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# AI-Driven E-Commerce Strategies and Business Redirection in GCC Countries: Trends, Challenges, and Strategic Implications

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## Abstract

This study scrutinizes the pivotal role of Artificial Intelligence (AI) in shaping and enhancing e-commerce strategies and business redirection approaches within the United Arab Emirates. As digital transformation accelerates, AI technologies—ranging from predictive analytics to intelligent automation—have become instrumental in enabling rapid, remote, and intelligent transactions. These innovations allow businesses to optimize supply chains, personalize customer experiences, and streamline decision-making, redefining how commerce is conducted in the digital age.

While AI fosters operational efficiency and competitive advantage, its integration also presents challenges. Issues such as technological readiness, cybersecurity threats, data privacy, and the digital divide remain pressing concerns, especially for small and medium-sized enterprises (SMEs) navigating this evolving landscape. Moreover, despite the legitimacy of AI-enabled transactions, trust deficits persist due to the virtual and often anonymous nature of online engagements.

This research explores how UAE-based e-commerce enterprises adopt AI to redirect their strategic models, enhance user trust, and respond to changing market dynamics. By analyzing the intersection of AI capability, business agility, and transactional security, the study aims to provide actionable insights for entrepreneurs and decision-makers seeking to leverage AI for sustainable growth in the region's digital economy.

## Assessing Learning in an Undergraduate Leadership Course at a STEM-Focused Institution

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### Abstract

This paper will discuss the use of pre- and post- course reflection as a means of assessing the impact and overall learning of students enrolled in an undergraduate leadership course (the psychology of leadership). The psychology of leadership course was offered as a special topics elective course at an undergraduate institution of moderate size in the northeastern region of the United States for six semesters prior to receiving full course approval for Spring of 2022. An overview of the course and an analysis of the pre- and post-course assessment data collected is presented. As a result of reading this paper, readers will have the opportunity to learn about assessing learning in an undergraduate leadership course focusing on self-development on students at a specialized institution focusing on STEM education and examine emergent themes from qualitative pre- and post-course assessment data from students at a specialized institution focusing on STEM education.

**Keywords:** Leadership, self-development, assessing learning, undergraduate students.

### Introduction

Self-development is defined as a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes (Day & Lance, 2004). Exposing students to self-development in their undergraduate career can assist with their self-development and leadership development in their discipline or intended field of interest. Research claims that some disciplines, such as STEM-related fields, are not perceived as leadership-focused by those who work in said fields (Schell & Kauffmann, 2016, June). Therefore, the need exists to encourage self-development practices for students in STEM-related fields to augment the impressions of potential for learning about leadership, and how doing so can assist not only with leadership development, but also in working to eradicate many of the biases and stereotypes that are associated with working in STEM-related fields (Thébaud & Charles, 2018). Leadership development is a learning process (Brown & Posner, 2001). Individuals can benefit from exposure to leadership approaches, strategies, and theories, and learning about the intricacies of leadership, including the contradictions and paradoxes, can help to improve problem-solving abilities and result in a more sophisticated understanding of what leadership entails (Cronin, 1984). From a self-development perspective, learning about leadership has the potential to assist with student development through giving them the opportunity to form a more cogent understanding of what they bring to the table as an individual, a team member, and as an aspiring effective leader.

A good leader must be ambidextrous and have the ability to carry out different actions simultaneously and undergo multiple multi-level learning processes (Kafetzopoulos, 2022). This kind of adaptive leadership is complemented with the leader's propensity to take steps to develop themselves as a person and as a leader. Leadership development (i.e., self-development) can trigger critical self-reflection (Brown & Posner, 2001; Kember, McKay, Sinclair, & Wong, 2008). Reflection can serve as a method for helping individuals form a foundation for leading, developing, and influencing others through focusing on self-development (Stead, Thornton, & Frost, 2021).

The Kirkpatrick model of training evaluation denotes four levels of evaluation: Reactions, learning, behavior, and impact (Topno, 2012). Research indicates that this model is most effectively implemented at the reaction and learning levels (Topno, 2012). With this in mind, evaluating leadership in the psychology of leadership course will focus on assessing student learning through the use of pre- and post-course assessments, which includes questions on course expectations, course learnings, and personal leadership definitions (Topno, 2012; Bond, 2005).

The term leadership has been defined in myriad ways by countless researchers and scholars through the years. This presents a challenge in attempting to discover one true definition of leadership. However, working with individuals on the ways in which they define leadership while they are engaged in developing a practice for effective

leadership can assist the individual with finding a center for their understanding of leadership in accordance with who they are and what is most important to them. Therefore, this paper will discuss the utility of working with undergraduate students at a specialized institution to build and refine their personal definition of leadership. This is inspired by the author's experience in a two-year undergraduate leadership development program, where personal leadership definitions were generated at the beginning and end of a foundational leadership course (University of Central Florida, n.d.).

This paper will work to investigate the following questions: *What does assessing learning in an undergraduate leadership course focusing on self-development look like for undergraduate students at a specialized institution?*, and *What if any differences exist between pre- and post-course assessment data from an undergraduate leadership course focusing on self-development?* As a result of reading this paper, readers will have the opportunity to: 1.) Learn about assessing learning in an undergraduate leadership course on students at a specialized institution focusing on STEM education., and 2.) Examine student-generated emergent themes from qualitative pre- and -post course assessment data from students at a specialized institution focusing on STEM education.

### **Review of Related Scholarship**

A review of the relevant literature is presented and will focus on assessing learning, reflection, and leadership definitions.

### **Assessing Learning In Higher Education**

Jarvis (1992) defines learning as personal change. This definition is transferrable across many disciplines and schools of thought. A framework is provided for the measurement of change in the course of learning, centering on three levels of learning: Non-learning, surface learning, and deep learning (Hay, 2007). Non-learning refers to the simple repetition of prior knowledge and constitutes reinforcement without change (Jarvis, 1992). Surface learning is the addition or deletion of concepts in the absence of integration with remaining parts of the prior knowledge structure, while deep learning highlights the meaningful integration of prior knowledge and newly acquired information in ways that demonstrably increase understanding of the topic (Hay, 2007; Mann, Gordon, & MacLeod, 2009). The intention of the psychology of leadership course is to guide undergraduate students toward the development of deep learning skillsets through the use of reflection-based deliverables.

Bond (2005) makes case for the pre-assessment and post-assessment in academic courses as a reasonable way to assess student's learning and for the impact of what is learned. With this in mind, the psychology of leadership course makes use of a pre- and post-course assessment as a means of assessing student learning. The pre-course assessment serves as a diagnostic tool to assess student learning prior to being exposed to course topics as well as to make any adjustments during course delivery, while the post-course assessment examines student learning at the end of the course experiences (i.e., after exposure to course topics) with adjustments being made to the next cycle of the course in subsequent semesters. Pre- and post-assessment will be utilized for the purposes of this paper.

William (2011) makes the distinction between the assessment for learning and the assessment of learning: Assessment *for* learning refers to the tools used to assess learning such as tests, quizzes and other similar tools used within the structure of the course, and assessment *of* learning connotes assessing what is learned during an experience such as an academic course through the use of methods like final examinations, final presentations, and pre- and post-course assessment (William, 2011). Assessment for learning works well with providing feedback throughout a learning experience in an academic course, while assessment of learning is good for making adjustments to course design and/or course delivery (William, 2011). The psychology of leadership class utilizes both types of assessing learning, but for the purposes of what is outlined in this paper, the emphasis will be on assessment of learning. Although assessment of learning is somewhat controversial in the field of higher education, it serves as a commonly used way to assess student learning in a collegiate setting (Dellwo, 2010; Campbell & Stanley, 2015).

Vygotsky (1978) defines the zone of proximal development as a point of progression that will develop more intricately in the near future but have embarked on the process of developing at present. As such, the psychology of leadership course works to promote student learning by utilizing students' current experiences as a foundation for students' intended or future experiences with regard to leadership.

DePaolo and Wilkinson (2014) contend that word clouds can assist with investigating the assessing student learning in an undergraduate course in higher education by providing some feedback on what is being retained by students with regard to course material. The use of word clouds can serve as a meaningful tool for assessment by analyzing patterns and common themes of word usage and phrases to evaluate if key concepts are being understood by students in a given academic course, especially courses involving some form of reflection (DePaolo & Wilkinson, 2014). For the purposes of this paper, word clouds will be used to analyze selected pre- and post-course assessment student data from the psychology of leadership course.

### Reflection & Reflective Practice

Lundgren and Poell (2016) define reflection as the activity of exploring or examining an issue and considering it in relation to experiences. Previous research maintains that reflection is an effective tool for students to become aware of their competences and abilities (Stead, Thornton, & Frost, 2021). Reflection can play a key role in the assessment for learning and the assessment of learning, with the learner's experiences as the starting point for a cycle of reflection, conceptualization and experimentation (William, 2011; Healey & Jenkins, 2000). Students enrolled at a specialized institution focusing on STEM-related majors might not have experience with this concept due to the priorities and demands associated with their respective major (Xie, Fang, & Shauman, 2015). Therefore, it is important to provide guidance and supervision when facilitating students through a leadership course emphasizing reflective practice. Students in the psychology of leadership course have individual-based deliverables centering on reflection, and the course as a whole presents a series of reflections and applications to personal and professional experiences, all of which is collected periodically throughout the entirety of the course (Stead, Thornton, & Frost, 2021; Lundgren & Poell, 2016; Healey & Jenkins, 2000). These efforts underscore Ryan's (2013) research on the interplay of reflective and reflexive work within higher education settings (i.e., the classroom) which helps the learner (i.e., students) to distinguish between experience, generalization, and best practices.

Research on reflection defines two main levels: Surface level reflection and deep level reflection (Mann, Gordon, & MacLeod, 2009; Mezirow, 1991). Surface levels of reflection tend to be less analytical and more descriptive, while deeper reflection involves more analysis and critical synthesis, which suggests that it occurs less often because it is more difficult to achieve (Mann, Gordon, & MacLeod, 2009). Deeper levels of reflection are associated with higher quality thinking (Mezirow, 1991). The psychology of leadership course zooms in on surface and deep level learning and pairs these ideas with surface and deep level reflection (Hay, 2007; Mann, Gordon, & MacLeod, 2009).

According to Kember, McKay, Sinclair, & Wong (2008), four different levels of reflection exist: *Habitual Action* represents an action with little to no conscious thought, resulting in non-reflective behavior; *Understanding* is a process of comprehending knowledge without relating it to other situations; *Reflection* involves taking a concept and thinking about it in relation to experiences and applications, which can help to elucidate meaning and has the potential to result in a change of perspective; and *Critical Reflection* refers to a change in perspective through the examination of conscious and unconscious beliefs and assumptions which can result in the learned information being incorporated into the learner's belief system (Kember, McKay, Sinclair, & Wong, 2008). Defining these levels proves to be valuable for educators by assisting in evaluating the depth of reflection of students in their course (Kember, McKay, Sinclair, & Wong 2008). With these four levels of reflection in mind, the psychology of leadership course takes the following approach: *Habitual Action* is represented through the use of the pre-course assessment to gain insights on previous interpretations of leadership; *Understanding* is observed by course lectures, course discussions; *Reflection* is promoted through a series of reflective-based course assignments; and *Critical Reflection* is represented by the post-course assessment, and through the final deliverables which are indicative of the overall course experience (Kember, McKay, Sinclair, & Wong, 2008). Overall, the psychology of leadership course provides opportunities for students to engage in self-development through reflection and reflective practice, and these concepts along with the leadership framework and selected course topics have helped to reinforce this intention (Lord & Hall, 2005; Payne, 2024).

### Leadership Definitions

Effective leadership development is a process in which leaders take personal responsibility for initiating, sustaining, and evaluating growth in their own leadership capacities and in their conceptual frames about the conduct of leading of others (Day & Lance, 2004). The psychology of leadership course utilizes an effective

leadership framework called the Action Based Effective Leadership Development and Influence (ABELDI) Framework (Payne, 2024). The ABELDI Framework defines effective leadership as working to achieve one's own objectives while assisting others in achieving their objectives (Payne, 2024). This definition of effective leadership is integrated into course through the use of the ABELDI Framework and it accentuates the intent of the course, which is for students to apply course material toward personal and professional experiences (Payne, 2024).

Research points to a more traditional definition of leadership of leading people toward a common goal (Bass, 1960). The common goal or vision is determined by the leader, and this can be a vision of their creation, or they can be acting on behalf of another's vision. The psychology of leadership course observes this traditional definition of leadership but places more emphasis on the aspects associated with self-development, such as individual identity, values, and more (Lord & Hall, 2005). The course accentuates the alternative definition of leadership involving taking action, inspired by the Donald H. McGannon quote "Leadership is action, not position" (Peter, 1991, p. 71). The course emphasizes the moral and ethical components of effective leadership to affirm that these are essential components of taking action (Starratt, 2004). The result is more of a prequel to the traditional definition of leadership by highlighting alternative approaches to how leadership is defined. For example, before a leader can effectively lead people toward a common goal, a case can be made for the leader to understand themselves at a deeper level. This can be accomplished by focusing on aspects of self-development, which work to develop the leader's confidence, skills and strategies (Lord & Hall, 2005).

For students in an undergraduate leadership course at a STEM-focused institution, it seems to be more useful to emphasize the individual components of taking action as opposed to leading people toward a common goal, since students will most likely not assume traditional leadership roles until later in their career. As such, by focusing on self-development leadership competencies, students will be able to develop the skills required to lead effectively through formulating an understanding of themselves.

Two categories of leadership definitions will be utilized for the purposes of this paper: *Traditional Leadership* (leading others toward a common goal), and *Alternative Leadership* (any description other than that of the traditional leadership definition). Alternative Leadership definitions from the psychology of leadership course are likely to reflect aspects of learning as a result of taking the course. Lastly, the ABELDI Framework consists of four areas: *aspire, inspire, model, and persuade* (Payne, 2024). The *persuade* area is reflective of the Traditional Leadership definition, while the other three areas reflect Alternative Leadership definitions and approaches.

Making use of student definitions of leadership through the use of a pre- and post-course assessment allows students to reflect upon what leadership means to them while they explore aspects of leadership in an undergraduate course setting (Lundgren & Poell, 2016; Stead, Thornton, & Frost, 2021; Lord & Hall, 2005). By focusing on student definitions of leadership, in addition to other aspects of the course, the psychology of leadership course provides a space for deep reflective practice, which is in itself a critical component of the practice of self-development (Mann, Gordon, & MacLeod, 2009).

### **Description of Practice**

Classroom andragogical and pedagogical research points to independent thinking as an essential ingredient in the recipe for effective learning practices in education (Merriam, 2001; Kozulin & Presseisen, 1995). At specialized institutions, particularly those whose focus is on students retaining myriad technical skills like STEM-focused institutions of higher learning, there may be fewer opportunities to lean into self-development approaches (Xie, Fang, & Shauman, 2015). The purpose of the psychology of leadership course is to introduce students to the theories, concepts, and application of leadership, with the ethical implications of these concepts woven throughout the course (Payne, 2024). The overall aim of the course is for students to apply course material directly to their personal and professional experiences, the result of which is intended to encourage thinking for oneself as well as in engaging in self-development toward the development of a practice of effective leadership (Kozulin & Presseisen, 1995; Brown & Posner, 2001). The psychology of leadership course utilizes learning elements to help encourage effective leadership practices by way of course design and course delivery, each of which is explained below.

#### **Course Design**

The psychology of leadership course is an unrestricted elective open to all majors, and as such, relies more on a series of reflective individual application-based assignments and team-based presentations rather than on tests and quizzes. All deliverables in the course culminate into an individual effective leadership development action plan, and final team presentations applying course concepts to a selected medium. Learning outcomes for the

psychology of leadership course state that students who complete the course will be able to: 1) Identify and apply theories, approaches, and styles of leadership; 2) Develop and analyze effective leadership development plans; and 3) Apply course content to various sources through the lens of their own experiences. The psychology of leadership course aspires to help students expand their respective frames of reference through the use of reflective, application-based deliverables (Mezirow, 1997; Payne, 2024).

### Course Delivery

Delivery of the psychology of leadership course content relies primarily on principles of instructional theory and experiential learning, highlighting a learn-by-doing approach (Schank, Berman, & Macpherson, 1999). Students have a series of opportunities to engage in experiential learning while also allowing those who wish to rise to the challenge of sharing what they learned with the rest of the students in the course (Payne, 2024). The psychology of leadership course is designed to promote a learning environment in which the instructor steps back to allow the experiential learning to take place through cognitivist-centered approaches to learning (Payne, 2019; Glock, 2011). Assessment *for* learning in the psychology of leadership course is focused on the practice of self-development (William, 2011; Lord & Hall, 2005). There are no quizzes or tests, however a series of summative, reflective-based assignments intent on allowing students to apply the course material to their personal and professional experiences while projecting how the material can be applied to future personal and professional experiences, framed in the course as a student's *leadership journey* (Stead, Thornton, & Frost, 2021; Lundgren & Poell, 2016; Healey & Jenkins, 2000; Vygotsky, 1978). Assessment *of* learning in the psychology of leadership course makes use of pre- and post- course assessments focusing on leadership definition, course expectations, and overall learning from the course through formative, reflection-centered individual and team deliverables (William, 2011; Bond, 2005; Lord & Hall, 2005; Stead, Thornton, & Frost, 2021).

### Discussion of Outcomes

The psychology of leadership course was offered as a special topics course from Spring 2020 to Fall 2021 semesters at a STEM-focused specialized institution and has been offered as a full course since the Spring 2022 semester. The pre- and post-course assessment of the psychology of leadership course was implemented during the Spring 2024 semester in two sections of the course. Students received class assignment credit for completing the pre- and post- course assessments. Refinements were made to the pre- and post-course assessments after the Spring 2024 semester, so data was collected from the Summer 2024 and Fall 2024 semesters. Both the pre- and post-course assessments were made available to students electronically and consisted of the following questions: 1) *What is your definition of leadership (pre- and post-course assessment)?*; 2) *What do you hope to get out of taking the psychology of leadership course (pre-course assessment)?* and *What did you learn from taking the Psychology of Leadership course (post-course assessment)?*; and *Additional comments (pre- and post-course assessment)*. The responses associated with *additional comments* were omitted since they consisted of mostly unrelated items. Thematic analysis was used to interpret the course evaluation feedback from the previous semesters (Clark, Braun & Hayfield, 2015). Content analysis was conducted to create codes for appropriate data sources (Neuendorf, 2001). Highlights are presented via emergent themes from the qualitative pre- and post- course assessment data. A total of thirty-eight responses to the pre- and post- course assessment were collected and analyzed from the Summer 2024 and Fall 2024 semesters.

### Leadership Definitions

Word frequency. Word clouds were utilized to analyze the frequency of words used in the pre- and post-course student leadership definitions (DePaolo & Wilkinson, 2014). The top twenty words used in leadership definitions were identified, and thirteen words that showed up on both the pre- and post-course student leadership definitions were eliminated. The results yielded seven unique words for each set of definitions. The top seven words used in the pre-course definitions were as follows: 'Charge', 'together', 'support', 'look', 'bring', 'definition', and 'leader'. The top seven words used in the post-course definitions were: 'Towards', 'inspire', 'positive', 'good', 'influence', 'around', and 'action'.

*Words inclusive of course concepts.* The words used in the post-course leadership definitions that were inclusive of course concepts were: 'Inspire', 'positive', 'influence', and 'action'. The ABELDI Framework was covered during the psychology of leadership course on a consistent basis throughout the semester, and makes use of the words 'action', 'inspire', and 'influence' (Payne, 2024). In addition, ethical leadership is covered as a course topic which is revisited throughout the semester of the course and frequently makes of the words 'positive' and 'good' (Northouse, 2018).

Definition word count. In analyzing the word counts from the pre- to post-course definitions of leadership,

three categories emerged: *Minus* (post-course definition with word count less than the pre-course definition), *Equal* (post-course definition with word count equal to the pre-course definition), and *Plus* (post-course definition with word count greater than the pre-course definition). Eleven pre- and post-course definitions were labeled as *Minus* (29% of total respondents), one pre- and post-course definition was labeled as *Equal* (3% of total respondents), and twenty-six pre- and post-course definitions were labeled as *Plus* (68% of total respondents). Traditional & alternative leadership definitions. Leadership definitions were categorized as *Traditional* (i.e., similar to leading people toward a common goal) and *Alternative* (i.e., any definitions different from Traditional definition of leadership). For the pre-course definitions of leadership, ten (26% of total respondents) were categorized as *Traditional*, and twenty-eight (74% of total respondents) were categorized as *Alternative*. The post-course definitions of leadership yielded eight (21% of total respondents) definitions categorized as *Traditional* and thirty (79% of total respondents) definitions categorized as *Alternative*. From this information, we can see that there were two instances where respondents switched from a *Traditional* to *Alternative* definition of leadership via the post-course assessment survey.

In analyzing the pre- to post-course leadership definitions, twenty-five respondents (66% of total) began the course with an *Alternative* definition of leadership and finished the course with an *Alternative* definition of leadership. Only three respondents (8% of total) had *Alternative* leadership definitions on the pre-course assessment and ended up with *Traditional* leadership definitions of the post-course assessment. Please see Table 1 for a breakdown of the leadership definitions from pre- to post-course assessments.

Overall, thirty-four respondents (89% of total) experienced a change in their definition of leadership from the pre- to post-course assessments, and four respondents (11% of total) experienced no change in their definition of leadership from the pre- to post-course assessments. Regarding leadership definitions that are inclusive of course concepts, twenty-seven respondents (71% of total) had post-course leadership definitions inclusive of concepts covered during the course, and eleven respondents (29% of total) had post-course leadership definitions that were not inclusive of course concepts. The *Alternative to Alternative* (alt → alt) definitions of leadership were reported to have the most significant changes, with nine pre- to post- word count course definitions labeled as *Minus* (24% of total respondents), one pre- to post-course definition labeled as *Equal* (3% of total respondents), and fifteen (39% of total respondents) pre- to post- word count course definitions labeled as *Plus*. Both the *Traditional to Alternative* and *Traditional to Traditional* definitions of leadership have one pre- to post-course definition labeled as *Minus* (3% of total respondents), no pre- to post-course definitions labeled as *Equal*, and four pre- to post-course definitions labeled as *Plus* (11% of total respondents). The *Alternative to Traditional* definitions of leadership had three pre- to post-course definitions labeled as *Plus*, with no pre- to post- course definitions being labeled as either *Minus* or *Equal*. Please see Table 2 for a breakdown of leadership definitions from pre- to post-course assessments with word counts.

Table 1: Leadership definitions from pre- to post-course assessments

DEFINITION (PRE → POST)	NUMBER	PERCENTAGE OF TOTAL RESPONDENTS
*TRAD = TRADITIONAL DEFINITION *ALT = ALTERNATIVE DEFINITION		
TRAD → ALT	5	13%
ALT → TRAD	3	8%
TRAD → TRAD	5	13%
ALT → ALT	25	66%
<b>TOTAL</b>	<b>38</b>	<b>100%</b>

Table 2: Leadership definitions from pre- to post-course assessments with word counts

DEFINITION (PRE → POST)	MINUS PRE → POST WORD COUNT	EQUAL PRE → POST WORD COUNT	PLUS PRE → POST WORD COUNT	TOTAL
*TRAD = TRADITIONAL DEFINITION *ALT = ALTERNATIVE DEFINITION				
TRAD → ALT	1	0	4	5
ALT → TRAD	0	0	3	3
TRAD → TRAD	1	0	4	5
ALT → ALT	9	1	15	25
TOTAL	11	1	26	38

### Course Expectations & Course Learnings

Course expectations were assessed via the following pre-course assessment question: *What do you hope to get out of taking the Psychology of Leadership course?* Course learnings were assessed via the following post-course assessment question: *What did you learn from taking the Psychology of Leadership course?*

**Word frequency.** Word clouds were utilized to analyze the frequency of words used in the aforementioned pre- and post-course assessment questions (DePaolo & Wilkinson, 2014). The top twenty words used in the pre- and post-course assessment questions were identified, and eight words that showed up on both the pre- and post-course student leadership definitions were eliminated. The results yielded twelve unique words for each question. The top twelve words used in the pre-course assessment question were as follows: ‘Hope’, ‘better’, ‘want’, ‘become’, ‘understand’, ‘work’, ‘qualities’, ‘able’, ‘lead’, ‘leaders’, ‘gain’, and ‘one’. The top twelve words used in the post-course assessment question were: ‘Lot’, ‘ways’, ‘help’, ‘styles’, ‘type’, ‘become’, ‘aspects’, ‘course’, ‘situation’, ‘effective’, ‘making’, and ‘things’.

**Words inclusive of course concepts.** The words used in the post-course leadership question that were inclusive of course concepts were ‘styles’, ‘situation’, and ‘effective’. The words ‘styles’ and ‘situational’ can be interpreted as reflective of the style approach to leadership and the situational approach to leadership (Northouse, 2018). The word ‘effective’ is reflective of the ABELDI Framework, which focuses on effective leadership (Payne, 2024). Students were routinely prompted to apply course topics to their effective leadership journey (e.g., their future-oriented experiences) as well as to their practice of effective leadership (e.g., their present experiences), which is demonstrative of the zone of proximal development (Vygotsky, 1978).

### Reflections

This paper presents an example of assessing learning in an undergraduate leadership course focusing on self-development at a specialized institution. Based on the results, it is suggested that the psychology of leadership course can assist students in expanding their respective frames of reference through the use of reflective, application-based deliverables (Mezirow, 1997; Payne, 2024). The course emphasizes deep learning through centering on previously obtained knowledge in conjunction with new information learned in the course (Hay, 2007; Mann, Gordon, & MacLeod, 2009). Assessing learning in the psychology of leadership course primarily leans upon the assessment *of* learning, as outlined in this paper, but also can serve as an example of how assessment *for* learning can be impacted through the use of course delivery approaches focusing on self-development and reflective practice (William, 2011; Lord & Hall, 2005; Bond, 2005; Stead, Thornton, & Frost, 2021). This paper also made attempts to examine differences between pre- and post-course assessment results in an undergraduate leadership course focusing on self-development. The results suggest that students’ post-course leadership definitions were more reflective of course concepts as compared to students’ pre-course leadership definitions, and that course learnings were reflective of course concepts. However, more research is required. This information is indicative of personal change, and pre- and post-course definitions are suggested as ways to allow both educators as well as students to better understand the nature and degree of personal change taking place (Jarvis, 1992). Assuming that leadership development is a learning process, the psychology of leadership course is suggested to have the potential to help undergraduate STEM students in forming a more intricate understanding of leadership overall (Brown & Posner, 2001; Cronin, 1984). Most pre-course definitions were categorized as Alternative, and most post-course definitions were categorized as Alternative, which is demonstrative of the evolution in our collective understanding of what leadership entails.

This paper featured an example of assessing learning in an undergraduate leadership course. A key limitation involves the use of one rater (i.e., the instructor), and research indicates that using multiple raters can help to reinforce the findings and interpretation of data (Goffin & Gellatly, 2001). Another limitation involves the use of qualitative research, and more specifically, the use of pre- and post-assessment design, where other factors are likely to have influenced changes from pre- to post-course assessment data (Geldhof, Warner, Finders, Thogmartin, Clark, & Longway, 2018; Campbell, & Stanley, 2015). Future research should employ the use of a multi-stage pre- and post-course assessment approach to potentially improve the degree to which the results can be generalized (Dellwo, 2010; Carminati, 2018; Sydnor, Sass, Adeola, & Snuggs, 2014). Further, more work should be done to eliminate response shift bias that is common to the pre- and post-assessment experimental design (Geldhof, Warner, Finders, Thogmartin, Clark, & Longway, 2018). The majority of pre- to post-course leadership definitions resulted in the post-course definition word count being greater than the pre-course definition. Although this information can be useful when assessing learning in an academic course, the length of an individual's leadership is likely to not tell the whole story. As an example, the author had experience with defining leadership at the beginning of the two-year leadership program and again at the end, which reflected a substantial decrease in the leadership definition word count (University of Central Florida, n.d.). Lastly, future research should integrate quantitative-based questions into the pre- and post-course assessments, such as the inclusion of learning objectives with a rating scale, and an overall deeper analysis of the data through the use of more intricate content analysis and inter-rater reliability (Neuendorf, 2001). An example of this would be a question listed on both the pre- and post-course assessment such as *Confidence in my ability to practice effective leadership*, with a 10-point rating scale and a follow-up question requiring students to qualify their selected rating.

### Recommendations

The psychology of leadership course works to exemplify the significance of how exposing students to self-development in their undergraduate career can assist with their self-development and their leadership potential in their discipline or intended field of interest, particularly with STEM-related majors (Schell & Kauffmann, 2016, June). The attainment of knowledge has been purported to be incomplete and is subject to the communication within disciplines to be more fully understood (Stumme, Wille, & Wille, 1998). Helping students majoring in STEM-related fields to understand how developing subject matter expertise can be applied to leadership-oriented perspectives can make a substantial difference in whether or not the student will seek or accept a leadership position in the future.

Leadership educators are in prime positioning to guide students on a path toward becoming effective, ambidextrous leaders through exposure to leadership concepts and by having students center their learning on applications to their experiences supported by reflective practice (Kafetzopoulos, 2022; Kember, McKay, Sinclair, & Wong, 2008). Pre- and post- course assessments can be effective in helping to tell the story of how course material is received, and hopefully, retained by undergraduate students in a leadership course focusing on self-development. Further, word clouds can be useful in analyzing qualitative data and to give some indication of what shows up in the data (DePaolo & Wilkinson, 2014). Although word clouds can be effective for this purpose, more sophisticated data analysis would be needed to delve deeper and to make more connections and assumptions. A study by Heimerl, Lohmann, Lange, and Ertl (2014, January) serves as an example of delving deeper into word cloud data analysis. Lastly, the use of definitions indicative of course content is suggested to be useful in tracking student progress and development as a result of being exposed to course content. More research is needed to arrive at a more definitive conclusion.

Undergraduate courses focusing on self-development have the potential to assist students in shaping aspects of their being by taking into account the meaning they make through reflective-based course deliverables. First, students can benefit from pre- and post-course assessments by reflecting on what they have learned in a course, and how they plan on making use of the material going forward. Second, undergraduate students at specialized institutions are able to benefit from leadership courses focusing on self-development and are able to apply what they have learned back to their intended field of interest to assist with their leadership development potential (Xie, Fang, & Shauman, 2015). Third, reflection serves as an effective tool by which students are able to engage in deep learning practices (Stead, Thornton, & Frost, 2021; Lundgren & Poell, 2016; Healey & Jenkins, 2000; Ryan, 2013). Fourth and finally, pre- and post-course assessment data can assist students with their self-development by allowing them to see their progress and giving them space to prognosticate the use of what has been learned into the future (Bond, 2005).

