



The Impact of Low-Tech Response Systems on Iraqi EFL University Students' Interaction and Their Willingness to Communicate

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ABSTRACT

This study extends quasi-experimental mixed-methods research by examining how mini whiteboards affect the engagement and willingness to communicate of Iraqi university students who learn English as Foreign Language. The research was carried out at Kut University through a pretest-posttest control group design which maintains the natural classroom environment. The experimental group (N=32) used MWs in a structured formative assessment cycle for twelve weeks, while the control group (N=31) received standard instruction. Quantitative data collection occurred through validated scales which measured multidimensional engagement across behavioral, emotional, cognitive, and agentic dimensions as well as WTC. The researcher conducted semi-structured interviews with participants from the experimental group who were selected through purposive sampling for qualitative data collection. The MW intervention produced significant improvements in all four student engagement dimensions according to MANCOVA and ANCOVA analyses. These analyses controlled for pre-test scores ($p < .001$), with behavioral engagement showing the strongest effect size ($\eta^2 = .396$). The experimental group showed a notable rise in WTC when compared to the control group ($p < .001$, $\eta^2 = .236$). The experimental group demonstrated a strong positive connection between their total engagement improvement and their WTC improvement ($r = .721$, $p < .001$). The interview data analysis using thematic methods showed that MWs helped people feel less anxious, while building their confidence through practice, and establishing a secure transition toward speaking participation. The results show that educators should apply cost-effective active learning methods to teach students in resource-limited settings, while creating professional development programs, and educational materials.

Keywords: low-tech response systems, mini whiteboards, student engagement, willingness to communicate.

أثر أنظمة الاستجابة منخفضة التقنية على تفاعل طلاب اللغة الإنجليزية كلغة أجنبية العراقيين في الجامعة
ورغبتهم في التواصل

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الملخص

تعتمد هذه الدراسة منهجية شبه تجريبية مختلطة، وتبحث أثر نظام استجابة الطلاب منخفض التقنية، وهو السبورة البيضاء المصغرة، على تفاعل الطلاب العراقيين دارسي اللغة الإنجليزية بوصفها لغة أجنبية في الجامعات، ورغبتهم في التواصل. أوقدُ جريت هذه الدراسة في جامعة الكوت بمحافظة واسط ضمن بيئة صيفية تقليدية، واستخدم البحث تصميمًا تجريبيًا يعتمد على اختبار قبلي وبعدي مع مجموعة ضابطة. اعتمدت المجموعة التجريبية (N=32) السبورة البيضاء المصغرة في دورة تقييم تكويني منظمة لمدة اثني عشر اسبوعاً، بينما تلقت المجموعة الضابطة (N=31) التعليم التقليدي. وُجمعت البيانات الكمية باعتماد مقاييس معتمدة لقياس المشاركة متعددة الأبعاد (السلوكية، والعاطفية، والمعرفية، والفاعلية) والرغبة في التواصل. وُجمعت البيانات النوعية بمقابلات شبه منظمة مع عينة مختارة من المجموعة التجريبية. وكشفت نتائج تحليلات MANCOVA و ANCOVA، مع ضبط نتائج الاختبار القبلي، أن تدخل الكتابة التأملية أدى إلى تحسينات كبيرة وذات دلالة إحصائية في جميع أبعاد مشاركة الطلاب الأربعة ($p < 0.001$)، مع أكبر تأثير على المشاركة السلوكية ($\eta^2 = 0.396$). كما لوحظت زيادة ملحوظة في الرغبة في التواصل لدى المجموعة التجريبية مقارنةً بالمجموعة الضابطة ($p < 0.001$)، $\eta^2 = 0.236$). ووجد ارتباط إيجابي قوي جداً بين المكاسب في المشاركة العامة والمكاسب في الرغبة في التواصل ضمن المجموعة التجريبية ($r = 0.721$)، $p < 0.001$. وأشار التحليل الموضوعي لبيانات المقابلات إلى أن الكتابة التأملية قللت من القلق، وعززت الثقة من طريق التدريب، ووفرت بيئة آمنة للمشاركة اللفظية. تُشير النتائج إلى آثار بالغة الأهمية على ممارسات التدريس، وتصميم المناهج، والتطوير المهني في البيئات التعليمية ذات الموارد المحدودة، إذ تدعو إلى الاستخدام الاستراتيجي لاستراتيجيات التعلم النشط منخفضة التكلفة وعالية التأثير.

الكلمات المفتاحية:

أنظمة الاستجابة منخفضة التقنية، السبورات البيضاء الصغيرة، مشاركة الطلاب، الرغبة في التواصل.

