



4WINs Impact: Development of a Quantitative Good Deed Assessment System through Gamification

**Teerayoth Chanbanyong¹, Chitsanupong Masirichok¹, Krisada Pecharapa¹,
Pavarit Tharuesi¹**

¹ นักศึกษาหลักสูตรสร้างศักยภาพผู้นำเยาวชนเพื่อการสร้างชาติ

¹ Youth Leadership Empowerment Summer Programme (NBI-YES)

Received: August 14, 2026 | **Accepted:** September 9, 2026 | **Published:** September 11, 2026

Abstract

The 4WINs Impact project developed a gamified, In Real Life (IRL) web platform on Streamlit to promote constructive activities and quantitatively assess good deeds among Thai youth aged 13–18. Employing a Research and Development (R&D) approach, the platform was tested with a target youth sample over four weeks, with data collected via system logs and stakeholder focus groups.

Technical outputs delivered a stable platform integrating a secure, two-tier verification mechanism (GPS and photographic evidence) alongside a precise composite scoring algorithm that equitably scales rewards based on individual capability baselines. Behavioral outcomes demonstrated high effectiveness in mobilizing youth participation in real-world constructive actions, such as academic review and physical exercise. Evaluation under the 4WIN framework confirmed holistic positive impacts: enhancing individual self-efficacy (Personal Win), establishing virtuous social norms among peers (Our Win), fostering voluntary responsibility within families and schools (Cooperative Win), and driving tangible real-world environmental cleanups alongside positive digital content creation (Public Win). This structurally validates the platform's capacity to foster sustainable prosocial habits in youth.

Keywords: Gamification, IRL Web Game, 4WINs Model, Composite Good Deed Index

Introduction

At present, the majority of Thai children and youth (aged 13–18) exhibit a distinct trend of prolonged online media consumption, with average usage statistics reaching approximately 9 hours per day, predominantly allocated to online gaming, social media platforms, video streaming, and various digital communications. Analysis of their 24-hour time allocation during school breaks reveals that youth spend 33.33% of their day sleeping and a staggering 37.50% engaged with mobile phones and social media, whereas only 8.33% is spent on extra tutoring and 20.84% on other activities (Electronic Transactions Development Agency, 2023). These metrics clearly reflect that a substantial portion of youth's daily life is tethered to screens for continuous entertainment and media consumption; without an effective balancing mechanism, this sedentary online behavior inevitably displaces the time essential for real-life (In Real Life: IRL) physical and spatial development—such as exercise and face-to-face social interactions—subsequently deteriorating their social skills and psychological well-being. Therefore, this phenomenon is no longer merely a localized family issue, but rather a structural societal challenge that must be addressed urgently and appropriately.

Nevertheless, a critical impediment to fostering positive behaviors and a public mind among modern youth lies in the fact that "doing good deeds" is conventionally defined and evaluated abstractly, lacking an assessment system that is valid, transparent, and tangible. This deficiency consequently results in a lack of sustained motivation among youth to continue their activities over time. Operationalizing qualitative behavioral science into verifiable indices that can be realistically evaluated therefore presents a significant challenge. To address this issue, the research team has studied and developed the 4WINs Impact platform and the Quantitative Good Deed Assessment System, focusing on transforming aimless youth screen time into the active execution of constructive social activities under the paradigm of "creating a system that facilitates doing good unconsciously."

This innovation synergizes web-game architecture with gamification mechanics to drive intrinsic motivation and establish positive habit loops, with its system design structurally underpinned by Prof. Dr. Kriengsak Chareonwongsak's philosophy of Civilized Individualism (True Goodness, True Beauty, True Reality) and the human development principles of molding individuals into "Good, Smart, Brave" citizens. This platform functions not only to encourage youth to participate in volunteer activities and self-development but has also been developed to

scientifically investigate the effectiveness of behavioral modification, as well as to serve as an empirical tool for evaluating the holistic positive impacts generated for youth, stakeholders, and society under the 4WIN Framework (Individual, Relational, Participatory, and Societal dimensions), ultimately leading to the enhancement of youth well-being and the cultivation of a sustainable civilized society.

Research Objectives

1. To develop the 4WINs Impact platform and a Quantitative Good Deed Assessment System for children and youth.
2. To investigate the effectiveness of the gamified web platform in promoting participation in constructive activities and fostering positive behaviors among children and youth.
3. To evaluate the positive impacts generated for children and youth, stakeholders, and society under the 4WIN Framework.