It is hoped that this paper can assist other leadership educators in the creation of a learning practice which aims to provide a space for deep learning of what leadership means to undergraduate students, and how they can apply this information to their past, current, and future efforts in self-development.

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## The Impact of Russia's National Identity Quest on Kremlin Policymaking

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### **Abstract:**

A pivotal aspect of Russia's historical experience entails an underdeveloped national identity. Are they European or Asian? Is adherence to the Russian Orthodox church a prerequisite for being Russian? Having for centuries argued about the country's "true path," its citizens are perpetually unsure about common values and objectives which hold their nation together.

Yet, the habitually confused and vascillating Russians seek redress in politicized messianic aspirations. In the tsarist empire, in the Soviet or in post-Soviet state a mainstream assumption is that Russia has a higher spiritual purpose. The national tendency is therefore to follow a leader whose policies may be unjust and oppressive, but who summons citizens for a holy mission.

President Vladimir Putin does precisely what any popular Russian leader must do – supply his fellow-countrymen with a lofty cause. It purports to fill a gapping void in place of a national identity which Russia failed to develop. Putin perceives himself not merely as restorer of the imperial grandeur; his mission is messianic indeed -- to build the new "Russian World." Its purpose is no less than universal salvation, with Russia as a "light upon the nations" in a new global order. This paper demonstrates that Putin's "Russian World" vision is largely behind his policies in Serbia, the Ukraine, and elsewhere.

**Key Words:** Russia; national identity; "Russian World"; Putin; policy

## Perceptions of Classroom Teachers Towards Guidance Teachers/ School Psychological Counselors And The Factors Affecting These Perceptions

Aşkın Öykü USTA

### Abstract

The aim of this study is to determine the perceptions of classroom teachers towards guidance teachers/school psychological counselors and the factors affecting these perceptions. According to the results of the study, classroom teachers generally have a positive perception towards guidance teachers/school psychological counselors and guidance and psychological counseling services. However they have high expectations from guidance teachers/school psychological counselors with regards to their tasks which are not included in their job descriptions. This makes guidance teachers/school psychological counselors to have negative perception towards classroom teachers, and makes classroom teachers to have negative perception and to show resistance, and eventually makes it difficult to work in full collaboration. The main factors leading to negative perceptions and resistance in classroom teachers are that the guidance and consultancy services are not taken seriously, that such practices are seen as unnecessary, that a sufficient level of guidance and counseling is not gained, and that the parties are not opened to collaboration and solidarity. The socio-demographic factors that affect the perceptions of classroom teachers towards guidance teachers/school psychological counselors are the age of the classroom teachers and the number of students in the school.

**Keywords:** School Psychological Counselor, Guidance Teacher, Guidance and Psychological Counseling Services, Classroom Teacher.

### Introduction

Elementary school students spend most of their time with their classroom teachers, other than their families. Classroom teachers are individuals who can significantly influence not only the development of elementary school students but also the attitudes and habits that they will gain later in their lives. Before 2018, there were mainly cognitive domain courses in undergraduate education received by classroom teachers. (Kılıç-Özmen and Kabapınar, 2019). However, due to the classroom environments getting crowded and the need for intensive curriculum to be completed on time,

classroom teachers do not have sufficient time left for practices and approaches to guide students' cognitive development. Today, guidance teachers/school psychological counselors fill the significant gap in meeting this need.

Guidance teachers/school psychological counselors are the staff responsible for providing guidance and psychological counseling services in educational institutions. These services include ensuring students to adapt to school, to develop positive attitudes on educational environments and learning, learn to learn, to acquire cognitive skills for relaying what they have learned, to increase the effectiveness of learning, to recognize emotions better, to gain social skills to express themselves better, to acquire skills to cope with the difficulties in daily lives, to support the development of their personalities and professional skills (Ministry of National Education, 2017).

Guidance and school psychological counseling has been an area that started to be researched after the 1950s in Turkey. This area of specialization was published in the "Journal of Tebliğler" dated 1969 and became one of the specialization areas in assigning the teachers (Doğan, 1996). However, uncertainties regarding the name and scope of this area of specialization continued for a long time (Dağlı, 2014). Finally, it was called "guidance teacher" in accordance with the "Regulation on Guidance Services", which was published by Ministry of National Education in 2017. Among the main duties of guidance teachers are the following: Providing guidance and psychological counseling to families, students, teachers and administrators individually and/or as a group, getting to know individuals and evaluating them in terms of educational aspects, providing preference counseling when assigned, attending family visits with teachers, if necessary, participating in academic research and activities falling into their area of responsibility, participating in parent-teacher meetings (Kalm, 1999; Ministry of National Education, 2017).

As with most of the recent practices, there is also a number of problems for counseling and guidance practices in Turkey. A considerable part of these problems are due to the negative perceptions of school administration, classroom

teachers and guidance teachers/school psychological counselors about each other, and also due to the negative perceptions towards guidance /psychological counseling practices (Korkmaz, 2011). The changing dynamics of social and cultural life have diversified the problems which the students face both in school and out of school. In order to identify these problems in the fastest way possible and to provide permanent solutions, classroom teachers and school psychological counselors have to work in full collaboration and solidarity. (Hatunoğlu and Hatunoğlu, 2006). In addition, the negative perceptions of classroom teachers and guidance teachers/school psychological counselors about each other should be turned into positive. For positive perception, first of all, negative perceptions and the main factors causing them should be determined. These perceptions also vary due to the diversity in the main factors of perceptions (school administration, classroom

teachers, guidance teachers/school psychological counselors), which will affect the success of psychological counseling and guidance practices. Therefore, these perception types can be listed as the perception of school administration towards psychological counseling and guidance practices, the perception of school administration towards guidance teachers/school psychological counselors, the perception of classroom teachers towards psychological counseling and guidance practices, the perception of classroom teachers towards guidance teachers/school psychological counselors, perceptions of guidance teachers/school psychological counselors towards school administration and classroom teachers, the perception of guidance teachers/school counselors towards psychological counseling and guidance practices. They can even be diversified more under the influence of different factors.

Considering that classroom teachers have a significant role which is to assist school psychological counselors in the implementation of guidance and psychological counseling services, it is understood that the success of these services will depend mainly on the willingness and volunteering of the classroom teachers and, more importantly, on the positive perceptions of classroom teachers towards guidance teachers/school psychological counselors (Penbegül, 2014). Indeed, in many studies (Bozic and Carter, 2002; Karakuş, 2008; Loynd, Cooper and Hough, 2005; Reiner, Colbert and Perusse, 2009; Ünal, 2004) in literature, positive perceptions of teacher and school principal have been shown to increase the effectiveness, functionality and success of guidance and psychological counseling services. Therefore, the subject of this study is limited within the framework of the perceptions of classroom teachers towards guidance teachers/school psychological counselors and the factors affecting these perceptions.

#### Perceptions of Classroom Teachers Towards Guidance Teachers/School Psychological Counselors

Guidance and psychological counseling services have an important and effective role in the services provided to students, which is a significant part of the education process (Camadan and Kahveci, 2013). It is considered that the roles of guidance teachers/psychological counselors in psychological counseling and guidance practices are the subject of the majority of the studies on guidance teachers/psychological counselors in schools (Stelzer, 2003). In a significant part of such studies which aimed at identifying roles, the opinions of teachers, students, school administration and students' parents are consulted. In the remaining studies, the opinions of guidance teachers/psychological school counselors are consulted. However there are a few number of studies on all perceptions of the classroom teachers towards guidance teachers/psychological school counselors and on the factors affecting the perceptions, including the role perception.

A study was conducted to determine mutual perceptions by Kılıç-Özmen and Kabapınar (2019) with 49 teachers (32 classroom teachers, 17 psychological counselors) who worked in private and public schools in Istanbul and it was determined that the perceptions of classroom teachers towards psychological counselors were generally positive, but the perceptions of psychological counselors towards classroom teacher were generally negative. In addition, another striking result of the study was that "classroom teachers have a negative perception towards psychological counselors" view was among the perceptions of psychological counselors towards the classroom teachers. Therefore, the results obtained in the relevant study showed that despite the positive perceptions of classroom teachers towards psychological counselors, psychological counselors have negative perceptions towards classroom teachers and also themselves through classroom teachers. Of course, it would not be true to interpret these results directly as if psychological counselors have a lack of empathy towards the classroom teachers. When it comes to perception, there is a perceiver and there are factors affecting the perception. Some of these factors may also be the other individuals' negative attitudes and behaviors that lead to this perception. Therefore, the negative perceptions of psychological counselors towards classroom teachers may be due to their lack of empathy or it may be due to the fact that classroom teachers make them feel this way. Similarly, the positive perceptions of classroom teachers towards psychological counselors may stem from the fact that they developed enough empathy towards psychological counselors and/or that psychological counselors exhibited positive attitudes and behaviors that would

make them feel this positive perception. According to Korkmaz (2011), if the primary reason of psychological counselors' negative perceptions towards classroom teachers is psychological counselors, then the factors causing this condition are that psychological counselors can not develop a common understanding, they generalize the negative experiences they have experienced before, they give up developing positive perception, they can not stop themselves from acting as if they are the only experts, they develop a passive attitude in school, they are not opened to collaboration and solidarity, and finally they are not equipped well in terms of their professional fields. Korkmaz (2011) states that if the primary reason is the classroom teachers, then the factors leading classroom teachers to develop negative perceptions towards psychological counselors are that guidance and counseling services are not taken seriously, such practices are deemed unnecessary, a sufficient level of understanding regarding guidance and counseling has not been achieved, and finally the parties are not opened to collaboration and solidarity. Some studies (Kızıl, 2007; Nazlı, 2007; Paskal, 2001) in literature reported that teachers and school administrators did not have sufficient knowledge about counseling services and do not collaborate with psychological counselors. In the study conducted by Kızıl (2007), it was found that 66.7% of guidance teachers/school psychological counselors could not collaborate with classroom teachers.

In order to determine mutual perceptions, a study was carried out by Korkmaz (2011) with 234 classroom teachers and 103 school psychological counselors working in the schools of Batman province. Korkmaz (2011) evaluated perception levels in three stages as positive, medium and negative in this study and determined that mutual perceptions were at medium level. In this study, it was determined that there is a significant difference in the perceptions of classroom teachers towards school psychological counselors depending on the type of school that the teachers work in, their assignments and the number of students in the school. Considering the perceptions of classroom teachers towards guidance teachers depending on the type of school, it was observed that elementary school teachers' perception level were negative while secondary school teachers' level were medium, and elementary school teachers' perception level was lower than that of secondary school teachers. Similarly, when it comes to the perceptions of classroom teachers towards guidance teachers depending on the type of assignment, it was observed that elementary school teachers' perception level was negative while secondary school teachers' level were medium, and elementary school teachers' perception level was lower than that of secondary school teachers. Furthermore, it was observed that the perceptions towards guidance teachers were at medium level for teachers in schools with 500 to 1000 students and negative for teachers in schools with 1501 and above students. There was a significant difference between these two groups and the level of perception became negative as the number of students increased in the school. On the other hand, in the study conducted by Korkmaz (2011), it was observed that the classroom teachers' gender, seniority period (years) and habits of reading educational publications did not have a significant effect on their perception levels.

In a study conducted by Semiz-Köroğlu (2006) in 41 schools of Kırıkkale province with 424 classroom teachers and 41 school psychological counselors working together for at least 2 years; it was found that the perceptions of classroom teachers towards emotional intelligence levels of school psychological counselors were at a medium level. In this study, it was found that class teachers' period of service (years) and their ages affected their perceptions significantly, but their branches, genders and educational ranks in their branches did not affect their perceptions significantly. Accordingly, teachers who are 41 and older and with a service period of 21 years and more had significantly more positive perceptions towards emotional intelligence levels of psychological counselors.

A part of the classroom teachers' negative perceptions towards school psychological counselors stem from the different expectations regarding the roles (duties and responsibilities) of psychological counselors. Dougherty and Purcell (1991) reported that differences in role expectations resulted in resistance to guidance and counseling suggestions. This situation prevents the classroom teachers and school psychological counselors from working in full collaboration, and in addition to the practicing

problems, it causes conflicts between classroom teachers and psychological counseling teachers from time to time (Pişkin, 1989).

School administrators, teachers and parents often consider the role of counselors from their own perspective (Burnham & Jackson, 2000). However, this perception changes consistently over time. Since the late 1990s, school counselors have started to be perceived as educational leaders, student advocates and social change agents (House and Martin, 1998; Stone and Clark, 2001). New roles included in the roles of psychological counselors create new expectations. It also leads to negative perceptions when psychological counselors fail to satisfy these roles. As a result of negative perceptions on psychological counselors, the targeted results for students are negatively affected by guidance and psychological counseling services. Many studies have been conducted regarding the perceived roles of school

psychological counselors and guidance and counseling services in schools in both local and foreign literature since they are significant factors for teacher resistance to guidance and psychological counseling practices and therefore to school psychological counselors in addition to negative perceptions towards school psychological counselors.

For example, in the study conducted by Akin (2007) with 170 teachers in elementary schools of Yalova province; it was found that the awareness levels of elementary school teachers about the primary duties of school psychological counselors were enough, but they had expectations from school psychological counselors to do jobs that were not within their job descriptions.

In a study conducted by Kardeş (2014) with 43 educational institution administrators and 211 teachers to determine the perceptions of school administrators and teachers towards guidance teachers; the perceptions towards the facts that the school guidance teachers should be supported by the school administration, that the school guidance programs have a supportive role in the development of all their children, and that the school guidance teachers' mission is to support students' social and emotional development were observed to be at high level. On the other hand, teachers' expectations regarding the role of school guidance teachers to attend in-class activities and spend time in the management of crisis were found to be at low level. In this study, it was found that the perceptions of teachers towards guidance teachers were not affected by their gender, graduation status and professional seniority significantly. However, it was found that the perceptions of the teachers were affected by the meeting frequency of the teachers and the guidance teachers, and the teachers who met the guidance teachers more frequently had a more positive perception.

In the study conducted by Akgün (2010) with 14 pre-school teachers working in kindergartens attached to elementary schools in Ankara province; it was found that the majority of teachers considered guidance and psychological counseling services good enough and in the current situation they did not

have much expectation from the guidance teachers/school psychological counselors to take a more active role.

In the study conducted by Carr-Mamett (2008) in the schools of Pennsylvania in USA to measure the perceptions of school psychological counselors, the perception levels of teachers were found to be lower than the perception levels of school administrators and school psychological counselors. Accordingly, school administrators and school psychological counselors had much expectation from the school psychological counselors to take a more active role.

In general, there was a positive perception in terms of the studies conducted in Arab countries (Al-Amir & Brinson, 2006; Al-Sarraf, 1993; Saleh, 1987; Samaneh, 2000) on perceptions towards school counselors and school counseling was believed to be effective and necessary. However it was observed that resistance to psychological counseling services continued. A study conducted by Saleh (1987) has revealed that most of the teachers in Kuwait were satisfied with school counseling services, although few schools had counselors. According to another study conducted in Kuwait, teachers believed that school psychological counselors were very important in terms of the quality of their schools (Al Sarraf, 1993). Similarly, Al-Amir and Brinson (2006) found that students and teachers considered school psychological counseling to be necessary in the United Arab Emirates. These results indicate that although psychological counseling has started to be better understood and approved by teachers and parents, as a profession, it is still quite new in the Arab region, but is developing and drawing considerable interest. However, it has been reported that there is still a resistance to psychological counseling in schools in the region (Khansa, 2005).

## Conclusion

Elementary school students spend most of their time with their classroom teachers, other than their families. Classroom teachers are individuals who can significantly influence not only the development of elementary school students but also the attitudes and habits that they will gain later in their lives. Guidance teachers/school psychological counselors have significant roles in ensuring the students to adapt to school, to gain positive attitudes and cognitive skills with regards to learning, to increase the effectiveness of learning, to recognize emotions better, to gain social skills to express themselves better, to acquire skills to cope with the difficulties in daily lives, to support the development of their personalities and professional skills. The changing dynamics of social and cultural life have diversified the problems which the students face both in school and out of school. In order to identify these problems in the fastest way possible and to provide permanent solutions, classroom teachers and school psychological counselors have to work in full collaboration and solidarity. However, concerning the implementation of guidance and psychological counseling services, the classroom teachers being

reluctant and not volunteering, and more importantly, their negative perceptions towards guidance teachers/school psychological counselors makes this situation difficult.

The aim of this study is to determine the perceptions of classroom teachers towards guidance teachers/school psychological counselors and the factors affecting these perceptions. According to the results of this study, classroom teachers generally have a positive perception towards guidance teachers/school psychological counselors and guidance and psychological counseling services. However, they have expectation from the guidance teachers/school psychological counselors to take a more active role. This makes guidance teachers/school psychological counselors to have negative perception towards classroom teachers and thus makes it difficult to work in full collaboration. It is observed that teachers have a positive general perception and school counseling is believed to be effective and necessary but resistance to guidance and psychological counseling services continues. The main factors leading to negative perceptions and resistance are that the guidance and consultancy services are not taken seriously, that such practices are seen as unnecessary, that a sufficient level of guidance and counseling is not gained, and that the parties are not opened to collaboration and solidarity. It was determined that the socio-demographic factors affecting the perceptions of classroom teachers towards counseling teachers/school psychological counselors are the age of the classroom teachers and the number of students in the school. On the other hand, gender of classroom teachers, their graduation status and habit of reading educational publications do not have a significant effect on their perception level towards guidance teachers/school psychological counselors.

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## Visualization and Simulation Analysis of Battery Management System Based on Thermodynamic Models

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### Abstract

With the development of battery pack applications in technology, the analysis of the battery management system (BMS) becomes increasingly important. Therefore, the simulation of BMS is aimed at reducing unnecessary thermal energy and enhancing battery performance. Based on the theoretical concept of thermoelectric modules, the study intends to utilize Simulink, Matlab, and other tools to simulate the thermal consumption in BMS under different temperature conditions by modeling the thermodynamic and battery's relationship to help predict feasibility of BMS tests. Among them, the visualization of heat distribution through thermal models allows us to optimize the efficiency of BMS. Furthermore, the improvement of battery's operation through adjusting parameter variations involves temperature, state of charge, and material. The research not only provides a new analysis tool for BMS but also expands the application of thermodynamic models. In the future, the study will use finite element analysis as a tool for numerical simulation, conducting further in-depth studies on the safety of BMS while improving thermal efficiency. The goal of the BMS model is to achieve a balance between efficiency optimization and industry safety and to develop reliable battery management system for industrial applications.

**Keywords:** *Battery Management System (BMS), Thermodynamic Modeling, Efficiency Optimization, Safety Improvement, Simulink*

## Game – Based Teaching Proposal for Greek Primary School Mathematics and Geology

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### Abstract:

This paper proposal presents a game entitled KIDEDU (Play - Create - Learn) launched at the University of Piraeus, aiming to provide an attractive means for pupils to cultivate mathematical and geological skills. It is a teaching proposal for the six (6) grades of the Greek Primary School. The scientific team of the project is trying to make an innovation for the Greek Education and formulates a teaching proposal in this field. The proposal concerns "mathematics" and "geology" and how pupils 6-12 years old learn to use them in their daily life. The game-based teaching - guiding pupils to learn in a fun way and solve problems. The game was tested on 8–10 year old. Then a questionnaire was distributed to the pupils, and they responded to it. According to their responses, pupils prefer play-based teaching, they learn easily and enjoyably and learn more by playing. The aim is to extend it to all levels of education and make it the main teaching method for all pupils in schools. A demonstration of the game is provided.

**Keywords:** *Digital game-based learning, distance learning, differentiated learning, guided discovery learning.*

### Introduction

In recent years, digital game-based learning (DGBL) has emerged as a powerful educational tool, transforming the traditional classroom into an interactive and engaging learning environment. The evolution of educational technology and the increased emphasis on differentiated and student-centered pedagogies have opened new avenues for innovation, particularly in primary education (Prensky, 2007; Tomlinson, 2014). Within this context, the present paper introduces KIDEDU (Play – Create – Learn), a game-based teaching initiative developed at the University of Piraeus, aiming to enhance the learning experience of primary school pupils in the subjects of mathematics and geology.

The KIDEDU project responds to the growing need for educational practices that resonate with the learning preferences of digitally native children aged 6–12. Pupils are not passive recipients of information but are encouraged to explore, create, and apply concepts through structured gameplay, thereby enhancing both cognitive engagement and intrinsic motivation (Papastergiou, 2009).

The initial implementation of KIDEDU targeted pupils aged 8 to 10 and involved gameplay followed by a structured questionnaire. This aligns with contemporary research in digital pedagogy, which supports the integration of game mechanics to promote deeper learning and increased retention (Tsami, 2020). As a differentiated learning tool, KIDEDU allows pupils to progress at their own pace, adjust to their own cognitive needs, and actively construct knowledge—principles that are crucial in modern primary education (Tomlinson, 2014).

This paper explores the theoretical underpinnings of the KIDEDU project, its instructional design, and the results of its pilot testing. It further proposes the expansion of this educational model across all levels of formal education, with the long-term vision of mainstreaming game-based learning as a primary pedagogical method in the Greek school system.

### Literature Review

The integration of digital games into educational practice has seen significant growth, particularly in response to the changing learning preferences of 21st-century students. Digital Game-Based Learning (DGBL) has been defined not merely as the use of games in classrooms, but as the deliberate design of instructional environments where

educational goals are embedded within gameplay mechanics (de Freitas & Jarvis, 2007). The relevance of DGBL is particularly pronounced in subjects such as mathematics and geology, where abstract or complex concepts can often appear disconnected from learners' everyday experiences.

Digital environments allow learners to engage with simulations, problem-solving tasks, and interactive feedback that support experiential learning. Connolly et al. (2012) found that well-designed educational games improve cognitive, behavioral, and affective outcomes, especially when applied to STEM-related fields. Moreover, such environments offer opportunities for contextualized learning, enabling children to understand the application of scientific and mathematical knowledge in real-world scenarios. In the context of geology, this may involve exploring ecological systems, geological formations, or weather patterns through simulated interaction rather than rote memorization.

From a motivational perspective, research shows that digital games can lead to higher levels of engagement and perseverance, especially in STEM subjects where learners often struggle with abstraction or lack of context (Tüzün et al., 2009). The motivational pull of DGBL is enhanced when learners feel a sense of control, progression, and relevance—factors that also characterize effective guided discovery environments. Teachers, therefore, play a crucial role not just as facilitators of gameplay, but as designers of learning experiences that align game content with curriculum goals.

In sum, the literature supports the strategic integration of DGBL and GDL, especially in mathematics and geology. These approaches enable learners to experiment, explore, and construct meaning, while also accommodating diverse needs through differentiation. When appropriately designed, digital games can foster both engagement and deep learning, particularly when guided exploration is at the heart of the instructional strategy.

### **Theoretical Framework & Research Questions**

The development of the KIDEDU platform is grounded in a combination of constructivist and socio-cognitive learning theories, drawing particularly on the principles of Digital Game-Based Learning (DGBL), Guided Discovery Learning (GDL), and Differentiated Instruction (DI). These frameworks support the creation of an educational experience that is engaging, learner-centered, and adaptable to the needs of diverse pupils within the primary school context.

At its core, KIDEDU aligns with Vygotsky's (1978) socio-cultural theory, which emphasizes the importance of social interaction and scaffolding in the learning process. According to Vygotsky, learners perform best when guided through their Zone of Proximal Development (ZPD)—the space between what they can do alone and what they can achieve with help. In KIDEDU, this guidance is built into both the game design and the instructional framework, where learners are encouraged to discover concepts through structured exploration and problem-solving. This is a clear expression of Guided Discovery Learning, where the teacher or system provides timely cues, hints, or challenges that help the student progress without direct instruction (Mayer, 2004).

Simultaneously, DGBL introduces motivational and cognitive mechanisms that are supported by self-determination theory (Deci & Ryan, 1985), which highlights autonomy, competence, and relatedness as key drivers of intrinsic motivation. The game's mechanics are designed to support these elements: players make meaningful choices, experience adaptive challenges, and receive immediate feedback that fosters a sense of accomplishment and relevance. This creates a positive feedback loop that encourages repeated engagement and deeper conceptual understanding, particularly in subjects such as mathematics and geology, where abstract thinking and conceptual transfer are required.

#### **3.1 Research Questions**

Based on the above objectives, the study addresses the following research questions:

To what extent does the KIDEDU game enhance pupil motivation and engagement in mathematics and geology?

How do guided discovery elements within the game influence learners' conceptual understanding of scientific and mathematical content?

What are pupils' perceptions of learning through game-based and differentiated approaches?

Can the KIDEDU model be effectively expanded across different age groups and subject areas within primary education?

### Methodology

The study was conducted in three Greek public primary schools, with a sample of approximately 200 pupils aged 8–10 years, corresponding to the third and fourth grades. The schools represented mixed socio-economic areas, and the student sample included pupils with varied academic abilities. Parental consent and school approvals were obtained, and participation was fully voluntary and anonymized.

This age group was chosen based on developmental appropriateness and cognitive readiness to engage with narrative-based tasks, logical puzzles, and scientific reasoning (Tomlinson, 2001). The diversity of the sample enabled the evaluation of how the game functioned within heterogeneous classrooms, particularly in terms of differentiated instruction.

#### 4.1 The KIDEDU Game Environment

KIDEDU (Play - Create - Learn) is a 3D single-player educational game developed by a research team at the University of Piraeus. The game follows the narrative of a child sent to complete a grocery list, who is then interrupted by a wizard requesting help to break magical spells in exchange for the grocery items. The gameplay is structured around interactive mini-games and puzzles integrated into the storyline, each requiring players to apply concepts from mathematics and geology.

To support differentiated learning, the game offers three difficulty tiers based on age and cognitive development (6–8, 8–10, and 10–12 years), with variations in the complexity of tasks and game mechanics (Tomlinson, 2001). This design allows adaptation to individual learner needs, offering both scaffolding and challenge, in line with inclusive instructional strategies.

#### 4.2 Procedure and Implementation

The game was introduced during regular class time, and pupils played individually on computers or tablets. Teachers facilitated the technical setup but did not provide instructional intervention during gameplay, aligning with the principles of guided discovery learning and autonomous exploration (Hmelo-Silver, Duncan & Chinn, 2007). Each child completed the game independently, without peer or teacher interference, to preserve the internal validity of the learning experience and isolate the game's effect on student engagement.

This setup mirrors the conditions of prior GBL research that emphasizes the balance between learner autonomy and embedded instructional guidance through game mechanics and feedback systems (Gee, 2007; Arnab et al., 2012).

#### 4.3 Post-Game Questionnaire

After completing the game, all pupils were asked to fill out a brief, anonymous questionnaire designed to assess: their engagement during the game, their perceptions of learning effectiveness, and their preferences regarding instructional format (game-based vs. traditional teaching).

The questionnaire was based primarily on Likert-scale items (1 = strongly disagree to 5 = strongly agree) tailored for young learners, a method widely used for affective and perception-based data collection in primary education (Chatterji, 2003; Cohen, Manion & Morrison, 2011). Items included statements such as “I enjoyed learning with the game,” “I want to play more games like this,” and “I understood maths/science better through the game.”

The form also included optional open-ended questions for qualitative insights, which allowed pupils to describe what they enjoyed or struggled with. Questionnaire administration took 10–15 minutes, and clarifications were provided by teachers when needed, without leading responses.

## Findings

Following the implementation of the KIDEDU game across three primary schools, a total of approximately 200 pupils aged 8–10 completed the game experience and participated in a post-intervention survey. The results suggest a strong positive reception of the digital game-based learning model, as well as indications of increased engagement and learning efficacy compared to traditional methods.

Research data was collected from both the questionnaires and the Contractor's personal notes. This data was analyzed and cross-referenced in order to provide evidence relating to the research questions. The most important findings per question are presented in this section.

The initial phase of this research showed that the questionnaire was reasonably well structured, with an average completion time of between 3 and 4 minutes. More specifically:

- Most of the kids were able to solve the problems of the game and complete the game with ease. Their participation was particularly active and intense, showing enthusiasm during the implementation of the activities. No particular problems were observed in getting familiar with the game.
- Children's interaction with the application environment was highly engaging, with children quickly reaching high levels of practicality.
- The educational game encouraged pupils to develop various problem-solving strategies, act in a specific environment, control their actions and understand the consequences of their interaction with it, encouraging critical thinking.
- When solving the problems, the pupils either followed a specific plan of approach to the solution or flexibly adapted to the requirements of each activity.
- Pupils mainly preferred to work in pairs. One child helped and guided the other where this was deemed necessary, thus limiting the role of the teachers.
- The use of images and sound effects played an important role in engaging pupils with the educational game.

Gender: Of the 200 survey participants, 49% were boys and 51% were girls. The gender distribution among participants is relatively balanced, with slightly more girls than boys.

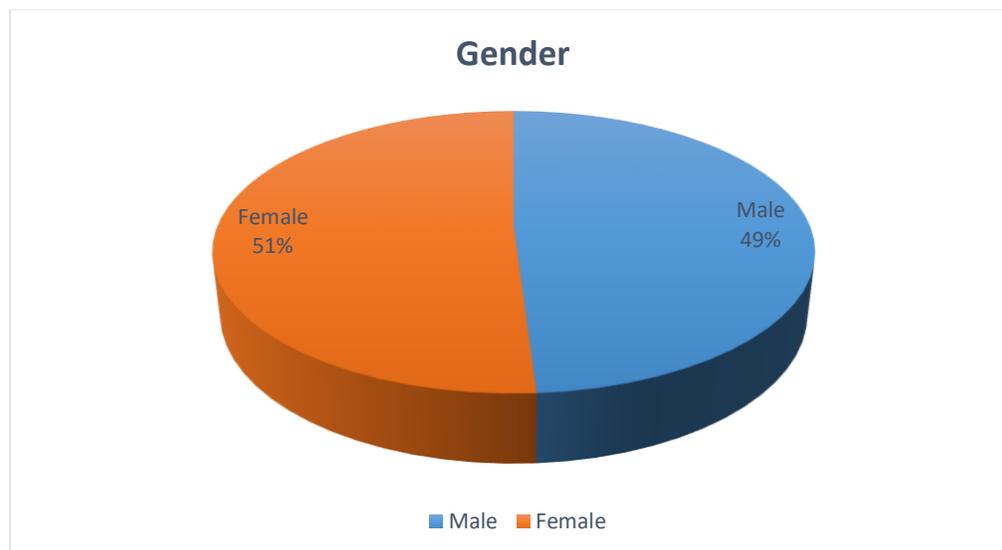


Fig. 1 Gender of the participants

Educational Level: All pupils aged 8-10 years (elementary school pupils).

Use of Technology: 94% (188 out of 200) of the children use a computer or tablet. The large majority of children use a computer or tablet, which shows their familiarity with technology and their ability to effectively interact with the game application.