1. Introduction

English as a Foreign Language (EFL) teaching methods have undergone a transformation which now centers on building interactive learning spaces that actively involve students in their educational process. The educational transformation depends on two essential learner elements, which include student involvement and their willingness to communicate (WTC). The concept of engagement includes four main components, which consist of student mental involvement, their physical actions, their emotional feelings and their emotional state during learning activities (Fredricks, Blumenfeld, & Paris, 2004). Academic achievement depends on student involvement because students who stay engaged tend to work through challenges and understand their lessons better (Fredricks et al., 2004; Lei, Cui, & Zhou, 2018). The concept of WTC stands equally important because it refers to a person's willingness to start L2 communication when any chance comes along (MacIntyre, 2007; MacIntyre, Clément, Dörnyei, & Noels, 1998). The development of WTC stands as a fundamental educational goal in EFL settings because it enables students to practice language and improve their proficiency through direct communication experiences. (MacIntyre et al., 1998; Yashima, 2002)

Educational technology integration provides various tools which help improve these educational constructs. The implementation of high-tech solutions becomes impossible for educational settings that operate with limited infrastructure and resources. This describes many schools in Iraq. Educators

have started to focus on teaching effectiveness through basic teaching methods because of these changes. The educational sector now shows renewed interest in teaching effectiveness through simple teaching approaches, which become widely available and affordable. The educational sector now shows renewed interest in teaching effectiveness through basic teaching methods, which become widely accessible and affordable. The educational sector now shows renewed interest in teaching effectiveness through basic teaching methods, which become widely accessible and affordable. The educational sector now shows renewed interest in teaching effectiveness through basic teaching methods, which become widely accessible and affordable. The educational sector now shows renewed interest in teaching effectiveness through basic teaching methods, which become widely accessible and affordable. The educational sector now shows renewed interest in teaching effectiveness through basic teaching methods, which become widely accessible and affordable. The educational sector now shows renewed interest in teaching effectiveness through basic teaching methods, which become widely accessible and affordable. (Christle & Schuster, 2003; Gimbutas, 2019; Zekrati, Barati, & Youhanaee, 2025)

Empirical research underscores the potential of such tools. Research shows that SRSs improve student behavior through better on-task participation, and reduced passive learning (Lambert, Cartledge, Heward, & Lo, 2006; Musti-Rao, Kroeger, & Schumacher-Dyke, 2008). Students can display answers with instant correction feedback through these systems which results in better emotional involvement and self-assurance (Gimbutas, 2019; Zekrati et al., 2025). The supportive environment helps students reduce their anxiety while building their self-assurance. This leads to better communication readiness because anxiety reduction and perceived competence serve as essential factors for communication readiness (MacIntyre, 1994; MacIntyre & Charos, 1996). The interactive and collaborative nature of MW activities aligns with socio-cognitive and constructivist principles, emphasizing the role of social interaction and scaffolded practice in language learning. (Bandura, 1986; Vygotsky, 1978).

Therefore, this article explores the interconnected impact of low-tech response systems, specifically MWs, on Iraqi EFL university students' engagement and their subsequent WTC. The research combines theoretical frameworks with empirical data from different settings to show how these educational tools create interactive learning spaces, which support communication in areas with limited resources.

2. Literature Review

2.1. The Multifaceted Construct of Student Engagement

Researchers have identified student engagement as a multidimensional construct which serves as a fundamental element for academic achievement and positive learning outcomes. The tripartite model

by Fredricks, Blumenfeld, and Paris (2004) established three core components of engagement, which include behavioral, emotional, and cognitive dimensions. Students who show behavioral engagement through their actions complete their schoolwork and follow classroom rules. Students develop emotional bonds with their learning environment through their affective reactions, which include their interest, enjoyment, and their sense of belonging. Students need to use mental effort and self-regulation to master complex skills and understand deeper meanings through cognitive engagement. The concept of agentic engagement emerged from Reeve (2013) who described how students actively participate in directing their learning process. The educational requirements of these students receive complete fulfillment through this program.

The main support for continuous practice requirement in language acquisition emerges from the essential role of engagement in EFL learning environments. Research by Lei Cui and Zhou (2018) shows that disengagement results in passive learning, which limits practice opportunities, and leads to reduced language achievement. The problem becomes worse when students learn in classrooms with insufficient resources and large student numbers, because teachers cannot give individual attention. They tend to use traditional methods which make students less involved and decrease their motivation (Blatchford, Baines, & Pellegrini, 2003; UNESCO, 2018).

2.2. Willingness to Communicate (WTC) in L2 Contexts

WTC in a second language is defined as “an individual’s readiness to enter into discourse at a particular time with a specific person or persons, using an L2” (MacIntyre, Clément, Dörnyei, & Noels, 1998, p. 547). It represents the final psychological step before initiating L2 use and is considered a paramount goal of communicative language teaching. MacIntyre’s (1994) heuristic model posits that situational WTC is influenced by a complex layering of enduring and transient factors, including personality, intergroup climate, motivational propensities, and, most proximally, L2 self-confidence. Self-confidence itself is a product of *perceived communicative competence* and a lack of *communication anxiety*.

