



Self-study mobile-assisted language learning and students' English writing strategies

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ABSTRACT

This paper explores the way the demographic factors, usage behaviours, and learning strategies of English writing students affect their proficiency in writing by using Mobile-Assisted Language Learning (MALL) tools. In particular, it poses the following question: How do the demographics, MALL use patterns, and learning strategies of the learners interact to influence their proficiency in writing English? The online questionnaire was used to gather data on 124 university students in Kalimantan. Descriptive analysis showed that 67 per cent of the participants are female, with a majority of them being aged 18 to 20 years. Most of them applied MALL tools to train text types (28 percent), improve the writing style (21 percent), and grammatical accuracy (19 percent). The findings have shown great scores of self-direction (86%), problem-solving orientation (79%), which portrays proactive and reflective learners. All of those strategies were related to enhanced writing abilities at all levels. The conclusion of the paper is that the integration of the MALL tools can enhance self-directed and problem-based learning in writing classes. The results provide a helpful contribution to educators in the creation of adaptive and strategy-based MALL-assisted instruction writing.



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INTRODUCTION

Mobile technology has also significantly transformed many fields in life, including education. To be more precise, one of the considerable subfields of language education, MALL, has been receiving an increasing amount of attention lately because of its ability to improve the language learning and writing abilities of students (Al-Shehab, 2020; Garcia-Ponce et al., 2023; Mortazavi et al., 2021; Pollard, 2018). Such a transition to MALL is noticeable especially among students of higher education who are increasingly using mobile technologies to achieve academic advantages. The number of studies examining the potential of MALL is quite numerous, with many of them dedicating their attention to the overall effect of MALL on language learning. Nevertheless, (Alhuwaydi, 2022; Stockwell, 2022) stated that there has been a focus on the particular factors of learning that include self-direction, leveraging experience, readiness to learn, and a problem-centered approach. Although this has been achieved, the available studies have focused on general learning acquisition, but not on particular learning strategies that learners acquire as a result of using MALL. Literature has seldom investigated MALL usage among learners to promote self-directed learning, capitalising on previous experiences or problem-centered approach, which are all critical components of lifelong learning. As an example, (Morgana & Kukulska, 2021) found that the interactive nature of most language learning apps and the convenience of studying whilst walking may boost student motivation if they learn languages using mobile devices.

Furthermore, MALL has been noted to improve language proficiency. According to a study conducted by (Liu et al., 2019), it was established that the students who accessed the mobile language learning tools had high language proficiency compared to those who learnt using the traditional language learning tools. Multimedia, instant feedback, and custom learning courses offered by mobile applications helped in this enhancement. The available literature however has a large proportion of viewing language learning in general without delving in detail into the learning strategies and approaches that students use when learning MALL. This absence of concentration creates a knowledge gap on how MALL could be used by students to boost self-directed learning, take advantage of previous experiences, plan new learning, and be problem-centered.

Moreover, one of the least studied skills regarding MALL research is writing (Alfian et al., 2016). Writing, as a language learning and academic achievement, demands other skills as compared to speaking or reading (Rahayu et al., 2024). The educational value of MALL is thoroughly reported; the influence it produces on the development of independent writing and orientation of problem-solving in university students is still unclear. Thus, it is necessary to conduct more specific research on how MALL can develop these competencies, in particular, writing essays (Gharehblagh, 2020). The existing body of knowledge does not significantly provide a profound understanding of the effects of MALL on certain learning strategies, including problem-solving orientation, self-directed learning, and application of the previous knowledge, especially in independent learning settings. Besides, there is an apparent research gap in terms of the impact of MALL on the writing skills of students at universities. To mitigate this shortcoming, this research would examine how the use of MALL tools would influence the learning strategies of university students and how this would result in improved writing skills. With these particular research questions, the study adopted a survey research method to gather data, as this study is exploratory and descriptive in its purpose and direction to the student usage and perception of the IEP.