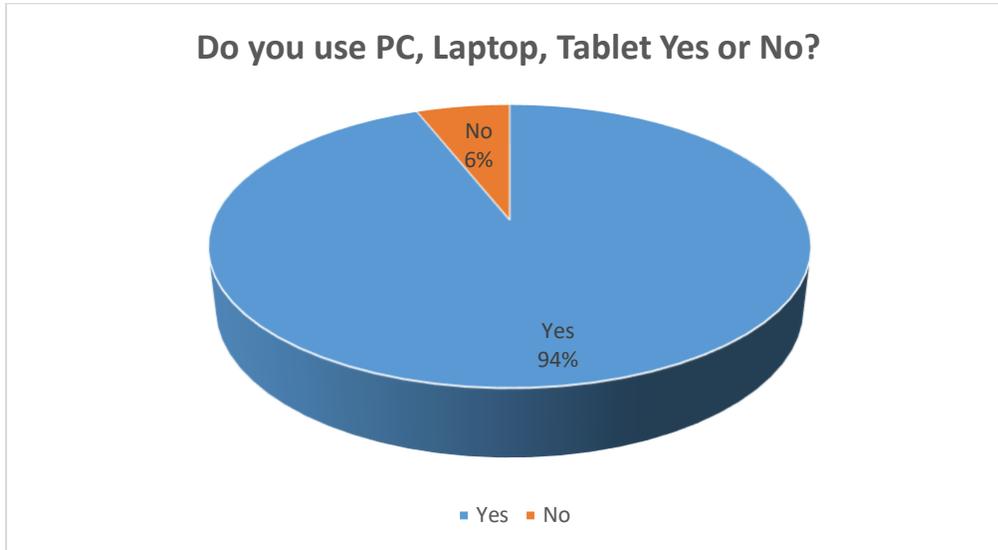


Fig. 2 Use of Technology

The following questions are related to the Game Experience: The children's experience during the operation of the game application was assessed through quantitative analysis of the respective responses. The results collected are detailed below:

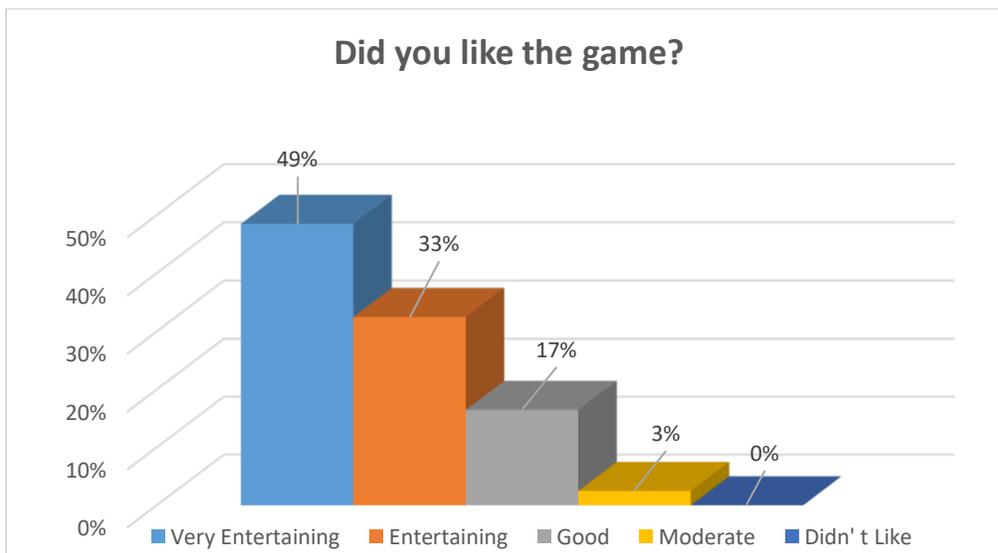


Fig. 3 Game Fun

Game Fun: 82% of children rated the game as fun or very fun.

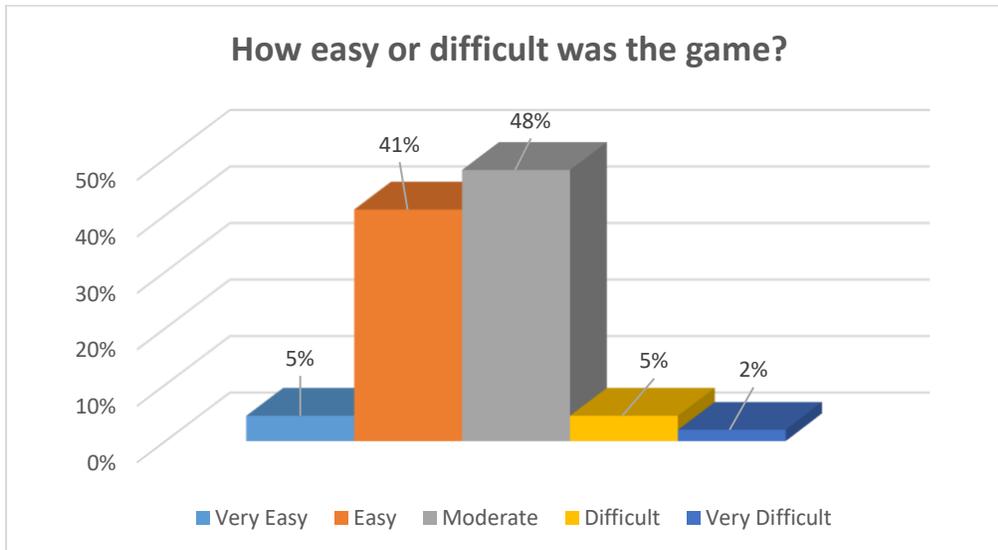


Fig. 4 Game Difficulty

Game Difficulty: 93% of children found the game very easy, easy of moderate.

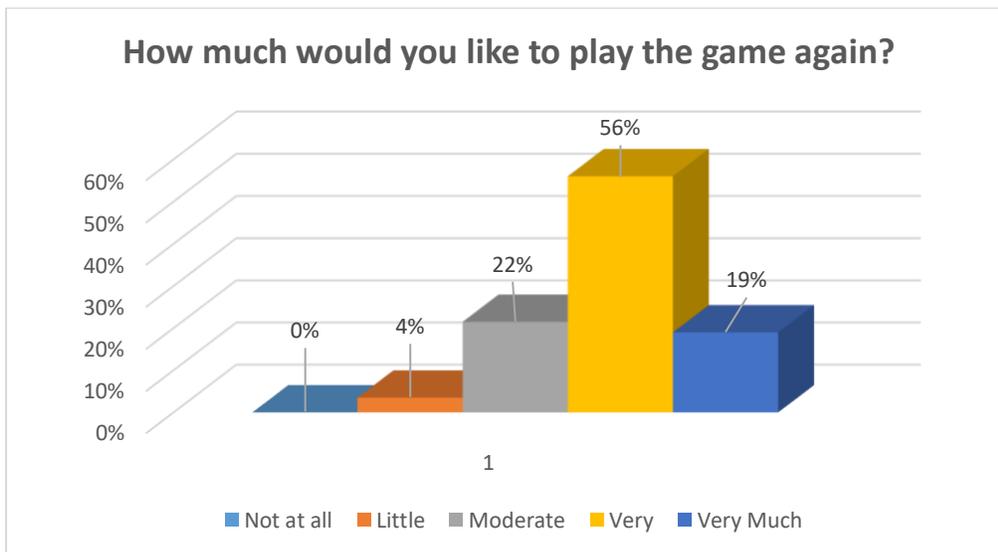


Fig. 5 Willingness to Replay

Willingness to Replay: 75% of the participants (very and very much) answered that they want to play the game again.

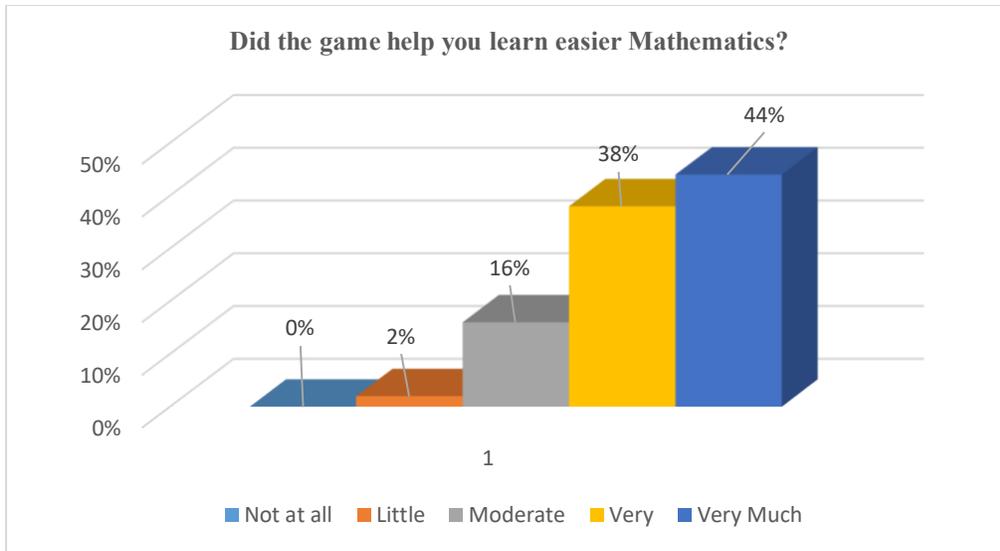


Fig. 6 Easier Learning Mathematics

Easier learning: 82% of children answered that they learned Mathematics easier or much easier playing the game.

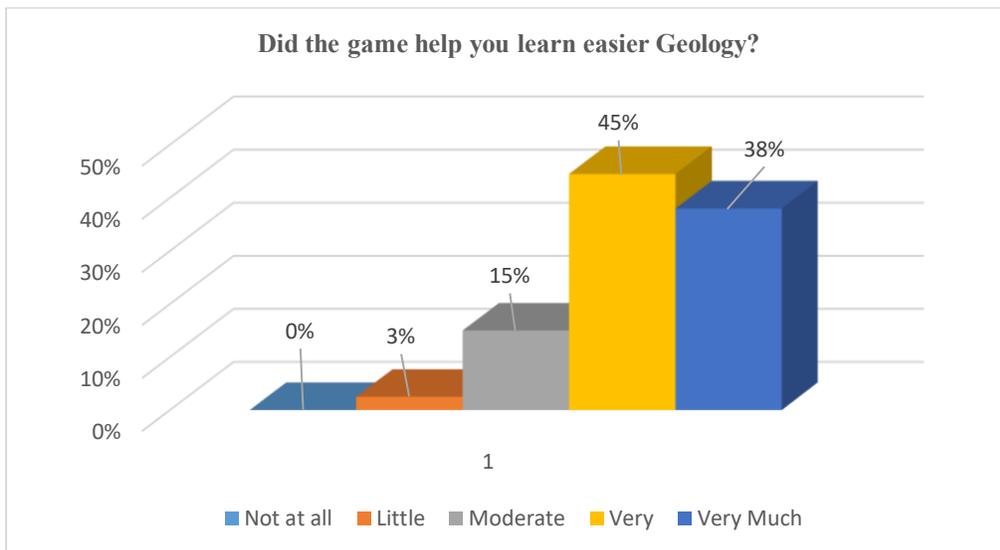


Fig. 7 Easier Learning Geology

Easier learning: 83% of children answered that they learned Geology easier or much easier playing the game.

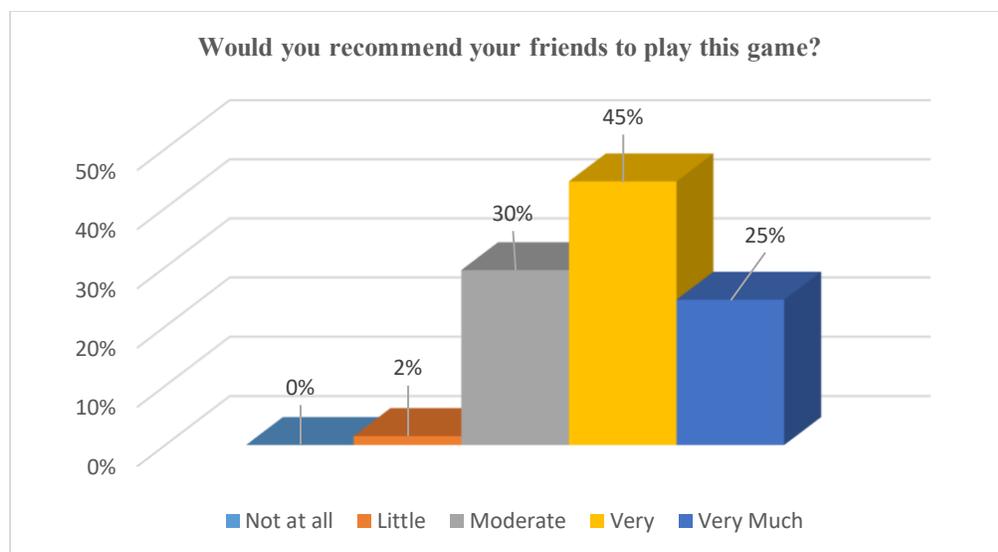


Fig. 8 Recommendation of the game

Game Recommendation: 70% of the participants will recommend (very and very much) the game to their friends.

## Discussion

The outcomes of the KIDEDU intervention reinforce the pedagogical value of integrating digital game-based learning (DGBL) with guided discovery and differentiated instruction. The game's ability to maintain pupil attention, promote deep engagement, and foster conceptual learning in mathematics and geology suggests that such tools can play a transformative role in contemporary education.

### 6.1 Engagement through Storytelling and Interactivity

A central feature of the game was its narrative-driven structure, which appears to have significantly contributed to learner engagement. As noted by Barab et al. (2009), embedding educational content in compelling narrative contexts enhances immersion and allows learners to develop identity and purpose within the learning environment. In the case of KIDEDU, the quest-based storyline and the inclusion of fantastical characters (e.g., the wizard) created a meaningful context for learners to solve problems and apply their knowledge.

Interactive digital environments that involve exploratory play and challenge-based learning have been shown to enhance intrinsic motivation (Malone & Lepper, 1987; Whitton, 2010). Pupils in this study responded positively to the challenges and autonomy the game offered, which aligns with the broader literature linking autonomy-supportive environments to increased cognitive engagement and learning outcomes (Ryan & Deci, 2000).

### 6.2 Guided Discovery and Problem-Solving

While the game did not involve direct instruction, its design embedded structured problem-solving elements, offering scaffolded support without removing learner agency. Kirschner et al. (2006) argue that minimally guided instruction often leads to cognitive overload; however, when digital environments are carefully designed to include embedded guidance, learners are supported through productive struggle—a core tenet of guided discovery learning.

In the KIDEDU game, mini-games and puzzles required pupils to apply logical reasoning and basic science concepts in interactive ways. This method reflects what de Jong and van Joolingen (1998) describe as "learning through discovery simulations", where learners benefit from rich, hands-on tasks that are constrained and structured to support conceptual understanding.

### 6.3 Differentiation through Game Design

The inclusion of age-based content levels (6–8, 8–10, 10–12) enabled the game to address varying developmental needs and prior knowledge. As Carolan and Guinn (2007) suggest, differentiation in digital learning tools can be achieved through adaptive content delivery and tiered complexity. KIDEDU applied this principle by varying game mechanics and question difficulty, allowing pupils to interact with materials appropriate to their zone of proximal development (Vygotsky, 1978).

This flexibility is especially important in heterogeneous classroom settings, where standardized instruction often fails to meet diverse learning needs. Digital games, when well-designed, can offer non-stigmatizing differentiation, where learners are not visibly grouped or labelled, but simply experience tailored levels of challenge within the same environment (Pellegrino & Hilton, 2012).

### 6.4 Toward Sustainable Integration

The positive feedback from pupils in this pilot implementation suggests a potential pathway for expanding such tools into broader curriculum use. However, for sustainable integration, educator training and curricular alignment are crucial. As Egenfeldt-Nielsen (2007) warns, educational games risk becoming isolated experiences unless embedded within pedagogical frameworks and accompanied by reflective activities.

Furthermore, although this study focused on short-term pupil perceptions and in-game performance, long-term impact studies are needed. Particularly, mixed-method approaches that combine gameplay analytics with learning outcomes and behavioral observations could provide deeper insights (Ritterfeld, Cody & Vorderer, 2009).

## Conclusion

This project contributes to a growing body of research that views learning as an active, constructivist process, where children build knowledge through interaction, play, and guided exploration (Bruner, 1961; Hmelo-Silver et al., 2007). By situating tasks within a meaningful context (e.g., a magical quest), learners were able to apply abstract concepts to simulated real-world situations—an approach known to foster transferable knowledge (Perkins & Salomon, 1992).

A key takeaway from the pilot study is the game's capacity to support differentiated learning without compromising inclusivity. Pupils of varying skill levels were able to access the content at an appropriate level of challenge, without the stigma often associated with differentiated instruction in traditional classroom settings (Tomlinson, 2014). The inclusion of in-game scoring and feedback further supported formative assessment practices, helping learners monitor their progress and build self-efficacy (Black & Wiliam, 2009).

Although promising, the study also highlights the need for systemic support in integrating such tools into mainstream education. Future work must examine not only pupil performance but also teacher readiness, curriculum alignment, and long-term learning outcomes. As highlighted by Sandford, Ulicsak, Facer, and Rudd (2006), the success of DGBL depends not only on the design of the game itself but on the broader ecosystem in which it is implemented.

In sum, KIDEDU demonstrates that playful learning environments, when grounded in sound pedagogy and thoughtful design, can enrich the educational experience and bridge the gap between formal curricula and the digital lives of today's learners. Moving forward, interdisciplinary collaboration between educators, designers, and policymakers will be essential to unlock the full potential of such innovations.

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## Leading with Compassion:

### Transformational Leadership and the Good Samaritan

#### An Exegetical Analysis of Luke 10:25-37

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#### **Abstract**

The parable of the Good Samaritan found in Luke 10:25-37 exemplifies the qualities of a transformational leader: idealized influence, intellectual stimulation, individualized consideration, and inspirational motivation. While a transformational leader leads by example for the growth and development, both personally and professionally, of their followers, there is a disconnect in the scholarship that studies transformational leadership and transformational leadership in light of Scriptural characters such as the Good Samaritan. Through an exegetical inter-textual analysis to understand the context of the parable of the Good Samaritan, emergence of characteristics of transformational leadership were presented. These attributes can be applied to many different aspects of life including professional endeavors, working leadership, business, education, and servanthood. The Good Samaritan expounds upon what it means to be a transformational leader by extending kindness beyond societal and cultural norms. These kindnesses and acts of compassion becomes a testimony to today's world and the reputation of a business. The similarities of the Biblical passage and its application to the modern world become evident through this intensive study. A modern-day leader can reflect on these principles and be a transformational leader in the workplace, the church, or in organizational business practices. Just as the Good Samaritan went beyond social and cultural norms to provide basic needs to the beaten man, modern day Christian leaders in the workplace and in leadership roles can use these same characteristics to show Christ's love in a world that needs compassion and kindness. Using the four I's of transformational leadership, the Good Samaritan exemplifies a selfless love that penetrates deeper, going beyond what is expected. Christian love is self-sacrificial and transformational leadership puts other needs above one's own needs. This study aims to bridge the gap between Biblical scholarship on the Good Samaritan and the theory of transformational leadership.

***Keywords:** transformational leadership, compassion, business, culture, self-sacrificial love*

## Does teacher–child relationship quality impact socio-emotional development differently for children with versus without behavioral difficulties?

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### Abstract

Previous research highlights that teacher–child relationship quality plays a key role in children’s socio-emotional development (Baker et al., 2008; Pianta & Stuhlman, 2004). This relationship may be particularly crucial for children identified early on as having behavioral difficulties, as they are already at increased risk for academic challenges, social exclusion, and eventual school dropout. This study investigated whether the quality of the teacher–child relationship moderates socio-emotional development among kindergarten-aged children, depending on whether they are perceived by their teacher as behaviorally “challenging” or “not challenging.” Relationship quality was assessed using the *Student–Teacher Relationship Scale (STRS; Pianta et al., 2008)*, and socio-emotional development was measured with two validated instruments: the Social Competence and Behavior evaluation (SCBE; Lafrenière et al., 1992) and the *Ages and Stages Questionnaires: Social–Emotional (ASQ:SE; Squires et al., 2011)*.

Twenty-six preschool teachers from two regions of Quebec participated in the study. Each selected a representative sample of children from their classroom, including at least one child perceived as easier than average, one average, and one more challenging, for a total sample of 105 children. Regression analyses with three-way interaction terms were conducted to examine the interplay between behavioral group, time 1 and time 2 socio-emotional scores, and relationship quality variables (conflict, closeness, dependence).

Results indicated that children’s social competence (SCBE) increased from time 1 to time 2 as a function of teacher–child dependency, except for the subgroup of children without behavioral difficulties, for whom higher levels of dependency were associated with a decrease in social competence over time. In addition, socio-emotional development, as measured by the ASQ:SE, generally increased as a function of closeness in the teacher–

child relationship, although high levels of closeness were not significantly associated with higher overall ASQ:SE scores. Finally, and as expected from a theoretical standpoint, lower levels of conflict in the teacher–child relationship predicted greater gains in socio-emotional development, whereas higher conflict was associated with a decline in development between the two time points.

These findings highlight the need to go beyond a one-size-fits-all approach to teacher–child relationships. While conflict clearly undermines development, other relational dimensions such as closeness and dependency may have complex, child-specific effects. Providing teachers with training and systemic support to develop nuanced relational strategies is essential for promoting equity and well-being in early education.

**Keywords :** Teacher–child relationship, Socio-emotional development, Behavioral difficulties, Early childhood education

### Biography

Geneviève Tardif, Ph.D., is a professor of psychology and psychoeducation at Université du Québec en Outaouais, Québec, Canada. Her research focuses on early socio-emotional development, teacher–child relationships, and the impact of individual and contextual factors on child adaptation. She has led and collaborated on multiple funded projects related to relational processes in educational settings. Her work aims to bridge research and practice to support inclusive and developmentally sensitive interventions in early childhood education.

Noémie Paquette, Ph.D. Candidate, is a professor in education sciences at Université du Québec à Trois-Rivières, Québec, Canada. Her research interests focus primarily on early childhood education and care. She is particularly interested in educational quality in childcare services, authority practices, and pedagogical orientations in preschool education. She also explores children's socioemotional development and how teacher training can support this development. She is a member of the Réseau Qualité Petite Enfance, where she collaborates with other researchers to enhance educational practices in early childhood settings.

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## Humanizing Social Science: Blending Inquiry-Based Education and Trauma-Informed Facilitation in Public Exhibits

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### Abstract

This presentation examines how facilitation works in tandem with interactive exhibits in outdoor public settings to enhance social science learning and foster pro-social connections among public audiences. It draws on *Middle Ground: Considering Ourselves and Others*, a collaborative project between the Exploratorium, a science museum dedicated to inquiry-based learning, and Urban Alchemy, a nonprofit employing formerly incarcerated individuals trained in trauma-informed care to steward urban environments. Installed in San Francisco's civic plazas, Middle Ground invited the public to engage with themes of *social cognition, influence, and connection* through exhibits and facilitation designed to provoke reflection and dialogue, transforming public spaces into inclusive learning landscapes.

We share findings from two studies investigating the impact of facilitation on visitor engagement and learning. Study 1, a quasi-experimental study, showed that facilitation increased exhibit use, improved visitor experience ratings, and significantly enhanced learning outcomes related to social connection. This presentation focuses on Study 2, a design-based research effort aimed at studying and refining facilitation strategies through participant observation in the field and analysis of facilitator-visitor interactions. Grounding our findings in the intersecting frameworks of inquiry-based education and trauma-informed care, we highlight facilitation as a transformative practice capable of making social science learning personally meaningful, relevant, and deeply humanizing.

Our work with *Middle Ground* underscores the power of content-humanizing facilitation to make social science education personal, social, and accessible. We propose a facilitation approach that blends inquiry and trauma-informed principles for educators and researchers seeking to engage diverse publics around socially and emotionally charged topics in ways that are respectful and resonating.

## Development and Validation of a Medical Mistrust Scale for Healthcare Students and Providers

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### Abstract

This study aimed to establish a medical mistrust scale (MMts-HSP) among healthcare students and providers in Taiwan. Three hundred twenty-two valid surveys were collected from the healthcare students and providers in Taiwan. KMO's and Bartlett's test results demonstrated that the sample size was appropriate for exploratory factor analysis. After going through exploratory factor analysis and principle component analysis, five factors and 31 items were identified, using a 9-point Likert scale: "provider trustworthiness" (8 items; 41.578% of variance explained), "healthcare accessibility" (6 items; 10.675% of variance explained), "institutional integrity" (7 items; 5.524% of variance explained), "treatment justifiability" (6 items; 3.904% of variance explained), and "system reliability" (4 items; 3.370% of variance explained). The five factors maintained in the MMtS-HSP explained 65.051% of variance. All five of the factors from the principal component analysis had eigenvalues greater than one: 12.889, 3.309, 1.712, 1.210, and 1.045, supporting the multidimensionality of the MMtS-HSP scale. The five subscales' Cronbach Alpha values were 0.906, 0.885, 0.894, 0.859, and 0.856, and the scale's overall Cronbach alpha was 0.952. These results suggest that the subscales/factors and the MMtS-HSP scale as a whole have reasonably satisfactory reliabilities in evaluating participants' medical mistrust.

**Keywords:** *Medical Mistrust, Exploratory Factor Analysis, Multidimensionality, Validity And Reliability*

# Investigation Of The Presence Of Polycyclic Aromatic Hydrocarbon (Pahs) In Filling Station's Control Wells In Tarauni

L.G.A. Kano – Nigeria.

Isa Magaji Azare

A Paper Proposal To Be Presented At The Wei Conference, Boston July 22 – 24, 2025

## Introduction

Polycyclic aromatic hydrocarbons (PAHs) are organic pollutants composed of two or more fused aromatic rings of carbon and hydrogen atoms. They are typically colorless, white, or pale-yellow solid compounds (Abdel-Shafy and Mansour, 2016; Suman et al., 2016). The molecular arrangements of aromatic rings in space can be linear, angular, or in clusters (Abdel-Shafy and Mansour, 2016). Depending on the number of rings present in the compounds, PAHs are classified as light-molecular weight PAHs (LMW PAHs; with two or three aromatic rings) and high-molecular weight PAHs (HMW PAHs; with four or more aromatic rings). Depending on their molecular weight, they are either emitted as a gaseous phase (LMW PAHs) or in particulate form (HMW PAHs) (Lee and Vu, 2010).

Additionally, PAHs can be classified into alternant and non-alternant types based on their ring structure. Alternant PAHs consist of only a fusion of six carbon benzene rings, while non-alternant PAHs such as fluorene include a six-carbon benzene ring fused with an additional ring of fewer than six carbons (Gupte et al., 2016). The presence of dense  $\pi$  electrons on aromatic rings contributes to the chemical persistence of PAHs, making them more resistant to nucleophilic attack (Haritash and Kaushik, 2009). In 1983, the United States Environmental Protection Agency (USEPA) identified 16 PAHs as priority pollutants due to their high concentrations, widespread exposure, recalcitrant nature, and toxicity (Zheng et al., 2018; Mojiri et al., 2019). PAHs are known for their low water solubility, minimal vapor pressure, and high melting and boiling points, all of which vary depending on their structures (Lee and Vu, 2010). PAHs with increased molecular weight are tending to decrease water solubility and increase lipophilicity, making them more recalcitrant compounds (Okere and Semple, 2012).

The primary sources of PAH pollution are divided into two main categories: anthropogenic emission sources and natural emission sources (Mojiri et al., 2019). While natural sources such as volcanic eruptions, natural forest fires, and lightning-induced moorland fires are considered insignificant (Srogi, 2007; Ravindra et al., 2008; Abdel-Shafy and Mansour, 2016), anthropogenic sources play a crucial role in determining PAH pollution levels. These anthropogenic sources can be further classified into industrial (e.g., filling stations), mobile, domestic, and agricultural emission sources (Ravindra et al., 2008). Incomplete combustion is a major contributor to the release of PAHs in various industrial activities like waste incineration, iron and steel production, aluminum production, cement manufacturing, coal-tar pitch production, dye manufacturing, asphalt industries, rubber tire manufacturing, fungicide and insecticide production, exhaust from refineries or filling station, and power production (Srogi, 2007; Ravindra et al., 2008; Abdel-Shafy and Mansour, 2016; Gupte et al., 2016; Mojiri et al., 2019).

The levels of pyrogenic polycyclic aromatic hydrocarbons (PAHs) tend to be higher in urban areas, as discussed by Abdel-Shafy and Mansour (2016) and Mojiri et al. (2019). Petrogenic PAHs, on the other hand, originate from petroleum and its derivatives, which are commonly found in storage facilities, during transportation, use, and due to leaks of crude oil and its products, especially at filling stations (Abdel-Shafy and Mansour, 2016). High molecular weight (HMW) PAHs are predominantly associated with pyrogenic sources, whereas low molecular weight (LMW) PAHs are more commonly found in petrogenic sources, as highlighted by Marris et al. (2020). Biogenic PAHs, produced by biological entities such as microorganisms, phytoplankton, algae, and plants during the slow biological decomposition of organic matter, were also discussed by Mojiri et al. (2019). Atmospheric PAHs (gaseous phase as aerosols) are deposited in water, soil, and plants in the particulate phase through dry/wet deposition processes (Abdel-Shafy and Mansour, 2016). PAHs with three or more aromatic rings are very strong adsorbent to the soil particles due to low vapor pressure and high hydrophobicity (Abdel-Shafy and Mansour, 2016).

The accumulation of PAHs in soil/sediment leads to the transport of pollution to groundwater, resulting in unavoidable exposure to PAHs. Exposure to PAHs occurs primarily through inhalation, ingestion, and dermal contact

(Burchiel and Luster, 2001). It is possible for exposure to occur through multiple routes simultaneously, such as dermal and inhalation exposures from contaminated soil and water (Rengarajan et al., 2015; Abdel-Shafy and Mansour, 2016). Many individuals are exposed to PAHs in the workplace, such as workers at filling stations and traffic police who inhale vehicle exhaust and road dust containing PAHs (Lee and Vu, 2010). However, exposure is not limited to the workplace, with instances of exposure occurring through consuming polluted water and other means (Lee and Vu, 2010; Suman et al., 2016).

