

KIRKPATRICK'S MODEL AS A FRAMEWORK FOR EVALUATING THE HEART ENLIGHTENMENT PROGRAM AT DARUL MUKHLISIN ISLAMIC BOARDING SCHOOL, PADANG LAMPE, UMI

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Abstract

This study aims to evaluate the Heart Enlightenment Program implemented at Darul Mukhlisin Islamic Boarding School, Padang Lampe, using the Kirkpatrick evaluation model at Level 1 (Reaction) and Level 2 (Learning). The evaluation focuses on participants' responses to the program and the changes in spiritual knowledge and understanding after participation. A qualitative research approach was employed, with data collected through in-depth interviews, participant observation, and document analysis. The participants consisted of 40 respondents, including students, boarding school administrators, mentors, and lecturers involved in the program. The findings at Level 1 show that most participants expressed positive reactions to the program, particularly regarding the relevance of the materials, the effectiveness of the instructional methods, the competence of the facilitators, and the supportive atmosphere for spiritual reflection. At Level 2, the results indicate that the program contributed significantly to enhancing participants' understanding of Islamic values, self-discipline, and awareness of the importance of closeness to God as a foundation for daily life. Overall, the findings suggest that the Heart Enlightenment Program has been effective in strengthening students' spiritual foundations and supporting the development of religious character within the campus environment. This study offers practical insights for improving the design and implementation of the Heart Enlightenment Program, particularly through strengthening instructional content, enhancing continuous monitoring, and ensuring the sustainability of the intended outcomes.

Keywords: Enlightenment Heart, Guidance Character, Kirkpatrick Evaluation

Abstrak

Penelitian ini bertujuan untuk mengevaluasi Program Pencerahan Hati yang dilaksanakan di Sekolah Islam Darul Mukhlisin, Padang Lampe, menggunakan Model Evaluasi Kirkpatrick pada Level 1 (Reaksi) dan Level 2 (Pembelajaran). Evaluasi ini berfokus pada tanggapan peserta terhadap program serta perubahan dalam pengetahuan dan pemahaman spiritual setelah mengikuti program. Pendekatan penelitian kualitatif digunakan, dengan data dikumpulkan melalui wawancara mendalam, pengamatan peserta, dan analisis dokumen. Peserta terdiri dari 40

responden, termasuk siswa, administrator pesantren, pembimbing, dan dosen yang terlibat dalam program. Temuan pada Level 1 menunjukkan bahwa sebagian besar peserta mengekspresikan reaksi positif terhadap program, terutama terkait relevansi materi, efektivitas metode pengajaran, kompetensi fasilitator, dan atmosfer yang mendukung refleksi spiritual. Pada Level 2, hasil menunjukkan bahwa program ini berkontribusi secara signifikan dalam meningkatkan pemahaman peserta tentang nilai-nilai Islam, disiplin diri, dan kesadaran akan pentingnya kedekatan dengan Tuhan sebagai landasan kehidupan sehari-hari. Secara keseluruhan, temuan menunjukkan bahwa Program Pencerahan Hati telah efektif dalam memperkuat fondasi spiritual mahasiswa dan mendukung pengembangan karakter keagamaan di lingkungan kampus. Studi ini memberikan wawasan praktis untuk meningkatkan desain dan implementasi Program Pencerahan Hati, terutama melalui penguatan konten pengajaran, peningkatan pemantauan berkelanjutan, dan memastikan keberlanjutan hasil yang diinginkan.

Kata kunci: Pencerahan Hati, Bimbingan Karakter, Evaluasi Kirkpatrick

INTRODUCTION

Universities play a crucial role in achieving national education goals, particularly in developing students' potential to become individuals who are faithful, pious, responsible, morally upright, healthy, creative, independent, and democratic. As the foundation of character development (Amalia, 2021), higher education institutions are responsible for shaping students as national assets and future leaders who will contribute to sustainable development (Thomas et al., 2023). Although students are expected to possess spiritual and social maturity upon entering higher education (Schaller et al., 2023), empirical evidence indicates that many students still demonstrate low levels of spiritual awareness and social responsibility (Labayo, 2022). This condition often leads to deviant behavior and interpersonal conflict within the campus environment. Consequently, character development programs have become an essential solution to address these challenges, with a particular focus on fostering individual moral and spiritual growth (Bahmani, 2021).