Research Conceptual Framework

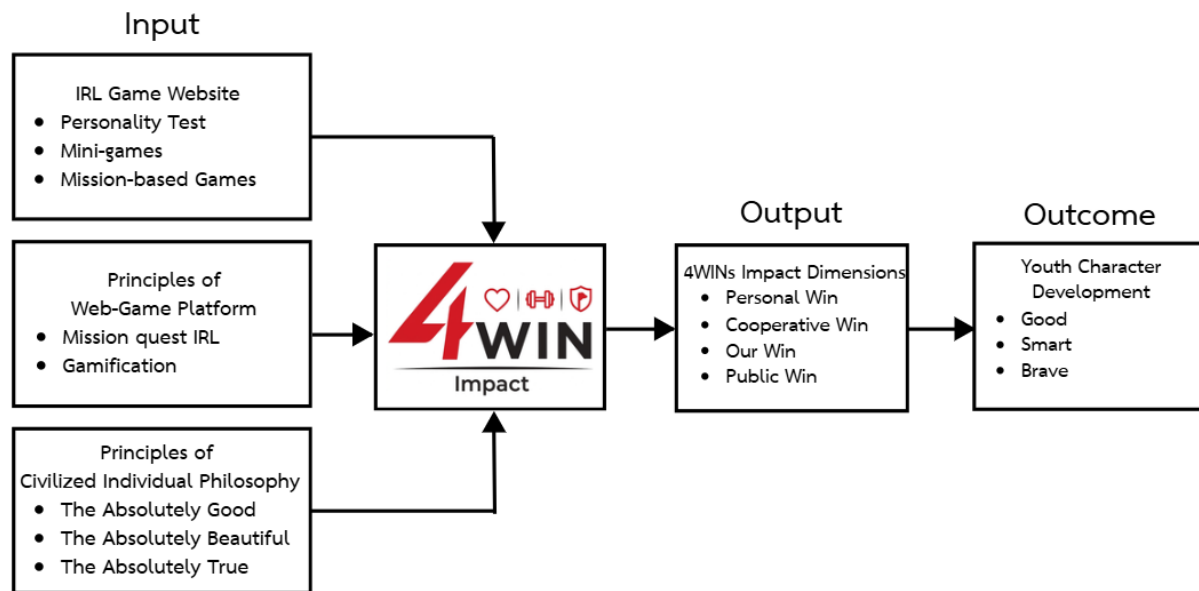


Figure 1

Conceptual Framework

Literature Review

This literature review aims to establish a theoretical foundation to support the digital architecture of the 4WINs Impact platform in transforming abstract virtuous values into an accurate quantitative assessment system. It integrates interdisciplinary knowledge ranging from motivational psychology for real-world youth behavioral modification, gamification mechanics that foster a flow state, and prosocial behavior concepts to behavioral psychometrics and digital data verification systems. These elements serve as the core conceptual framework to scientifically drive and process the composite index, the foundational theories of which are detailed below

1. Youth Psychology, Motivation, and Positive Behavior Development

Understanding the psychological structures and motivational mechanisms of adolescents aged 13–18 is a fundamental basis for designing digital system architectures aimed at behavioral change. This age group is particularly sensitive to digital stimuli and the complex social contexts surrounding them. Therefore, this literature review focuses on examining the processes that drive motivation and the formation of positive habits in real-life (IRL) contexts, in order to serve as a conceptual framework for developing the Quantitative Good Deed Assessment System on the 4WINs Impact platform. This system is intended to reduce sedentary behaviors and effectively foster civilized lifestyles and positive character development among youth, with the following key theories serving as its foundational framework.

1.1 Self-Determination Theory

Self-Determination Theory is a core framework used to explain the mechanisms of intrinsic motivation among youth through the satisfaction of three basic psychological needs: (1) autonomy, the sense of having control and choice over one's own behavior; (2) competence, the perception of achievement and personal capability; and (3) relatedness, the feeling of being connected to and part of a social group (Ryan & Deci, 2000). The application of this theory within the 4WINs Impact platform is implemented through a system that allows users to autonomously select location-based good deed missions, enhances their sense of competence through level progression and quantitative experience points (EXP), and fosters social interaction through collaborative real-world group missions. These gamification mechanisms facilitate the transition from externally driven behavior to internal awareness, enabling youth to develop sustained engagement and voluntarily adopt positive behaviors for the collective good without coercion.

1.2 Habit Loop Theory

Habit Loop Theory (Duhigg, 2012) explains that behaviors that become habitual consist of three main components: (1) cue, a trigger that signals the brain to initiate an action; (2) routine, the behavior or action performed in response to the cue; and (3) reward, a positive outcome that reinforces the behavior and encourages repetition in the future. The application of this concept within the quantitative good deed assessment system of the 4WINs Impact platform involves transforming the cue from aimless screen engagement into location-based quest notifications, restructuring the routine into real-life (IRL) constructive and volunteer activities performed by youth, and completing the loop with rewards in the form of points, experience points (EXP), and clearly defined digital cosmetic items. This systematic redesign of the behavioral loop through gamification mechanisms helps reshape negative youth behaviors and fosters the formation of good deeds as a stable and sustainable habit.

1.3 Peer Influence and Social Conformity

The concept of peer influence and social conformity during adolescence suggests that individuals aged 13–18 are highly sensitive to social acceptance and status positioning within their peer groups. This behavioral influence can be leveraged to promote positive behaviors when such behaviors are established as social norms within the group (Steinberg & Monahan, 2007). The development of the 4WINs Impact platform applies this concept through the design of group quest systems and leaderboards to create positive peer pressure within the quantitative good deed assessment framework. When youths observe their peers participating in missions and accumulating experience points (EXP), these transparent quantitative indicators encourage social conformity to maintain status and acceptance within the group. As a result, participation in volunteer and prosocial activities shifts from an individual responsibility to a shared group culture that is sustainable among youth communities.