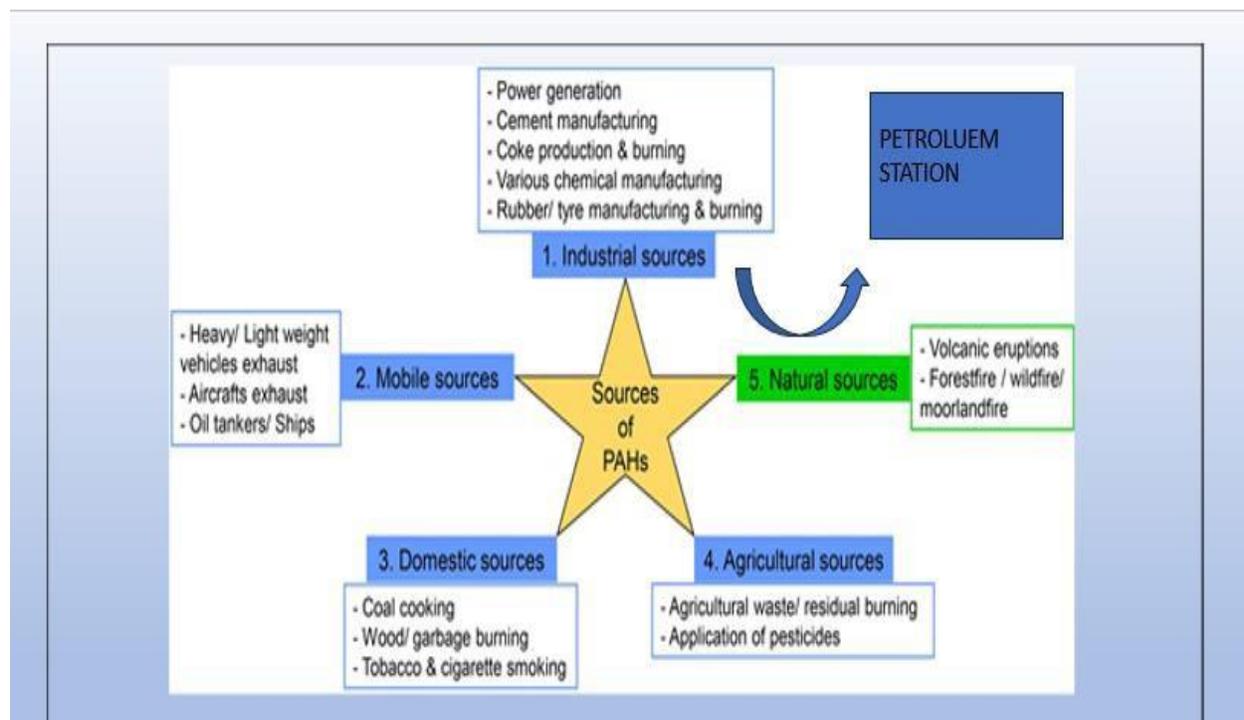


Figure 1: Various types of polycyclic aromatic hydrocarbon (PAHs) emission sources

### Statement of research Problem

The swift growth of industry and cities has led to the release of harmful pollutants into the environment, such as polycyclic aromatic hydrocarbons (PAHs) (Mojiri et al., 2019). These persistent pollutants pose a significant threat due to their toxic properties, especially when found in water sources near petroleum stations. PAHs are widespread, present in both water and land ecosystems, as well as in the air (Adeniji et al., 2019). The acceleration of PAH deposition in soil/sediments and water is attributed to their higher hydrophobicity and low aqueous solubility. These compounds are strongly adsorbed onto soil particles, making the soil ecosystem a primary sink for PAHs (Lu et al., 2011; Kuppasamy et al., 2017). Unfortunately, groundwater contamination due to PAHs has been largely ignored. PAH pollution is severely impacting the health and well-being of humans, as well as other organisms worldwide (García-Sánchez et al., 2018).

### Aim and Objectives Aim

The aim of this work is to investigate the presence of Polycyclic aromatic hydrocarbons in filling station's control wells in Tarauni L.G.A. Kano state, Nigeria.

### Objectives

To identify the PAHs presence in filling station wells

To compare the concentration levels of PAHs in filling station's wells with control

## Research Questions

What are the types of PAHs present in filling station's control wells in Tarauni LGA?

What are the concentration levels of PAHs present in the study area?

What are the differences in the level of contamination in ground water with that of the WHO approved standard?

## Scope of the study

The study is concerned with determining the contamination level of PAHs in the well water of petroleum filling stations in Tarauni L.G.A Kano - Nigeria. Five PAHs (Naphthalene (Nap), acenaphthene (Ace), acenaphthylene (Acy), anthracene (Ant), fluorene (Flu),) will only be considered, due to time factor and other resources available at researchers

## Significance of the Study

This study serves as a solid foundation for assessing the risks of ongoing water usage from a filling station. Recent advancements in integrated PAH remediation techniques have shown promise in effectively reducing PAH pollutants. The study comprehensively discusses the characteristics, sources, exposures, toxicity, and health impacts of PAHs, emphasizing the importance of PAH

remediation. Additionally, it raises awareness among government officials and citizens about the potential risks of locating a filling station within a community.

## Literature Review

The literature will be reviewed base on the following headinds

Polycyclic Aromatic Hydrocarbons (PAHs)

Sources of PAHs

PAHs in the Aquatic Environment

Human and Environmental Effects of PAHs

5 Standard Exposure Limits of PAHs in Water and Exposure Routes of PAHs to Humans

USEPA classification of PAHs

## Methodology

### Study Area

Tarauni LGA is one of the eight Local Government Areas in the metropolis and lies within the Latitudes 110.57'00"N and 120.02'00" North of the Equator and Longitudes 080.33'00"E and 080.36'00''E of Greenwich Meridian. It has 10 political wards covering an area of 28 Km<sup>2</sup>with its headquarters in the locality of Unguwa Uku within the City of Kano. It is bounded to the north by Nassarawa LGA, to the east and south by Kumbotso LGA and on the western by Kano Municipal LGA.

### Climate

The climate of the area is determined by the movement of the two air masses, the maritime air masses originating over Atlantic Ocean and the dry air masses coming from the sahara desert (May – September and October – April) respectively. The mean temperature ranges from 26°C - 33°C. Tarauni LGA is very hot throughout the year. Nighttime temperatures are cool during the months of December, January and February, with average low temperatures of 11°-14°C. Data were obtained for this study with aid of instruments such as field observation, questionnaires and interviews. The primary sources of data were got from structured and opened questionnaires as well as oral interviews from randomly selected five wards in the LGA.

### Geology and Landform

The geology and landform of Tarauni Local Government Area in Kano State, North-western Nigeria, is characterized by a flat relief with an average elevation of 500m, Precambrian Basement Complex rocks, sandy loam

soil with low fertility, savannah vegetation, River Kano drainage, and a tropical savannah climate with high temperature and low rainfall.

#### Population

Tarauni Local Government Area, one of the 44 local government areas in Kano State, Nigeria, has a population of 221,367 according to the 2006 national census, an estimated 308,600 people based on projections from the 2016 national population census. Kano State, where Tarauni is located, is

the most populous state in Nigeria, with a total population of over 15 million people as of 2020. The state is known for its rich cultural heritage, historical significance, and economic importance in the country.

#### Economic Activities

The economic activities in Tarauni Local Government Area are diverse and include farming of crops like millet, maize, sorghum, and vegetables, animal husbandry, works and road construction, healthcare, education and training, and industries and cottage industries, with farming being the main occupation.

#### Water Sampling

The borehole water at Tarauni L.G.A filling stations will be chosen for the study. Six liters of water will be randomly collected from various locations in the study area, with the following coordination points: 2 from the west, followed by 2 from the east, north, and south, each replicated twice, totaling 16 water samples to represent the study area. One water sample from the central zone of Tarauni will be used as a control for the study. One litre will be taken from each sample for chemical analysis before PAHs extraction.

#### Laboratory Analysis

##### **Chemical analysis of water samples**

At each sampling location, temperature (°C), pH, electrical conductivity and total dissolved solids (TDS) will be determined in situ using Hannah Portable Meter (model HI991300). The water samples were acidified immediately after taking measurements with 0.5 M HCl to prevent microbial utilization of trace elements. From the pool, 100 ml water samples will be filtered and concentrated to about 60ml in 100ml standard flask to which 5.0ml HNO<sub>3</sub> is added (Churchman, 2012). This will make up to 100ml mark with deionized water followed by elemental analysis with Unicam 969 Atomic Absorption Spectrophotometer (AAS) using 1% HNO<sub>3</sub> as blank.

##### pH

Water pH will be determined with a glass electrode on a pye Unicam Model 290Mk pH meter.

##### Electrical conductivity (EC)

Electrical conductivity will be determined using a Wheatstone bridge at 25°C.

##### Extraction of Six PAHs

The samples will be stored in a dark room at 4 °C without treatment or filtration and will be processed promptly after collection. Analytes will be quantified through external calibration, preparing standard solutions through dilution of the stock solution, and analyzing them using HPLC-FLD to generate linear calibration plots based on chromatographic peak areas. Analysis of Six PAH from water samples will be conducted using HPLC in accordance with EPA method

550.1. Extraction of PAHs from water samples will be performed using a Dionex Auto Trace 280 SPE system.

##### Statistical Analysis

All of the data will be subjected to descriptive analysis, and the means will be ranked in ascending order.

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## Taiwan, Semiconductors, and the New Economic Cold War

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### Abstract

In the backdrop of a geopolitical situation that dates back to the early days of the Cold War is the ever-growing importance of semiconductors. From both an economics and national security standpoint, this can neither be understated nor discussed without mentioning Taiwan. This paper explores the increasing significance of both semiconductors and Taiwan to the global economy, especially when it comes to the threat that a rising China poses to both Taiwan and the United States. Why is Taiwan the best when it comes to producing semiconductors? How much is that driving Xi Jinping's open desire to reclaim Taiwan? How much does the United States' willingness to defend Taiwan from China depend on Taiwan's ability to make the most advanced computer chips in the world? Should Taiwan be worried about its main semiconductor producer investing in operations in the United States? How would the global economy be impacted by an invasion or blockade of Taiwan by China? Have the United States and China entered into a Cold War over computer chips, and will that spill into other ongoing disputes between the two nations, such as the South China Sea? And if a new Cold War has started, how quickly can it become hot?

*Keywords:* computer chip, China, semiconductor, South China Sea, Taiwan, TSMC, United States, Xi Jinping

### Introduction

On December 31, 2024, Chinese President Xi Jinping gave an address and made clear that China views reunification with Taiwan as inevitable. He explicitly stated that everyone on both sides of the Taiwan Strait are one family and that "No one can sever our blood ties" (The Times of India, 2024). And as tensions over the South China Sea remain, Xi Jinping spent part of April 2025 visiting Vietnam and Malaysia, along with Cambodia as well. All three nations are also members of the Association of Southeast Asian Nations, also known as the economic bloc ASEAN. ASEAN works to maintain relationships with both China and the United States and its members include those three nations, Brunei, Indonesia, Myanmar, the Philippines, Singapore, and Thailand (Mingjiang et al, 2025). And in an expansion of the 2022 decision made by the Biden Administration to cut China off from AI chips made by Nvidia and Advanced Micro Devices, chip software makers like Synopsys and Cadence Design Systems have stated the Commerce Department recently sent them letters that said to stop selling their chips to China. These efforts by the Trump Administration to expand semiconductor export controls have drawn condemnation from the Chinese government (Leswing, 2025).

The one place on earth that brings all of these issues together is Taiwan and this paper first begins by exploring the importance of both semiconductors and Taiwan to the global economy in the backdrop of the threat from the other side of the strait posed by China. Other topics discussed include Taiwan's competitive advantage in producing semiconductors, how much that might be playing a role in Xi Jinping's desire to reclaim the island, and how much that factors into the United States willingness to defend Taiwan from a full Chinese invasion. Questions that will also be asked are how much would the global economy be negatively impacted should anything happen to Taiwan, has a cold war already started between the United States and China over computer chips, and if so, how likely is it to become hot?

### What are Semiconductors?

Most materials either let electric currents flow freely or block them. Copper wires are an example of something that lets electric currents flow, while glass is known to block currents. While semiconductor materials such as silicon and germanium are more like glass when it comes to their limitations in conducting electricity,

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adding elements like phosphorus and antimony in a process known as doping helps negative currents flow. The process of doping has allowed for devices to be created that can create and control electric currents. Scientists at AT&T's Bell Labs used this knowledge in 1947 to build a device that applied gold filaments attached by wires to a power source and a metal that was germanium. Scientists were able to control the current that had surged across the germanium. This proved William Shockley's theory to be correct that if semiconductor material like silicon or germanium was placed near an electric field, it could attract electrons with the semiconductor becoming a conductive material if enough electrons were attracted. The result would be an electric current flowing through a material that was previously unable to conduct electricity, which is what the Bell Labs scientists proved was possible in 1947 (Miller, 2022).

William Shockley took those developments one step further by inventing a device called a transistor, which could turn a large electric current on and off by manipulating the smaller current that had been applied to the middle of the transistor (Miller, 2022). Essentially, a semiconductor is a switch to turn electric currents on and off with "on" represented by 1 and "off" represented by 0 (Mazurek, 1999). Eight engineers would later leave Shockley and be credited for starting Silicon Valley when they launched Fairchild Semiconductor. Silicon Valley is a 50-mile stretch of land that stretches from south of the San Francisco Bay to San Jose, while also encompassing Palo Alto, Menlo Park, Mountain View, Milpitas, and Santa Clara. It is where the highest concentration of U.S. semiconductor companies are located. One of the eight engineers, Eugene Kleiner, also founded one of the world's most powerful venture capital firms called Kleiner Perkins (Miller, 2022; Mazurek, 1999).

Fairchild Semiconductor research and development team was successful under Gordon Moore in devising new technology and opening new markets as well, which included civilian purposes. And it was Gordon Moore who has one of the greatest technological predictions of the twentieth century when he wrote in 1965 that every year for the next decade, Fairchild would double the number of components that could fit in a silicon computer chip. In what became known as Moore's Law, costs per transistor fell while computing power increased (Miller, 2022). Intel would later make a significant leap in 1997 when it reduced the time needed to double from twelve months to nine.

In the twenty-first century, semiconductors can be found in all electronics and modern technology ranging from smartphones and LED lights to supercomputers and nanotechnology. One device, such as an iPhone or Tesla, could have thousands of chips with each chip having millions or billions of transistors. An example of this is the Apple A16 chip, which has 16 billion transistors and the more transistors a chip possesses, the faster the device it is powering performs (National Science Foundation; Trusted Reviews, 2023).

### **Dawn of the Cold War and the Rising Importance of Taiwan**

In 1949, the State Department under Secretary of State Dean Acheson published a White Paper that attempted to explain why the Nationalists were defeated in the Chinese Civil War and who was responsible for China being "lost" to the Communists. Despite recognizing the Nationalists as the legitimate government of China, the White Paper stated they were "corrupt, reactionary and inefficient" and that internal forces that the United States unsuccessfully tried to influence were responsible for the Communist victory. Secretary of State Acheson reiterated this point in 1950 when he described Chiang Kai-Shek as a refugee and said the United States as washing its hands of the Chinese Civil War. The United States had decided that it was not in its interest to defend Taiwan from a Communist takeover and that the island of Formosa [Taiwan] was not strategically important enough. This is why Mao initially rejected the idea of North Korean leader Kim Il-sung to invade South Korea because he wanted the Chinese Civil War to officially end with Taiwan being captured first. But Kim Il-sung thought North Korea should invade South Korea first before the possibility of the United States changing its mind when it came to defending Taiwan, which was eventually given the go-ahead by Stalin and the Soviet Union (Kissinger, 2011).

While working at the State Department under Secretaries of State George Marshall and then Dean Acheson, George Kennan drafted the "strategic concept" memorandum in 1948 that initially excluded Taiwan from the American defensive perimeter security zone in the western Pacific. The only exception would be if there is sudden Communist political influence that emerges on the island, which Kennan thought was more likely to occur than a full Chinese Communist invasion. Rather than use the U.S. military to defend the island and potentially clash with Communist Chinese forces, it would be more productive to help create a government that could resist Communist penetration on its own. Only if that failed and Taiwan and the surrounding islands could not remain isolated from mainland China should military operations be considered. But Kennan would eventually adjust his early assessment by claiming Taiwan was strategically important and should be kept out of the control of both the Communists and Nationalists. He also briefly considered if there was a chance the United States could have the same sort of relationship with the Chinese Communists that it had with Tito's communist regime in Yugoslavia (Heer 2018).

In the days leading up to the Korean War, both Taiwan and South Korea were considered to be outside the defensive perimeter that mostly encompassed islands like Japan, Okinawa, and the Philippines (Gaddis, 2005). But

two days after North Korea invaded South Korea to spark the Korean War, President Harry Truman ordered the U.S. Seventh Fleet in the Pacific to “neutralize” the Taiwan Strait to make sure neither the Communists nor Nationalists fired at one another. This thwarted Mao’s plans to invade Taiwan and it became clear that both Stalin and Mao did not anticipate the United States to strongly defend South Korea, while also linking Taiwan to the same conflict (Kissinger, 2011; Dittmer, 1992). Linking Taiwan with South Korea further entangled China in the Korean War and as Henry Kissinger described, the war setback China’s efforts to unite with Taiwan by a century and left America committed to defending Taiwan (Kissinger, 2014). Now both Taiwan and South Korea are part of the United States defensive perimeter strategy in the Pacific with the Korean War having sparked the 1954-1979 Mutual Defense Treaty between Taiwan and the U.S. (Shambaugh, 2021). While circumstances have somewhat changed since 1979, should Taiwan ever fall to mainland China or the United States completely abandon the island, it would show other countries in the region that security guarantees offered by the United States were meaningless. Such a situation would also give China full control of the Taiwan Strait, which would expand its access to the Pacific (Woodward, 2017). As U.S. defense policy expert Michael Mazza has stated:

“Even though no US troops are stationed on Taiwan, the island’s continued de facto independence is crucial for America’s forward defence perimeter, which since World War II has sought to keep would-be aggressors from approaching the United States via the Pacific Ocean. If Taiwan fell into unfriendly hands, moreover, America would find it increasingly difficult to defend its Asian treaty allies, notably Japan and the Philippines” (Woodward, 2017, P. 125).

### **The Economic Miracle and Transition to Silicon**

In the post-WWII period and especially since the 1960s, Taiwan often set new economic records with an annual average economic growth rate of around 8.3%. Like the economic models of Japan and South Korea, Taiwan developed strong export industries that had low costs of labor and production, along with good markets in the United States, Europe, and more ready to import Taiwanese goods. Between 1949 and 1996, GDP per capita increased from \$170 to \$13,500. The 1960s was also when Taiwan began to transition into more of an industrial economy. Previously, its export base was mostly agricultural products like sugar, rice, tea, and bananas. Taiwan also shifted from being a large recipient of economic aid from the United States to being an aid donor and foreign investor. This period of development led to Taiwan being part of the ‘Asian Tigers’ alongside Singapore, South Korea, and Hong Kong. The 1980s also saw Taiwan achieve both low levels of inequality and a diamond shaped economy, which meant a large middle class with few super wealthy or very poor. (Brown and Wu Tzu-hui, 2019).

From 1949 until 1987, Taiwan remained under martial law with the Nationalists often brutally suppressing efforts to organize political opposition. The lifting of martial law in 1987 came twelve years after the death of Chiang Kai-Shek and the first ever elections on the island were held in 1996. Mainland China became concerned because while they were well familiar with the Nationalists, there was uncertainty among those in Beijing about what would happen if they lost. While the Nationalists were victorious in 1996, they would eventually fall from power at the start of the twenty-first century and not return until 2008. And in addition to democracy emerging in Taiwan in the 1990s, the decade also saw Taiwan pursue a path of economic liberalization with many shipbuilding, banks, and telecommunications being privatized (Brown and Wu Tzu-hui, 2019).

The economic transformation that began during the 1960s also resulted in Taiwan inserting itself into semiconductor supply chains. The strategy was about providing jobs, access to advanced technology, and strengthening the security relationship it had with the United States. Early efforts resulted in convincing Texas Instruments to open a semiconductor facility in Taiwan and within two decades, Taiwan became one of the Asian leaders in manufacturing semiconductor devices. But most of the money to be made was in designing and producing the most advanced chips, and therefore Morris Chang set out to creating Taiwan’s own semiconductor company. Out of these efforts came the Taiwan Semiconductor Manufacturing Company, which was officially founded in 1987 and received 48% percent of its startup capital from the Taiwanese government. And in order to convince a foreign chip firm to provide advanced production technology, the Dutch semiconductor company Philips was offered a 27.5% stake in TSMC in exchange for the transfer of production technology, license of intellectual property, and \$58 million. TSMC also benefited from having close ties with the chip industry in the United States with many of its first customers being U.S. chip designers, along with many employees having previously worked in Silicon Valley. Morris Chang promised to never compete with its customers by agreeing to only build computer chips but never design them. This all means that coinciding with economic liberalization and democracy in the 1990s was the booming success of the Taiwan Semiconductor Manufacturing Company (Miller, 2022) whose chips are used for applications like consumer electronics, mobile and telecommunications networks, automobiles, high-performance computing, and more. The company is also now the world’s largest computer chip maker and

responsible for 90% of the world's advanced chips production capacity. TSMC is also a top supplier for Western firms like Apple and it has become indispensable for the United States (Tseng, 2023).

In 1995, Taiwan produced 3% of the world's computer chips (Mazurek, 1999) with that share increasing to 12% five years later with Taiwan becoming the fourth largest semiconductor producer at the end of the twentieth century (Cheng, 2006). The 1990s also saw Advanced Semiconductor Engineering Inc (ASE), which is Taiwan's largest operation for chip testing and assembly, open subsidiaries in Malaysia and the United States. Joint ventures were also announced between TSMC and multiple long-standing American customers (Matthews and Cho, 2000).

Taiwan also jumped out to a huge advantage over China when it came to the production of semiconductors due to Mao's efforts to keep foreign technology out of China. Mao's efforts were so extreme that even a few years after his death in 1979, a study found China only had fifteen hundred computers throughout the whole country. While Taiwan was embracing the latest technology that would come to define the modern world even today, Mao was leading the Cultural Revolution and sending China's top scientists to live on and study peasant farms (Miller, 2022).

### **The Ties That Bind Across the Taiwan Strait**

In 1995, less than 1% of Taiwan's total exports were to mainland China. But ten years later, China became Taiwan's largest trading partner and total trade with China reached 22% in 2014. This has coincided with China running a trade deficit with Taiwan that reached \$75 billion in 2014, and the U.S. share of trade declining from 24% of Taiwan's exports in 1995 to 10.5% in 2014. China has also become the top recipient of Taiwanese foreign direct investment totaling \$8.7 billion for the year 2013, which was 63% of all FDI outflow for Taiwan (Woodward, 2017). Trade volumes have also steadily increased between China and Taiwan since both became members of the World Trade Organization (WTO). It is also worth noting that Taiwan became China's fourth largest trading partner during the 1990s (Burdekin et al, 2013). One major concern that has been previously expressed by Taiwanese officials is the use of economic statecraft by China to exert influence over Taiwan. Increase in economic relations and activity over the Taiwan Strait could, in theory, make Taiwan dependent on China for its economic security and stability. That would result in Taiwan's autonomy being eroded over time, which would make political unification inevitable with the Chinese Communist Party in charge (Wu, 2025).

TSMC also established an 8-inch fabrication plant in Shanghai in 2004, which is a sign of modern China breaking from the legacy and beliefs of Mao about foreign technology (Kirby, 2013). The largest competitor to TSMC in mainland China is the Semiconductor Manufacturing International Corporation (SMIC). It is headquartered in Shanghai and first incorporated in the Cayman Islands in 2000. It became the third-largest pure-play foundry in the world in 2005 with a market share in China of over 50%. It is still publicly traded in Hong Kong and at one time traded on the New York Stock Exchange (NYSE). But SMIC has also been accused of stealing trade secrets from TSMC's Shanghai operations with TSMC having previously filed lawsuits in U.S. federal courts. (Chu, 2013).

China faces a series of problems when it comes to developing a semiconductor industry with one of the main ones having to do with being dependent on foreign technology in almost every step of the production process. Most of the technology is controlled by geopolitical rivals like Taiwan, South Korea, Japan, and the United States. For example, the software needed to design chips is mostly dominated by U.S. firms, while China controls less than 1% of the global software market. The Chinese also only have 2% market share of the core intellectual property building blocks of transistor patterns, while also supplying only 4% of the world's silicon wafers, 1% of the tools needed to fabricate chips, and 5% of the chip design market. The largest market share holders of the intellectual property building blocks are American and British firms. And when looking across the whole semiconductor supply chain, Chinese firms only have around 6% market share, which is significantly less than the 39% held by American firms, 16% for South Korean firms, and 12% for Taiwanese firms. China's other major problem is that the chips it produces can be fabricated elsewhere. Even the machinery China uses is mostly American, Dutch, and Japanese with the manufacturing primarily being South Korean and Taiwanese as well (Miller, 2022).

But the Chinese semiconductor industry has greatly benefited from what has been described as a 'fatal attraction' that some in the Taiwanese semiconductor industry have for mainland China. For example, between 2014 and 2018 an estimated 1,500 senior engineers relocated from Taiwan to China to work for Chinese computer chip firms. The links between Taiwanese participants in the industry and the Chinese defense production system is strong (Krige, 2024).

The Taiwan Strait itself has also seen increased militarized activities with 2021 being the most active with Chinese fighter jets. For example, on June 15, 2021, 28 aircraft from the Chinese air force entered Taiwan's air defense identification zone (ADIZ) with the aircraft including both fighters and bombers. Another 56 fighters crossed into the ADIZ on October 4, 2021 (Nguyen et al, 2021).

### **Chinese Technology and the Chip Industry: Peaceful or Threatening?**

In 2014, Xi Jinping declared there is no national security without cybersecurity, which echoes the sentiment that the primary risk facing China is the digital world. While China has been successful in harnessing digital technology for authoritarian purposes, the government knows that its digital capabilities remain dependent on imported semiconductors that are mostly produced in the United States. While China has been successful in replicating Silicon Valley when it comes to software for applications like e-commerce, online searching, and digital payments, that software mostly relies on imported foreign hardware beginning with computer chips. Even its surveillance apparatuses that monitor dissidents and ethnic minorities uses imported semiconductors from American companies such as Intel and Nvidia. Chinese leaders have acknowledged that their position in computer chip global supply chains is vulnerable (Miller, 2022).

The rhetoric of Xi Jinping has since ratcheted up given how the demand for computer chips continues to increase while foreign firms like TSMC and South Korea's firm Samsung remain the dominant players. Design and production of semiconductors has essentially been monopolized by a few firms, all of which are outside of China. In every step of the computer chip production process, Chinese firms remain reliant on foreign technology that is mostly controlled by geopolitical rivals Taiwan, Japan, South Korea, and the United States. These vulnerabilities will continue to show themselves as Chinese tech companies continue to advance in areas like cloud computing, autonomous vehicles, and artificial intelligence. No Chinese firms can even produce a competitive GPU, which means they must be imported from AMD and Nvidia. AMD and Intel also provide China with x86 server chips (Miller, 2022).

And while China has somewhat closed this gap and dependency on foreign chips over the last decade with American and British chip architectures and Taiwanese foundries all helping China develop supercomputer programs, Xi Jinping has called for Chinese companies to "assault the fortifications of core technology research." For China this means more than just relying less on foreign semiconductors or achieving a higher market share. It is about remaking and transforming the global semiconductor industry. Those desires have caught the attention of other countries like the United States, which under President Biden banned the sale of computer chips to firms such as Huawei (Miller 2022). The Trump Administration during the first term also banned Huawei from doing business in the United States on the grounds of national security after accusing the company of secretly giving the Chinese military access to sensitive telecommunications (Krige, 2024). And I argue that another way for China to remake the global semiconductor industry is to invade and capture Taiwan, which could then give China full access to TSMC's operations.

But vulnerabilities also exist for Taiwan as it pertains to the energy needs of the semiconductor industry. As recent as 2023, Taiwan imported 96.7% of the oil, coal, and natural gas used for energy production. This poses a challenge for Taiwan as the semiconductor industry and companies like TSMC continue to increase their electricity consumption. Taiwan is also dependent on imports of raw materials and all of this can also be jeopardized if China was to ever try and blockade the island (Liu et al, 2025).

### **U.S.-Taiwan Relations and Taiwan's Economic Security**

What has been described by some as the "semiconductor chip war" is largely part of the technological race between the United States and China. This strategic competition now includes a United States that has moved toward economic nationalism, which means it is prioritizing self-sufficiency over economic interdependence. Countries choosing to do this are attempting to protect themselves from the weaponization of economic interdependence, which is something China has long been accused of doing. While economic theories about division of labor and comparative advantage show how interdependence can contribute to economic growth in a positive manner, economic, health, and national security concerns can also arise when global supply chains are disrupted (Wu, 2025).

In the post-2020 pandemic world, what has been described as "chip nationalism" has especially emerged in pursuit of technological sovereignty. Nationalist ambitions have resulted in TSMC investing in Phoenix, Arizona, Kumamoto, Japan, and Dresden, Germany. Companies like Intel and others have also begun to voice that TSMC cannot be relied upon because it is located where The Economist has previously described as 'the most dangerous place in the world.' While serving as Secretary of Commerce, Gina Raimondo labeled U.S. dependency of chips from Taiwan as 'untenable and unsafe.' While some have voiced concerns about what that means for the economic security of Taiwan and whether it can continue to count on allies like the United States for defense purposes, companies like TSMC still have most of their production capacities and most advanced processes still in Taiwan. The rise and progress made in artificial intelligence will also continue to make both Taiwan and TSMC important to global supply chains. The United States also cannot afford to relocate TSMC entirely away from Taiwan given its

very important strategic location and its collaborative relationships with upstream and downstream producers. The company and its location in Taiwan remain vital for the United States in its race against China, which means that the United States will still find Taiwan important enough to defend despite concerns those in Washington may have about American soldiers needed to defend the Taiwan Strait at some point in the future (Wu, 2025). But should there be any major shift in the status quo, depending on who is in power in Washington, that assessment may change. It also cannot be assumed that economic interdependence will keep China and Taiwan from going to war with one another given what has happened over the past decade between Russia and Europe over Ukraine.

Chip nationalism can also jeopardize the strategic importance of Taiwan and what has been called its “silicon shield.” Fears about the semiconductor industry moving out of Taiwan may cause other businesses to think about doing the same. This would cause Taiwan to become less economically important and as a result, more susceptible to Chinese coercion and aggression (Sacks and Huang, 2024).

### **Has a Cold War Begun?**

The phrase “Cold War” is now often used when discussing U.S.-China relations with speculation about whether the two countries are on a collision course for one, or even if one has already started. Initially, as Robert Daly from the Kissinger Institute on China and the United States at the Wilson Center has noted, using a Cold War framework to describe the relationship between the U.S. and China has been largely rejected. Unlike the Soviet Union, China is more than just a military power. It is a large consumer market that is also integrated economically with the United States with the two nations dependent on one another in certain aspects (Daly, 2022). Patricia M. Kim from the Brookings Institution has also pointed out that treating China like the Soviet Union and therefore trying to enact a modern-day containment policy will also be much more difficult due to China not viewing the “capitalist world” with the level of hostility that the Soviets did. Modern-day China needs to be engaged with the outside world in order to maintain steady economic growth (Kim et al, 2023).