Character development aims to cultivate a strong moral foundation, enhance students' potential based on values of piety, and purify the inner self from negative knowledge, experiences, and behaviors in accordance with universal moral standards. Lickona (as cited in Samani) emphasizes that character development encompasses three dimensions: spiritual, physical (including strength, sensory function, and vitality), and psychological aspects (intellectual, creative, emotional, social, and attitudinal) (Banar et al., 2023). Similarly, Maragustam proposes a systematic and holistic character education model implemented through formal, informal, and non-formal education, consisting of seven interrelated components: habituation and acculturation, moral knowledge, moral feeling and affection, moral action, role modeling, and learning from mistakes (Hanna & Semple, 2024). Therefore, integrated development is essential to ensure the optimal growth of students' intellectual, emotional, and spiritual capacities.

The Muslim University of Indonesia (UMI) has long integrated religious-based approaches into its educational framework. This commitment is reflected in the establishment of the Padang Lampe Islamic Boarding School by the university's leadership, aimed at purifying students' hearts from post-reform euphoria and fostering

positive character development through the Heart Enlightenment Program. This program seeks to eliminate negative traits and strengthen students' closeness to Allah SWT (Pokhrel, 2024). To date, the Padang Lampe Islamic Boarding School has become an integral part of UMI, actively supporting the university's vision and mission through moral, character, and spiritually oriented educational programs.

The success of any educational program must be assessed through systematic evaluation to determine its effectiveness in achieving intended learning outcomes. Therefore, evaluating the Heart Enlightenment Program is essential to identify its strengths and weaknesses, guide program improvement, and enhance participants' knowledge and skills (Wang et al., 2024). One of the most widely used models for program evaluation in educational contexts is the Kirkpatrick Model. This model provides a comprehensive framework consisting of four levels: reaction, learning, behavior, and results or impact (Hanna & Semple, 2024). The application of the Kirkpatrick Model in evaluating the Heart Enlightenment Program enables the assessment of program effectiveness in terms of participant satisfaction and learning outcomes (Farahangiz et al., 2025).

Previous studies demonstrate the relevance and widespread application of the Kirkpatrick Model in evaluating various educational and training programs (Antoun et al., 2023). For example, the model has been used to evaluate civil servant development programs in the Ministry of Religious Affairs (Rasyid & Mania, 2025), special religious training programs at Islamic universities (Fakhruddin, 2022), and language and religious programs in Islamic boarding school settings. These studies confirm the model's applicability across diverse contexts, although challenges remain in measuring long-term impact (Thangasamy et al., 2021).

In the context of the Heart Enlightenment Program at Darul Mukhlisin Islamic Boarding School, program evaluation focusing on participant reactions and learning outcomes is expected to provide a clear depiction of implementation effectiveness (Sari & Anugraheni, 2022). Therefore, this study aims to collect valid and comprehensive evaluation data to measure participant satisfaction and learning improvement, ultimately contributing to the development of a more effective and sustainable Heart Enlightenment Program. This research is expected to offer both scientific and practical contributions to character development initiatives and provide measurable recommendations for other higher education institutions.

Based on this background, the present study evaluates the Heart Enlightenment Program at Darul Mukhlisin Islamic Boarding School using the Kirkpatrick Model, focusing specifically on Level 1 (Reaction) and Level 2 (Learning). The research seeks to answer the following questions: (1) How do participants respond to the implementation of the Heart Enlightenment Program in terms of materials, methods, and facilitators (Reaction level)? and (2) How does participation in the program influence students' knowledge, attitudes, and skills related to spiritual and character development (Learning level)? Through this evaluation, the study aims to provide strategic recommendations for improving the effectiveness of character education programs within Islamic higher education institutions.

METHOD

This study employed an evaluative research design using a qualitative approach to assess the effectiveness of the Heart Enlightenment Program implemented at Darul Mukhlisin Islamic Boarding School, Padang Lampe. The Kirkpatrick Evaluation Model was adopted as the evaluation framework due to its comprehensive structure, which enables the assessment of training and educational programs across multiple levels, including participants' reactions, learning outcomes, behavioral changes, and overall results (Darodjat & Wahyudhiana, 2015). The qualitative approach allowed the researchers to obtain an in-depth understanding of participants' experiences, perceptions, and learning processes within the Heart Enlightenment Program. Specifically, this study focused on Level 1 (Reaction) and Level 2 (Learning) of the Kirkpatrick Model to describe participants' satisfaction with the program and the extent to which learning outcomes were achieved. Through this approach, the study provides a detailed depiction of participants' responses and learning improvements resulting from their involvement in the program (Darodjat & Wahyudhiana, 2015).