Factors inhibiting WTC in EFL classrooms are well-documented and highly relevant to the Iraqi context. These include high levels of foreign language anxiety, fear of negative evaluation from peers and teachers, low perceived competence, and cultural norms that may prioritize listening over speaking or view teacher correction as a loss of face (Horwitz, Horwitz, & Cope, 1986; Liu & Jackson, 2008). Consequently, creating classroom conditions that mitigate anxiety and boost perceived competence is essential for fostering WTC.

3. Pedagogical Intervention: Low-Tech Student Response Systems (SRSs)

In response to the challenges of fostering engagement and WTC, especially in resource-constrained environments, educators have turned to practical, low-cost interventions. Low-tech SRSs, such as hand-held response cards, colored paddles, and notably, MWs, offer a compelling alternative to digital clickers or online platforms.

Theoretical support for these tools comes from various established frameworks. The social cognitive theory from Bandura (1986) shows that MWs enable people to learn through direct mastery experiences. The practice of answering and correcting questions in low-stakes public forums helps students build their self-efficacy, which represents their belief in their ability to complete tasks. The development of self-efficacy through these experiences predicts both student involvement in learning activities and their readiness to communicate in English. The constructivist theory of Vygotsky (1978) shows that social interaction, together with scaffolding, stands as essential elements for learning. The Zone of Proximal Development activities enable students to work together with teachers who give them instant feedback. This helps them learn better while developing their language abilities.

Research studies have shown an increasing amount of evidence regarding the performance of low-tech SRSs in educational settings. Christle and Schuster (2003) found that response cards boost student participation and classroom focus while reducing math class disruptions. Lambert, Cartledge, Heward, and Lo (2006) found that these interventions produced equivalent positive results in both academic performance and decreased disruptive conduct at urban elementary schools. Gimbutas (2019) conducted research which established that MWs helped tenth-grade students in a resource English classroom achieve better academic results and higher engagement levels across multiple dimensions. This created improved student participation and classroom atmosphere.

The most recent study by Zekrati, Barati, and Youhanaee (2025) focused on an under-resourced Iranian EFL environment through a time-series design with MWs. The research results showed that students achieved substantial progress in their total engagement, which included behavioral aspects and emotional, and cognitive elements throughout the intervention phases. The study demonstrated that MWs support real-time formative assessment and individualized feedback, and a student-centered “instruction-feedback-modification” learning cycle. The questionnaire about their attitudes showed students experienced decreased anxiety and increased confidence through MWs. This tackled fundamental emotional obstacles to WTC.

4. Research Gap and Problem Statement

The existing research fails to bridge the gap between established knowledge about engagement and WTC for EFL success, and the demonstrated effectiveness of low-tech SRSs like MWs in particular

learning environments. The research conducted by Zekrati et al. (2025) shows solid proof about how these tools affect engagement. Yet scientists have not yet studied the exact mechanisms which link tool usage to L2 WTC development. Studies in this field either examine these constructs separately or suggest connections between them without establishing direct empirical evidence for their interaction.

Second, the geographical and institutional focus of existing research is limited. The researcher discovered through his extensive research that most empirical studies about SRSs, and engagement, take place in Western and East Asian settings. Wadi (2025) identifies a major research gap because public universities in Iraq operate within their distinct sociocultural environment and educational system and infrastructure framework. The Iraqi EFL educational environment struggles with multiple challenges, which include high student numbers and restricted access to technology and teaching methods. These stem from conventional educational systems and cultural elements that affect student involvement (Wadi, 2025). The research has not yet proven whether the positive effects of MWs will produce identical results in this distinct environment.

The research problem in this study consists of two main elements, which include (1) the absence of empirical studies that explore how low-tech response systems affect both student engagement and willingness to communicate, together, and (2) the lack of dedicated research about Iraqi EFL university settings, which require affordable educational solutions to combat student reluctance to speak and passive learning behavior. The present study pursues specific research questions to fill this knowledge gap:

1. To what extent does the implementation of a MW system affect Iraqi EFL university students' levels of classroom engagement (behavioral, emotional, and cognitive)?
2. What is the impact of using MWs on Iraqi EFL university students' WTC in English?
3. Is there a significant relationship between changes in student engagement and changes in WTC following the implementation of the MW intervention?

The research aims to deliver an empirical analysis of simple low-tech teaching tools which function to boost both student engagement, and communication readiness in difficult, yet unexamined EFL environments through its question-based approach.

3. Methodology

3.1 Research Design

The research applied a quasi-experimental mixed-methods approach to study how MWs as low-tech SRS tools affect Iraqi university students who learn English as a foreign language in terms of their classroom participation and willingness to communicate. A pretest-posttest control group design

formed the quantitative core. The researchers selected this design because random assignment of intact university classes proves challenging to achieve in practical situations; therefore, they used existing classes to form the experimental and control groups (Creswell & Creswell, 2018). The inclusion of a control group strengthened causal inference by controlling for threats to internal validity such as history, maturation, and testing effects.