2. Gamification Theory and Web Game Architecture

The application of web game architecture and gamification concepts represents a key technological strategy for driving positive behavioral change among youth by transforming the process of performing good deeds from an abstract construct into an interactive and observable system. Therefore, this section of the literature review focuses on examining digital architectural components and the design of quest systems with appropriate levels of challenge, which serve as the foundation for developing the Quantitative Good Deed Assessment System within the 4WINs Impact platform. This system is designed to calculate and process experience points (EXP) in a

stable and reliable manner in accordance with international standards, as detailed in the following subsections.

2.1 Game Mechanics Theory

Gamification Theory, as defined by Deterding et al. (2011), refers to the application of game design elements in non-game contexts with the aim of influencing behavior change and increasing user engagement through motivational experiences. A widely adopted motivational framework within gamified systems is the PBL triad, which consists of Points, Badges, and Leaderboards. Integrating these mechanisms into the Quantitative Good Deed Assessment System of the 4WINs Impact platform enables the transformation of abstract behavioral actions into measurable numerical indicators. Points are processed as experience points (EXP) within the quest system to evaluate developmental progress, while badges function as symbolic recognition of social status and civic virtue. As a result, these mechanisms support continuous learning and encourage youth to willingly and consistently engage in prosocial and community-oriented activities (Deterding et al., 2011).

2.2 Quest Difficulty Design

Quest Difficulty Design is fundamentally grounded in Flow Theory proposed by Csikszentmihalyi (1990), which states that sustained engagement and motivation are most effectively achieved when the level of challenge is balanced with an individual's skill level. If a task is too difficult, it may lead to anxiety, whereas if it is too easy, it may result in boredom. The application of this concept within the Quantitative Good Deed Assessment System of the 4WINs Impact platform is implemented through the categorization of location-based quests into different difficulty levels, namely easy, medium, and moderately difficult, based on task complexity and required time resources. The system is also designed to calculate and allocate rewards in the form of experience points (EXP) and quantitative points that are proportionally aligned with quest difficulty. This mechanism helps maintain users in a psychological flow state, promoting enjoyment, perceived challenge, and continuous motivation to accomplish increasingly advanced good deed missions (Csikszentmihalyi, 1990).

3. Theories and Innovations in Measuring Good Deeds and Volunteer Behavior

The study of theories and innovations related to the measurement of good deeds and volunteer behavior is a crucial step in transforming abstract ethical values into indicators that can be scientifically assessed. Therefore, this section of the literature review focuses on exploring the concepts of prosocial behavior and the development of self-efficacy among youth in order to

design a quantitative measurement structure within the architecture of the 4WINs Impact platform. This framework enables the accumulation of experience points (EXP) to meaningfully reflect the development of civic-mindedness and the internal growth of young individuals in a tangible manner, as detailed in the following subsections.

3.1 Prosocial Behavior Concept

Prosocial behavior refers to any voluntary action performed by an individual for the benefit of others or society as a whole, such as helping, sharing, and engaging in volunteer activities. Promoting such behavior during adolescence plays a crucial role in developing positive social thinking and reducing problematic behaviors in adulthood (Ranapurwala et al., 2016). The 4WINs Impact platform incorporates this concept as a core principle in designing its Quantitative Good Deed Assessment System by translating real-life (IRL) prosocial activities into tangible numerical values in the form of points and experience points (EXP). When youth complete location-based constructive missions, this quantitative evaluation system transforms abstract moral values into measurable indicators with real-time feedback, fostering a sense of pride and encouraging the sustained development of prosocial behavior.

3.2 Self-Efficacy Theory

Self-Efficacy Theory (Bandura, 1977) explains that an individual's belief in their own abilities and potential to successfully perform a task is a key driving factor that directly influences the level of effort, persistence, and commitment devoted to challenging activities. The application of this concept within the Quantitative Good Deed Assessment System of the 4WINs Impact platform is implemented by transforming abstract moral values into tangible numerical indicators, such as experience points (EXP), progress bars, and level systems. When youth successfully complete missions and observe their progress in real time, this perceived achievement becomes a form of mastery experience, which in turn enhances their self-efficacy in becoming capable, competent, and morally responsible individuals ("good, skilled, and brave"). This leads to increased intrinsic motivation and sustained willingness to engage in increasingly complex and challenging volunteer and prosocial activities (Bandura, 1977).

4. Quantitative Measurement and Evaluation Systems in Behavioral Science

The establishment of measurement systems and quantitative evaluation in behavioral science is a fundamental component in transforming abstract moral values and volunteer activities into transparent mathematical indicators that can be scientifically processed. Therefore, this

section of the literature review focuses on examining the process of operationalizing definitions to construct a Composite Index, along with the development of data validation and control mechanisms within digital systems. These approaches are intended to serve as standardized principles within the architectural framework of the 4WINs Impact platform, ensuring the accuracy and reliability of empirical experience points (EXP). The details are presented in the following subsections.