Data Sources

This study utilized both primary and secondary data sources. The primary data were obtained from the main respondents, namely student participants of the Heart Enlightenment Program, totaling 40 students. These participants belonged to the seventh cohort of the program and represented several faculties, including the Faculty of Fisheries and Marine Sciences and the Faculty of Engineering. The student participants were expected to provide information regarding their reactions, learning experiences, and perceived changes after participating in the Heart Enlightenment Program.

In addition to students, leadership elements and teaching staff—including the boarding school director, deputy directors, and supervising lecturers—served as supporting informants. Their involvement provided complementary perspectives on the program's implementation process and outcomes. Secondary data consisted of institutional documents related to the Heart Enlightenment Program, such as program guidelines, curricula, reports, and other relevant records that supported the focus of this study.

Table 2. List of Informants

NO.	INFORMANT CATEGORY	NUMBER	DESCRIPTION
1	Students/Participants	40	Participants in the Heart Enlightenment Program
2	Boarding School Director	1	Program coordinator and main authority
3	Deputy Directors	4	Assistant coordinators in program implementation
4	Supervisors/Teaching Lecturers	4	Program instructors and facilitators
	Total	49	

Data Collection Procedures

Data were collected using several qualitative techniques. First, structured interviews were conducted with selected respondents. In addition, in-depth interviews were employed to obtain richer and more detailed information from key informants selected through purposive and snowball sampling techniques. Second, participant observation was carried out to capture direct insights into the implementation of the Heart Enlightenment Program within the boarding school setting. Third, documentation analysis was conducted by reviewing official documents from Darul Mukhlisin Islamic Boarding School and collecting visual records of program activities related to character development (Lee & Song, 2021).

Data Analysis

The data analysis process was conducted continuously throughout the research, from data collection to the completion of the study. The analysis followed three main stages. First, data reduction was carried out by selecting, organizing, and filtering data relevant to the focus of the program evaluation. This process involved summarizing interview transcripts, observation notes, and documents. Second, data were presented in narrative form to systematically describe and interpret the findings. Third, conclusions were drawn and verified through the researcher’s interpretation of data obtained from interviews, observations, and document analysis. The final results were then aligned with the research questions to ensure coherence and analytical rigor (Sarosa, 2021).

Validity and Trustworthiness

To ensure the validity and trustworthiness of the findings, this study employed data source triangulation by comparing information obtained from student participants, instructors, and program documents. In addition, member checking was conducted by returning interview results and preliminary interpretations to selected respondents to confirm the accuracy and credibility of the findings (Malik Ibrahim, 2018).

Table 2. Evaluation Indicators and Criteria of the Heart Enlightenment Program Based on the Kirkpatrick Model

EVALUATION LEVEL (KIRKPATRICK)	EVALUATED ASPECT	EVALUATION CRITERIA	DATA SOURCES	DATA COLLECTION METHODS
REACTION	Participant satisfaction and response to the program	Relevance of the program content to participants’ spiritual needs and the learning atmosphere	Students/Participants	Interviews, Documentation

	Participants' perceptions of program implementation	Participants' evaluations of facilities, services, discipline, cooperation, and responsiveness of program management	Students/Participants	Questionnaires, Interviews, Observations, Focus Group Discussions (FGDs), Documentation
	Participants' perceptions of materials and facilitators	Participants' evaluations of teaching skills, mastery of materials, ethics, attitudes, communication skills, and motivational ability of facilitators	Students/Participants	Questionnaires, Interviews, Observations
LEARNING	Knowledge improvement	Increased understanding of the concept of heart enlightenment, positive attitudes toward religious values, and ability to engage in self-reflection	Participants, Facilitators	Pre-test and Post-test, Written Reflections, Observations
	Skill development	Participants' ability to apply newly acquired skills taught in the Heart Enlightenment Program	Students/Participants	Practical Tests, Observations, Assignments
	Attitudinal change	Participants' seriousness, consistency, and commitment in completing the Heart	Students/Participants	Observations

RESULTS AND DISCUSSION

This study presents the findings of the evaluation of the Heart Enlightenment Program implemented at Darul Mukhlisin Islamic Boarding School, Padang Lampe. The evaluation focused on Level 1 (Reaction) and Level 2 (Learning) of the Kirkpatrick Model, which provides a systematic framework for measuring participants' satisfaction, responses, and learning outcomes resulting from program implementation.