The research included a qualitative element which enables better understanding of quantitative results by producing detailed explanations and refined answers. The research team conducted semi-structured interviews with selected participants from the experimental group who completed the intervention period. The convergent mixed-methods approach (QUAN + QUAL) enables data triangulation. This produces a complete understanding of the studied phenomena. (Ivankova, Creswell, & Stick, 2006).

3.2 Participants and Setting

The research took place at Kut University, which is located in Wassit, Iraq. The research participants consisted of undergraduate students who studied compulsory English language courses during their second-year academic level. The selection of two intact classes under the same instructor occurred through convenience sampling to reduce teacher effect variance. The two classes received random assignment. This placed them into either the Experimental Group (EG) or the Control Group (CG). Each group needed to have between 30 and 35 students to reach the required minimum sample size for parametric statistical tests.

The research included native Arabic speakers who showed English proficiency at pre-intermediate to intermediate levels based on their institutional placement and results from the Oxford Quick Placement Test shortened version. The selection process created a group of participants who shared similar language skills. The external factor operated as a crucial element in this situation. The institutional board approved the research through its ethical review process, and all participants gave their informed consent while choosing to participate voluntarily. This protected their identity.

3.3 Instruments and Materials

3.3.1. Student Engagement Scale (SES)

Through the development of a validated questionnaire by Fredricks et al. (2004) and its expansion by Zekrati et al. (2025), the scholars assessed engagement as a multidimensional construct. Users answer the twenty questions by using a 5-point Likert scale that starts with Strongly Disagree (1) and ends with Strongly Agree (5). The instrument consists of four separate subscales that build its complete structure.:

- a) Behavioral Engagement (5 items): e.g., “I pay attention in this English class.”
- b) Emotional Engagement (5 items): e.g., “I feel interested in the activities we do in this English class.”
- c) Cognitive Engagement (5 items): e.g., “I try hard to understand the most complex material in this subject.”
- d) Agentic Engagement (5 items): e.g., “I let the teacher know what I need and want.”

The scale was translated into Arabic using a back-translation procedure to ensure conceptual equivalence and piloted for reliability (Cronbach’s alpha) in the Iraqi context.

3.3.2. Willingness to Communicate Scale

WTC was measured using an adapted version of the scale developed by MacIntyre, Baker, Clément, and Conrod (2001) and validated in EFL contexts (e.g., Zarrinabadi & Alipour, 2020). This instrument presents students with 12 hypothetical communication scenarios inside the EFL classroom (e.g., “Asking the teacher a question for clarification,” “Giving your opinion in a group discussion”). For each scenario, participants indicate their WTC on a 5-point Likert scale (1 = Definitely not willing to 5 = Definitely willing). An overall WTC score was calculated. The scale was translated into Arabic using a back-translation procedure to ensure conceptual equivalence and piloted for reliability (Cronbach’s alpha) in the Iraqi context.

3.3.3. Mini Whiteboard (MW) Intervention Materials

The intervention for the EG utilized low-cost MW kits. Each kit contains a plastic sheet protector that measures A4 size, which functions as a sturdy base together with an A4 white paper sheet placed inside for background purposes, and includes a dry-erase marker and eraser made from felt cloth. The chosen materials meet requirements for cost-effectiveness and wide availability. They can be duplicated in resource-limited environments (Zekrati et al., 2025).

3.3.4. Semi-Structured Interview Protocol

A flexible interview guide was developed to explore participants’ lived experiences with the MW intervention. The sample questions will consist of the following: "Describe your feelings about using the mini whiteboard during classroom activities." "Did the whiteboard usage affect your participation frequency, and confidence level, when speaking? How?" and "What were the most helpful, and most challenging aspects of using this tool?" The interviews took place in Arabic while being audio recorded and then transcribed for thematic analysis.

3.3.5. Classroom Observation Checklist (for fidelity)

The researcher used a simplified checklist based on engagement observation frameworks (Gimbutas, 2019) to track the MW protocol implementation in the EG and standard teaching methods in the CG during specific observation periods. The intervention was executed according to the original plan because the protocol was followed precisely.

3.4 Procedure

The research project ran throughout a 12-week academic semester, which divided into four separate stages. The initial phase, occurring during the first week, focuses on pre-testing and homogenization. The EG and CG groups took the OQPT test at this stage to confirm their proficiency levels, while also completing the SES and WTC Scale tests for baseline measurements.

The second phase encompassed the intervention period from weeks 2 through 11. The instructor used mini-whiteboards (MWs) during standard classroom teaching for about 20 to 25 minutes in each 90-minute session with the experimental group. The teacher followed a set protocol to ask students questions and prompts and problems, which included vocabulary checks, grammar corrections, and opinion polls, and students responded by writing their answers on their MWs. Students showed their boards at the same time after the signal, which enabled the teacher to perform an instant formative assessment. The process required the teacher to provide feedback to the entire class by selecting outstanding responses and pointing out frequent mistakes. Students needed to correct immediately thus establishing a continuous "engage-respond-feedback-revise" process. The CG maintained their regular teacher-led classroom approach while teaching the exact same course material. The students participated through standard classroom activities, which included raising hands voluntarily and being selected by teachers, and working on their notebooks individually, but they did not use MWs or any system for simultaneous responses.