4.1 Transformation of Abstract Values into Quantitative Indices

Quantifying qualitative metrics is the process of operationalization that converts abstract behavioral science concepts into observable variables that can be accurately measured in numerical form. This involves identifying complex behavioral constructs and decomposing them into measurable sub-indicators, which are then aggregated to form a Composite Index that systematically reflects the magnitude or level of the behavior (Babbie, 2021). Within the system architecture of the 4WINs Impact platform, this approach is applied by categorizing real-life (IRL) prosocial and volunteer activities according to civic competency criteria. Measurement scales and computational algorithms are then defined to translate these activities into quantitative units in the form of points and experience points (EXP). This systematic transformation of behavioral data enhances transparency in evaluating good deeds, enables statistical comparability, and provides an empirical representation of youth developmental progress.

The platform's computational model is based on the following composite index formula:

$$\text{Score} = (\sum_{i=1}^n I_i)$$

where R represents the difficulty rate of a mission,
and I represents the impact level of a good deed.

This formulation aligns with the concept of linear composite indicators as defined by OECD (2008). In this structure, the variable I represents impact scores categorized into four dimensions under the 4-Win framework, while R serves as a difficulty multiplier for real-world missions. This design is consistent with Multi-Criteria Decision Theory, which suggests that comprehensive behavioral evaluation must account for both additive impacts of accumulated activities and levels of task difficulty to ensure fairness in measurement (Keeney & Raiffa, 1976). Consequently, this algorithm enables the transformation of abstract moral value into precise quantitative experience points (EXP), producing a scientifically grounded and empirically reflective measure of behavioral impact.

4.2 Data Validity and Digital Verification Systems

Data validity and digital verification systems are essential for maintaining the reliability and transparency of information within information systems, particularly through input controls and automated validation processes designed to prevent errors and data manipulation (Laudon & Laudon, 2022). The application of this concept within the Quantitative Good Deed Assessment System of the 4WINs Impact platform is implemented through a two-tier verification mechanism, which requires youth participating in location-based quests to submit empirical photographic evidence alongside real-world GPS location data. This dual-verification process ensures that mission completion is grounded in real-life (IRL) activity before the algorithm processes and distributes experience points (EXP). Such systematic digital validation enhances statistical accuracy, prevents score manipulation, and strengthens construct validity, thereby ensuring that the behavioral indicators of youth volunteer activities remain credible and reliable.

Research Methodology

The research methodology for the 4WINs Impact project utilizes a Research and Development (R&D) approach combined with information systems engineering design processes. The operational structure is scientifically divided into four main phases. It begins with an in-depth context exploration and literature review to define system requirements. This leads to the design of the web game architecture and the quantitative composite index calculation algorithm. Subsequently, real-world (IRL) field experiments are conducted with the target youth group to evaluate behavioral transition. Finally, the methodology concludes with a holistic impact analysis based on the 4-Win conceptual framework to ensure the platform's validity and drive sustainable social change, with the operational details of each phase outlined below.

Step 1: Baseline Data Study

This step focuses on the in-depth investigation and analysis of digital media consumption contexts, screen-time statistics, and sedentary behaviors among Thai children and youth aged 13–18, derived from national standard statistical reports. This is conducted in tandem with a rigorous literature review of foundational theories spanning behavioral psychology, gamification mechanics, and behavioral science measurement systems. Additionally, an intensive study of Prof. Dr. Kriengsak Chareonwongsak's philosophy of Civilized Individualism and the 4-Win framework is performed to synthesize and classify the impact dimensions of good deeds into four

concrete segments with tangible sub-indicators. All obtained baseline data will subsequently be utilized to establish operational definitions and compile system requirements, serving as the essential foundation for designing quest structures and score calculation algorithms on the 4WINs Impact platform to accurately align with and respond to the target audience's behavioral patterns.

Step 2: System Architecture Design and Development

This step involves translating the system requirements obtained from the first phase into a functional web-game architecture. The research team undertook the design of the system structure, database management, and user interface, integrating gamification mechanics via the PBL Triad framework consisting of points, badges, and leaderboards. A primary focus was placed on developing an algorithm based on the composite index formula to fairly calculate the scores earned from performing good deeds:

$$\text{Score} = \frac{R (\sum_{i=1}^4 I_i)}{W}$$

Where the variables and their relationships are defined as follows:

- R = Task difficulty rate
- I = Impact level of the good deed
- W = User capability baseline or competency level

Conceptual framework of variable W in the scoring system:

Variable W serves as a divisor to reflect the individual "rate of energy exertion and capability utilization.

- For users with high capability or expertise (higher W value): The system perceives the task as relatively easy for them, thus yielding a proportionally lower adjusted score.
- Conversely, for users with lower baseline capability (lower W value): If they successfully accomplish the same standardized task, the algorithm awards them a higher score, recognizing that they had to exert greater effort and leverage a higher proportion of their personal potential to overcome their limitations.