But others like Matthew Turpin from Brookings suggests a cold war between the United States and China has already started. Instead of asking is a cold war destined to happen, Turpin states the questions that should be asked are “how do we want it to unfold and how long will it last?” The beginning of cold wars can only be seen in hindsight and the Chinese Communist Party viewed American engagement as an existential threat to grip on power inside China. This became evident when Xi Jinping addressed the Central Committee in January 2013 and said, “capitalism is bound to die out and socialism is bound to win” (Kim et al, 2023). A battle of ideas is also taking place as the editor-in-chief of China’s *Caixin* magazine wrote in 2013, “This is nothing short of a competition between the American Dream and the Chinese Dream” (Daly, 2022).

The Chinese Dream, which has also been called the Chinese Dream or Great Rejuvenation, is a shift away from the developmental moderation model of Deng Xiaoping and more about “big power diplomacy” (Zhao, 2023; Shirk, 2023). Some of the aspirations behind the dream are national rejuvenation, strong military, and the dreams of youth, ecological civilization, pursuit of values, and peace. Under Xi Jinping, this dream has also caused China to adopt more forceful policies and actions on issues centered around core issues (Nguyen et al, 2024). This has caused others in the international community like the United States and Taiwan to view the dream more as the “Chinese Threat” or nightmare (Zhao, 2023; Shirk, 2023).

Bolt and Cross (2018) also write how both China and Russia want to change the current liberal order despite neither being the architects in its creation. China and Russia also want a more multipolar world instead of what they view as Western triumphalism since the end of the Cold War. They also want more global issues settled at the United Nations Security Council where they possess veto power and more state sovereignty with less focus on human rights and democracy. Russia wants to maintain a sphere of influence over former members of the Soviet Union, hence Ukraine, while China wants the United States to not intervene in maritime disputes that it has with its neighbors. And those maritime disputes include both the South China Sea and Taiwan.

### **Taiwan, the South China Sea, and the Risk of a Cold War Becoming Hot**

From 1954 to 1979, Taiwan was under the protection of the United States through formal defense treaty. But following reproachment efforts between the U.S. and China during the 1970s, the defense treaty was terminated and mainland China, or the People’s Republic of China, was recognized as the official Chinese state over Taiwan, also known as the Republic of China. But Taiwan has been able to depend on security guarantees through the Taiwan Relations Act of 1979, along with the occasional purchases of military equipment from the United States (McDevitt, 2023). But American sentiment toward Taiwan began to change in the 1990s following Taiwan’s official transition to democracy, the Tiananmen Square Massacre that badly damaged China’s global image, and human rights concerns that President Bill Clinton made a priority to address with China (He, 2016).

But the 1990s was also when China's military began to seriously modernize and has since surpassed Taiwan in almost every aspect of modern warfare. No longer are the threats made by the Chinese Communist Party hollowed since the People's Liberation Army (PLA) can now reach and inflict serious damage on Taiwan (McDevitt, 2023). But China also has other options aside from launching a full-scale invasion of the island with two of them being blockade and quarantine. While a blockade is virtually the same as a declaration of war that involves shutting down all air and sea traffic of a specific country, quarantine is more selective and only targets specific vessels or Cargo. Any enacted quarantine would negatively impact Taiwan's trading capabilities, which would have serious repercussions for the global economy if Taiwanese semiconductor exports are disrupted. Quarantines can also be maritime or aerial specific, which could mean targeting vessels and planes carrying any materials related to semiconductors. But the United States could also target TSMC facilities and other important infrastructure in Taiwan before it can be captured by the PLA should a full-scale invasion ever be launched (Liu et al, 2025).

Should China choose to enact a quarantine against the island of Taiwan, it would probably involve one of the most contested bodies of water, which is the South China Sea. Roughly half of the world's maritime trade by merchant fleet tonnage, which in 2012 was estimated to be \$1.2 trillion. Around 80% of China's imported oil also passed through the South China Sea in 2012, along with 66% and 60% of South Korea and Japan's imported energy supplies respectively. The South China Sea is the most direct route for oil between the Gulf and East Asia, while also being an important connection for East Asia to connect with the Indian Ocean, Suez Canal, and Europe. It has also become very important for China as its footprint in Africa continues to expand. The Malacca Strait is the only major shipping route that can be used to connect the South China Sea to the Indian Ocean and it is estimated that 12.9 million barrels of oil passed through the strait daily in 2011 (Woodward, 2017).

In a challenge to international maritime law, China claims most of the Sea is part of its territory and it circulated a map to the United Nations in 2009 with a U-shaped, nine-dash line to mark its claimed territory. These claims date back to 1947 and show China claiming the Paracel Islands, Scarborough Shoal, the Spratly Islands, and part of Indonesia's Natuna Islands. In addition to global trade, one of the main economic interests centered around the South China Sea are the estimated oil and natural gas deposits. Both China and the United States estimate billions of barrels of oil and trillions of cubic feet of natural gas reserves can be found in the sea. The South China Sea also possesses 10% of the world's annual fish catch and 30% of the world's coral reefs. It also has five times more traffic than the Panama Canal and its been estimated that more than 50% of all oil tanker shipments and merchant fleet tonnage passes through the sea. Any disruptions in the South China Sea could result in billions of dollars being added global shipping costs annually. Near total Chinese control of the South China Sea would essentially make countries like Malaysia and Vietnam land-bound and dependent on China for access to international trade. The same would also happen to Taiwan if China took full control of the East China Sea with Taiwan essentially being surrounded by Chinese lakes (Corr, 2018).

And just as China has sought to leverage its interdependence with Taiwan to its advantage, it has the leverage to do so with its South China Sea neighbors and other ASEAN countries. For example, China is Brunei's third-largest source of imports and second-largest course for Cambodia. China is also the largest export and import market for Indonesia, the largest export market for Laos, the second-largest export destination for Malaysia, and the Philippines third-largest export market as well (Forsyth, 2018). This is because China chooses to not behave like a "competition state," which results from the political level of globalization coming together with the interconnectedness between state as competitive advantages are promoted over nation-state sovereignty. Competition states focus on their competitive advantages in goods and services produced in order to receive economic gains and build new coalitions within their respective spheres of influence. State agencies become integrated into the global economy and come to both accept and embrace the interdependencies that result from transnational linkages (King and Kendall, 2004; Cerny, 2010). I argue that China before Xi Jinping came to power mostly acted as a competition state, which is why it had not launched a full military invasion of Taiwan or militarized the South China Sea. But under Xi Jinping, China has sought to use its economic competitive advantages to militarize the South China Sea, ratchet up the rhetoric about reclaiming Taiwan, and as a result derail its own peaceful rise by choosing to no longer be a competition state.

I believe the result of this has been a new Cold War and while a hot war is not guaranteed to happen, it has become more likely as China continues down the trajectory it has chosen over the last decade.

### **Final Thoughts**

According to the Rhodium Group, a Chinese blockade of Taiwan would cost the global economy at least \$2 trillion, while economists from Bloomberg estimate the damage could be as high as \$5 trillion. That would roughly be a 5% drop for the global economy with Taiwan and China expected to see their economies decline by 12% and 9% respectively (Patey, 2024). Some Bloomberg economists also believe Taiwan's GDP could decline by as much

as 40% with China's also dropping around 16.7% (Welch et al, 2024). The global economy would lose trillions as supply chain disruptions would impact consumer electronics, automobiles, telecommunications, health, and other industries that are dependent on advanced technologies like semiconductors. Other domino effects would be the likelihood of sanctions enacted by the United States against China, which would even rattle the European Union. An estimated 80% of solar panels used by the European Union come from China and roughly 90% of the permanent magnets that are needed for electric vehicles come from Chinese-based suppliers. Unless the European Union pursues a more diversified path, its dependency on China for electric vehicle batteries will increase from 30% in 2023 to 50% by 2027. This also means Europe will be even more impacted should military action be taken by China against Taiwan (Patey, 2024).

Even using the Russian invasion of Ukraine as a measuring stick for the potential damage and fallout to the global economy is not useful given that the combined GDPs of the United States, China, Taiwan, Australia, and Japan is around \$54 trillion. That is more than 24 times the size of the combined economies of Russia and Ukraine. Another question becomes what would become of the foreign exchange reserves held by China, which as of November 2024 were the largest in the world and valued at \$3.523 trillion with 93% being foreign-denominated deposits and bonds. China may also hold another \$786 billion in U.S. dollar-denominated assets through holdings in Belgium and Luxembourg, along with 30.6% of U.S. publicly held, marketable debt that is valued at \$8.635 billion. Another \$769 billion in U.S. bonds is held by China and while holders of Treasury bonds cannot demand early repayment, they can sell bonds they hold to other parties. The United States Treasury tracks who owns bonds by bank account number and would be able to spot if China is selling off U.S. Treasuries, which could be an early warning sign that military action against Taiwan is imminent in order to mitigate the damage and losses expected from sanctions (Neely, 2025).

TSMC has also begun to establish operations in the United States and announced in May 2025 that it will triple the size of its campus in Phoenix, Arizona over the next ten-plus years. The coming decades will also see six fabrication plants built by TSMC in the north Phoenix area (Boehm, 2025). As this paper has previously stated, semiconductors has allowed Taiwan to deeply integrate itself into the global economy and security apparatus of the United States. Its economic competitive advantage has been closely linked to its security position and its ability to balance relations with both the U.S. and China. But if that changes and Taiwanese companies are able to expand their operations and be less dependent on the island itself, would the United States be willing to pay what would be expected to be a high price to defend the island? While there is no guarantee how this conflict would play out, war game simulations seem to suggest that American, Japanese, and Taiwanese forces would be able to defend Taiwan. But this would come at a steep price in the loss of soldiers, aircraft, and ships (Neely, 2025).

If China was to revert back to acting like a competition state and focus on its competitive economic advantages and the well-being of both its economy and the global economy, then in all likelihood a hot war over Taiwan can be avoided. But if it follows the same path Russia chose under the leadership of Vladimir Putin, who tried to use Russia's competitive advantages to exploit Europe and invade Ukraine, then Chinese military action via quarantine, blockade, or full invasion is unfortunately inevitable. The choice for how this ends regarding Taiwan and semiconductors rests solely on China and the world will have to react accordingly.

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## Cannabis use motives and cannabis-related outcomes: A moderated moderation model of protective behavioral strategies and gender

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**Background and aims:** Cannabis use motives have been linked to cannabis-related outcomes, but inconsistencies across studies suggest that additional variables may influence these relationships. Protective behavioral strategies (PBS) have been proposed as a moderating factor, though findings have been mixed. Gender differences may further shape these associations, yet no studies have examined whether the moderating role of PBS is itself moderated by gender. This study aimed to examine whether PBS use moderates the relationship between cannabis use motives and cannabis-related outcomes, and whether this moderation varies by gender.

**Methods:** Data were drawn from the Psicocann Project, a longitudinal study involving 612 young adults (ages 18-25) recruited from the community, all of whom reported cannabis use in the past month. Of the initial sample, 82.5% completed a three-month follow-up. For this analysis, only participants who reported cannabis use at both time points were included, yielding a final sample of 462 individuals (Mean age = 20.98; 61.3% male). At baseline, participants completed measures of cannabis use motives

(coping, enhancement, social, conformity and expansion) and three cannabis-related outcomes in the past month: frequency of use, quantity consumed in grams, and cannabis-related consequences. At the follow-up, PBS use and the same cannabis-related outcomes over the past month were assessed. Single moderation and moderated moderation analyses were conducted using the PROCESS Macro in SPSS.

**Results:** The results showed that PBS significantly moderated the relationship between social motives and cannabis quantity, with this association being significant only at low levels of PBS use. Additionally, moderated moderation analyses revealed that PBS moderated the relationship between expansion motives and cannabis quantity, and between conformity motives and cannabis-related consequences, but only among men. Specifically, expansion motives were positively associated with cannabis quantity at low and moderate levels of PBS use but negatively associated at high levels.

Conformity motives were linked to more cannabis-related consequences when PBS use was low, an association that was no longer significant at moderate and high levels of PBS use.

**Discussion:** Our findings highlight the role of PBS in mitigating the impact of cannabis use motives on patterns of use and related consequences, with such strategies being more beneficial for men than for women. This gender-specific efficacy underscores the need for tailored prevention and intervention programs that account for differential benefits of protective strategies across genders.



## Leverage and Cooperative Work as Catalysts for the Development of Linguistic Competence in English as a Foreign Language: An Approach Based on the Tasking Methodology

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### Abstract

This study examines the role of collaborative leverage and cooperative learning in the development of linguistic competence in English as a foreign language, within the framework of the Tasking methodology. Unlike approaches that prioritize group homogeneity or mere collaboration, this research adopts a perspective in which the differences among team members are not only complementary but serve as strategic resources that enhance collective learning. Leverage is understood here as the ability of each member to propel the group's progress by drawing on their individual strengths, generating a multiplier effect on overall language performance.

The study was conducted with a population of 138 EFL students enrolled in a teacher training college in southern Peru. A purposive sample of 50 pre-service English teachers was selected for analysis. A mixed-methods design was employed, combining quantitative data from evaluated communicative tasks with qualitative data from focus group interviews. Preliminary findings suggest that peer leverage—expressed through the recognition, appreciation, and active use of differentiated skills—is associated with significant improvements in linguistic competence, primarily evidenced in oral language production during collaborative tasks.

The study concludes that cooperative learning based on leverage not only enriches group learning dynamics but also represents a transformative strategy for strengthening linguistic competence, particularly in diverse and under-resourced educational settings. This approach offers a renewed perspective on how to prepare future language teachers to construct linguistic knowledge in a socially engaged, conscious, and strategically collaborative manner.

**Keywords:** *Linguistic competence, task-based learning, leverage, cooperative learning, pre-service language teachers*

## Public Opinion and Immovable Cultural Heritage: At the crossroads between Localism, Participation, and Development

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### Abstract:

Public opinion on immovable cultural heritage is shaped by a complex interplay of desires to implement localism, participation, and local development. This proposal hypothesizes that public opinion on heritage preservation is increasingly driven by a triple dynamic – specific individuals or groups at the same time advocate for greater agency over their cultural landmarks, increased participatory decision-making regarding management of cultural heritage while also aspiring to generate substantial developmental effects on city and wider region. The proposal elaborates how the information obtained during public opinion surveys bring many paradoxical opinions and positions on ways of managing immovable cultural heritage. These seemingly paradoxical situations where the respondents simultaneously accept and reject certain development directions have an important role as they expose the current vulnerability of local communities that play a vital role in heritage use and preservation. Integration i.e. solidification of confronting stances within a community can sometimes lead to confusion, exclusivity, resistance to change, passivization or even conflict with broader societal and developmental needs. Using primary data from the research project HEI-TRANSFORM and other secondary data, this proposal examines how difficult is to navigate the interest of multiple stakeholders at the local level to produce beneficial effect for the whole community. Through an analysis of survey data and policy frameworks, this proposal argues that striking a balance between community involvement and adaptive heritage policies is essential.

**Keywords:** Immovable cultural heritage, public opinion, localism, participation, urban development

### Introduction

Immovable cultural heritage acts as a cornerstone of local identity, a link to historical narratives, and a source of communal pride. As a result, any alterations in its management provoke strong emotions and often lead to conflicting viewpoints. The delicate nature of balancing the interests of multiple groups in relation to management, utilization or regulation of immovable cultural heritage necessitates careful consideration, as missteps in management can severely affect local development and diminish community quality of life (Kiefer, 2008). For instance, policies that emphasize economic benefits over conservation may lead to the degradation of historic sites, thereby eroding the distinctive character and authenticity of a place (Logan, 2012). Similarly, excessively stringent conservation measures may impede necessary urban development and adaptation to contemporary needs, generating discontent among residents and key stakeholders (Fischel, 2001, Pendlebury, 2009). In this regard, achieving equilibrium between conservation efforts and sustainable development remains a complex challenge that demands a comprehensive and adaptive approach (Smith, Waterton, 2019). Given these complexities, any proposed modifications in cultural heritage management must undergo thorough rigorous evaluation process alongside with active participation of local populations. Community involvement and public engagement in decision-making processes are vital to ensuring that cultural heritage remains both meaningful and advantageous to society (Graham, Ashworth, & Tunbridge, 2016). Methods such as public consultations, participatory planning, and opinion surveys serve as effective tools for integrating community perspectives into heritage governance. Encouraging local engagement not only fosters a sense of ownership and accountability but also enhances the sustainability of heritage initiatives. Without collective support, even well-intentioned projects risk facing opposition and potential failure (Vecco, 2010; Vecco, Srakar, 2018).

Moreover, research indicates that public opinion on heritage management often reflects seemingly contradictory attitudes, wherein individuals simultaneously advocate for preservation while supporting modernization initiatives (Soini, Birkeland, 2014). These paradoxes highlight the intricate nature of cultural heritage governance, where communities may champion the conservation of historic structures while also endorsing large-scale infrastructure projects that threaten these same sites. Such tensions underscore the necessity for a nuanced and context-sensitive approach to heritage policymaking (Ursic, 2023).

The paper examines these competing perspectives within local contexts by drawing on findings from the HEI TRANSFORM project (2025). It will explore how different governance models influence heritage conservation and community well-being, while also assessing the potential effects of new policy frameworks, alternative funding mechanisms, and the roles of both private and public institutions in heritage stewardship. Through comparative analysis of various management approaches in terms of actor responsibility, this paper aims to evaluate the effectiveness of different strategies and identify critical challenges that policymakers and heritage professionals must navigate in ensuring the preservation of immovable cultural heritage.

## 2. Theory – Localism and new localism

Planning for heritage-based development is often perceived as a form of consultation or interactive management, where the objective is to harmonize the interests of different (political, financial, class, ethnic, cultural) socio-economic groups that are present in a given space (Healey 2003; Sanoff 2008). These groups may have conflicting interests and differ not only in regard to aims and expectations but also according to the level of acceptance of new ideas, which may be translated into power, pressure or influence when it comes to the decisions about interventions in cultural heritage present within a locality. In this regard, it is possible to notice discrepancies between desirable and practical implementations on terrain when planning for sustainable heritage-based development. This problematic is in the case of immovable cultural heritage often exposed in various NIMBY (not in my backyard) syndromes where different types of civil society initiatives, local communities and, on the other side, conservation approaches, development aspirations of investors, political structures and other actors clash to assert their particular interests and needs (see Fischel 2001; Kiefer 2008). Frictions and consequently non-optimized or imbalanced relations between actors lead to reinterpretations of the roles of immovable cultural heritage and partly limit their function in building locally-based “cultural capital” (Bourdieu 1986: 248) among the local population.

Differences in the understanding of the role of immovable cultural heritage is based on different understanding of local space, its boundaries, roles and influences it should project on the surroundings. From this perspective, the paper pays particular attention to the phenomenon of localism and new localism. It analyses how elements of “new localism” (Strassoldo, Tessarin 1992: 287) reflect opinions of various stakeholders that are involved with management of immovable cultural heritage in Slovenia. In the case of cultural heritage, local actions are often connected to hierarchized and rigid (traditional, autarkic) local networks whilst the new localism conceptualization envisages the use of local elements in ways that benefit both the local and general (global) society.

Localism can be best described as a relation between place (understood as a space, which is relatively small and limited) and social phenomena that occur in it. This relationship is valorised (ideologised) from the point of observer or actor and becomes a part of his state of conscience (ibid.). In this way locality (and space in general) becomes an important ingredient in the construction of someone’s identity, and contrary to the theories of vanishing territorial determinism, emphasizes the importance of locality in everyday life. Traditionally, localism and rootedness have been considered backward and part of conservative pole of values. Modernisation processes seemed to be directed towards cosmopolitanism, universalism, and mobility. Territorial attachment, described by Tönnies (1999: 31) as part of “Gemeinschaft”, seemed to vanish, as it was supposed to be gradually destroyed by functional “Gesellschaft”. Strassoldo (2004: 7) explains that Gemeinschaft was, actually, to some extent influenced or restrained by those processes, but the trend did not change its contents: “It has found inner limits in some basic human needs, and has generated dialectically its own limiting contradictions and countervailing forces” (ibid.). The consequence of these processes was new localism, where elements of old localism were fused with the processes of globalisation that brought new elements into locality. Mlinar (2001: 770) examines old localism in relation to new localism on the basis of analytical dimensions of “connectedness” and internal “characteristics”. Connectedness is analysed through the prism of autonomy, while internal characteristics are defined according to exclusion or integration of specialties. It is possible to assert that old localism is much more closed, less connected, in comparison to a choice oriented new localism. Similar differences are recognized in the way old and new localism exclude or integrate specialties that appear in localities.

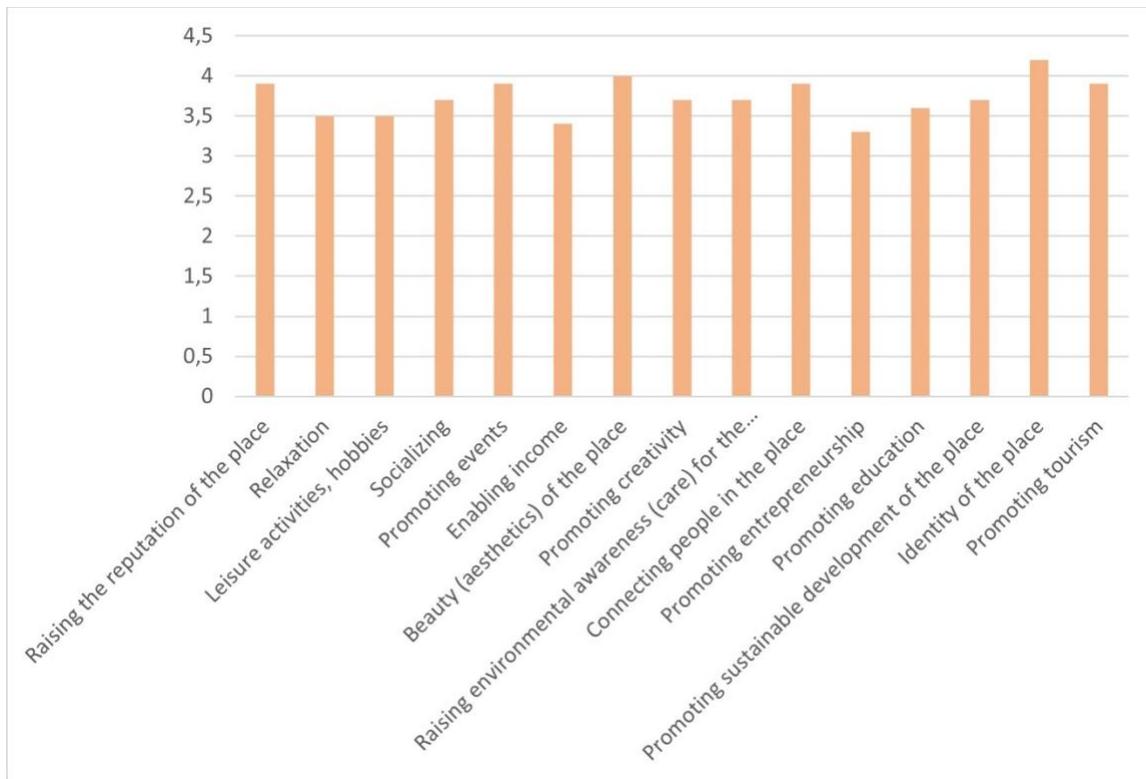
### Methodology and analysis of data from HEI TRANSFORM project

The research methodology employed in this study is grounded in an extensive panel survey conducted as part of the HEI-TRANSFORM (2025) project in Slovenia. A fundamental aspect of the research involved developing a questionnaire designed to assess the role of immovable cultural heritage in enhancing the quality of life within local communities. The primary objective of this research was to gather data that could inform the optimal management

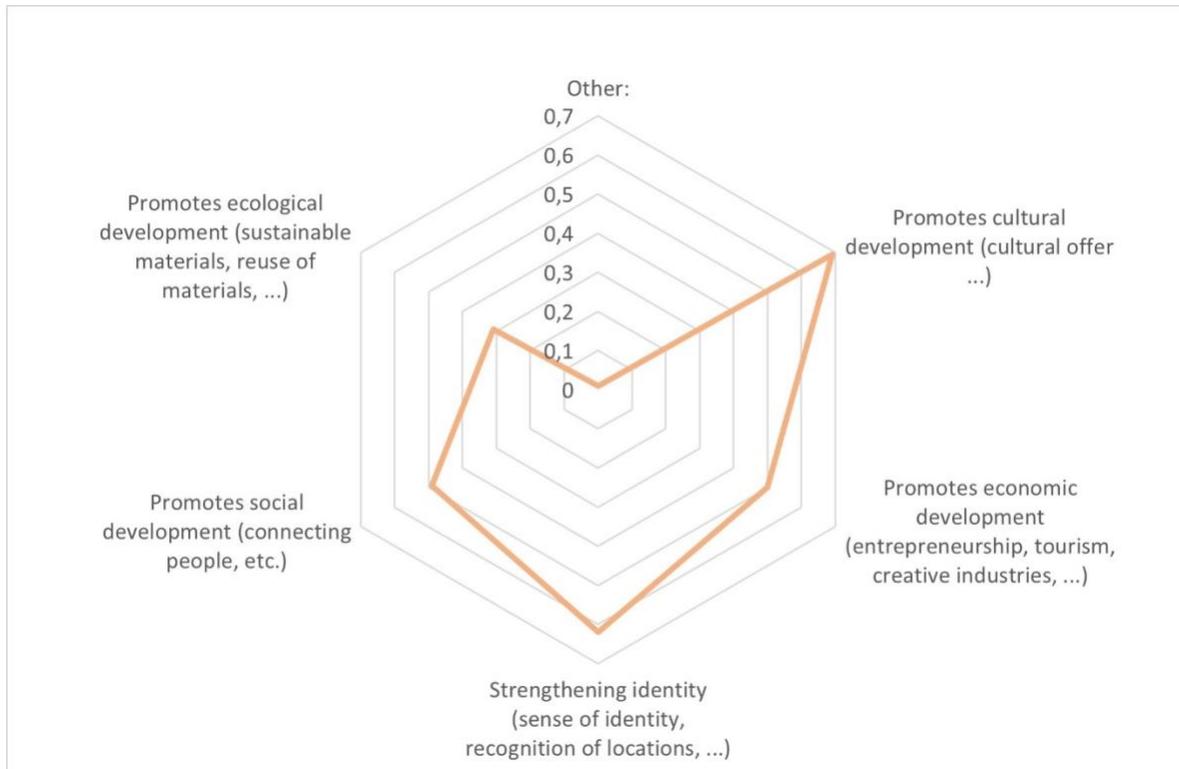
and utilization of immovable cultural heritage. Additionally, the study aimed to explore public perceptions regarding the benefits and drawbacks of recent modifications and modernization efforts applied to cultural heritage sites. The data collection phase commenced in January 2024 and concluded in February 2024. The panel survey encompassed the entire territory of Slovenia, employing a balanced sample based on key demographic factors, including gender, age, geographic distribution, income, and education. A total of 1,150 individuals (N = 1150) participated in the study.

Findings from the HEI TRANSFORM survey (2024) indicate that Slovenia exhibits a strong sense of connection to immovable cultural heritage at the local level (Uršič, Brečko, Filipovič Hrast, 2024). Respondents emphasize the significance of cultural heritage in shaping local identity and defining the character of a place. They express a deep identification with immovable cultural heritage, which, through its symbolic, cultural, architectural, and urban attributes, serves as a fundamental representation of locality, place, and community. This strong attachment underscores the crucial role of immovable cultural heritage in influencing development strategies for towns, cities, and broader spatial planning efforts (graphs 1 and 2).

Graph 1: How important is immovable cultural heritage according to specific dimensions



Graph 2: Why can immovable cultural heritage be an opportunity for?

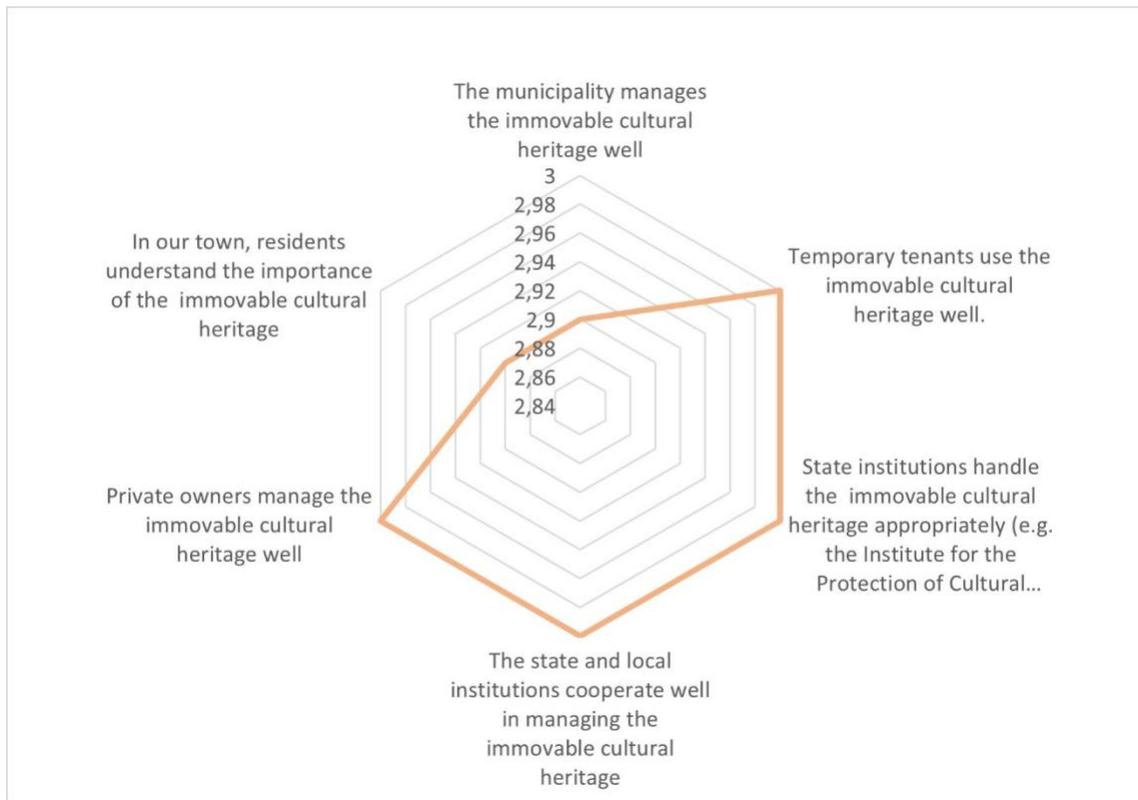


The most important dimension of the immovable cultural heritage is therefore a typical localism dimension i.e. the identity of the place, followed by the beauty (aesthetics) of the place and other dimensions. However, the presence of several other dimensions, many of which also relate to economic activities (e.g. promoting tourism, enabling income, promoting entrepreneurship), indicates that the key role of immovable cultural heritage, in addition to its symbolic-cultural value or symbolic cultural capital, is also represented by economic capital. This emphasis on economics is a dimension which is due to the need of flexibilization and global flow of resources, people and information (Castells, 2010), much more connected to the notion of new localism. If symbolic capital represents the basis for further networking of leisure activities (e.g. promoting events, connecting people in the place, promoting creativity, socializing, raising environmental awareness, other leisure activities, hobbies, etc.), economic capital complements the role of immovable cultural heritage for the development of places (e.g. promoting tourism, enabling income, promoting entrepreneurship, etc.) in new circumstances of new localism trends. It is precisely this dual role of immovable cultural heritage between localism and new localism that understandably often causes tensions regarding appropriate further development strategies for places, as different interest groups seek different advantages in managing immovable cultural heritage. This is especially noticeable from the analysis of relationship between the municipality, local community, the state and other institutions that are included in the management, use and development of immovable cultural heritage.