The current research has a unique methodological approach since it does not discuss the effects of mobile learning devices on general skills but rather on particular learning strategies and writing skills through a survey-based design. Particularly, the following questions are covered within the frame of this research: (1) What are the demographic features, utilization, and learning strategies of English writing students with the help of MALL tools? (2) What are the interactions or effects between these utilization patterns and learning strategies, and the English writing proficiency of students? (3) How much do MALL tools develop particular learning strategies (problem-solving orientation and self-directed learning) in English writing classes? The research will address these questions and, therefore, contribute to the existing literature on MALL and benefit the educational researchers and policymakers. Moreover, the results are likely to be utilized in the development of more effective MALL tools and strategies, which, in turn, would enhance language acquisition and writing skills of university students and, thus, would add a substantial amount of knowledge to the academic debate on MALL as an instrument of language acquisition and writing proficiency.

MALL can generally be understood as mobile phones and tablets used in language learning on a formal and informal basis in a way that provides unparalleled accessibility, flexibility, and potential for personalized learning (Alisoy & Sadiqzade, 2024). These tools usually include different

applications for vocabulary learning, grammar learning, and writing assistance, and revamp the old-fashioned learning background. More importantly, since the focus of this paper is on the learner agency and strategic interaction, we will differentiate and expound on specific peculiarities and implications of Independent MALL. Independent MALL is not a part of formal educational environments, and learners are encouraged to plan and manage their own learning processes through mobile devices (Cakmak, 2019). This autonomous mode contrasts with the teacher-directed MALL since it inherently promotes the process of self-directed learning (SDL) because they choose resources, goals, and track their progress independently. Moreover, students working in the Independent MALL usually have to overcome strong problem-solving orientations because they have to overcome language obstacles, rectify mistakes, and adjust strategies without instant interaction with the instructor (Yan & Singh, 2023). This conceptual framework of the larger MALL environment and the complexity of the active processes within the Independent MALL is crucial to explaining the complex relationships between MALL tools, particular strategies of learning (such as self-direction and problem-solving), and eventually, their impact on English writing competence among university students, which is the main area of this study.

METHOD

Research Design

A cross-sectional survey was undertaken in this study to describe the relationship between demographic factors, pattern of use, and strategy of learning among the university students in relation to the skills of writing English with the help of Mobile-Assisted Language Learning (MALL) tools. The design was selected because it would help gather a sample of behaviors, perceptions, and self-reported strategies at one point in time among learners (Creswell & Clark, Plano, 2018; Luhanga & Harbaugh, 2021). The purpose of this case was to gather information regarding the thoughts and perceptions of students regarding MALL tools. The research methodology of the study was a cross-sectional survey, and an online questionnaire was used to collect the data (Ramadass & Aruni, 2019). This research is a survey of opinions of the population that is categorized with respect to its purpose.

The whole population is covering all the potential participants in one of the public universities in Kalimantan, but a sample is a smaller segment of the population. In other situations, the whole population is so limited that it can be covered by the study (Rebollo & Ábalos, 2023). But in case of a large population, a subset or sample may have to be chosen to deal with it. In this research survey, stratified random sampling of students was selected, so as to have a fairly balanced representation of the variables under study, such as

departments, semesters, and ages, among others. Simple random sampling was used to select the students in each stratum. To determine the size of the sample, the Slovin Formula was applied, and it consisted of 124 students representing all the departments in the Faculty of Education who are taking general university courses, that is, English courses.