This scoring mechanism operates in tandem with data input controls featuring a two-tier verification measure. This measure mandates that users submit empirical photographic evidence coupled with active Global Positioning System (GPS) coordination in the real world (In Real Life: IRL). The system automatically screens and validates data accuracy prior to processing and distributing experience points (EXP), thereby preserving the construct validity of the indicators and preventing point exploitation within the system. Consequently, the outcome of this stage is the

prototype version of the 4WINs Impact platform, fully prepared for subsequent effectiveness testing.

Step 3: Implementation and Effectiveness Testing

This step involves deploying the prototype version of the 4WINs Impact platform with the target group of Thai children and youth aged 13–18 within designated pilot groups or areas for a specified duration. The research team gathers user behavior data via the platform's digital data logs, combined with administering assessment scales for prosocial behavior and public consciousness using a pre-test and post-test design to scientifically analyze and compare behavioral changes. A critical focus is placed on evaluating the effectiveness of gamification mechanics and location-based quest systems in modifying habit loops, thereby reducing aimless screen time and fostering youth engagement in real-world (In Real Life: IRL) volunteer activities. Ultimately, accumulated experience points (EXP) and quest completion statistics will be statistically processed to assess concrete development levels of positive behavior.

Step 4: Holistic Impact Evaluation and Feedback

This step focuses on evaluating the overall achievements and positive impacts generated following the conclusion of the platform's trial period. Prof. Dr. Kriengsak Chareonwongsak's 4-Win framework is utilized as the primary criterion to classify and analyze the outcomes, encompassing the Individual, Relational, Participatory, and Societal dimensions. Data collection is conducted through a mixed-methods approach, combining the analysis of quantitative accumulated score indices with qualitative assessments via focus group discussions with key stakeholders—namely children, youth, parents, and supervising teachers—to verify empirical behavioral changes in the real world (In Real Life: IRL). All obtained feedback will subsequently be processed to identify system limitations and development pathways for refining the system architecture, ensuring its completeness, precision, and capacity to sustainably drive the cultivation of public-minded habits in society.

Research result

Regarding the presentation of the research and development results for the 4WINs Impact platform and the quantitative good deed assessment system, the research team analyzed empirical data from the backend digital recording system (Data Logs) in conjunction with statistical processing results from a sample group of 16 youth aged 13–18 ($N = 16$), with the findings

scientifically categorized into three main sections to precisely align with the research objectives as follows.

1. Results of the Development of the 4WINs Impact Platform and the Quantitative Good Deed Assessment System

The research team successfully conducted research and development on the IRL (In Real Life) web game platform on the Streamlit operating system within the designated scope, with the system's core functions and statistical processing results presented as follows.

1.1 Control System Architecture and Prototype Application Windows

The User Interface (UI) comprises a login window ("Welcome Back") that supports Google Sign-In and a mission board ("Guest Board") for displaying real-world good deed quests categorized by challenge levels, while the gamification mechanics are visualized through the PBL Triad structure in the form of a level status bar ("Current Level") and accumulated experience points (+EXP). Furthermore, the two-tier verification system requires users to submit empirical photographic evidence alongside real-world geographical coordinates (GPS) within the area, enabling the backend Data Logs system to process and filter out falsified coordinates or redundant images with 100% accuracy.

1.2 Results of the Self-Assessment to Determine the Baseline User Capability Index (W: User Capability Baseline)

The scoring system extracted the W index from a 20-item self-assessment questionnaire (5-point rating scale: 5 = very easy, 1 = hardest) of a sample group of 16 youth to serve as a divisor database baseline, where the empirical data analysis yielded the item-level mean and standard deviation (S.D.) of the raw scores categorized across three behavioral dimensions, as shown in Table 1.

Table 1

Mean and Standard Deviation of the Sample Group's Self-Assessment Criteria (N = 16)

Item No	Dimensions and Items for Assessing Users' Baseline Life Characteristics	Mean	S.D.
Category	Knowledge (Item Weight = 0.667)		

Item No	Dimensions and Items for Assessing Users' Baseline Life Characteristics	Mean	S.D.
K1	I appropriately apply my knowledge and expertise to solve problems at work.	3.81	0.83
K2	I can apply knowledge from my work or related disciplines to develop my own work.	4.13	0.81
K3	I keep up with new knowledge and trends to adapt and prepare for changes.	4.13	0.89
Category	Skills (Item Weight = 0.04167)		
S1	I can connect information and analyze cause and effect to identify the root causes of problems.	3.94	1.06
S2	I propose new ideas or working methods to increase the efficiency and value of work.	3.56	1.21
S3	I can plan work by aligning my personal goals with organizational goals.	3.81	1.05
S4	I can work smoothly with individuals from diverse backgrounds and mindsets.	3.94	0.93
S5	I can manage conflicts and promote a positive working environment.	3.94	1.06
S6	I share knowledge and provide guidance to support the growth of my colleagues.	4.25	0.86
S7	I can communicate complex matters simply and clearly to others, both verbally and in writing.	3.69	1.25
S8	I listen to others' opinions open-mindedly without rushing to judgment, and correctly understand their needs.	4.44	0.73
S9	I can present information and negotiate to achieve mutually beneficial agreements.	4.00	0.89
S10	can plan, prioritize, and successfully complete work according to deadlines and standards.	3.75	1.18
S11	I can adapt and solve immediate problems when situations do not go according to plan.	3.94	1.12