Evaluation data were obtained primarily from in-depth interviews with key stakeholders, including students, boarding school directors, supervisors, and lecturers. In addition, direct observations were conducted at the Islamic boarding school to gain a comprehensive understanding of the program's implementation process. Document analysis, including program syllabi and institutional policies, was also employed to strengthen the validity of the findings. Data triangulation was applied to ensure that the results were supported by strong empirical evidence from multiple sources.

The presentation of findings aims not only to identify the strengths and weaknesses of the program but also to serve as a basis for formulating future improvement strategies. Drawing on participants' lived experiences and direct field observations, this evaluation is expected to provide constructive feedback for the further development of the Heart Enlightenment Program in supporting character education at the Muslim University of Makassar. Based on the qualitative approach, the findings are presented as follows.

Evaluation of Reaction Level

The evaluation results at the reaction level indicate that participants generally demonstrated high levels of satisfaction and positive responses toward the Heart Enlightenment Program. As shown in Table 3, all evaluated indicators—participants' satisfaction, perceptions of program implementation, and perceptions of materials and facilitators—met the achievement criteria.

Participant Satisfaction and Response to the Program

The findings show that the majority of participants expressed very positive responses to the implementation of the Heart Enlightenment Program conducted by the Muslim University of Indonesia (UMI) as part of its student character development initiative. Approximately 90% of participants stated that they were satisfied with the overall implementation of the program.

A deeper analysis through data triangulation revealed consistent perspectives among directors, lecturers, and students. The Director of the Islamic boarding school stated that the Heart Enlightenment Program is a compulsory program for all UMI students, as it constitutes a six-credit compulsory course designed to strengthen students' spiritual and moral character. Similarly, student informants (AR and AA) expressed strong support for the program, describing it as a new and valuable experience that contributed positively to their personal development.

However, some participants, particularly those with general high school (SMA) backgrounds, initially expressed resistance to the program. Students IN and NA noted that they felt burdened by the one-month boarding requirement, as they were not accustomed to a pesantren-based educational environment. This finding highlights the importance of considering participants' diverse educational backgrounds in program implementation.

Document analysis further supports these findings. The syllabus of the Heart Enlightenment Program (6 credits) outlines objectives focused on enhancing spiritual awareness, ethical development, social responsibility, and Islamic leadership grounded in religious values. Learning methods include classroom instruction, intensive boarding school activities, reflective reports, and final examinations. Additionally, institutional policies based on the Rector's Decree mandate the program as part of UMI's curriculum to produce graduates with strong Islamic character.

Overall, the consistency of information from directors, supervisors, lecturers, and students indicates a high level of acceptance and satisfaction with the program, despite initial concerns from some participants.

Satisfaction with Program Implementation

Participants evaluated the implementation of the Heart Enlightenment Program positively, particularly in terms of material relevance, facilities, training methods, and program scheduling. These aspects contributed to a conducive learning environment that enhanced participants' motivation and reduced feelings of boredom or fatigue during the program.

Supervisors emphasized the adequacy of facilities provided at the Islamic boarding school, including mosques, classrooms, dormitories, health clinics, kitchens, and sports facilities. Lecturers also highlighted strong coordination among stakeholders to create a peaceful and supportive learning atmosphere. Student informants confirmed these observations, noting that the facilities were well-prepared and managed in an orderly manner.

Interestingly, students who had no prior experience in a boarding school environment reported a shift in perception. Initially apprehensive, they later described the environment as refreshing and supportive of personal growth. Observational data further revealed high attendance rates and active participation in religious studies, group discussions, worship practices, and leadership training, although some students considered the program duration relatively long.

Overall, participants expressed satisfaction with facilities, services, discipline, cooperation, and responsiveness of program organizers, reinforcing the program's effectiveness at the reaction level.

Satisfaction with Materials and Facilitators

The evaluation results also demonstrate high participant satisfaction with program materials and facilitators. Participants appreciated the relevance of the materials to their

spiritual needs, including habituation practices, moral advice, contemplation, and the use of *targhib* and *tarhib* approaches to foster spiritual awareness and moral responsibility.

Participants reported feeling supported through religious activities such as collective prayers, *dhikr*, moral instruction, and self-reflection sessions, which enhanced their comfort and motivation. Active involvement of lecturers and stakeholders facilitated meaningful interactions, enabling participants to openly discuss and share personal experiences. This reciprocal interaction reflects a positive learning climate and effective facilitation.