Instruments and Procedures

The data were collected by means of a predesigned online questionnaire designed on the ground of the existing educational frameworks and the past research on MALL. Section I captured important personal data of the respondents, such as their gender, age, and level of mastery of English in writing skills, in five categories. These levels are “Beginner” when considering people who are only beginning to learn in English writing, “Elementary” when considering those with basic writing skills, “Intermediate” when considering those with a moderate level of English writing skills, “Upper-Intermediate” when considering those with skills in writing in English, and then there are the ones at the advanced level. These classes were a significant measure of how apt the students were in their English writing. Section II included the statements concerning the student learning styles and strategies during the use of MALL tools during English writing lessons. These were formulated in the form of a Likert scale, taking 5 points. The construction of this part was theoretically supported by established educational frameworks. In particular, the principles of Andragogy partly determined the aspects related to self-direction, building on experience, and willingness to learn (Knowles et al., 2014), and the problem-based approach relied on constructivist theories of learning (Knowles et al., 2014), while the problem-centered approach drew from constructivist learning theories (Vygotsky, 1980; Waite-Stupiansky, 2022). In an attempt to fill the gaps, the current research investigates the role of demographic factors, patterns of utilization, and learning strategies among university students using MALL tools in their writing proficiency in English. The researcher takes an exploratory, survey-based research to determine the major tendencies of independent, as well as problem-focused learning in the context of mobile-based writing.

Data Analysis Procedures

The validity of the questionnaire was tested by a pre-test on 15 students who completed the form and provided feedback on potential issues such as bias, ambiguity, and multiple interpretations. The questionnaire was issued to the selected sample after considering these problems. Online Forms were used to deliver the questionnaire online. The data obtained was measured and evaluated with the help of simple frequency percentages. The

questionnaire underwent a test of reliability and validity before the instrument was given out. To measure the reliability, we used measures to avoid the same participant giving more than one response and to ensure that all the respondents finished all the questions in the survey. The Cronbach's Alpha of 0.92 of the study shows that it is very reliable. This internal consistency measure indicates that the questions in the questionnaire are very much correlated. The Cronbach's Alpha of 0.92 is excellent, and it means that the questionnaire will be very reliable in obtaining the measures of the criteria and indicators of interest. The questionnaire validity was established on the basis that the questions were correlated to the purpose of the research and the literature review on MALL tools in English writing classes. It also makes the questionnaire measure what it is meant to measure, which validates its effectiveness. The methodology was made to allow the particular setting of using MALL tools in English writing classes. The survey was designed so that it would help identify the behaviors, strategies, and attitudes of the students regarding the following criteria and indicators:

Table 1. Questionnaire Criteria and Indicator

Criteria	Indicator	Description
Self-Direction	Setting personal learning goals	Measures students' ability to set learning goals while using MALL tools in English writing classes.
	Initiative in learning	Assesses students' initiative and proactive behavior in their learning process with MALL tools.
	Seeking additional learning resources	Evaluate how actively students seek additional resources to supplement their MALL-assisted English writing learning.
Leveraging Experience	Application of past knowledge	Examines whether students apply their past knowledge in their English writing tasks aided by MALL tools.
	Reflection on past experiences	It looks at how students reflect on their past experiences to enhance their current learning in MALL-assisted English writing classes.
Readiness to Learn	Preparedness for new learning	Assesses students' preparedness for learning new concepts and skills in English writing using MALL tools.
	Active engagement in learning	Evaluates the level of active engagement of students in their English writing learning process

		aided by MALL tools.
Problem-Centered Approach	Problem-solving preference	Measures of students prefer a problem-solving approach when dealing with challenges in MALL-assisted English writing classes.
	Hands-on problem solving	Assesses students' ability to solve problems hands-on in the context of MALL-aided English writing tasks.
	Creativity in problem-solving	Evaluates how creatively students solve problems while learning English writing with MALL tools.
	Persistence in problem-solving	Measures students' persistence in solving problems encountered during their MALL-assisted English writing learning.

Table 1 is a guide to the creation of a complex research instrument, which is a questionnaire, aimed at assessing different aspects of Self-Directed Learning (SDL) among students in Mobile-Assisted Learning (MALL) conditions of English writing. All criteria outlined in the table are individual dimensions of SDL, whereas its indicators provide conceptualizations in a fine-tuning that can be translated directly into a questionnaire item. This is a systematic method of ensuring that the self-regulatory ability of learners in a MALL-based setting is fully and thoroughly assessed.