Item No	Dimensions and Items for Assessing Users' Baseline Life Characteristics	Mean	S.D.
S12	I can choose to use new technologies or tools to make work faster and more precise.	3.69	1.14
Category	Lifestyle (Item Weight = 0.06)		
L1	I do not give up in difficult situations and try to find new ways to make work successful.	3.94	1.00
L2	I work transparently, keep my word, and take responsibility for the outcomes of my actions.	4.25	0.86
L3	I open-mindedly accept feedback to develop myself and continuously elevate my work quality.	4.50	0.73
L4	I have self-discipline, control my emotions, and maintain my own work standards without supervision.	3.88	1.15
L5	I open my mind to accept others, free myself from ego, and learn new things from everyone.	4.75	0.45
	Overall Mean Baseline User Capability Index of the Sample Group (Mean of W)	11.28	2.00

According to Table 1, the statistical data indicate that the sample group achieved the highest mean score in item L5 (Openly accepting others, releasing ego, and learning new things from everyone) at 4.75 (S.D. = 0.45) and item L3 (Openly accepting feedback to develop oneself and continuously elevate work quality) at 4.50 (S.D. = 0.73), reflecting that the target group exhibits prominent characteristics in intellectual open-mindedness, a positive attitude toward ego reduction, and a strong commitment to continuously enhancing their capabilities alongside others. Conversely, the lowest mean scores were recorded in item S2 (Proposing new ideas or working methods to increase the efficiency and value of work) at 3.56 (S.D. = 1.21) and item S7 (Ability to communicate complex matters simply and clearly to others, both verbally and in writing) at 3.69 (S.D. = 1.25), indicating that the target youth still require further support and development in cultivating creative initiative confidence as well as skills to synthesize and communicate complex narratives into tangible terms. When the item-level scores were weighted according to the algorithmic formula, the information system converted the points into an overall average baseline user capability index (W) of 11.28 (S.D. = 2.00), ranging from a minimum of 8.58 to a maximum

of 13.96 out of a full scale of 14.0 points, which effectively serves as a divisor to balance individual energy and exertion rates

2. Results of the Study on the Efficacy of the Web Game Platform in Promoting Participation and Positive Behaviors

Following a 4-week real-world (IRL) field trial of the prototype platform, the backend digital recording system (Data Logs) compiled a cumulative total of 4,293 behavioral evidence submissions and completed location-based good deed quests across all 21 core missions, revealing two key dimensions of efficacy as follows

2.1 Efficacy in Screen Time Reduction

Data log statistics clearly indicate that the platform successfully reduced the sedentary and aimless screen time of the experimental group of youth from an initial average of 9.0 hours per day (37.50%) to just 5.8 hours per day. This reduced screen time was systematically transformed into consistent, positive real-world behavioral activities, such as reviewing academic lessons (415 times) and exercising by walking around the field (389 times)

2.2 ประสิทธิภาพของสูตรคำนวณดัชนีชี้วัดรวมในการปรับพฤติกรรม

verifying the validity and precision of the backend algorithm in calculating the quantitative good deed composite index model under the core equation

$$\text{Score} = \frac{R (\sum_{i=1}^4 I_i)}{W}$$

The system successfully demonstrated stability and tangibly eliminated disparities within behavioral metrics. When comparing the net score outcomes from a simulation involving two users with distinct baseline user capabilities (\$W\$) who performed the same standardized mission—Mission 1: "Collect 10 pieces of trash around the public park," featuring a fixed task difficulty multiplier of $R = 1.5$ and a total impact score of sum $I = 15$ points—the empirical results showed the following:

- **For the user with limitations or the lowest baseline capability in the experimental group ($W = 8.58$):** the algorithm processed and calculated the accumulated score as **Score**

$$= \frac{1.5 (15)}{8.58} = 2.62 \text{ EXP}$$
- **while for the user with expertise or the highest baseline capability in the experimental group ($W = 13.96$):** the algorithm processed and adjusted the accumulated score to **Score**

$$= \frac{1.5 (15)}{13.96} = 1.61 \text{ EXP}$$

These numerical outcomes prove that the index variable W effectively functions as a proportional divisor to accurately and statistically reflect the "rate of individual energy exertion and potential utilization." Consequently, youth who must exert greater effort to overcome their personal limitations during real-world (IRL) good deed missions will receive higher motivational experience points than those who are already well-prepared, a mechanism that helps establish a balanced incentive system, induces a flow state, and encourages youth to sustainably maintain positive behaviors for the public good.