The analysis of the relationship between the public and formal structures of government is an important element of the management of immovable cultural heritage. The model of this relationship largely influences the development of immovable cultural heritage, or rather reflects the system of values regarding the use, development, and management of immovable cultural heritage in individual cases. In terms of the relationship between the public and formal authorities, it should be emphasized that the majority of respondents understand the aforementioned relationship as a tripartite structure, whereby in the relationship between the municipality and the local community, the municipality is understood as part of the formal authority, and in the case of the relationship between the state and the municipality, the municipality itself is understood as part of the local community that represents local interests. This tripartite structure points to the high importance of localism and new localism in Slovenia, where the state is (too) often perceived as an external element and local interests occasionally prevail over the needs of the wider society. Graph 3 shows the views of respondents regarding different types of managers of immovable cultural

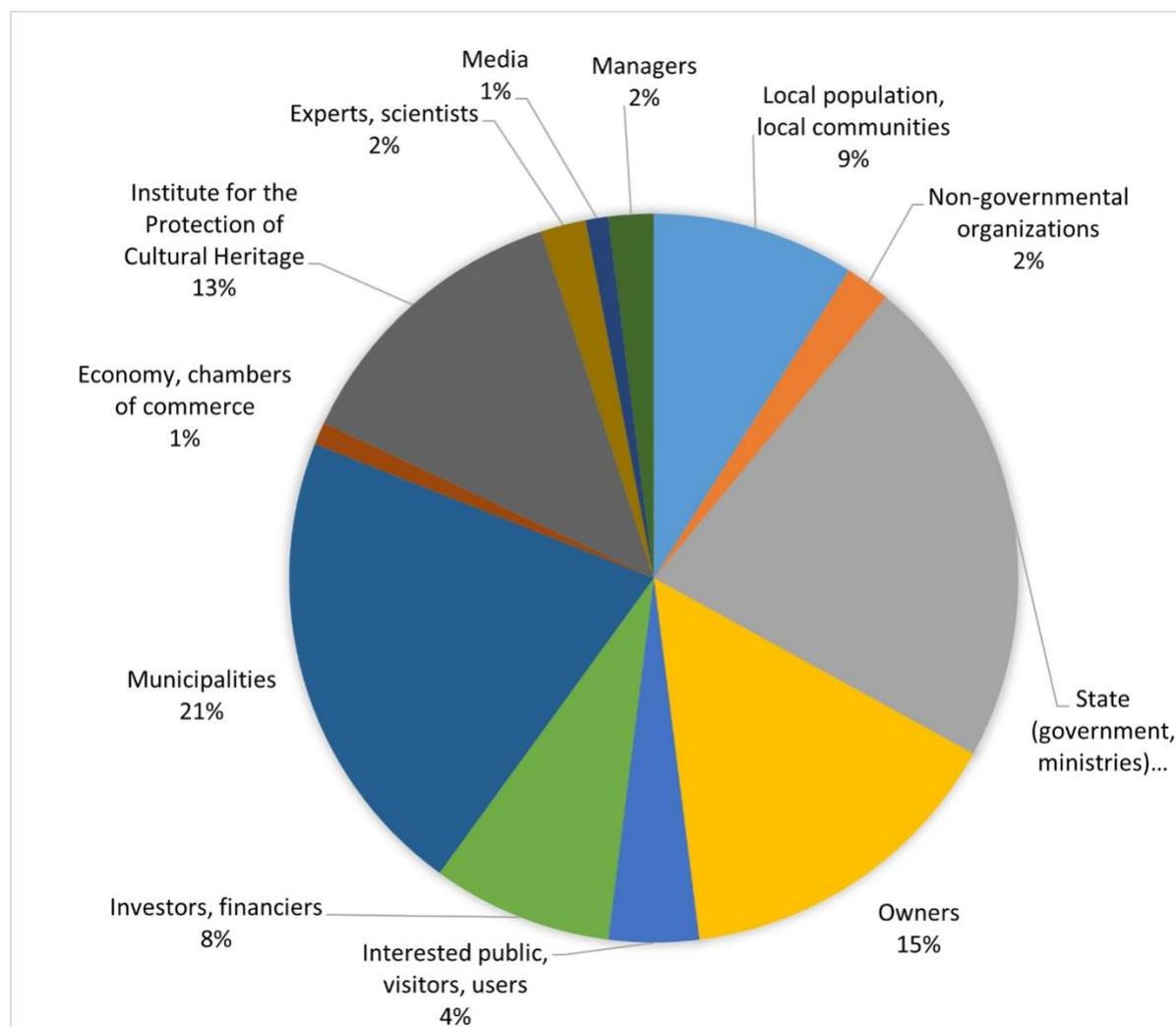
heritage in their locality, whereby they perceive the municipality as the best manager of immovable cultural heritage in the locality.

Graph 3: Please assess how you see the management of immovable cultural heritage in your locality?



When asked who has the greatest power in the processes of renovation and reuse of immovable cultural heritage, respondents put the state in first place, followed immediately by the municipality and then, at a smaller distance, the owners and the Institute for the Protection of Cultural Heritage (Graph 4). The aforementioned hierarchy points to the fact that respondents are aware of the importance of the state, which, through certain levers (including the Institute for the Protection of Cultural Heritage), can influence the use, management and modification of immovable cultural heritage in their locality. Particularly significant is the high level of awareness of the potential role of the state in the management of immovable cultural heritage, which, through the prism of the respondents, is strongly linked to the financial aspects of the renovation and maintenance of the immovable cultural heritage, where municipalities and local communities are heavily dependent on state funds.

Graph 4: Who, in your opinion, has the greatest power in the processes of renovation and reuse of immovable cultural heritage?



The presented data where state is positioned as a key actor in the processes of renovation, is consistent with data from other research (see, for example, Kušević, 2016, Fakin Bajec 2011, 2020) and draws attention to the complex relationship between the state and local authorities. From this complex relationship between key actors, we can generate several conclusions. First, the data highlight the issue of financial and physical maintenance of heritage. Municipalities clearly express dissatisfaction with the method, scope, and procedure for maintaining cultural heritage managed by the state. What is surprising, however, is that municipalities are at the same time not prepared to transfer the maintenance and ownership of immovable cultural heritage to the municipality or local community. They see the transfer of competences regarding immovable cultural heritage as a type of financial burden and municipalities are not prepared to risk further growth in costs in the municipal budget. Although municipalities are aware of the great importance of immovable cultural heritage for the development of municipal cultural activity, they are not prepared to engage more in the management of immovable cultural heritage in state ownership. In this regard, municipalities would rather give up part of their sovereignty or autonomy in terms of control over cultural capital originating from immovable cultural heritage than engage in complex strategies that would require knowledge and resources for management. We can assume that, given the current constellation of relations between the state and local communities (municipalities), they have more modest ambitions regarding the management of immovable cultural heritage, although they are aware of its importance and the possibilities that immovable cultural heritage brings for the potential further increase in the quality of life in the local community. Secondly, this assumption is also confirmed by the answers that indicate the need for further integration or cooperation between the economic (private) sector and the management of immovable cultural heritage. In this regard, municipalities indicate relatively strong support for deeper integration of PPPs (public-private partnerships) in order to optimize the maintenance of immovable cultural heritage and increase financial benefits for the municipality. This mutual

influence or The relationship between the marketing/commodification of immovable cultural heritage and the preservation/use of heritage for the development of cultural activities and the improvement of the quality of life is very sensitive and raises many questions regarding further development, as it easily interferes with certain expectations of individual groups within local communities and quickly causes conflict situations (see for example NIMBY syndromes). Due to these problematic aspects, municipalities prefer to maintain the status quo and generate chaotic ambivalence, where they simultaneously support (financial) dependence and (decision-making) independence from the state in the management, use, modification, and development of immovable cultural heritage.

### **Conclusions** – Emerging localism or new localism?

The paper analyses the perceptions of multiple groups of stakeholders in order to produce a view i.e. model that could potentially strike a balance between various parties in the process of management of immovable cultural heritage in local communities. The analysed data show that local communities miss some key elements, tools and mechanisms that would enable them to fully participate in the process of implementation of sustainable heritage management. One of these key missing elements lies in the incapacity of the present participation system (both on formal (legislative) and informal (legitimacy) level) to provide adequate channels of communications with various layers of local stakeholders. The incapacity of involved actors to present, specify and include interest of multiple local groups seems to generate imminent complications that translate into direct conflict between involved parties although both might have similar aspirations. Another missing element is the incapacity of formal systems (institutions that deal with heritage management) to build up actor empowerment and enable the process of deliberation for local stakeholders (Peck, Theodore, 2015). The process of deliberation that would try to activate the presence, active engagement in local environment and help actors to contribute to the solving of situation on terrain is not well formulated and supported. Regardless the intention of local stakeholders to participate in the process of cultural heritage management, the supportive systems that would enable them to both learn about possibilities of sustainable heritage development and learn from the experience of other similar cases in order to help to develop an adequate model for the specified context is missing on systemic (formal) level. Each model of sustainable cultural heritage management has to be adapted to the context of location in which it is embedded. This notion presupposes the need to integrate expert (outsider) and local (insider) knowledge for the optimisation of the situation on terrain in order to assure harmonious co-existence between the usage of heritage and the interests of local communities. Only such model assures long-term sustainability in terms of adequate quality of life for the local community, while at the same time assuring optimal preservation and use of cultural heritage for the general public.

The data also show that strong elements of new localism are present in localities of selected case studies. The fact that localities in all selected case studies recognize both the social and particularly economic characteristics of cultural heritage management suggests that local communities have developed the capacities to detect the elements that are needed for the functioning of the heritage models on the wider (global) scale. The conflicts between various stakeholders on the local and state level shows that the elements of new localism are not well recognized and above all not well connected or integrated into the system of participation when it comes to sustainable management of heritage. Particularly the low trust in formal actors obstructs any further integration of elements of new localism within the general system of cultural heritage management. The low level of trust is consistently regenerated through the existent institutionalized system that does not support gradual empowerment or deliberation of local actors when it comes to cultural heritage management. Old localisms are in this constellation used as a ‘weapon’ by local communities to prevent unwanted consequences to present lifestyles or general quality of life. The elements of new localism (e.g. recognition of global economic capabilities of heritage, importance of content creation on heritage sites etc.) are present but not activated on the local level due to systemic failures. These include the incapability of the political and institutional system to recognize and enable a sufficiently trustworthy environment to start and produce a balanced outcome between all involved stakeholders. The problematic aspects suggests that local actors are not sufficiently equipped or given the possibility to learn about the issues and how to deal with the challenges they are confronted with. These answers definitively require more elaborate future studies that combine analysis on legislative system, institutional operation, social capital and value system in Slovenia when it comes to heritage studies.

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## Cycles of war and transition in Ethiopia: Critical examination of war and transitions in Tigray's war of Ethiopia

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### Abstract

In a destructive-constructive cycle, war and revolution fuel each other. Despite the numerous revolutions Ethiopia has experienced during the past half century, reform and reconstruction have been its main struggles. Most revolutions and wars in Ethiopia illustrated how war and emancipatory ideals clashed to bring about desirable transitions. Revolutions, war, and transitions have been the main facets of Ethiopia's political economy for centuries. However, most transitions that came after revolutions and wars focused on bringing about the desired change were aborted, and new cycles of war continued to dominate the remaining epoch of every government. Recent transitions towards development and democracy have proven the consistent reform failures of consecutive governments in Ethiopia. The October 2020 war that broke out in Tigray region of Ethiopia is the most destructive war of the century. The Tigray war also testified the vicious cycle of abortion of desired changes and transitions. This article examines the current war in Tigray and its manifestations of impasses of transition towards democracy and development. It also analysed the vivid depictions of war that emphasize its historical, human, and infrastructure consequences employed to portray the razor-sharp picture of war and revolution. This article consulted the recent war, which was embarked in October 3/4, 2020, in Tigray to test and examined the war with succeeding transitional regimes from the past to the present. The article used qualitative data from a variety of primary and secondary sources to depict the historical impasse of revolution and transitions. The findings indicate that no governments were able to oversee or practically carried out a smooth transition following a revolution or war in Ethiopia. The findings in this article led to the possible recommendations of peaceful transitions and lessons forward in democratic development.

## Hippies Community Symbolic Activism: Catholic Youth In Kupang City

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### Abstract

This study aims to determine the activism of the hippie community in Kupang City as a form of social movement. The research method used is qualitative with a phenomenological approach. Data collection techniques used are in-depth interviews, observation, and documentation. The results of the study show that symbolic activism by the Catholic-Hippies community in Kupang as a form of movement against the teachings of the Catholic Church, is carried out by consuming alcohol, having free sex, and using dreadlocks. The Catholic-Hippies community in Kupang, who adopted the Hippies lifestyle, expressed activism against the policies of the Kupang Regional Government symbolically by using drugs and wearing colorful clothes that have a combination of red and yellow, and wearing clothes with the V sign.

**Keywords:** *Lifestyle, Hippies, Activism, Symbolism*

### Introduction

Culture is the behavior of humans and their embodied products in speech, actions, and artifacts. It depends on the capacity of man to study or spread knowledge to generations (Doku and Asante, 2011). Culture is the result of creation by humans, and its existence will help humans in life every day. Humans in a cultural context are creatures filled with symbols. Humans within their lives do not let go of product culture. The interactions that occur between men will become a learning process to obtain culture (Rendell *et al.*, 2010)

Cultural nature dynamic that is always experiencing change along with the interaction that occurs between humans. The interactions occur between man as agent and culture's temporal effects or permanence. Globalization has sped up the interaction among human beings, facilitating the transmission of marks from one group to other groups (Magu, 2019). Globalization has its influence on language and communication (Doku and Asante, 2011). Globalization is an acceleration in all aspects of life, from cultural to criminal, financial to spiritual (Magu, 2019).

Globalization in culture speeds the integration of nations into world-supported systems with existing development means modern communication (Raikhan *et al.*, 2014). Globalization in culture causes the potential disappearance of identity culture local due to the increasing threat of assimilation culture. The power of cultural globalization will produce thoughts and ideas that have an impact on local values and cultures that are increasingly fading (Hosseini, 2010). If these foreign cultures are widely liked by many people, they will become popular culture (Parker, 2011). The term popular culture was coined in the 19th century. Popular culture is determined by the interaction between people in everyday activities, such as clothing styles, use of slang, and the food people eat are examples of popular culture (Chowdhury, 2014).

One of the popular cultures spreading along with the existence of globalization culture is the Hippies. Hippie is a term that has different associations. Hippies have some associated methods of dressing, behavior, and lifestyle. In addition, some people classify addicts as drug addicts, fans of rock and roll, or view radical politics as Hippies (Stone, 2008). The Hippie lifestyle is identical to anti-establishment in the form of symbolic activism. The Hippie lifestyle first emerged time in Germany during the period 1896 to 1908, then in a way wide appeared widely in several cities in America in the 1960s. During period 1960s, America was involved in the Vietnam War, which did not fully get support from American society. The circles of the young man who refuses government policy react through a style of Hippie life (Jony *et al.*, 2017). In postmodern discourse, the Hippie community is often depicted as a broken person school, liberals with hair long, and drug-fueled rebels (Poon, 2017).

Distribution style Hippie life takes place in some areas, but some areas are centered on counterculture, namely Haight-Ashbury in San Francisco, Greenwich Village in New York, and Sunset Trip in Los Angeles, which because of location, history, and population own uniqueness and fit become center main *counterculture* (Issitt, 2009). The main area Hippie marked with the existence of public class workers, as well as the existence of One-factor similarity, is price-affordable property. Property like a valuable house interested the public from various populations for living, and in the 1950s, the environment-style hippies, a mixture of various layers public, started from African Americans, white skin, Hispanic, gay, and lesbians who had a life. Condition diverse background behind different cultures will create a progressive social environment.

The distribution of Hippie culture in Indonesia began in 1968 when they came to Kuta Beach as tourists. The presence of tourists with the style This Hippie Life is utilized by local residents for open business rental houses, bicycles, motorbikes, and open food stalls that provide various needs for tourists (Mahagangga, 2018). A journey to a country as a traveler is one of the ways the Hippie community spread the Hippie lifestyle. Distribution of Hippie culture through journey tourism also occurs in the city of Kupang. The Hippie lifestyle was adopted by Catholic youth in Kupang with characteristics of dreadlocks hairstyle, Bob Marley's tattoo, and using accessories of a kind of headband, piercings, necklace, and bracelet "peace" as a symbol of the Hippie lifestyle.

A study aiming to give a description activism symbolic community of Catholic Hippies in Kupang. Expected Contribution from the Study: This is expected to be able to provide new references regarding the symbolic activism carried out by the young Catholic community in Kupang who adopted the Hippie lifestyle.

## Theoretical Basis

### Globalization

Globalization is often considered the opening of state borders for current trade, investment by foreigners, immigration, information, and technology (Edwin and Okpara, 2015). Agwu *et al.* (2014) argues that globalization facilitates the deletion of barriers between world countries which gives access without obstacles to social connection. Igwe (2013) emphasized that characteristics of unique globalization often include improvement in capital mobility, and a decline in transportation, technology, and communication. Mir *et al.* (2014) explained globalization is a set phenomenon that includes dimensions of economic, social, political, technological, and cultural. Globalization culture will cause values, behaviors, and patterns from the public international will enter a country that can threaten the existence of local culture (Al-Rawashdeh, 2014). Progress technology information more and more makes it easier to transmit values, and culture foreign enter to a country (Pacheco, 2020).

### Culture

Culture is knowledge, beliefs, art, morals, law, custom customs, and habits in a group transmitted to society to member public from One generation to generation next (Nwamuo and Anonaba, 2017). Concept culture consists of values held by members group, the norms that they follow, and stuff the material they create. This refers to the way life individual members group in society; how they dress, ceremony religion, and pleasure (Oni, 2005). Based on this perspective sociological culture is overall from inherited ideas, attitudes, beliefs, values, and knowledge in a way down hereditary, which composes or forms guidelines from action social (Mahadi and Jafari, 2012). Culture is the construction of the individual and the construction of society. Differences in culture can observed among people in to what extent to adopt and engage in attitudes, values, beliefs, and behaviors that, with consensus, is the culture that is adopted in society. culture shows the differences that exist in group society and represents routine collective (Tomlinson, 1999).

### Reference Group

Youth community Catholics in Kupang is a group formed from the existence of similar religious values that are adhered to by its members that are Catholic as well as similarity from aspect age that is considered young with range age 17 – 27 years. Youth community Catholics in Kupang own similar field conditions the people of Kupang City are along with the rise case corruption as well as policies government that assess no care about people's welfare. The party authority Church the Catholics should play a role in doing control to policy government area and free from power political precisely lost his role like in case of eviction place prostitution that is not accompanied by step concrete for open field work.

Hyman in 1942 first used a draft about reference groups for show groups, memberships, and non-users hips that have a role in the behavior of someone. The reference group is a group whose perspectives become framework reference actors (Paynton, 1966). Merton (1968) in the theory about reference groups that in the structure social

community there is group reference which is a social group in which a person imitates and identifies values to form his personality. A reference group that is followed by somebody is not always bound to group membership. Group membership is a group in which a person in a way official becomes its member. Someone in a way physique becomes a member group let go on purpose or not, forced or not. Reference group theory explains that 1) in society individuals are influenced by the group that believes their role is important, 2) individuals use groups as guidelines in determining attitude, and 3) individuals use groups as a base for comparing themselves with other people or group others, 4) individuals can use more from One group as guide references ( some group reference ), 5) group particular ones used by individuals as reference own strength For influence attitudes and behavior individual.

Reference group according to Paynton (1966) is every group social that can recognized where the individual refers to it in making decisions and judgments. Individuals refer to groups as point comparisons to make themselves a perspective in looking at something or to maintain their position in a group that has consequences on the acceptance of norms and goals. The formation of a group can happen Because existence of similar values held by some individual or the intended purpose achieved so for make it happen formed a group.

### Catholic Religious Groups and Global Activism

Religious institutions not only do religious activity solely, but they also issue various of types related activities with welfare like, houses, charities, schools, and homes for the homeless. Institutions religious also manage orphanage foster care and collect money for the poor. Religious institutions own role in controlling society (Nath, 2015). The church as an institution of religion also gets the freedom to give service to the poor and run orphanage care, and schools (McGregor *et al.*, 2012).

Church Catholic is an institution of globally given protection and immunity funds moment face to face with the country of Indonesia. The Indonesian government is trying to get support from the church to fund the Cathedral and treat Catholic Church staff with courtesy and respect. On the other hand, Indonesia put pressure on the Vatican to integrate the diocese of East Timor into the Indonesian Bishops' Conference, over which Indonesia has greater control. The Vatican refused and remained maintaining the independence of the Catholic Church in East Timor and its direct access to the wider Catholic network (Kohen, 2000). In South Korea, the Church is present in the life of society. The Church works hard to build, educate, enliven, inspire, and give hope to the Korean people. The church also provided scholarships for Korean sons and daughters to study in the United States. Korean scholars and politicians, including the first president of South Korea, Rhee Syngman, also received scholarships from the church (Park, 2012).

### Method

The approach used in answering the research problems carried out is qualitative. In the field of study, qualitative, questions research and choice methodology involve many problems practical (Crescentini and Mainardi, 2009). Study qualitative related to analysis phenomenon social non-statistically. Research qualitative characteristics by interpreting data in a subjective, studying various data sources, and using the researcher as an instrument of key research (Shakouri, 2014).

Methodology approach in a way qualitative can done with various types of methods, including ethnography, narrative, phenomenology, and case studies. case. Phenomenology is viewed as a relevant method with Topic research and formulation of the problem that has been set. Approach phenomenology is used to develop a better understanding of various problem complexes. Approach phenomenology gives an underlying understanding existence of man in the environment and social culture (Bhar, 2019).

Data collection techniques in dig related information with activism symbolic community Catholic - Hippies Kupang with two methods technique data collection, namely observation field, and interviews in-depth. The interview was done with the Catholic youth in the city of Kupang who adopted the lifestyle of Hippie. Individuals who identify their relevance become informants related to a study titled Hippie- Catholic Activism Kupang. Individuals' criteria originate from the youth community Catholic and are included in the group Hippie lifestyle in Kupang City.

Amount of informants used in the study as many as five informants consisting of from member hippie community consisting of 4 informants and one informant who is a nurse Church Catholic in the city of Kupang. Access to informants was obtained through an introduction direct to the youth community Catholic in Kupang which adopted

the Hippies lifestyle. The data mining process was carried out on site informants normally be active or that will be agreed upon by informants and researchers. The main factors of the location study are comfort informants as well as easy access for informants and researchers.

Observation performed on places Hippie community in Kupang City like OCD Beach Club Lasiana Kupang, colorful beach club, the King Imperial Tenau, Atmosphere Club Discotheque, and BnB. In addition, researchers also observed related when and what to do, and gathering times in youth community with style the life of the Hippies. Researchers also observed a way direct style of fashion, the style of Rasta hair, favorite music, and symbols worn by young people in Catholic Kupang.

Data analysis conducted in the study This use analysis qualitative consisting of stages of data reduction, data presentation, and extraction conclusion. Data reduction in matter This is when the researcher makes a summary of notes regarding successful data collected, selecting the received data based on something fundamental and becoming essence in research, as well as prioritizing something that is considered researcher-important.

Presentation of data is the step next thing done by researchers in doing data analysis. In the presentation of data, particularly in the study qualitative, the researcher recommended Making notes summary about the connection between variables used in the research and the relevance between the results study with the theory research. Data presentation can make it easier researcher to know the problem and what happened so that the researcher can make a plan work furthermore made identify the problem based on What only understood researcher from the results study. Withdrawal conclusion is the conclusion obtained from successful data collected by researchers which can support in a way strong the evidence contained inside it.

## RESULTS

### Activism in Alcoholic Consumption

The interview results obtained from informants with the initials EN and AR show that one of the activism carried out by the Hippies community in Kupang City is alcohol consumption. Consumption of drinking is considered a tradition in society City of Kupang. The community in Kupang City and other areas of East Nusa Tenggara has a habit of consuming alcohol named Sopi. Sopi is produced from fermentation palm or sugar palm as a symbol of togetherness.

The freedom-oriented lifestyle of Hippies in life is activism social as a form of movement rejection of policies government, establishment, or attachment. Form a movement carried out by a community of young people Catholic with style Hippie life is not done with violence However through style life that tends to prioritize freedom with ignore regulations, norms, or values held in the middle public.

### Activism in Sex-free

Catholic religious teachings prohibit Catholics from being sex-free because including in committing adultery can result in the transmission of disease contagious. Information received from Sister Vira shows in The Bible in Matthew and Luke mentions Jesus teaching his followers no adultery. Relationship sexual outside marriage is a dirty and sinful thing.

Catholic religious teachings prohibit sex-free activities that are not adhered to by Catholic youth who adhere to the lifestyle of Hippie. Based on the results of interviews with informants FE and EN research can know that the Hippie lifestyle term free love is used to describe behavior sexual community with the style of Hippie life. The term free love means sex as something that must be done through Spirit love, and everyone has the right to do it with only whoever is selected, without complying with rules or prohibitions that apply in society.

In general cultural sexuality became a method new for the community with style life Hippie For in a way aggressive rebels oppose the view of dirty and embarrassing sex and the deconstruction connection sexual only done by people who have married so that brings up prohibition sex free. While a community with style life Hippie show sex as

an expression based on unity, love, and peace. For the community with style life Hippies, sex is things to do celebrated rather than hidden, and pushed No For ridiculed or even forbidden.

### Symbolism in the Hippie Community

Based on the results interview with Suster Vira show that the involvement of the Catholic Church in the field of political objectives gives justice and welfare to society. Church Catholic positions his institution not only as a religious institution that deals with connecting man with His God but also institution of social society.

Youth community Catholic Kupang own method alone in give movement rejection in the form of activism symbolic to party Church Catholics involved in politics in Kupang City. Dreadlocks were owned by the youth community Catholics who adopted the style life of Hippies as a form of activism symbolic meaning of freedom is a movement that rejects to partisanship Church Catholic in the world of politics. Dreadlocks as a symbol of irregularity and unrestricted freedom want to be restricted in life.

Findings research obtained from the results of interviews with EN and AB who are members Hippie community in the City of Kupang shows music become a symbolic movement rejecting regulations and policies of the government that restrict freedom, injustice, and the inability public to increase the welfare community. Community hippies use music to express themselves in a way emotional, spiritual, and political. Music is A statement, a voice from a movement without violence. Youth community Catholic with style Hippie life in Kupang City which originated from youth community Catholic own group reference which becomes a reference in behave. Group references originate from international band groups and also local ones that flow rock music with lyrics to a song full of will criticism. This is no let go from the existence of similar values that are upheld that as criticism of war and anti-violence, as well as the policy of a government that makes the people suffer. Besides music, activism is symbolic as a form of a movement carried out by a community of young Catholics wearing clothes with symbols.

Findings obtained from results of interviews with AR and FE informant members The Hippie community wears clothes with a V sign that means peace and not discrimination. This is done as a form of resistance to policies implemented by the Kupang City Regional Government which are considered Still discriminatory. In addition to wearing clothes with a V sign the activism symbolic action carried out by the youth community Catholics in Kupang is wearing clothes that have a pattern color.

Color clothes colorful which have a combination of red and yellow as worn by Bob Marley have meaning alone. Red means brave and yellow means peace. The clothes are used as a form of resistance to government corruption, even though it's the people's money from taxes. This red dare, so they as officials must brave to reject corruption. Yellow also means peace So all something must done in a way peace without violence. In the case of closing localization government area precisely does it with violence whereas not a few citizens are looking for living expenses on the spot such as selling food and drink, place parking, or service security Because place localization is often visited by tourists overseas.

### Discussion

Hippies' lifestyle as a form of activism and symbolic resistance carried out by the youth community Catholics in Kupang to the teachings Catholic Church as well as the involvement of Catholic Church in activity politics practical. The Hippie's lifestyle also expresses activism to policy Kupang Regional Government in a symbolic way. Giddens (1986) explains social activism as an effort collectively to chase interests together or activism to reach objectives together through action (collective action) outside institutions established. This also happens in the lifestyle of Hippies as an activism symbolic community of young Catholics in the city of Kupang is forming a movement for the Parties Church and government area to violate prohibitions against freedom individuals like alcohol consumption, having *free sex*, and using drugs prohibited. Wesson (2014) stated activism in the use of forbidden drugs is part important for style Hippie life. The use of drugs means exploring yourself and having fun.

Youth community Catholics in Kupang also want Church Catholic as an institution religious in nature and sacred with no involvement in political practicals. The movements carried out by youth community Catholics in Kupang want to present a change for order a life that upholds tall values of freedom. As values found in Western countries that appreciate the freedom of individuals.

Hippies as activists symbolized their style of a unique and different life with culture Indonesian society because more put forward freedom sexual, use of drugs, and alcohol, and their fashion with symbols that have meaning. This is because the lifestyle of Hippies as counter-hegemony to institutions both religion and government that do not value freedom is related to sexuality.

Issit (2009) explains that connection-free sex became a method new for the community with the lifestyle of Hippies in a way that aggressively deconstructs the meaning of sexual connection from the teachings of Catholicism and policies the government that has only done by people with status marriage. On the contrary, prohibition is carried out by the party church Catholic as a religious institution according to Nath (2015, p.83) because religious institutions are not only related to ritual or religious ceremonies but also have a form of social control. Prohibition to connect sexuality in a way free from social control to prevent the occurrence of pregnancy out of wedlock and minimize the occurrence of abortion.

Hippies as a style of life for youth community Catholics in Kupang are also expressions of a movement against the domination of the state that limits the freedom of individuals to use drugs. Issitt (2009) explains that drugs and the Hippie community are intertwined related because drugs form rebellion or resistance. While government through Law No. 35 of 2009 concerning drugs has forbid ownership and use of drugs in a way free. The use of barbaocoa become a revolution in social values and norms in society which consider drugs as forbidden substances.