One of them, like the Self-Direction and Readiness to Learn criteria, is imperative because it is necessary to measure the intrinsic motivation of the learner and his/her active involvement. Such indicators as "Setting personal learning goals" and "Initiative in learning" under Self-Direction would be operationalised into questions that would assess the level of autonomy goal-setting and involvement of students in MALL stimulated English writing activities. Likewise, "Ready to learn new things" within Readiness to Learn would investigate the openness and willingness of students to accept new things and skills supported by MALL tools. Also, the criterion of Leveraging Experience investigates the way learners combine previous knowledge with reflection about the past experiences and apply this to their present learning. The guides used in its indicators, such as Application of past knowledge and Reflection on past experiences, guide the development of items that explore how students apply the existing cognitive schemas and how they use the previous encounters with learning to enhance their writing proficiency in English using MALL. At the same time, the "Problem-Centered Approach"

criterion can be used as the prism through which the strategies and attitudes of students towards the challenges faced in MALL-assisted learning will be seen. Indicators such as Problem-solving preference, Hands-on problem solving, Creativity in problem-solving, and Persistence in problem-solving play a crucial role in the construction of a wide range of questions that reveal the preferred varieties of problem-solving among the learners, how they apply their solutions in practice, how they think creatively, and how they persevere in their pursuit of solutions. All these indicators make it possible to create a strong questionnaire, which usually uses a Likert scale to measure responses that are quantifiable, which will lead to the final creation of the empirical data and to the creation of more effective MALL-integrated pedagogical interventions in English writing.

FINDINGS

Section I of this paper was well planned to create a baseline knowledge on the cohort of participants with a keen interest in gathering the essential demographic and contextual data among the 124 respondents. This preliminary step was critical towards making sure that follow-up analyses could be put into perspective so that more detailed interpretations of results could be made regarding Self-Directed Learning (SDL) in the context of the Mobile-Assisted Learning (MALL) environment of writing in English.

To be more exact, this part carefully accumulated data related to the gender of the participants, which is a significant parameter that can possibly distinguish any possible patterns or disparities in the usage of technology, learning styles, or self-managed actions that might be present in the demographic groups. Moreover, the age has also been recorded in order to give a good understanding of the generation traits of the learners, acknowledging that age tends to be associated with different rates of digital literacy, past learning experiences, and the methods of self-motivated learning. This contextual information is helpful in determining the role of other variables, like exposure to mobile technologies or cognitive maturity, as factors that may be relevant in the process of utilizing MALL tools and learning SDL competencies.

The primary element in this preliminary data collection was the determination of the perceived level of proficiency of the respondents in English writing skills. This pre-tested assessment of writing proficiency, which is normally determined by self-assessment scales or standardized tests, is a crucial independent variable whereby the impact of MALL tool use and SDL features can be determined. Knowing the current state of the skill distribution in the cohort enables the next analysis of whether the use of MALL has a different effect on the learners at different stages of the development of English writing. At last, the use of MALL tools by the

respondents in their English writing classes was adequately explored in this section. It entailed taking information on frequency, length, and type of MALLs application or platforms that students utilize, and what type of writing of English activities (e.g., grammar checking, vocabulary building, drafting, peer review) they perform using these mobile tools. The close-knit mapping of MALL tool use gives immediate information about the learning behavior and the technological activity of the target population to create a necessary empirical background to discuss the main research questions related to self-directed learning in this technological intermediated instructional setting.