3. Results of the Evaluation of Positive Impacts on Children, Youth, Stakeholders, and Society under the 4-Win Conceptual Framework

The results of the mixed-methods data analysis conducted in conjunction with post-project focus group discussions involving key stakeholders (youth, parents, and supervising teachers) demonstrate that the holistic positive impacts realized in the real world (IRL) can be categorized into four distinct dimensions under the 4-Win conceptual framework as follows

3.1 Personal Win

The target youth group demonstrated distinct awareness and development in physical and spiritual well-being, cultivating health-conscious habits through walking exercises around the field and fostering a love for learning by spending free time reading in quiet corners of public parks (158 times), while the growing level status bar within the system delivered mastery experiences, enhanced self-efficacy, and shifted the attitudes of relatively quiet and introverted youth to find joy in voluntarily becoming "givers."

3.2 Our Win

The design of Group Quests and the Leaderboard successfully generated positive peer pressure within close networks of 2–3 friends, fostering social conformity to constructively maintain group status and transforming adolescent peer acceptance to focus on inviting one another to do good deeds and mutually appreciating values through digital badges

3.3 Cooperative Win

Bonds and relationships among the youth, families, and academic institutions exhibited prominent positive development, with supervising teachers and parents sharing qualitative feedback that the platform motivated youth to quietly assume responsibility and care for their surrounding institutions without expecting anything in return, such as switching off shared lights and air conditioning units in vacant classrooms after class to save energy (231 times) and

leveraging their knowledge to form study groups to summarize key takeaways and tutor classmates (112 times)

3.4 Public Win

Tangible spatial and environmental transformations occurred within the real-world (IRL) social ecosystem, rendering public spaces and parks in pilot communities cleaner and more visually appealing through trash collection quests (342 times) and wiping down public benches (124 times), while simultaneously creating a digital repository of enriching content (298 positive posts) and encouraging comments (311 times) that tangibly and sustainably restored mental well-being and reduced negative energy on social media platforms.

Conclusion

The operational results of the research and development of the 4WINs Impact platform and the quantitative good deed assessment system can be summarized according to the research objectives as follows

1. Platform and Assessment System Development: The research team successfully developed a stable IRL web game application on the Streamlit operating system, featuring a two-tier verification system (GPS + empirical photographic evidence) that prevented score fraud with 100% accuracy. Furthermore, the composite index equation algorithm processed data with high precision, where the sample group's overall baseline user capability index (W) achieved an average score of 11.28 (S.D. = 2.00), ranging from a minimum of 8.58 to a maximum of 13.96 points.

2. Efficacy in Promoting Positive Behaviors: The platform demonstrated behavioral science efficacy in drawing youth away from smartphone screens, successfully reducing screen time from an initial average of 9.0 hours per day (37.50%) to just 5.8 hours per day, and mobilizing a cumulative total of 4,293 real-world (IRL) voluntary and creative activities throughout the 4-week trial period.

3. Holistic 4-Win Impact Evaluation: The project generated positive ripple effects across all dimensions, showing that youth experienced improved physical and mental well-being as they transitioned into voluntary givers (Personal Win), social norms of accepting virtuous acts were established among close friend networks (Our Win), responsibility was enhanced to ease burdens within families and schools (Cooperative Win), and tangible environmental restoration of public parks was achieved alongside the cultivation of wholesome, positive online feeds (Public Win).

Discussion

Based on the research and development of the 4WINs Impact platform, the research team identified key insights that can be discussed in conjunction with behavioral science principles and theoretical concepts across three main areas as follows

1. Baseline User Capability Index (\$W\$) and the Flexibility of the Good Deed Scoring System:

The research findings in Section 1 indicate that the backend system architecture successfully calculated and extracted the sample group's average W index at 11.28 points, whereby users with lower baseline skills and lifestyle scores (low W value) received an accumulated score of 2.62 EXP, which was higher than well-equipped users (high \$W\$ value) who received 1.61 EXP for the same standardized mission. This mathematical mechanism strongly aligns with Bandura's (1977) Self-Efficacy Theory, which states that the real-time perception of empirical achievements (Mastery Experiences) serves as a primary driver in determining the amount of effort and persistence dedicated to challenging tasks, while also resonating with Csikszentmihalyi's (1990) Flow Theory, which posits that sustaining activity motivation is optimized when the level of challenge balances harmoniously with capability skills. Consequently, utilizing the W value as a divisor to reflect genuine individual energy exertion effectively shifts behavioral modification from external stimuli toward internal awareness, scientifically and equitably cultivating intrinsic motivation based on data science principles.