The freedom-oriented lifestyle of Hippies in life is activism social as a form of movement to policies government, establishment, or attachment. Form resistance carried out by the youth community Catholic with Hippie lifestyle is not done with violence However through a lifestyle that tends to prioritize freedom with ignore regulations, norms, or values held in the middle public.

## Conclusion

Based on the research results and discussions presented previously, the conclusions in this study are:

Activism symbolic by the community of Catholic-Hippies in Kupang form resistance to the teachings of the Catholic Church done with the method of alcohol consumption, connection sex-free, and using style dreadlocks. Activism is symbolically done not only as a form of resistance to the teachings Catholic Church but also as an involvement Catholic Church in politics and practical activity.

The Catholic-Hippies community in Kupang who adopted the Hippies lifestyle expressed their activism against the Kupang Regional Government's policies symbolically by using drugs and wearing colorful clothes that had a combination of red and yellow and wearing clothes with the V sign.

By the conclusions above, the suggestions put forward in this study are:

The Catholic Church and the Regional Government should not strongly reject the existence of the Catholic-Hippies community in Kupang. A persuasive and family-oriented approach should be prioritized to reduce the negative behavior of the Catholic-Hippies community.

The Catholic-Hippies community comes from young Catholics who are of productive age, therefore, to reduce the negative behavior of the Catholic-Hippies community, the Regional Government can do this by providing employment opportunities and holding music activities involving participation from the Hippies community.

The church can play a role in implementing good coaching not only in church fellowship. The church that implements coaching will foster the congregation of the Catholic-Hippies community in various ways such as counseling, holding youth groups, family fostering, holding Bible studies, visits, and so on.

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## The Effectiveness Of Science Content For Elementary School Students through AI in Education-ITS #2

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### Abstract

According to the researches of Animation Cartoons, Contemporary Art, Which Is Designed as a Visual Explanatory Media in SDGs Research: Case-Study (ICSD, Columbia University, USA 2024) and The effective of the science content in an online learning system for elementary school students during the epidemic crisis (WEI, Harvard Faculty club, MA, USA 2023) and The effectiveness of science content through online learning for primary school students that will be applied into AI for education (Oxford Symposium, University of Oxford, UK 2024). The researchers have developed the Intelligent Tutoring System (ITS) with animated cartoons embedded in the system's domain mode to supplement science subject content according to the compulsory curriculum of elementary school students through the online learning system. In order to study. Even in times of crisis, the continuity of education will not be interrupted.

This is the second edition of the research that expands on the previous research which has increased the content of science subjects for students at a higher level according to the International Curriculum (Boston, USA, 2015) for high school students (grade 6-8) have expands their target study groups as grades 4-8 and tests by experimental research through ITS (Intelligent Tutoring System) online, it a teaching material that conveys knowledge of science content to wider ranges.

And evaluated by qualitative and quantitative research method 550 samples by random sampling. Of which the research result has accepted the hypothesis levels with significance by A one-way ANOVA statistic of SPSS program, it revealed that there was a statistically significant difference in defined level between at least two groups ( $F(4, 0.04), p = 1.00$ ). According to the criteria for analysis, the achievement of scientific skills of the target samples such as the knowledge, analytical, logical and critical thinking, detail-oriented, curiosity skills, patience, etc.

We found that the results accepted a significant level of hypothesis. It is believed that the effectiveness of the science content for elementary school students grade 4-8, through via AI for Education in ITS online system may be that tools that can be used to provide scientific knowledge according to the general compulsory curriculum, both traditional classroom and out-off-class teaching in time of crisis, to ensure that students' education can continue and be able to learn anytime, anywhere.

**Keywords:** *Effective Subject Contents, Effective Science Subject Content for elementary 4-8 students, Intelligent Tutoring System, Artificial Intelligent, AI in science education for elementary school students, Scientific skills for elementary students, ITS System of Science teaching.*

### Introduction

Artificial Intelligence (AI) plays a vital role in today's technology world, both in business and in general. In the field of education, it is inevitable. Artificial Intelligence (AI) has the potential to address some of the biggest challenges in education today, innovate teaching and learning practices (UNESCO 2021) Curriculum development and teaching approach such as the AI curriculum, AI Teacher and teaching system.



Figure 1 Overall ITS Architecture system conceptual Simulation

Based on our researches mentioned above, that we have developed an Intelligent Tutoring System (ITS) with animated science cartoons in the system to supplement science subject content according to the compulsory curriculum for elementary school students' study through an online learning system in order to their science study in several crisis such as: War, Displacements, Epidemics or Disasters. For their continuity of education not to interrupted.

This is continuation edition research of "The effectiveness of science content for elementary school students through AI in Education-ITS", WEI 2023, of which has added science content for students at two higher level according to the international curriculum (Boston, USA, 2015), for high school students (grade 6-8) has expanded the target study groups to grades 4-8 and tests by experimental research through ITS (Intelligent Tutoring System) like previous research.

## BACKGROUND OF PROBLEM

In the current situation, there are many crises that affect the education of primary or elementary school students, the crisis. These are major obstacles to children's continuing education. Therefore, online teaching and learning has an important role in solving those problems, so that children can learn anytime, anywhere.

Therefore, we should develop teaching tools using technology to be useful to help teachers teach and facilitate and improve the learning environment of children in all subjects. In particular, science is one of the important basic subjects that children will be able to apply science skills to study at a

high level in the future.

## Objective Of The Research

That's why we have summarized the objectives of this research for the learning achievement as follows:

The target students will be able to improve their scientific skills after learning science lessons from the animation through ITS online through this learning material.

To find technical guidelines for designing teaching materials and teaching systems that can improve effective teaching to transfer scientific knowledge to elementary school students anytime and anywhere.

To demonstrate science teaching materials and effective teaching systems, how science knowledge can be transferred to elementary school students to create scientific skills: Knowledge, logical, analytical and critical thinking, detail oriented, curiosity and patience. To be an effective alternative to education through the technology currently used.

## SCOPE OF THE STUDY

The scope of this research study are as follows:

### Conceptual framework

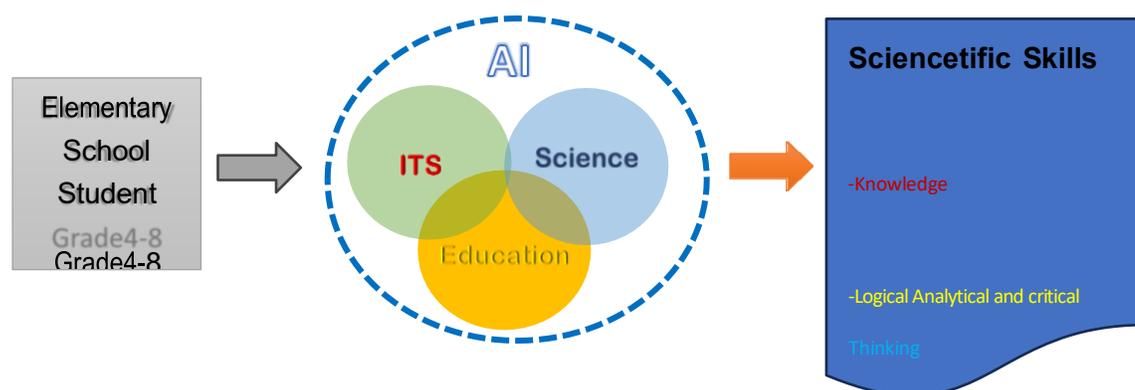


Figure 2 Conceptual Framework

**ITS:** The Intelligent Tutor System is the capability of computational systems to perform tasks typically associated with human intelligence, such as learning, reasoning, problem-solving, perception, and decision-making. It is a field of research in computer science that develops and studies methods and software that enable machines to perceive their environment and

use learning and intelligence to take actions that maximize their chances of achieving defined goals.

(Wikipedia,) [https://en.wikipedia.org/wiki/Artificial\\_intelligence](https://en.wikipedia.org/wiki/Artificial_intelligence) The intelligent tutoring system (ITS) consists of four modules:

**Knowledge domain module** is an important component of the system to respond the learning of user behavior in real time by using the knowledge based to create problems and assign tasks that are suitable for learners and interpret it by questions and comparisons. Our science content is in this module, which is one of the knowledge modules within the module.

**Student Module** is a core component of the system to involve the issue of the learner by collaborating between the learner module and the knowledge-based module.

**Pedagogical Module** has the main function of how to manage content. The teaching course of solves the problem of how to teach them by providing the learning environment.

**Interface Module** is the part where the intelligent supplementary teaching system is used to communicate with system users.



Properties and Changes of Materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Earth and Space, Sky	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evolution and Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Life Sciences (Biology)	<input type="checkbox"/>						
Physical Sciences (Chemistry and Physics)	<input type="checkbox"/>						
Earth and Space Sciences	<input type="checkbox"/>						

**Table1:** The international of science content subject of compulsory curriculums

For this research, we further expanded the science knowledge of grade 6-8 in this study, following the typical examples of compulsory curriculum frameworks in California, Florida, Massachusetts, New York, and Texas during the 2014–2015 academic year. The specify that topics should be taught for students in grades 6-8 concepts: in life science, earth and space science, and physical science as:

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
<b>6th Grade</b>	Light and Matter	Thermal Energy	Weather, Water Cycle and Climate	Cells and Systems
<b>7th Grade</b>	Chemical Reactions & Matter	Metabolic Reactions	Matter Cycling & Photosynthesis	Ecosystem Dynamics
<b>8th Grade</b>	Genetics	Natural Selection & Common Ancestry	Earth and Space	Contact Forces

**Table2:** Compulsory curriculum frameworks in California, Florida, Massachusetts, New York, and Texas during the 2014–2015 sciences.

RESEARCH METHODOLOGY

Study Group:

The samples 550 students studying in 5 grade levels (4-8) in elementary schools in privates’ schools and public schools in Thailand. It is divided into two groups: the treatment group (learning through the treatment) and control groups (traditional study in classroom) of each grade (Grade 4 (P. 4) = 100 samples, Grade 5(P. 5) = 100 samples, Grade 6 (P. 6) = 100 samples, Grade 7(M. 1) = 124 samples, Grade 8(M. 2) = 127 samples were randomize selected by sampling.

The study was conducted using experimental research methods and used a combination of qualitative and quantitative research methods. All sample were asked to fill out a questionnaire for pre-test before testing. The testing was approximately 1-hour, followed by a week of post-test, with in-deep interviews to gather the observed insights from the signs as the scientifically skilled outcomes of the samples such as the knowledge, analytical, logical and critical thinking, detail-oriented, curiosity skills, patience, etc. which has the effect from the treatment.

Treatment

Research Treatment Examples: Examples of science content for Grades 6-8: Treatment#1: Chemical Reactions & Matter Science Content for grade7.

Treatment#2: Weather, Water Cycle and Climate for grade6.

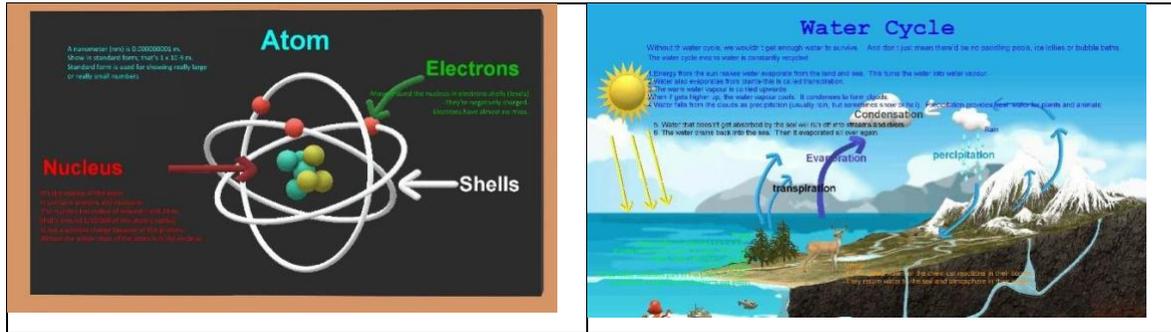


Figure 4 Treatments

Data and statistical analysis

Data analyzed by SPSS statistical program by ANOVA, chi-squared tests.

RESULTS

This section contains of an overall analysis of the data, a presentation, and interpretation and configuration divided into 5 groups varied by difference of grades of the sample. Tables and figures are given to provide data analysis. The result outcomes are clearly interpreted. Data collected included samples groups, evaluated and analyzed in ANOVA, chi-squared tests of the SPSS Program were performed.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Knowledge Measure Pretest	Between Groups	0.04	4	0.01	0.04	1.00
	Within Groups	120.81	546	0.22		
	Total	120.84	550			
Knowledge Measure Posttest	Between Groups	0.07	4	0.02	0.04	0.10
	Within Groups	225.04	546	0.41		
	Total	225.11	550			
Analytical Pretest	Between Groups	0.044	4	0.01	0.046	0.10
	Within Groups	128.94	546	0.24		
	Total	128.98	550			

Analytical Posttest	Between Groups	0.18	4	0.05	0.07	0.99
	Within Groups	363.81	546	0.67		
	Total	363.99	550			
Logical and critical thinking Pretest	Between Groups	0.04	4	0.01	0.05	0.10
	Within Groups	128.94	546	0.24		
	Total	128.98	550			
Logical and critical thinking Posttest	Between Groups	0.18	4	0.05	0.07	0.99
	Within Groups	363.81	546	0.67		
	Total	363.99	550			
	Between Groups	0.27	4	0.07	0.23	0.92
Detail_Oriented_Pretest	Within Groups	160.64	546	0.29		
	Total	160.91	550			
Detail_Oriented_Posttest	Between Groups	0.35	4	0.09	0.16	0.96
	Within Groups	302.58	546	0.55		
	Total	302.94	550			
Curiosity_Skills_Pretest	Between Groups	0.04	4	0.01	0.05	0.10
	Within Groups	128.94	546	0.24		
	Total	128.98	550			
Curiosity_Skills_Posttest	Between Groups	0.18	4	0.05	0.07	0.99
	Within Groups	363.81	546	0.66		
	Total	363.99	550			
Patience_Pretest	Between Groups	0.27	4	0.07	0.23	0.92
	Within Groups	160.64	546	0.29		
	Total	160.91	550			
Patience_Posttest	Between Groups	0.35	4	0.09	0.16	0.96
	Within Groups	302.58	546	0.55		
	Total	302.94	550			

**Table3:** A one-way ANOVA revealed that there was a statistically significant difference in defined value in between at least two groups ( $F(4, 0.40)$ ,  $p = 1.00$ ) There was a statistically significant difference in defined level between at least two groups understanding the treatment in between groups and within groups value = 550 and significant value in between groups = 0.95 in memory posttest and thought posttest

### The Conclusion And Recommendation

The Intelligent Tutoring System (ITS) is an animated cartoons format, which designed to teach supplementary science based on the compulsory curriculum of students in grade 4-8 through an online learning system. It can used for teaching in general compulsory courses, both in traditional classrooms and outside of the classroom in time of crisis. It can be continued education anytime, anywhere.

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# The Flood Warning System, Disaster Management Model, Case Study From Chiang Mai, Thailand

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## Abstract

An alert system that uses existing communication methods complemented by new technology that is suitable for the characteristics of society and local people to reduce the risk of disaster during the biggest flood crisis in October 2024. Alarm communication system that focuses on warning methods for the public to take timely action to prepare, risk mitigation, emergency response after a disaster, and recovery and reconstruction stages for preparation and response at all stages of a disaster.

It is a holistic warning system that integrates all sectors to reduce the risk of urban disasters that can reduce damage as a way to deal with floods mixed with the city's identity. The society and culture of the local people.

We have used the Sendai Framework for Reducing the Disaster Risk of Non-Economic Losses to assess the damage from this disaster with qualitative and quantitative research methods to track disaster damage from system users in all dimensions. We found that disaster damage decreased after evaluation with the Sendai framework.

We believe that Chiang Mai's integrated approach to disaster and risk management can serve as a model for warning systems that may benefit other localities to deploy to deal with disasters in the future.

**Keyword:** *The flood early disaster warning system, the disaster management phases of Chiang Mai, the flood crises of Chiang Mai operation model, Chiang Mai flood warning system,*

## Introduction

Chiang Mai is the largest city in Thailand and located in the north, a city in a valley among high mountains located in the lowlands along the river and in the monsoon zone. As a result, they face the problem of flooding every year in the rainy season. Depression and typhoons and many major storms are natural disasters that directly affect the area, which can be caused by climate change and humans sometimes.

It caused the heaviest flooding in 13 years, caused by the loss of trees from wildfires from the entire year and the deforestation problem. This caused the lack of large trees in the upstream forest that absorbed the water in the rainy season. This caused wild water along with mud to overflow from the top of the mountain and flood almost the entire city.

Although Chiang Mai has faced major floods this year, it has not caused as much suffering and damage to people's lives and area and property as the previous years, as the city's warning system has been well planned to deal with major flood disasters based on years of experience, coordinating with several government and non-government and volunteers local teams such as the water level monitoring teams at all sources that affecting the water level of the main river and the local public rescue teams for daily rescue and future treatment and rehabilitation plans, and recovery plans, and local meteorological teams to monitor storms that will increase the existing water level to become more critical.

For the principle of saving lives and protecting the property and pets of Chiang Mai residents. All kinds of communication tools have been deployed to communicate during this flood crisis. As a channel for warning. To deliver messages before the flood, during the flood and after it is a cheap and simple communication system used locally.

### Method

In this case study, we mention Chiang Mai's flood warning system protocol, which is constantly being improved and developed due to the flooding problem that recurs in the city every year. And the whole city can be used to deal effectively with this biggest flood crisis. This flood warning system is a subsystem in the disaster management plan, as detail are as follows:

: Disaster Management Plan

It is part of the city's disaster management plan response phase, which consists of 4 components; Preparedness, Response, Recovery and Mitigation Phases. Of which each phase had the sub tasks to be the detail inside contents.

In the disaster management phase. Policy is cornerstone for protecting communities affected by increased complexity. Therefore, a disaster management plan must be multifaceted and flexible enough, and achieve the target. Cooperation from all parties is a key factor for overall resilience of both the authorities and the community, which determines the effectiveness of this strategy in practice.

This flood warning system is a sub-plan of the gradual disaster management plan. The purpose of protecting significant damage to people, property and city infrastructure to minimum. This system has a sub-plan of each phase, the elements of each phase plan are as follows:



Figure 1: the elements of each phase of the 4 disaster management phases.

**Preparedness Phase:** Activities aimed at preparing for flood disaster, such as emergency plans, telecommunication, transportation plans, early warning plans, and sub-operations at each stage such as emergency electric off scheme and emergency routes and medical mobile teams and evacuation plan, high parking area, temporary shelters center and sandbag barriers plan.



Figure 2: Preparedness Phase

**Response Phase:** Activities aimed at responding to urgent needs in times of crisis, such as changing facility assessment methods, emergency response methods, food supply and distribution plans for everywhere, such as people trapped in homes and etc. and providing non-food items, water supply, sanitation and hygiene, and health interventions as well.



Figure 3: Response Phase

**Recovery Phase:** Activities aimed at restoring communities to normal life and rebuilding infrastructure and housing such as big cleaning the city, repairing vehicles and housing, and plans to dismiss or expand the temporary shelters and provide food and drinking water.



Figure 4: Recovery Phase

**Mitigation Phase:** Activities aimed at mitigating the impact of disasters, such as remedies and compensation to the public, and others, dealing with dangerous and vulnerable assets and infrastructure, along with assessing the flexibility of various rules for remedies and insurance, and drafting an overall plan for the next flood.



Figure 5: Mitigation Phase

**Warning System**

We are focusing on the communication tools used to communicate flood information to the public. This can be easily accessed by computers, CCTV camera, iPad and mobile phones, etc. Through broadcast media such as social media, local television and local radio networks. It is an integrated tool between government and people as follows:



Figure 6: The sub-function scheme of context diagram of the Chiang Mai flood warning system context diagram.

The context diagram shows the relevance of the flood warning system, with each external entity having internal sub nodes connected to each other. They also show the other phase entities that will be connected to the warning system afterwards.



Figure 7: The key of success in each sub-function

The context diagram illustrates the key elements that play a key role of success in driving different kinds of data flows in the diagram through broadcast by social media, television and radio including to the indirect node of village voice on call network to the people.



Figure 8: The sub-function scheme of context diagram of the Chiang Mai flood warning system context diagram.

The warning system process announces warning message through the city’s public relations unite that broadcasts 24-hour a day, which is the center authority for information management and operations linked to government entities such as city administration, military, police and meteorological and public teams such as volunteers, rescuers to evacuations people in a timely crisis with safety, and transmit real time information until the flood is over and into normal situation.

**Research Methodology:**

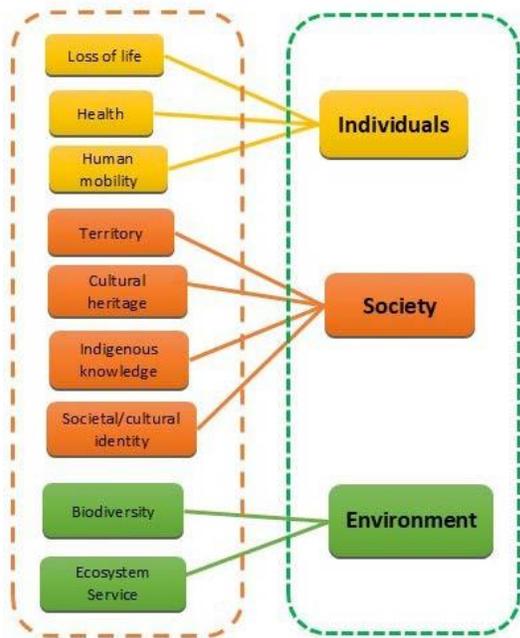
We have studied the efficiency and effectiveness of the flood warning system according of Chiang Mai’s prototype. By conducting research to study the thoughts of the different groups of participants who have a stake in this system by collecting data and configuring and calculating it by the SPSS program as follows.

**Study Group and Population.**

We classified the sample into 3 groups = 524 samples: Group 1: Affected people = 271 samples (51.7%), Government officials in relevant units = 124 samples (23.7%), volunteers and rescue teams = 129 Samples (24.6%) by Sampling by random.

**Treatment:** The flood warning system of Chiang Mai model.

**Research methodology:** Qualitative and quantitative. To study the efficiency of the system by the thoughts of system participants and the reduction of damage from disaster in terms of users. Using the Sendai Framework to disaster risk reduction of non-economic losses as a guideline for appraisal.



Sendai Framework for Disaster Risk Reduction of Non-economic losses categories into 3 main groups as Individuals: Life: Number of deaths and missing people, Health: number of directly affected people attributed (injured or ill attributed to disasters), Human mobility: number of people whose damaged dwellings were attributed to disasters.

Society such as Territory: direct economic loss resulting from damaged or destroyed critical infrastructure attributed to disasters, Cultural heritage: Direct economic loss to cultural heritage damaged or destroyed critically attributed to disasters, Indigenous knowledge and Societal/cultural identity: Number of people whose damaged dwellings were attributed to disasters.

Environment such as Direct economic loss resulting from damaged or destroyed critical infrastructure attributed to disaster. Biodiversity: Direct agricultural loss attributed to disaster, Direct economic loss resulting from damaged or destroyed critical infrastructure attributed to disasters.

Figure 9: Sendai Framework for Disaster Risk Reduction by UNFCCC

**Reliability level** defined value: No reliability, slightly reliable, some reliable, very reliable.

Non-Economic Loss (NEL) of Sendai Platform of Disaster Damage Loss defined value

NEL\_1 as Individuals Groups (Life, Health, Human Mobility): Not reduced at all, partially reduced, more reduced, much reduced

NEL\_2 as Society Groups (Territory, Cultural heritage, Indigenous knowledge, Societal/cultural identity): Not reduced at all, partially reduced, more reduced, much reduced

NEL\_3 as Environment Groups (Biodiversity, Ecosystem Service): Not reduced at all, partially reduced, more reduced, much reduced

**Data collection and statistical analysis:** SPSS statistical program.

**RESULTS**

This section contains the overall data analysis, presentation, interpretation, and explanation separated into 3 groups of the population whose direct and indirect impact with this protocol. To study the efficiency and reliability and NELs of user thoughts. Evaluated and analyzed in ANOVA, chi-squared tests of the SPSS Program were performed. We found out that:

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
	Between Groups	2.29	2	1.15	2.28	0.10

Warning System Reliability	Within Groups	262.53	521	0.50		
	Total	264.83	523			
NEL 1 - Individuals	Between Groups	1.64	2	0.82	1.83	0.16
	Within Groups	234.45	521	0.45		
	Total	236.09	523			
NEL 2 -Society	Between Groups	1.26	2	0.63	1.25	0.29
	Within Groups	263.09	521	0.50		
	Total	264.35	523			
NEL 3 - Environment	Between Groups	0.43	2	0.22	0.43	0.65
	Within Groups	264.19	521	0.51		
	Total	264.63	523			

**Table1:** A one-way ANOVA revealed that there was a statistically significant difference in defined value in between at least two groups of flood warning systems ( $F(2, 1.15), p = 0.10$ ). NEL 1 - Individuals ( $F(2, 0.82), p = 0.16$ ). NEL 3 -Society ( $F(2, 0.63), p = 0.29$ ). ( $F(2, 0.22), p = 0.65$ ).

The flood warning system has the highest reliability rating at 48.1% of better level, unreliability level = 0.2% as the lowest reliability level, and NEL 1- individuals group. The highest score is at a better level of 55% and NEL 2-society group. The highest score is at a best level of 44.7% and NEL 3- environment group. The highest score of a better level of 45.4%. The no-good level of the lowest score of NEL 1-3 = 0.2%. of all groups. The mean value of Reliability and NEL 1, NEL 2 and NEL

3 were the highest mean values in people samples. And the highest SD Value in government samples, NEL 1 highest in volunteer samples and NEL 2 highest in People sample.

### Conclusion and Discussion



Based on our research, we found the efficiency of reliability and the reduction in damage loss from the thoughts of those involved in this flood warning system. In particular, in the opinion of the public, there is the highest score of the mean value. Therefore, a simple communication tool is used to communicate within the city.

These have become an effective tool for flood warnings. From early warnings, during flood crises, and after flood crises, through an important variable, that is, the person who acts as the alarm itself, but can be used as verbal communication between humans at any time and anywhere.

No matter how good the alarm system is, there are still errors and unexpected accidents that occur. Although the overall number of losses has decreased, there are still

mistakes or disobedience of people or unwillingness or carelessness to heed warnings, so losses are always possible. However, we can conclude that the collaboration and integration of all sectors in this flood warning system case study. It may be useful and able to be adapted to benefit other regions.

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# The Role of AI Chatbots in Blended Learning: Enhancing Traditional English Language Teaching Methods for Saudi Students

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## Abstract

AI is becoming an essential tool in language learning and, unsurprisingly, its role is expanding rapidly. The need to investigate all aspects of learning is crucial.

Language learners are central to the language learning process, and therefore, their responses are important in understanding AI's influence on language learning. This study will examine second language learners majoring in English at Northern Border University. The study will aim to highlight their perceptions regarding the use of AI in their academic journey. Understanding their attitudes, preferences, and challenges will provide valuable insights for educators and developers looking to improve AI-based learning tools. By comparing frequent users of AI with those who rely on traditional methods, the research will shed light on the effectiveness of these tools and their limitations. This will help in creating a more holistic approach to second language acquisition that aligns with the needs and preferences of learners.

The study will focus on the benefits of AI, including its ability to enhance the speed of learning (Peters & Jandrić, 2019), its convenience (Božić & Poola, 2023), and its ability to increase engagement (Moybeka et al., 2023). Additionally, it will address challenges such as overreliance (Ali et al., 2023), bias (Nazir & Wang, 2023), and accuracy (Zhang et al., 2022).

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## What Urban Middle School Students Say - Technology Integration Pro's and Con's

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### Abstract

In order to determine the perspectives middle school students have concerning technology integration pertaining to engagement and global empathy, a qualitative case study was used with 16 participants in a private school in an urban setting. The research employed questionnaires and focus groups to address a significant gap in research as previous studies concentrated on the perceptions of either administrators or educators. Four themes materialized from the thematic analysis: positive technology engagement, negative technology engagement, global empathy, and technology use and application. Students expressed an increase in engagement when technology use fostered creativity, efficiency, and user-friendly experiences. Conversely, engagement was reported to be diminished when there were technical difficulties, complicated software, or an educational application of drill-and-kill experiences. Students overwhelmingly reported the presence of global empathy as technology provided pathways to understand diverse cultures, communities, and global challenges through multimedia resources, virtual interviews, and cross-cultural communication tools. The findings of the study establish a need for careful technology tool selection, adequate training for educators, and pedagogical approaches that prioritize student agency and creative expression. This research adds to the body of existing educational technology literature by providing authentic student perspectives on digital learning experiences and offers practical implications for educators, curriculum designers, and educational leaders seeking to optimize technology integration for meaningful learning outcomes.

**Keywords:** *Cognitivism, global empathy, middle school education, qualitative research, student engagement, student perspectives, student voice, technology integration*

### Background and Context

Technology use in learning environments has transformed the student experience exponentially over the last two decades. Learners are able to delve deeply into a multitude of subject areas as a result; science, technology, engineering and mathematics are easily integrated into other core subject areas where students are able to develop solutions to problems using simulations and other technologies (Zapille et al., 2017). Technology is ubiquitous and allows students immediate access to learning content, global problems, and problem-based activities (Spiteri & Chang Rundgren, 2017). Through educational technology, students can now access learning opportunities that extend beyond traditional classroom limitations. These technologies facilitate cross-cultural engagement with international communities, enable comprehensive investigation of specialized topics, and foster students' development as informed advocates for global causes (Widodo, 2023). Civic action is a potential result when students are able to experience learning through technology that promotes the enhancement of student global perceptions, and authentic educational activities that bring content to life (Yang & Baldwin, 2020).

In light of the meaningful potential that technology offers to the student learning experience, there must be an intention to do so (Yang & Baldwin, 2020). Overreliance on technology, especially when it is the only mode of accessing learning content, can lead to poorer performance on assessments as compared to those who have multi-modalities in the learning approach (Wexler, 2019). Students have reported using technology for three to four hours a day which also has led to weaker academic outcomes (Sampasa-Kanyinga et al., 2022). Technology also must be monitored by the instructor as almost half of 400 students reported misusing electronics during class time (Hazelrigg, 2019).