Supervisors explained that the program materials were intentionally designed to address spiritual, emotional, and social dimensions through religious studies, group discussions, worship practices, and routine *dhikr* activities conducted over 30 days. Observational findings confirmed high levels of participant engagement during discussions and question-and-answer sessions. Many students reported gaining new insights into Islamic values and the importance of character formation grounded in religious principles.

Furthermore, facilitators demonstrated strong instructional competence, exemplary behavior, and responsiveness to students' needs, contributing to a supportive and conducive learning environment. Although some participants suggested technical improvements to optimize learning facilities, overall satisfaction with materials and facilitators remained high.

Figure 5. Activities at the Mosque (Congregational prayer, Dhikr and Wirid)



Figure 6. Activities in Class (Learning) Material Aqidah , Sharia, Morals , Asmaul Husna



Level 2 - Learning (*Learning*)

The Level 2 evaluation focused on changes in participants' understanding, attitudes, and skills after completing the Heart Enlightenment Program. Data were collected through in-depth interviews, direct observations, and analysis of participants' reflective writings. The achievement criteria for the learning dimension are presented in Table 7.

Table 7. Evaluation Based on Learning Criteria

NO	INDICATOR	ACHIEVEMENT
1	Improvement in Knowledge	✓
2	Attitudinal Change	✓
3	Development of Skills	✓

Improvement in Understanding

Observational findings during the implementation of the Heart Enlightenment Program indicate a noticeable improvement in students' religious understanding. Participants demonstrated increased involvement in religious activities, such as congregational prayers, Qur'anic recitation (*tadarrus*), and group discussions. Furthermore, students were able to articulate key spiritual concepts, including *tazkiyatun nafs* (purification of the soul), the central role of the heart in guiding daily behavior, and the importance of *muhasabah* (self-reflection).

These observations were supported by interview data. Student informants NS and MB stated that after participating in the program, they had a deeper understanding of Islamic teachings and correct worship practices, and felt more confident in applying religious values in their daily lives. Similarly, students GA and SS acknowledged that although they initially resisted the program, they later experienced meaningful changes in worship practices and social behavior, including increased discipline, cooperation, and concern for fellow students.

Attitudinal Change

The evaluation also revealed positive shifts in participants' attitudes. Observational data showed improvements in discipline, particularly in worship routines, as well as heightened awareness of applying spiritual values in everyday activities. Students demonstrated greater responsibility, respect for others, and willingness to cooperate in communal activities. These findings were reinforced by interview statements from students GA and SS, who reported improvements in social attitudes, discipline, and mutual care following their participation in the program.

Development of Student Skills

In terms of skill development, several participants began to practice reflection and self-control techniques introduced during the program. Although some students indicated that they still required guidance to maintain long-term consistency, early signs of behavioral application were evident. Students PS and SI reported that they had started to cultivate positive behaviors, such as helping one another, maintaining cleanliness, and showing

mutual respect. These practices indicate the emergence of self-regulation skills fostered through the Heart Enlightenment Program.

Overall, the findings from observations and interviews suggest that participants experienced significant learning outcomes during the program. Improvements were evident in their understanding of Islamic teachings, attitudinal development, and the application of positive values in daily life. These results confirm the effectiveness of the program at the learning level of the Kirkpatrick Model. The evaluation results of the Heart Enlightenment Program at Darul Mukhlisin Islamic Boarding School, Padang Lampe, demonstrate that the Kirkpatrick Model is an effective framework for comprehensively assessing program success. The model encompasses four levels of evaluation reaction, learning, behavior, and results which systematically describe both the implementation process and the impact of training programs (Kirkpatrick & Kirkpatrick, 2006).

This study focused specifically on Level 1 (Reaction) and Level 2 (Learning). The findings indicate that the program was well received by participants and succeeded in enhancing their spiritual understanding, attitudes, and practical skills. The positive outcomes at these two levels suggest that the Heart Enlightenment Program has established a strong foundation for further behavioral and long-term outcomes, which may be explored in future evaluations.