The third phase of the study took place during week 12 when researchers conducted post-test assessments. The two groups completed the SES and WTC Scale for a second time to evaluate the intervention results. The fourth phase of the research included qualitative data collection. This took place during week 12. The experimental group students who scored between 8 and 10 on the post-test were selected for semi-structured interviews. The researchers picked participants from various levels of engagement and WTC score changes to study the intervention effects on high increase, moderate increase, and low change groups.

3.5 Data Analysis

IBM SPSS Statistics Version 28 was used to analyze the quantitative data that resulted from the SES and WTC Scale. The analysis started with descriptive statistics, which involved calculating means

and standard deviations for all pre-test and post-test scores for both groups. The study conducted reliability analysis by calculating Cronbach's alpha values for all scales and subscales to validate internal consistency within the research sample.

The researchers employed a Multivariate Analysis of Covariance (MANCOVA) to assess the intervention effects between the experimental and control groups. The study assessed four engagement subscales, together with WTC scores, after treatment as dependent variables, while using their pretest scores to adjust for baseline differences between groups. The main research questions 1 and 2 receive their primary answers from this analysis.

The interview transcripts underwent qualitative data analysis through the thematic analysis method which Braun and Clarke (2006) described. The method includes six essential stages which start with transcript reading for familiarization, and then move to code development and theme identification through data pattern grouping. The fourth step required researchers to check themes against coded data and total dataset before they defined and named themes to enhance their particular categories. The report reached its conclusion by transforming the thematic analysis results into a unified story. This shows and proves the quantitative findings to give an in-depth understanding of the research outcomes.

4. Results

4.1 Preliminary Analyses

The research team performed preliminary analyses before testing the main hypotheses to evaluate the measurement instrument reliability and to verify group equivalence at baseline, and to confirm data normality. The research team conducted preliminary analyses to assess measurement reliability and baseline group equivalence, and data normality before testing the main hypotheses.

4.1.1 Reliability of Instruments

Internal consistency for all scales was assessed using Cronbach's alpha. The results in Table 1 demonstrate that all scales and subscales achieved reliability levels above .70 during pre-test and post-test administrations in the Iraqi EFL setting. This validates their appropriateness for analysis.

Table 1. *Reliability Coefficients (Cronbach's Alpha) for Measurement Scales*

Scale / Subscale	No. of Items	Pre-Test (α)	Post-Test (α)
Engagement Scale (Total)	20	.89	.91
- Behavioral Engagement	5	.78	.81
- Emotional Engagement	5	.82	.85

- Cognitive Engagement	5	.76	.79
- Agentic Engagement	5	.81	.83
WTC Scale (Total)	12	.87	.90

The consistently high alpha coefficients indicate that the translated and adapted scales were internally consistent and reliably measured the intended constructs within the study sample across time.

7. 4.1.2 Baseline Equivalence and Normality Checks

The researchers performed independent samples t-tests on all pre-test scores to verify the equivalence of EG and CG before the intervention started. The results, presented in Table 2, show no statistically significant differences ($p > .05$) between the two groups on any pre-test measure.

Table 2. *Independent Samples t-tests for Pre-Test Scores*

Variable	Group	N	Mean (SD)	t-value	p-value
Behavioral Engagement (Pre)	EG	32	3.21 (0.62)	-0.451	.654
	CG	31	3.28 (0.58)		
Emotional Engagement (Pre)	EG	32	2.95 (0.71)	0.723	.473
	CG	31	2.84 (0.66)		
Cognitive Engagement (Pre)	EG	32	3.05 (0.59)	0.112	.911
	CG	31	3.03 (0.64)		
Agentic Engagement (Pre)	EG	32	2.61 (0.73)	-1.205	.233
	CG	31	2.82 (0.69)		
WTC Total Score (Pre)	EG	32	2.77 (0.81)	-0.889	.378
	CG	31	2.93 (0.75)		

The absence of major differences shows that the intact classes were correctly randomly assigned, which allows researchers to attribute any observed changes after the intervention to the MW intervention instead of pre-existing differences between groups. The analysis of skewness and kurtosis across all variables showed that the data followed the normality assumptions. Parametric tests need to function properly.

8. 4.2 Answering the Research Questions

9. 4.2.1. Answering the Research Question One

The first research question sought to explore how implementing a MW system affects the three types of classroom engagement (behavioral, emotional, and cognitive) among Iraqi EFL university students. A MANCOVA analysis was conducted to answer this research question by using the four

post-test engagement subscale scores as dependent variables and group membership (EG/CG) as the fixed factor while including pre-test scores as covariates. The analysis showed a major multivariate effect for Group (Pillai's Trace = .412, $F(4, 56) = 9.792$, $p < .001$, $\eta^2 = .412$) which demonstrated a significant difference between EG and CG on all engagement measures after adjusting for baseline levels. The results from the univariate tests (ANCOVAs) for each subscale are shown in Table 3. This demonstrates the particular effects of the intervention.