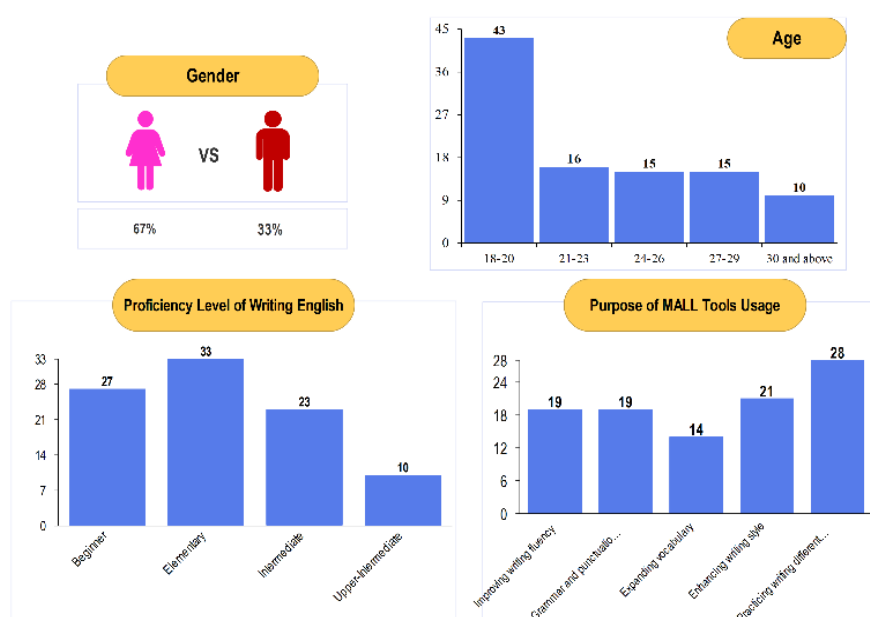


Figure 1. Respondents' Profile

In accordance with Figure 1, gender analysis demonstrated that the proportion of the total number of female participants was higher, at 67 percent, whereas males were 33 percent. The gender composition of the sample, which is dominated by female students, implies that there is a greater propensity of the female students to use MALL tools in their English writing assignments. The distribution of the age population was wide, with most of the participants in the 18-20 age bracket, which was the largest at 43 percent of the total. The other age groups (21-23 years, 24-26 years, 27-29 years, and 30 years and above) were comparatively homogeneous, with each taking up 16, 15, 15, and 10 percent of the total, respectively. The large sample of the age group used emphasizes the usability and wide usage of the MALL tools across the age groups.

In terms of English writing proficiency, the largest number of subjects included elementary level (33%), beginners (27%), and intermediate learners (23%). A lower percentage of the respondents were classified as upper-intermediate (10% or advanced (6%). This variety of degrees of proficiency helped to achieve a variety of experiences and results in the research. When speaking about the purpose of MALL tools, the most commonly mentioned one was to practice various writing types, as 28% of respondents answered. The improvement of the writing style came next at 21% with refining writing fluency and grammatical and punctuation accuracy, all rated at 19% respectively. The least popular application of MALL tools, as given by 14 percent of the respondents, was to enlarge the vocabulary. These results help illuminate the domain in which students find MALL tools the most beneficial, which is the real-life writing practice and style improvement. This section provides valuable comments on how MALL tools can be used by a diverse group of students taking English writing programs. The findings show that MALL tools are utilized in diverse ways where they are oriented towards the application of practical text writing and style development, which explains why the study aims at learning the effects of MALL tools on the English writing proficiency of the student.

In section II, the study explored the learning styles and strategies that students employ in English writing classes using MALLs. The purpose of the study was to understand how the students manage the process of learning, readiness to learn, ability to use past experiences, and propensity to a problem-oriented approach. The results of answering a set of statements on these aspects by the participant provide very interesting data on their behavior and strategies in the process of learning.