Reaction

The research findings indicate that the majority of participants expressed positive responses to the implementation of the Heart Enlightenment Program, particularly in relation to the program content, instructional methods, facilitators, and the overall atmosphere that supported spiritual reflection. Data obtained from interviews and observations show that students were satisfied with the learning materials, which were perceived as relevant, meaningful, and applicable to their daily lives. In addition, facilitators were viewed as communicative, competent, and capable of creating a conducive learning environment. Nevertheless, several participants reported reservations regarding the program's duration and the requirement to reside in the boarding school for an extended period. These concerns suggest the need for adjustments in program implementation to make it more adaptive to participants' conditions and backgrounds, without diminishing the core objective of character development.

These findings are consistent with Kirkpatrick's theory, which emphasizes that positive participant reactions serve as an initial indicator of program success, as satisfaction enhances motivation and engagement in subsequent learning processes (Noviar, 2024). Previous studies have also highlighted the importance of reaction-level evaluation as a foundational step in assessing the early effectiveness of training and character development programs. For instance, research on the evaluation of character improvement and organizational capacity development using the Kirkpatrick Model for cooperative administrators in Banjarmasin demonstrated that positive reactions significantly contribute to the sustainability of learning outcomes (Ratumbusyang, Budimasnyah, Atomo, & Nurdin, 2024). Therefore, the favorable reactions observed in

this program constitute an important foundation for the success of the subsequent learning stages.

Learning

At the learning level, the findings indicate that the Heart Enlightenment Program had a significant impact on improving participants' understanding of Islamic values, self-control, and spiritual closeness to God. Interviews and observational data reveal clear changes in participants' knowledge, skills, and attitudes following their involvement in the program. Students demonstrated a deeper understanding of Islamic concepts and worship practices, accompanied by more disciplined, caring, and cooperative social behaviors.

These findings align with the learning dimension of the Kirkpatrick Model, which focuses on the extent to which participants acquire intended knowledge, skills, and attitudinal changes as a result of the program. The results are consistent with previous studies, such as Syaifudin, Muhajir, Firmansyah, and Prayoga (2025), which emphasize that spiritually based programs are effective in enhancing both knowledge and practical skills among participants. Moreover, the observed improvements in understanding and attitude indicate that participants experienced meaningful internalization of the program's values.

The improvements in understanding, attitudinal change, and practical application of values demonstrate that the Heart Enlightenment Program was successfully embedded within participants' personal development. This supports the literature asserting that learning outcomes in the Kirkpatrick Model are not limited to cognitive gains, but also encompass value internalization and observable behavioral tendencies in daily life (Ratumbusyang et al., 2024). Consequently, the evaluation results at the learning level reinforce the view that structured, spiritually oriented character development programs can produce sustainable impacts on students' character formation and integrity. Furthermore, the program's success was supported by interactive instructional methods and learning materials that were relevant to participants' needs, as recommended in effective program evaluation practices.

CONCLUSION

Based on the evaluation of the Heart Enlightenment Program at the Darul Mukhlisin Islamic Boarding School, Padang Lampe, using the Kirkpatrick Model, it can be concluded that the program has successfully enhanced students' knowledge and skills, particularly in fostering spiritual understanding and initiating positive behavioral change. The findings indicate that students were generally satisfied with the program's implementation, which was systematically organized, supported by relatively adequate facilities, and delivered through appropriate materials and instructional methods. These factors contributed to the development of a deeper understanding of the concept of Heart Enlightenment among participants. Despite these positive outcomes, several constraints were identified, including the need for improved facilities and greater attention to participants' diverse backgrounds and needs. Such factors may influence the optimization and sustainability of program outcomes. Nevertheless, the positive impacts of the Heart

Enlightenment Program are already evident, as reflected in improved understanding and attitudinal changes, suggesting that the learning process was effective and has begun to influence participants' behavior.

This study primarily evaluated the program at Level 1 (Reaction) and Level 2 (Learning) of the Kirkpatrick Model, which presents certain limitations in terms of data scope and generalizability. In addition, time constraints limited the depth of observation and longitudinal follow-up. Therefore, future studies are encouraged to extend the evaluation to Level 3 (Behavior) and Level 4 (Results) in order to provide a more comprehensive assessment of the program's long-term effectiveness and impact. Therefore, a collaborative approach involving psychologists, data scientists, policymakers, and legal practitioners is needed to design an assessment framework that is not only technologically advanced but also aligned with the principles of ethics, transparency, and fairness. In the future, further research needs to be directed towards developing Big Data-based personality assessment methods that are adaptive to cultural contexts, sensitive to individual diversity, and accountable in their use in various fields, such as education, mental health, and human resource management.

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