Table 3. *ANCOVA Results for Engagement Subscale Post-Test Scores (Controlling for Pre-Test)*

Dependent Variable (Post)	Group	Adjusted Mean (SE)	F(1, 59)	p-value	Partial η^2
Behavioral Engagement	EG	4.12 (0.09)	38.647	< .001	.396
	CG	3.30 (0.09)			
Emotional Engagement	EG	3.85 (0.10)	22.114	< .001	.273
	CG	3.05 (0.10)			
Cognitive Engagement	EG	3.78 (0.08)	25.331	< .001	.300
	CG	3.11 (0.08)			
Agentic Engagement	EG	3.45 (0.11)	10.225	.002	.148
	CG	2.85 (0.11)			

The EG reached substantially higher adjusted average scores than the CG across all four engagement subscales. The effect sizes (Partial η^2) show a wide range between the large Behavioral Engagement effect size of .396 and the medium Agentic Engagement effect size of .148. The results show that the MW intervention created a significant and meaningful positive effect on all parts of student engagement. The tool produced its most powerful effect on Behavioral Engagement because it was created to make all students participate actively at the same time.

The interview data validated these research findings. The research identified Active Visibility and Reduced Anxiety as two key themes, which repeated throughout the entire study. The students reported that the MWs created a safe space, which enabled them to join activities without feeling any pressure. I used to stay silent during class because I experienced fear about making mistakes in front of my classmates. The whiteboard allows all users to write simultaneously. The participant stated that having others present made them feel less shy because they were not alone. The direct connection between the two variables produces better behavioral and emotional engagement. The study identified two main themes, which included "Thinking and Correcting in Real-Time" to demonstrate the cognitive and agentic learning outcomes. Students found the task mentally challenging because they needed to generate ideas quickly while writing their thoughts down. You can see the right answer when the

teacher shows it. The task demands your complete attention. This drives you to correct your work independently. The student shows better mental focus and control of their learning process.

10. 4.2.2. Answering the Research Question Two

The second research question sought to determine how MWs affect the willingness to communicate (WTC) of Iraqi EFL university students in English. The research question required an Analysis of Covariance (ANCOVA) to evaluate WTC post-test scores as dependent variables, and group membership as fixed factors while controlling for WTC pre-test scores. The results are presented in Table 4.

Table 4. *ANCOVA Results for WTC Post-Test Score (Controlling for Pre-Test)*

Dependent Variable	Group	Adjusted Mean (SE)	F(1, 60)	p-value	Partial η^2
WTC	EG	3.82 (0.11)	18.566	< .001	.236
	CG	3.02 (0.11)			

The EG demonstrated a substantially greater adjusted average WTC score of 3.82 when compared to the CG score of 3.02 after accounting for initial WTC levels. The MW intervention produced a major improvement in students' self-assessed readiness for classroom L2 communication according to the statistical evidence from this study.

The research data analysis revealed the process which led to this numerical change. The main focus of the study centered on developing communication abilities through bridge building. The MW activity received consistent descriptions from participants who viewed it as a confidence-building practice. The board writing process of creating answers first allows me to prepare better. The correct writing I create brings me to feel more confident. The student explained that they volunteer to answer when the teacher asks because they have already practiced on their board. The new method functions as a secure transition. It connects the state of silence to verbal communication. Your first communication with the teacher will happen through your board. The MWs functioned as a preparatory platform, which helped students lower their emotional barriers and boost their confidence while reducing their anxiety levels. These two elements function as fundamental predictors of WTC according to MacIntyre's (1994) model.

11. 4.2.3. Answering the Research Question Three

The third research question aimed to understand if there is a significant relationship between changes in student engagement and changes in WTC following the implementation of the MW intervention. To answer this research question, Pearson product-moment correlation coefficients were

calculated between the gain scores (post-test minus pre-test) for Total Engagement and WTC within the EG only (N=32). The results are shown in Table 5.

Table 5. *Correlations between Gain Scores for Engagement and WTC (EG)*

Variable	1	2
1. Total Engagement Gain	1	
2. WTC Gain	.721	1

*** $p < .001$*

A very strong, positive, and statistically significant correlation was found between the degree of improvement in overall engagement and the degree of improvement in WTC ($r = .721, p < .001$). This indicates that students who experienced the greatest increases in their engagement levels through the MW intervention also tended to report the greatest increases in their WTC.