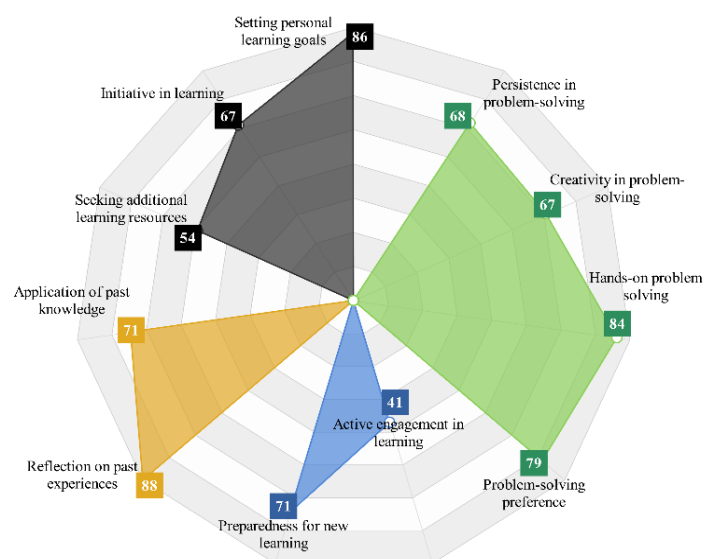


Figure 2. Learner Characteristics and Strategies

This part examined the self-reported characteristics of the participants in major aspects of Self-Directed Learning (SDL) in mobile-based English writing (Mobile-Assisted Language Learning, MALL). The data indicate impressive information about the autonomy in the learners, the metacognitive skills, the readiness of the learners to learn, and the problem-solving orientations. One of the main areas of concern was the criterion of Self-Direction, where a considerable percentage of the members were found to have a high degree of autonomy in their learning paths. In particular, a very high percentage of 86 percent of the respondents rated themselves as being active in the establishment of personal learning goals. This observation is a strong sign of an endemic sense of ownership of their own learning process and a sense of what they want to accomplish by learning, which is an attribute of highly self-directed learners. This kind of intrinsically motivated goal-setting is not just a manifestation of metacognitive planning strategies that are important in terms of efficient independent learning, but it also suggests the utilization of metacognitive planning strategies. Moreover, about 67 percent of the participants exhibited a noticeable initiative in learning, which is a proactive approach to education and not a passive attitude to learning instructions. This translates to a tendency towards giving opportunities and being in charge of their development towards learners. In line with this self-directed spirit, there was a notable 54 percent among the participants who engaged in extra learning materials outside the core curriculum. Such a practice indicates resourcefulness and motivation to expand their knowledge, as they go far with their learning activities in various sources. Consistent with these self-directed characteristics, the results of the analysis of MALL tool usage patterns showed that they were used mainly to perform highly functional and purposeful tasks by the participants. The most common reasons were to practice various kinds of texts, to improve the general writing style, and to improve the accuracy of grammar. It shows that the most frequently used MALL tools by the participants were the tools as the means of practical application, refining their writing mechanisms and reaching their self-set linguistic objectives, and, therefore, their use of technology was adjusted to their self-guided learning outcomes.

The paper also explored the capacity of the participants to Leverage Experience as part and parcel of the learning process. A sizeable percentage of 71% of the respondents said that they were able to apply prior knowledge effectively to the learning situations at hand. This large percentage not only indicates the stored information but also a deeper knowledge transfer and integration ability that enables the learners to build new meanings on pre-existing cognitive frameworks. More notably, a better percentage, 88 percent

of the respondents, reported that they always used to reflect on past experience in their learning process. This observation indicates a healthy degree of metacognitive awareness, where students perform a critical evaluation of their self-awareness and perform strategic modification of their behavior depending on past achievements and challenges. This reflective practice is essential in the practice of constant improvement and increased conceptual knowledge. With regard to their Readiness to Learn, 71% of the participants proved to be highly prepared for new learning. It implies a positive attitude towards new knowledge and skills acquisition, which is a characteristic of a growth mindset and susceptibility to new pedagogical methods, including those that are facilitated using MALL tools. Nonetheless, the difference was found in the active engagement in the learning process that was reported by half of the participants. Although students said that they were willing to learn something new, this gap might indicate the possible obstacles to regular active attendance, possibly due to the particular affordance of MALL tools, situational determinants, or even the definition of active engagement within the tool. This observation should be investigated further using qualitative research in order to unpack the reasons behind.

