-directed learning or become autonomous students.

The findings of the study suggest that compensation strategies have a minimal effect on learner autonomy. It seems that utilising linguistic cues for meaning inference or word creation as strategies to compensate for a limited vocabulary may not substantially boost the development of student autonomy.

This study shows some significant pedagogical implications. With regard to the result of the effect of the English language learning strategies on learner autonomy, it was revealed that all the six categories of the strategies promote autonomous English learning of Ghanaian university students, as also seen in studies such as Jianfeng et al. (2018). These strategies are the key to fostering students' self-directed learning skills and enhancing their language achievement. Due to the tertiary system of education in Ghana, even though students view the teacher as an authority figure in the classroom, they need to assume some responsibilities for their learning and make decisions about it, particularly outside the classroom; thus, making them autonomous learners. If there is to be an implementation of a curricula that incorporates assessment standards that demand autonomous learning from students, teachers will need to contribute by embracing a re-evaluation of their responsibilities and then create a learning environment that will enable them to teach the learning strategies for autonomous learning. Through the implementation of the strategies at the tertiary level, teachers change their roles of knowledge experts to facilitators who give the students the room to practice the strategies (Shang & Kou, 2015).

Additionally, the findings further revealed that affective strategies promote autonomous learning the most. It is important, therefore, for teachers and other stakeholders to promote the use of affective strategies in and outside the classroom. While there are many to

mention in detail, certain affective strategies such as relaxation, deep breathing, positive self-talk, reward, diary writing and sharing feelings with others, have all been demonstrated to promote student autonomy in English language learning. Consequently, Teachers should encourage the utilisation of these strategies through classroom learning activities that stimulate students to employ affective strategies. The learners should be taught how they can use these strategies in their English learning. Teachers should familiarize their students with these affective strategies to enable them to use the strategies automatically to manage their emotions when learning English.

5. Conclusions

This study investigated the impact of English Language Learning Strategies (ELLSs) on Learner Autonomy (LA) in an ESL context, focusing on a technical university in Ghana. It explored how ELLSs, divided into six categories - memory, cognitive, compensation, metacognitive, affective, and social - influence LA. The key findings indicate a positive correlation between ELLSs and LA, with affective strategies being most influential, particularly in managing speaking anxiety and promoting self-regulation in learning. Compensation strategies, though used, showed the least impact. This research fills a significant gap by focusing on an ESL environment at the university level in Ghana, a setting previously underexplored. A novel aspect of this study is its use of regression analysis, contrasting with the correlation analyses common in existing literature. This approach provides a deeper understanding of how ELLSs contribute to enhancing LA. The results are pivotal in understanding the dynamic between learning strategies and autonomy, particularly in oral communication skills.

However, the study has limitations. Its cross-sectional nature provides a basis for future longitudinal studies to further elucidate the impact of ELLSs on LA in Ghana. The research's scope, limited to first-year students at one technical university, suggests the need for broader studies to confirm the findings across different educational settings and student groups. Despite these limitations, this study offers significant insights and lays the groundwork for further research in the field of language learning strategies and learner autonomy.

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Appendix Table 1: Model summary^b link between ELLSs and Learner Autonomy

Model	R	R-Square	Adjusted R Square	Std. Error of Estimate
1	0.711 ^a	0.505	0.504	2.433

a. Predictors: (Constant), ELLSs

b. Dependent Variable: Learner Autonomy

Appendix Table 2: Model Summary^b of the link between the Six Categories of ELLSs and Learner Autonomy

Model	R	R-Square	Adjusted R- Square	Std. Error of Estimate
1	0.750a	0.563	0.559	11.624

a. Predictors: (Constant), Memory, Cognitive, Compensation, Metacognitive, Affective, and Social

b. Dependent Variable: Learner Autonomy