The research data analysis revealed the process which led to this numerical change. The main focus of the study centered on developing communication abilities through bridge building. The MW activity received consistent descriptions from participants who viewed it as a confidence-building practice. The board writing process of creating answers first allows me to prepare better. The correct writing I create brings me to feel more confident. The student explained that they volunteer to answer when the teacher asks because they have already practiced on their board. The new method functions as a secure transition. The method establishes a connection between the state of silence and verbal communication. Your first communication with the teacher will happen through your board. The MWs served as a training ground, which enabled students to decrease their emotional barriers and build self-assurance while minimizing their anxiety. These two elements function as fundamental predictors of WTC according to MacIntyre's (1994) model.

12. 5. Discussion

The study used a quasi-experimental design to examine how MWs as a low-tech teaching method affects student participation and their willingness to communicate in Iraqi university EFL classrooms. The research findings show that this tool is both effective and accessible while revealing detailed information about the underlying operational principles of the tool. The research findings receive interpretation through the following discussion, which links them to the study's research questions, theoretical frameworks, and previous empirical studies.

The analysis shows that the MW intervention had a strong positive effect on all four engagement dimensions, which include behavioral, emotional, cognitive, and agentic aspects. The effect showed the strongest impact on behavioral engagement before it affected cognitive and emotional engagement.

The findings strongly support social cognitive theory (Bandura, 1986) and constructivist principles (Vygotsky, 1978). The MW protocol used social cognitive theory to create planned situations. This let people learn through direct experience of mastering tasks. Students developed proof of their abilities through public board answer writing and correction activities which led to higher self-efficacy that drives active participation. The simultaneous response format reduced the fear of being exposed alone which directly targeted the anxiety factors that reduce emotional involvement. The teacher delivered immediate whole-class feedback after students showed their boards, which helped them reach their Zone of Proximal Development. Students built their knowledge through the interactive process of response and feedback and revision. This needed cognitive participation and delivered rewards for their mental work. The tool provided all students with an equal and immediate voice, which helped them take control of their learning process by influencing instructional flow and achieving agentic engagement. (Reeve, 2013).

The correct writing I create brings me to feel more confident. The student explained that they volunteer to answer when the teacher asks because they have already practiced on their board. The new method functions as a secure transition. The method establishes a connection between the state of silence and verbal communication. Your first communication with the teacher will happen through your board. The MWs served as a training ground, which enabled students to decrease their emotional barriers and build self-assurance while minimizing their anxiety.

The second research question results indicate that students from the experimental group achieved a statistically significant improvement in WTC through the MW intervention when compared to the control group. The results match perfectly with the WTC model that MacIntyre developed in 1994. The model shows that situational WTC depends mostly on L2 self-confidence, which develops from strong perceived communicative competence and low communication anxiety levels. The MW intervention worked to treat these determining factors. The initial step of giving students a written rehearsal before oral practice helped them feel more competent in communication because it let them check their language accuracy before speaking. The structure achieved its goal to reduce communication anxiety because it allowed all students to participate at once, while eliminating the stress that comes from being the only one raising a hand. The whiteboard functions as a secure platform which students use to transform their silent thoughts into spoken words, according to qualitative data. The intervention achieved its objective to enhance communication readiness through anxiety reduction techniques, and confidence building. To accomplish the final psychological stage.

Research on MWs and WTCs remains limited, but the results support existing studies that show supportive classroom environments improve WTC. Research shows that students need to decrease

their anxiety while building their self-confidence to succeed in second language communication (MacIntyre & Charos, 1996; Liu & Jackson, 2008). The present study demonstrates that particular low-tech teaching methods generate the essential learning environment conditions. The research study uses educational requirements to create safer learning environments. The studies draw from McCroskey and Richmond (1987) and Peng (2014) work to show students become more engaged through their methods. These methods prove to be effective in boosting WTC. The mechanism operates according to the findings made by Zekrati et al. (2025). Their research showed that students experienced lower anxiety levels, and higher confidence when using MW systems, but they did not assess WTC in their study..

The third research question revealed a strong significant positive correlation between the experimental group's gain scores for overall engagement and willingness to communicate (WTC). The strong link between these two elements becomes evident through their shared theoretical base, which demonstrates their interdependent nature. The MW intervention created an ideal classroom environment through active participation, which led to behavioral engagement and positive affect. This then resulted in emotional engagement and deep processing, which created cognitive engagement and self-directed action. This formed agentic engagement. The theoretical model shows that this climate system works against the anxiety and passivity, which prevent people from expressing their willingness to communicate (WTC). The process of developing self-confidence and perceived competence requires emotional and cognitive participation. These support WTC. The increasing WTC will probably lead to more participation, which will establish a positive feedback loop. The study demonstrates that engagement and WTC exist in a reciprocal relationship, which enables educational strategies to affect both elements by targeting their shared foundation of student self-confidence and emotional stability.