Lastly, the research was done on the predisposition of the participants to the Problem-Centered Approach of learning extensively. Another preference that was apparent among the participants was a desire to engage in problem-solving activities, with 79 percent of the respondents showing an active preference towards inquiry-based learning. In line with this, a still greater 84 percent preferred a hands-on approach, and this highlights a preference for the experiential learning process where knowledge is built up by direct interaction with challenges. In addition, the ability to think creatively in problem-solving was also reported by 67% of respondents, which means that respondents were able to think innovatively to overcome learning challenges. This is supplemented by 68 percent of respondents showing persistence in problem-solving, which relates to their resilience and persistence to overcome challenges they face in their endeavors of writing English through the assistance of MALL. The overall results of these findings strongly indicate that the participants generally have a strong inclination towards the practical, active, creative, and tenacious approaches to problem-solving in their learning processes. Overall, the findings can play an important role in the overall comprehension of the learning qualities and preferences of the participants who took English writing courses using MALL tools. The widespread scores recorded in self-direction, the acute capacity to utilize experience, the explicit willingness to learn new things, and the problem-focused attitude all define these learners as a group, which

is mostly proactive, reflective, prepared, and very practical in terms of approach to academic activities and skills acquisition.

DISCUSSION

The research results in the first and second sections gave a wide perspective about the demographics of the English writing students, patterns of their usage of MALL tools, and their learning strategies. The sample of the study was found to be more female-representative and heterogeneously aged, with the largest group being of the 18-20 age group. Such an observation indicates a universal attractiveness of MALL tools by various age groups and gender bias towards their usage. It also corresponds to the past studies that justify the necessity of considering gender and age considerations during the incorporation of educational technology (Alnujaidi, 2021; Islam & Hasan, 2020; Puebla et al., 2022; Viberg & Grönlund, 2013). Regarding the proficiency levels and the purposes of using MALL tools, the researchers concluded that the tools are used on different levels of proficiency with the major use of elementary level. The instruments served various purposes, which include practicing text writing, developing writing style, and improving grammar accuracy. This point outlines the multi-faceted benefits of MALL tools, and this is in line with other studies on technology-based language acquisition (Gharehblagh, 2020; Khodabandeh, 2017; Osifo, 2019).

The results presented in Section II showed that self-direction was quite high, and the tendency towards a problem-oriented approach was strong in the respondents, which strongly affected their use of MALL tools. As concerns the patterns of utilization, the most common patterns of use were practical issues like practicing various forms of writing (e.g., essays, reports), improving the overall style of writing, and grammatical accuracy, which were commonly used by participants. This trend indicates that MALL tools did not only serve as supplementary tools, but were actively involved as functional tools in their writing process. The self-direction was high, 86% of the learners set personal learning goals, and 67% of the learners exhibited initiative, which is explicitly translated to purposeful use of the tools; these learners actively pursued and personalized MALL tools to meet their individual goals of writing improvement. At the same time, the high level of motivation to adhere to the problem-centred method implied that the participants were actively involved in working with the MALL functions, providing instant feedback, grammar corrections, or stylistic corrections to correct it independently. This is the dynamic interplay between a problem-based mentality and the diagnostic powers of MALL tools, which underscores the strategic application in addressing writing problems. All these findings are indicative of a proactive, responsible, and viable attitude towards learning, which is in line with the modern-day pedagogical focus

on developing self-directed learning and problem-solving abilities among students. In spite of the important contributions that these results may provide, one may also consider accepting other rationales, including the influence of personal motivation or past experiences, on the high level of self-direction that should be characterized.

The study also admits that it has limitations, such as the possibility of bias, since it relies on self-reported data. The study was successful since it illuminated the complex connection between the use of the MALL tools and the learning tactics of students during English-writing lessons. The results are relevant to the body of evidence on the use of technology in language acquisition and have implications for educators and researchers. Nevertheless, further research is required to explore further into details, including the effects of MALL tools on various writing genres or the efficiency of certain tools in improving writing proficiency. The research demonstrates that the application of MALL tools in English writing courses is crucial due to academic purposes. Nevertheless, it also demonstrates the necessity to know the various needs and preferences of students. The practical implications of the study indicate that the teachers would have taken these findings into consideration in planning and using MALL tools in their lessons. To researchers, the study presents new horizons into the analysis of the efficacy and influence of MALL tools on English writing proficiency.