### The Problem with Technology Integration

The challenges with integrating technology is twofold. Educators are often using technology for experiences that resemble functionality tasks such as using software for writing papers and editing, data sorting, graphic

presentations, and basic internet use (Gray et al., 2020). Additionally, the absence of forward-thinking planning prevents technology from being used strategically in instruction. Rather than serving as a deliberate means to expand students' learning horizons and enhance their understanding, technology remains underutilized due to this planning deficit (Carver, 2016; Tamerat, 2020). The use of technology integration is a missed opportunity for educators as the embedment of technology thoughtfully through a learning unit can lead to improved student engagement and instructionally focused innovation experiences which then impacts student learning (Conradty & Bogner, 2022). The misstep that presents itself is the lack of planning on the part of educators when implementing technology when the wrong technology is selected, resulting in students not achieving outcomes, low engagement levels and stunted originality of the students' final product (Bereczki & Kárpáti, 2021).

### **The Missing Student Voice**

The term student voice refers to the presence of the students' role, perspectives or impressions as it applies to the instructional practice or policy in the educational setting (Holdworth, 2000). When student voice is linked to a presence of power, then agency is constructed that is student-centered (Ashton-Hay, 2025). Student voice can be developed in various aspects of education such as providing data, focus of respondents, co-researchers or researchers themselves (Fielding, 2004). The practice of using student voice in research is valuable as it provides a fulcrum to enact change in the learner experience positively; it is not merely the presence of student input (Ashton-Hay, 2025). Increasing student voice and agency has a plethora of positive potential outcomes such as emboldening the students' engagement to learning experiences and their educators (Ashton-Hay & Williams, 2023). Understanding student voice requires that the educational community understands its parameters clearly. When student voice is present, the incorporation of a view that students are important stakeholders is present, the clarity of the student perspective is apparent to them, there is not a treatment of tokenism on behalf of the student, the use of the student perspective is an agent of change, and the participation of the students is made voluntarily (Garwe, 2025; Kaur-Aujla, 2021; Partridge & Sandover, 2010; Young & Jerome, 2020).

### **Research Questions and Study Purpose**

The development of the research questions were thoughtful and designed in order to discern the insights that students have when using technology in their learning environments through the lenses of engagement and a connection to global issues that lie beyond their daily experiences. This research addresses two primary questions: (1) How do middle school students in the Midwest United States describe their experiences of technology-integrated learning activities regarding engagement during a unit of study? (2) How do middle school students in the Midwest United States explain their experiences of technology-integrated learning activities regarding global empathy during a unit of study?

The impetus for the research has a foundation rooted in the understanding that students need learning experiences that provide engagement that allow for the development of new understandings, the creation of their own solutions to problems, and interaction with learning content using technology (Khlaisang & Yoshida, 2022). The purpose of the qualitative case study was to explore the experiences of technology integration for urban, middle school students in the Midwest United States regarding engagement and global empathy.

### **Theoretical Framework**

The study employed a dual framework inform the conceptual foundation: engagement theory and cognitivism. Engagement theory emphasizes the need for a structure of educational experiences to embody a process where students *relate* (engage deeply and authentically to a topic being studied), *create* (develop solutions to problems related to the learning content), and *donate* (take action to employ their solutions previously developed) (Kearsley & Shneiderman, 1998). Engagement theory allows students to be integral participants in their learning experiences and facilitates engagement (Kearsley & Shneiderman, 1998). Vygotsky's cognitivism (1978) constructs an understanding where learning is broken up into smaller components (schemata), and that each moment of the educational experience such as view thoughts and principles are of great importance. Henceforth, the integration of engagement theory and cognitivism provides a comprehensive framework for understanding both the mechanisms and rationale underlying the student learning process. This theoretical synthesis creates the nuanced pedagogical moments that addresses the research questions and reveals deeper insights into the students' perspectives regarding technology integration within the educational context under investigation.

## Methodology

A qualitative case study methodology was used to capture rich, detailed perspectives of middle-school students regarding their experiences with technology integration in their learning activities encapsulated in a unit of study. Employing this methodology provided essential descriptions in which students could explain their interactions with technology regarding engagement and global empathy. The nuanced, detailed descriptions granted access to the students' lived experiences to be used for analysis to develop themes and analysis (Creswell & Creswell, 2018; Merriam, 2016).

## Participants and Setting

Sixteen middle school students (grades 6-8) from an urban, private K-12 school in Chicago, Illinois participated in the study through convenience sampling. The school utilized a 1:1 student-to-technology ratio and regularly integrated various digital tools across curricular areas. Participants had recently completed a unit of study of communication incorporating 8-10 different technology tools focused on global themes. Recruitment began as soon as IRB approval was gained. Once participant assent and parent consent were granted, data collection was able to begin. The students used various kinds of technology as determined by the topic under the umbrella of communication, including creating podcasts, television programs, and published periodical works. The technology selected was determined by educators for the purpose of executing a final product. Convenience sampling is a non-probability sampling technique frequently used for qualitative studies in which participants are selected based on availability, accessibility, and ease in recruitment. Figure 1 outlines the timeline of participant recruitment.

**Figure 1**  
*Timeline of Recruitment*



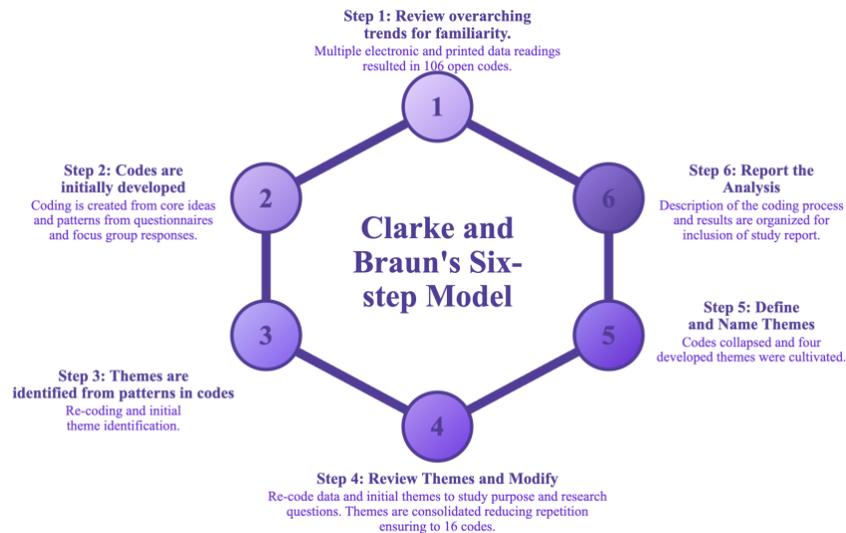
## Data Collection Tools

Two data collection tools were used to gather insights into middle-school perceptions of technology integration regarding engagement and global empathy: online questionnaires and focus groups. Questionnaires containing 15 open-ended written probes were utilized to acquire trends, attitudes, or opinions of the middle-school population being studied (Creswell & Creswell, 2018). Questions addressed both positive and negative aspects of technology use, engagement factors, and connections to global content. Four focus groups were developed to allow for a deeper exploration of questionnaire responses; focus groups provide more in-depth sets of data where participants are able to elaborate further on their initial responses (Creswell & Creswell, 2018, Merriam, 2016). Focus group protocols included 14 questions designed to elaborate on technology experiences and global empathy development, with particular attention to specific tools and applications that influenced student perspectives.

## Data Analysis

Data analysis utilized Clarke and Braun's (2013) six-step thematic analysis model. Initial coding identified 106 preliminary codes, which were subsequently refined through axial coding into 16 categories and ultimately consolidated into four major themes. The process for analyzing the data followed six steps offered by Clarke and Braun (2013) for data analysis: (1) Initially, data from the questionnaires and focus groups was reviewed for overarching trends to become familiar with data collected; (2) meaningful codes were developed for the process of chunking the data as they pertain to the research questions; (3) thematic patterns were established to facilitate the identification and analysis of relevant data; (4) review of previous themes was conducted and/or modified; (5) trends in the data pertaining to each theme were identified; and (6) finally, the learnings from the research were presented. Figure 2 presents the data analysis model used to determine themes to answer the aforementioned research questions.

**Figure 2**  
*Clarke and Braun's Six-step Model*



## Findings

Four emergent themes derived from data analysis that addressed the research questions concerning student experiences with technology integration regarding engagement and global empathy. Saturation occurs when participant responses reoccur, offering no new insights; a participant pool for a qualitative study of 15 to 20 individuals achieved saturation (Hennink et al., 2020; Merriam, 2016). Saturation was achieved at approximately the 10th questionnaire response and the 15th and 16th focus group participants as response began to repeat themselves.

### Theme 1: Positive Technology Engagement (Pros)

The first theme reflected on positive attributes of technology which elucidated the students' thoughts, feelings and behaviors with respect to how the use of technology promotes engagement in learning activities (Schindler et al., 2017). Participants expressed positive engagement interactions with technology through terms such as *fun*, *enjoy* or *like*. The use of technology to produce artifacts where students had creative agency were also indicative of favorable sentiments in so much the use of technology-based produced like using a camera, editing a video or audio clip, or producing a podcast. One participant explained, "There was a plethora of things you could do to enhance the overall quality of podcasting in editing. It was fun experimenting." While another elaborated,

I enjoy learning about new tools because they're particularly helpful even in other classes... it's an authentic way of sharing a voice so I know how to use a microphone like a proper microphone when giving an interview because it just helps my audio quality improve, and it makes a more enjoyable experience.

When students were able to use personal devices such as their own computers, phones, or devices, pleasurable experiences were also reported; such views were in direct reference to using specific applications or creating digital content directly related to their learning content.

### **Theme 2: Negative Technology Engagement (Con)**

The second theme provided insight into the participant experiences when technology was viewed with negative responses. When technology usage is unsuccessful it was described as unhelpful, inherently precipitating undesirable outcomes leading to a sense of vulnerability or sensitivity (Selwyn, 2016). Participant frustration followed suit as common problems of complexity of the programs, quality of the technology of microphones or devices, limitations on usage of programs, privacy, and headaches, or eye strain. One participant explained, “Sometimes I had to use technology that was completely new to me and that could be a little intimidating at first.” While another stated, “I have problems with getting headaches from being on technology.” Yet additionally topics of program glitching, freezing and poor internet connection were noted as conclusionary points of frustration. Another expressed,

Sometimes the internet quality isn't very good and it's really hard to access sites, so it'll take a minute to load a website, and if it's the wrong one or if it isn't helpful it's going to be more and more time waiting just going through website make which some projects a bit harder.

### **Theme 3: Global Empathy Development (Pro)**

Global empathy encapsulates the capacity for one to connect with those outside the realm of lived experience, view different perspective through a new lens, comprehending the feelings of others and communicating or applying those to worldwide contexts (Zapille et al., 2014). Overwhelmingly, participants expressed a better understanding of those who have different lived experiences, communities, and cultures directly as a result of using technology in their academic activities. One participant expressed, Participant 1 said,

I feel like sometimes you can <visually> see how and read an article about a person from another place in the world is going through something and that person is talking about it and it has an impact on you.

Other positive aspects of technology that foster global empathy included support in writing, engaging with individuals through video conferencing, reading through the modality of technology, and viewing visual images and video. As one participant explained, “I feel like whenever we did interviews using video conferencing and recordings, that was definitely more exposure to different people in the world and that made us care more about it.” Additionally, technology promoted global empathy as explained an ease of research foreign topics, experiencing how things different in various areas of the planet, experiencing social media, and the power of the internet. The power of technology provided a pathway for participants to learn and care about the world.

### **Theme 4: Technology Use and Application (Con)**

The outcomes of student learning can be directly impacted by the kinds and the methodology educators use when designing learning experiences (Lei, 2010). Student responses regarding use ranged topics such as kinds of technology, uses, and frequency and duration during the day. While various applications and programs were identified, all participants referred to their use of technology as, “all day and every day.” One participant expressed, “I use technology in school every day, all day. I also use it outside of school a lot.” Another stated the duration of use as, “about 6 to 7 hours.” Many participants elaborated they use technology when they get home and voiced responsibility for what they felt was excessive use of technology at times. Negative sentiments of technology integration expressed by participants stated that using computer programs for drill-and-kill learning experiences, antiquated technology, glitching or overly complicated programs. Participant 2 shared,

I hate IXL. It's bad and it's just so annoying because the teachers are basically using it to teach us and not teaching themselves. I just can't stand IXL because you get up to 90% and then all of a sudden, the program bumps you back down to 45% because you missed one question.

Figure 3 illustrates the four emergent themes related to technology integration, highlighting both positive and negative perspectives as expressed by study participants.

### **Figure 3**

*Emergent Themes and Related Quotes Regarding Technology Integration*

## Emergent Themes and Related Participant Quotes

### Qualitative Research Findings



## Discussion

### Student Agency and Technology Selection

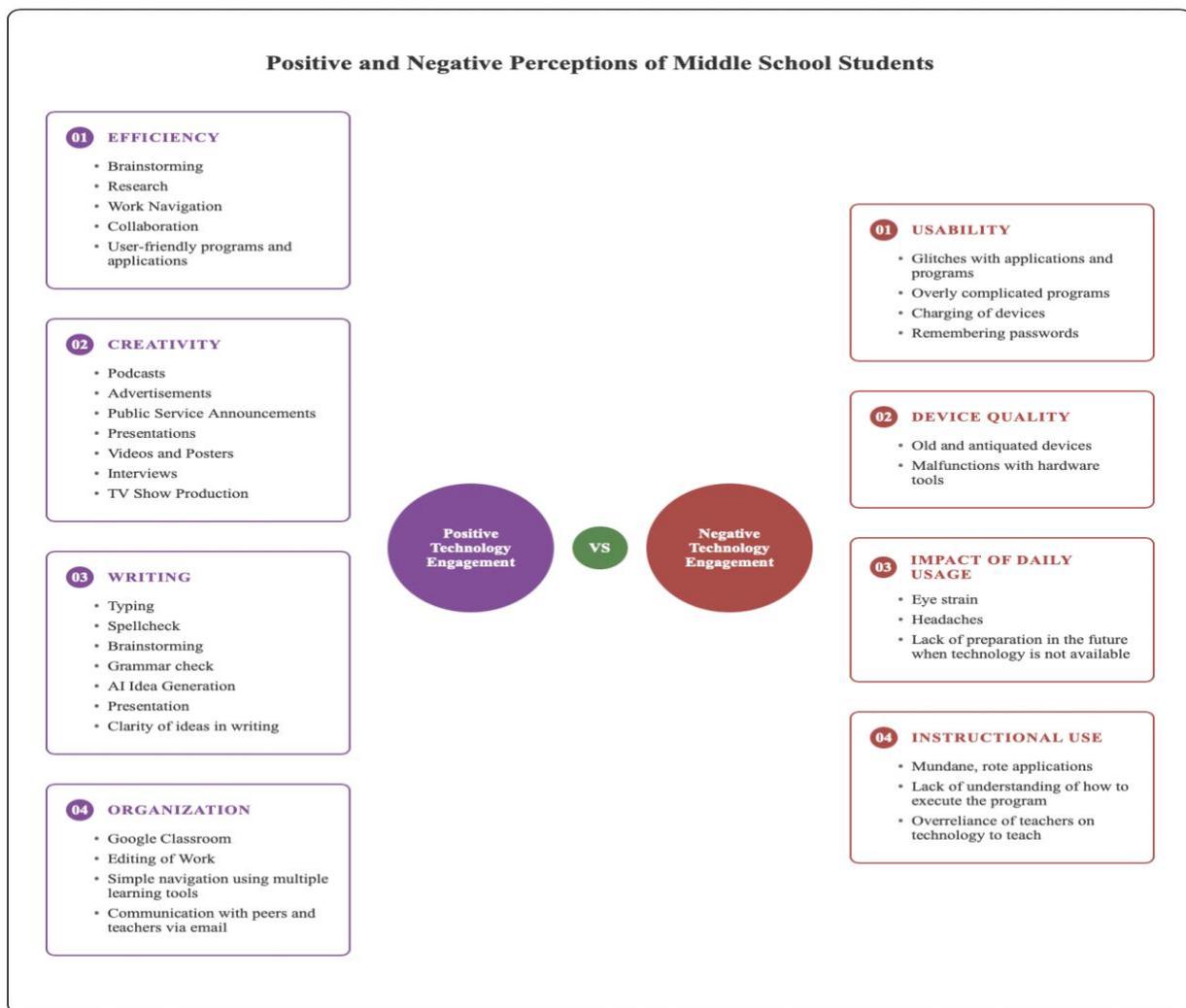
Technology has transformed the educational landscape in the past twenty years. As a result, there is an increasing need for educators to prioritize not only the selection of the technology being used but their own knowledge of the technology to ensure effective implementation (Baltynova et al, 2023). Students currently live in a world where technology is ubiquitous (Spiteri & Chang Rundgren, 2017). Incorporating technology that works properly and is developmentally appropriate can lead to pathways that promote student agency, research, exploration, and engagement from an immersive and authentic learning perspective (Hui, 2024; Moradi & Mahdia, 2023). The findings found that the efficacy of the technology selected played a significant role from the perspective is usability and practicality. As a result, if the participants did not find the technology to be reliable or usable, there was the propensity to find other technological solutions to meet the needs of the learning task. Such challenges lead to students wasting time and having increased levels of frustration with the activity which can be viewed as a negative impact on learning.

### The Importance of Technical Reliability

The need for technology to have the capacity to provide students with experiences that facilitate inventive, original products is one of the aspects of integration that promote student engagement (Berezki & Kárpáti, 2021; Conrady & Bogner., 2022). When technology presents challenges that impede the students' sense of locus of control, there are negative implications (Jamil et al., 2021). Participants overwhelming reflected frustration when there was a lack of connectivity with the internet or malfunctioning software. Supporting this was testimony of resentment when the technology was poorly selected to meet the needs of the learning experience, had over complicated components, repeated software malfunctions suggesting a lack of vetting, or ineffective application (Jamil et al., 2021; Werang & Leba, 2022).

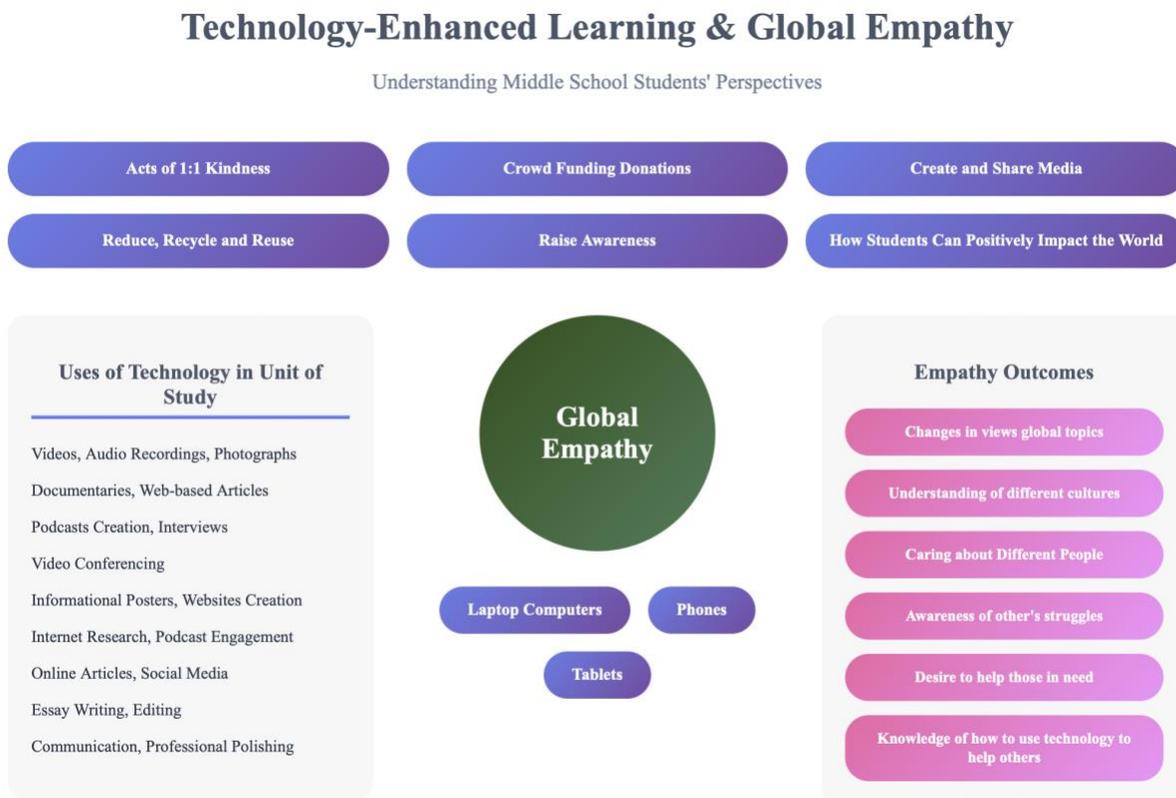
A common topic offered by participants was when “glitching” occurred with various technology tools resulting in a disconnect from the learning objective overall; such experiences lead to impede learning, reduce focus, and put unintended gaps in active engagement (Kostaki & Karayianni, 2020). Such challenges extend the amount of time students are using technology resulting in overuse; negative implications occur as a result and were reported as eyestrain, headaches and fatigue (Abou Hashish et al., 2022). A strong recommendation for vetting the developmental appropriateness, reliability, and need for excessive screentime is a result of participant responses when making technology integration decisions (Jamil et al., 2021; Kostaki & Karayianni, 2020; Werang & Leba, 2022). Figure 4 presents the positive and negative perception of the use of technology in learning experiences.

**Figure 4**  
*Positive and Negative Perceptions of Technology Use*



With the premise that global education provides the opportunity for students to develop empathy for the world, there is a strong argument that intentionally utilizing technology can improve students' sense of connection to the planet (Ahmed & Mohammed, 2022). Participant responses overwhelmingly confirmed the philosophy that the use of digital technologies provides a greater sense for experiencing and creating a greater understanding and appreciation as a result of interacting with diverse perspectives and communities. Human interconnectedness, synonymous with global citizenship, correlates with empathy emphasizing an ability to see the world from multifaceted viewpoints and this was, again, emphasized by participant responses (Jamil et al., 2021). Utilizing technology to explore real-world problems were noted by participants as a reason that amplified care, concern for the world and a belief of having the capability of making a positive impact. Simultaneously, participants spoke to the impact of the use of online videos, video conferencing, translation programs, and digitized resources to bridge the divide of linguistic, cultural, and social barriers to foster global compassion (Adedokun et al., 2015; Boboc et al., 2022). Importantly, the education community should note that there was a belief of participants to make a positive change in the world utilizing technology as a result of their amplified care, and concern for the global community well beyond their immediate community. Figure 5 presents the development global empathy as a result of technology integration.

**Figure 5**  
*Impact of Technology Integration Regarding Global Empathy*



**Challenging Negative Assumptions**

While there are negative implications of technology integrations (Ahn, 2022; Sampasa-Kanyinga et al., 2022), this study revealed the propensity for students to distinguish and reflect upon the beneficial and detrimental impacts of technology applications both academically and personally. Students expressed the capacity to appreciate the power that technology possesses to enhance their learning and explore global topics, both in a formal academic setting and informally through the use of multiple social media applications. When educational experiences are connected to students' lives, a self-belief in the ability to positively impact the world is fostered (Wyner & Doherty, 2022). Students identified many opportunities to effect change such as conducting local acts such as recycling, organizing or participating in park cleaning, or being kind to strangers as potential courses of action. Literacy skills developed through technology integration embolden participants' beliefs in using technology to serve other purposes; there is a

connection between literacy abilities and all other core learning subjects (Kim et al., 2022; Mead et al., 2019). Many participant responses supported the use of technology as they described previous uses of technology in other classes and lessons related to their unit, suggesting that creating digital content, such as posters or informational public service announcements, were additional avenues to advocate for others in need. The findings also contradict concerns about technology widening achievement gaps when students are given agency in technology selection and use creative applications rather than drill-and-kill programs. Participants spoke directly to the lack of vetting of technology impacting the learning experience negatively and suggested a resentment when technology is used as the modality to primarily teach academic content, which was described as “lazy teaching.” Such an observation should be noted by the education community. This supports Bereczki and Kárpáti's (2021) argument that educator selection of appropriate technology is crucial for positive outcomes.

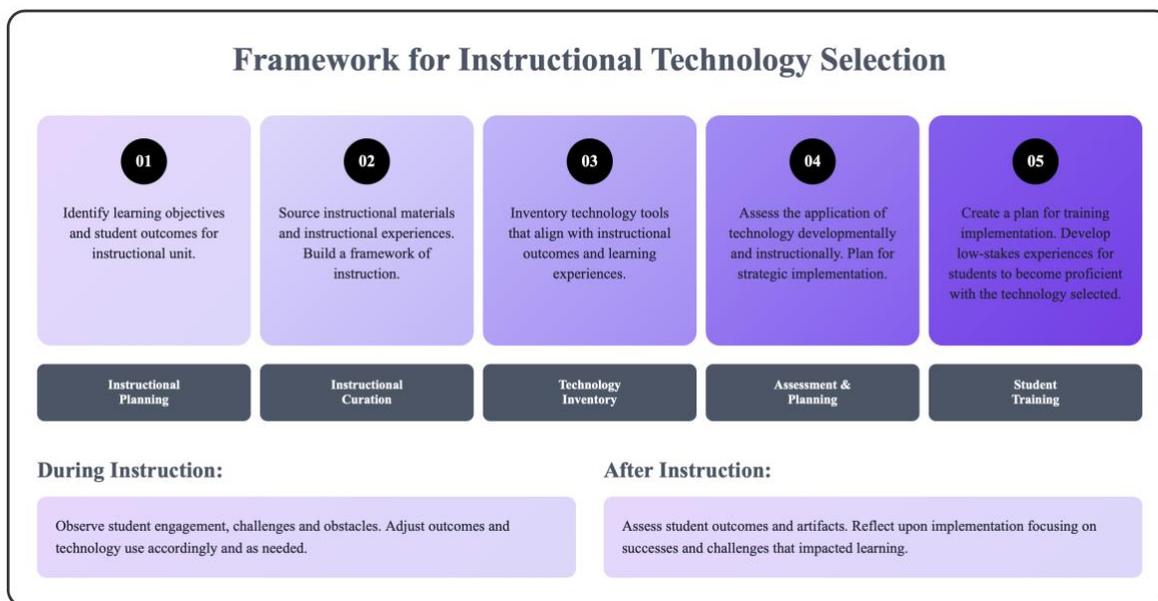
### **Recommendations for Educational Practice**

The study examined and explored a gap in the literature by putting student voice into the forefront of contemplation for how technology is leveraged in the classroom. As technology has taken a consistent presence in classroom environments and is constantly evolving, a recommendation is for educators to explore instructional technology pertaining to curricular objectives, learning outcomes, developmental appropriateness, quality standards, and creative potential (Williams et al., 2023). When technology was relied upon to teach content, was overly sophisticated, digital tools resembled *drill and kill* experiences, or digital tools were antiquated, participants expressed a tendency to become disengaged. If learning activities were planned with learning objectives, exposure, investigation, timing, quality, and digitally creative student learning outcomes in mind, the promotion of engagement and connectedness to the world could be an outcome; planning must be thoughtful.

As the need for planning and appropriate use was highlighted by participant responses, the identification of the instructional objectives and student outcomes for an instructional unit provides an initial overarching umbrella for the development could embolden the learning experience (Ozden, et al., 2024). Then, a systematic curation of instructional materials should occur to plan a course of action for students to move through learning activities to align with the targeted learning objectives. Planning could be more effective if a library of potential technology tools was developed to amplify the authenticity and intellectual richness of learning experiences across content areas. Developmental and useability appropriateness, and a determination should be a priority for evaluation to determine as to when and how technology will be strategically implemented. Concurrently, the vetting and exposure of technology to students should be enacted in a low stakes setting to provide an opportunity for application mastery before commencing upon academic endeavors. When using technology instructionally, Educators should observe student engagement, assess potential obstacles, and adjust the lesson activity when using technology instructionally (Lei, 2010). Figure 6 illustrates the framework for optimal technology integration experiences.

### **Figure 6**

*Framework for Optimal Technology Integration Experiences*



### Limitations

There were limitations that present constraints upon the generalizability of the study, thus impact its strength. The size of the institution is the first limitation as it impacts the overall participant pool potential; therefore, transferability of the results must be taken into consideration. There was a need, as a result, to include a multi-band sampling pool. In doing so, the participant population was expanded as much as possible. The representations that were portrayed by the participants were indicative of the subset of individuals available for the study. Efforts to expand the study to include more participants, different socio-economic backgrounds and geographic areas would fortify the reliability of the study.

### Conclusion

This study contributed important insights to educational technology literature by centering student voices in discussions of technology integration engagement and the development of global empathy. The findings revealed that students possess sophisticated understanding of how different technology applications support or hinder their learning experiences, challenging prevailing assumptions about technology's impact on learning. The research demonstrates that effective technology integration requires careful attention to tool selection, technical reliability, and pedagogical approach. Students respond most positively to technology that enhances their creative capacity and enables meaningful interaction with content and global communities. This supports both engagement theory and cognitivism by showing how technology can facilitate the "relate, create, and donate" framework while building schemata through meaningful learning experiences. By focusing on what students say about their technology experiences, rather than adult assumptions or educator reflections about technology effectiveness, the research provides authentic insights into how digital tools actually function within learning contexts. The findings offer guidance for educators, administrators, and technology coordinators seeking to improve educational technology integration. Key recommendations include prioritizing student perspectives in technology selection processes, investing in reliable technical infrastructures and tools, and designing technology-enhanced learning experiences that promote creativity and global connection. By attending to student perspectives on technology integration, educational leaders can make more informed decisions about digital tool selection and implementation, ultimately creating more engaging and effective learning environments for all students. This study demonstrates that students are valuable partners in educational technology initiatives and their insights should inform future integration efforts.

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## Exploring English Learning Motivation: A Comparative Study of EMI and Non-EMI Courses

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### Abstract

Previous research has limited the exploration of students' motivation for learning English in professional contents. Therefore, constructing a scale, the English Learning Motivational Self System in Professional Contents, is crucial. This scale aims to investigate into students' professional English learning motivational self, particularly in the content of medical education. To achieve this goal, this scale was developed using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). A research design including experimental (English as a Medium of Instruction, EMI) and control groups (Non-EMI) was implemented to verify the effectiveness of students' learning motivation. Additionally, the study explored the use of EMI teaching to predict students' professional English writing skills. The results indicated that EMI teaching promoted students' ideal self and ought-to self more than non-EMI teaching did. In the linear regression model, the two factors—ideal self and ought-to self—demonstrated significant predictive power to professional English writing skills. For the compound regression models of individual factors to professional English writing skills, the results showed that each factor had a significant prediction power for professional English writing skills. Ultimately, reducing the gap between their ideal self and the ought-to self was associated with increased professional English writing skills. The development of EMI teaching strategies should focus on shortening the gap between the ideal self and the ought-to self and pay attention to students' past English learning experiences.

**Keywords:** L2 motivational self system, ideal self, ought-to self, learning experience



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