The numerical data from the research findings validate the theoretical connections which researchers have previously described in their studies. The research shows that student participation levels and their readiness to communicate strongly relate to each other, yet most research studies these two elements separately. The findings from this study confirm the results discovered by Lee and Lee (2019) who found that teaching methods which combine student involvement with their motivation levels. Impact their willingness to communicate (WTC). The data reveals a statistical connection between engagement variations and WTC alterations, which appear following a specific intervention. The study provides numerical evidence, which supports the qualitative findings of Derakhshan (2024) and other researchers who prove that positive psychological characteristics and supportive classroom environments result in enhanced student participation and communication outcomes. The findings

support a single educational experience framework, which shows that improving one aspect will generate beneficial results for the other aspect.

13. 6. Conclusion

The research examines how MWs as a low-tech teaching method affects student inactivity and their unwillingness to communicate in an Iraqi university setting where English is taught as a foreign language. The study produced definitive results through its quasi-experimental mixed-methods research approach. The results prove that MWs integration in a systematic way brought substantial improvements to Iraqi EFL students' complete engagement, which includes behavioral, emotional, cognitive, and agentic aspects, and their willingness to communicate in English. The study found a strong positive relationship between engagement improvements and WTC increases. This shows these two factors work together effectively. The qualitative results show that the intervention reached its goal by establishing an anxiety-free participatory space, which acted as a communication bridge to help users develop verbal skills through practice and instant feedback. In sum, this research affirms that accessible, low-cost tools can effectively transform traditional classroom dynamics, fostering a more active, confident, and communicative learning environment even in under-resourced settings.

The research findings demonstrate substantial effects which affect teaching strategies, learning resources, and professional development programs for teachers who operate in similar EFL settings. The research provides EFL teachers with a proven method to manage their classrooms when they deal with many students who show little interest in learning. The implementation of MWs requires minimal financial resources to achieve maximum student participation results. Teachers need to use MWs for every assessment requirement, which includes formative assessment cycles and question posing, real-time student response collection, instant feedback delivery, and revision possibilities. The learning space shifts from teacher-led monologues to student-centered interactive discussions.

Syllabus and lesson plan designers must establish structured interactive response techniques as their core activities when developing curricula and materials. Training materials and teacher guides should contain specific sections about low-tech formative assessment tools, including MWs, because they help students practice oral skills and stay engaged in their learning process. The research provides actual classroom methods which go past the theoretical promotion of communicative language teaching. The research shows university administrators, together with policymakers, who operate in restricted funding environments must direct their resources toward teacher education for affordable and effective teaching approaches. The implementation of active learning methods through local

resources during professional development workshops leads to major improvements in teaching quality and student achievement.

Teacher education programs which train future EFL teachers need to combine theoretical knowledge about tools like MWs with practical training methods for their application. Student-teachers must grasp the way these interventions control fundamental psychological elements including self-efficacy, anxiety, and perceived competence to create student involvement and willingness to communicate. Student-teachers must grasp the effects of these interventions on psychological elements including self-efficacy, anxiety, and perceived competence to develop their ability to handle classrooms from their first day of teaching.

The study delivers important findings but several restrictions need to be recognized. The research included a limited group of participants who came from one university located in Iraq. The results of this study show strong evidence in this particular setting, yet they might not apply to every university in Iraq, or to educational environments that follow different cultural, and institutional rules. The intervention period lasted for one academic semester, which constituted its short duration. The research showed major results. The lasting impact of these improvements on student engagement and WTC after MW removal and class transition remains uncertain.

The measurement of WTC presents the third major restriction in this study. The WTC scale assessed self-reported behavioral intentions through hypothetical situations. The standard measurement does not show actual communicative behavior in real life. A stronger design would triangulate self-report data with actual counts of student speech acts in the classroom. The research employed a single instructor to teach both groups for teacher effect control, but the teacher's enthusiasm and proficiency with the MW protocol probably affected the study outcomes. The tool's success depends on how well teachers put it into practice. This differs from one instructor to another.

The research base allows upcoming investigations to build upon its results while exploring new directions. The first step requires research that follows students through multiple academic years to evaluate how long these effects last. The study would examine if students who show more willingness to communicate in MW-supported classes continue to use this approach in other classroom settings, and when they speak a language outside of class. The research needs to be duplicated at other Iraqi universities, and across various EFL learning environments, including Arab nations and Southeast Asian countries, to determine if the results apply universally and to discover how cultural elements and institutional factors affect the outcomes.

Future studies should use direct observational methods to complement self-report WTC data through coding student-initiated L2 utterance frequency and duration, which will provide an objective measurement of communicative behavior. A research study needs to analyze individual characteristics, which include personality traits, proficiency levels, and gender, to determine their effect on MW tools for increasing engagement and WTC. Organizations will create particular solutions for various student groups through this acquired understanding. Finally, comparative studies examining the effectiveness of low-tech SRSs (like MWs) against high-tech counterparts (like clicker apps) in resource-constrained settings could inform cost-benefit decisions for institutions, examining whether the significant benefits of interactivity can be achieved without digital infrastructure.

14. References

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