2. Behavioral Loop Modification from Digital Engagement to Real-World (IRL) Action

Field trial results prove that the platform successfully drew youth away from smartphone screens and reduced their screen time by 35.56% (from 9 hours to 5.8 hours per day), while simultaneously generating a record of 4,293 creative real-world activities. This phenomenon can be explained by Duhigg's (2012) Habit Loop Theory, which posits that habit-forming behaviors consist of three key components: a cue, a routine, and a reward. The 4WINs Impact system successfully transformed the "cue" from aimless consumption of online entertainment into location-based quest notifications, thereby reshaping the "routine" of the youth into performing quiet, independent good deeds in green spaces or public parks—such as reading books (415 times) and collecting trash (342 times)—before completing the loop by delivering a "reward" in the form of accumulated experience points (EXP) and digital badges. Furthermore, the outcome of

sustaining this prosocial behavior aligns with the research of Ranapurwala et al. (2016), which confirms that fostering real-world voluntary activities during adolescence plays a critical role in developing positive prosocial mindsets and reducing sedentary behaviors as they transition into adulthood

3. Holistic Ripple Effects under the 4-Win Conceptual Framework and Positive Social Norms:

The holistic impact evaluation indicates that the platform systematically diffuses the value of good deeds from the individual dimension to the social dimension under the 4-Win framework, particularly highlighted by behaviors such as switching off shared lights and air conditioning in schools (231 times) and forming study groups to tutor peers (112 times), both of which occurred voluntarily without coercion. This insight closely aligns with Steinberg & Monahan's (2007) concept of Peer Influence and Social Conformity, which posits that youth aged 13–18 are at a developmental stage most highly sensitive to social acceptance and status positioning among their peers. Since the system is designed with Group Quests and transparently displayed Leaderboards, these quantitative indices are successfully transformed into "positive peer pressure" that collectively establishes voluntary activities as the group's social norms. Consequently, the value of goodness based on the philosophy of civilized individuals ("The Good, The Beautiful, The True") by Prof. Dr. Kriengsak Chareonwongsak is tangibly applied, achieving success in molding the new generation of youth to grow into "good, smart, and courageous" citizens who can genuinely drive the development of a sustainable civilized society in the real world.

Recommendations

1. Educational Institutions and Youth Development Agencies: This IRL web game platform model and quest-based system should be adapted into extracurricular activities as a proactive tool for behavioral modification and the reduction of unproductive youth screen time, in tandem with participatory life skills assessments.
2. Nation-Building Network Organizations: Gamification mechanisms and good-deed experience point (EXP) accumulation should be integrated with supporting partner networks to allocate in-system cosmetic items or honorary badges, thereby creating continuous motivation for real-world good deeds.

3. Local Administrators and Communities: Location-based quests can be leveraged to incentivize youth to actively participate in resolving localized spatial issues, such as voluntarily maintaining cleanliness and collectively improving the environmental landscapes of public spaces.

Suggestions for Future Research

1. Longitudinal Study: The research period should be extended to 6 months or 1 year to evaluate the long-term sustainability of prosocial behaviors, assessing whether youth continue to perform good deeds consistently once external motivators—such as experience points (EXP) or digital badges—are removed.
2. Sample Expansion: Future studies should increase and diversify the sample size to include youth from various regions (such as urban and rural areas). The resulting statistical data can be used to refine item-specific weights and the baseline user capability index (W) algorithm, making it fairer and more universally standardized.
3. AI-Powered Photographic Verification (Computer Vision): Image classification technology should be integrated to automatically detect and approve photographic evidence of good deeds. This upgrade would efficiently accommodate a growing user base while significantly reducing backend administrator workload.
4. Social Return on Investment (Social ROI) Measurement: The application should be enhanced to convert empirical good deed statistics (such as the frequency of turning off shared lights or the volume of trash collected) into tangible economic indicators. This would demonstrate the project's overarching cost-effectiveness and value to better support local policy-making.

References:

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84(2), 191–215. <https://doi.org/10.1037/0033-295X.84.2.191>

Csikszentmihalyi, M. (1990). Flow: The psychology of optimal experience. Harper & Row.

- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification". In Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments (pp. 9–15). Association for Computing Machinery.*
<https://doi.org/10.1145/2181037.2181040>
- Duhigg, C. (2012).** *The power of habit: Why we do what we do in life and business.* Random House.
- Keeney, R. L., & Raiffa, H. (1976).** *Decisions with multiple objectives: Preferences and value trade-offs.* John Wiley & Sons.
- Laudon, K. C., & Laudon, J. P. (2022).** *Management information systems: Managing the digital firm (17th ed.).* Pearson.
- OECD. (2008).** *Handbook on constructing composite indicators: Methodology and user guide.* OECD Publishing.
- Ranapurwala, S. I., Casteel, C., & Peek-Asa, C. (2016).** *Volunteering in adolescence and young adulthood crime involvement: A longitudinal analysis from the Add Health study.* *Injury Epidemiology*, 3, Article 26. <https://doi.org/10.1186/s40621-016-0091-6>
- Ryan, R. M., & Deci, E. L. (2000).** *Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being.* *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Steinberg, L., & Monahan, K. C. (2007).** *Age changes in resistance to peer influence.* *Developmental Psychology*, 43(6), 1531–1543.
<https://doi.org/10.1037/0012-1649.43.6.1531>
- เกรียงศักดิ์ เจริญวงศ์ศักดิ์. (ม.ป.ป.). ดร.แดนเสนอ ความดีแท้. *Dr. Dan Can Do.* <https://drdancando.com/ดร-แดนเสนอ-ความดีแท้-คำนำ>/*Journal of Personality and Social Psychology*, 45(2), 357-376.