CONCLUSION

This research was carefully conducted in order to explore the intricate relationship between demographic factors, patterns of use of mobile-assisted language learning (MALL) tools, and the strategic learning patterns that were employed by the university students in the context of the overall development of their English writing proficiency. The first inquiry made into the use of MALLs showed that the students mainly utilized these online tools in more concrete and practical writing. Their reported interaction was focused on the practice of different genres of writing, and this poses a strategic initiative of writing to fit various communicative objectives. Moreover, the extra focus was put on the overall writing style refinement and, most importantly, on the grammatical accuracy improvement. This usage trend is a pointer to the fact that MALL tools are and are by no means additional aids used by learners, but are very tactical tools that they have adopted in their counter-repertoires to improve desired skills espoused, especially in areas that demand practising and instantaneous feedback. Such refinement in particular is mainly used to emphasize a distinct match with autonomous learning objectives.

One of the main results was revealed in the strong evidence of great tendencies of self-direction and problem-solving of the participants. What is especially significant about these findings is that they indicate that the utilization of MALL is not just a content-consumption phenomenon but also one that facilitates the development of strategic and independent learning processes in the English writing setting. A high quality of self-regulation can be observed in the personal goals of the participants, their initiative to find a writing practice on their own, and their capacity to diagnose and resolve the linguistic problems with the help of the mobile applications. This implies that through MALL platforms, a situation is created in which a learner is able to absorb control over his or her learning path to an extent of becoming more autonomous.

Although these results certainly answer the research questions of the study, as they reveal the common patterns of learner engagement and choice of the strategies of writing in the MALL setting, a glaring limitation should be noted: the writing proficiency was not directly indicated in the study. This limitation of the methodology requires limited interpretation of any inferences about the direct causal effect of MALL use on real writing performance. It is impossible to say with certainty that the use of MALL leads to better writing skills only with regard to the current data. However, it is possible to make a powerful inference: the strategic application of MALL through the formulation of personal learning objectives, metacognitive reflection on the previous linguistic experience, and active involvement in the process of problem solving involving linguistic problems, is likely to establish very favorable conditions for an organic acquisition of writing skills. These mechanisms result in engagement, deliberate practice, and self-corrected, and these aspects are also well known to be important in skill acquisition, although their precise cause-and-effect relationship with quantifiable outcomes cannot be determined in the context of this work.

The most prominent input of this research, therefore, is strong evidence that the concept of MALL is not a direct determinant of writing success but rather a mediator platform for inculcating self-directed and problem-centered approaches to learning. This is a critical point of difference: MALL is not a gift-bestowing writing since it simply equips learners with tools and spaces that allow them to cultivate and implement the very strategies required of them to pursue independent learning. This developed theoretical connection between mobile learning behaviors and greater strategic involvement is the strongest base of future research into how exactly technology can better support the development of independent writing within a wide range of academic as well as professional areas.

These findings have a number of great implications applicable not only to the practice of pedagogy but also to future research. To teachers, the point is simple: MALL adoption in teaching English writing must be, without any doubt, systematic. It needs to go beyond being a provider of corrective equipment and focus on the provision of reflective writing and strategy-based writing. It involves creating activities that motivate learners to use MALL as a self-assessment, peer, and revision by strategy thinking, instead of being based on the autograder to control grammar. To the researchers, the results highlight the necessity to conduct further research that embraces more resilient methodology designs. To be more exact, it is recommended that mixed-method or longitudinal research be adopted to achieve a systematized tracking of the quantitative and qualitative impact of long-term MALL use on quantifiable writing outcomes. Moreover, the next line of research might be associated with exploring the specific differences in effectiveness of certain mobile applications in fostering particular aspects of writing proficiency, i.e., such aspects of rhetorical organization, textual coherence, lexical richness, or syntactic complexity, which goes beyond the overallized concept of writing improvement. This study, thus, will be a valuable addition to the emerging academic sense of the role of MALL in higher education, which directly connects demographic features of learners and the modalities of their strategic involvement in the writing development. Although it admittedly has the major weakness of self-reported data, the results are truly potent in terms of proving the essential role of encouraging intentional and strategy-based MALL usage in order to truly increase the independent learning ability of students and eventually lead them to success in academic writing in a variety of scenarios.

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