



# Evaluation of in-Service Teacher Profession Education Program: Antecedent, Reaction, Learning, Behavior, Outcomes (ARLeBO) Approach

Riyadi Riyadi<sup>1,\*</sup>, Daryanto Daryanto<sup>2</sup>, Imam Mahir<sup>3</sup>, Faisal Madani<sup>1</sup>

<sup>1</sup> Graduate School Program, Universitas Negeri Jakarta, Jakarta, Indonesia

<sup>2</sup> Teacher Profession Education Program, Universitas Negeri Jakarta, Jakarta, Indonesia

<sup>3</sup> Mechanical Engineering Education Study Program, Faculty of Engineering, Universitas Negeri Jakarta, Jakarta, Indonesia

\* Email: [riyadi@unj.ac.id](mailto:riyadi@unj.ac.id)

## ABSTRACT

The purpose of this study was to evaluate the implementation of the in-service teacher professional education learning model in 2022 and whether the designed model is following the objectives of online learning and societal expectations in increasing teacher competence. The research method uses an evaluation method with a qualitative and quantitative approach. The evaluation model uses a combination of Content Stake and Kirkpatrick models. The research samples were studied program coordinators, lecturers, tutors, and in-service teacher professional education students at Jakarta State University in 2022 Phase 1. Data collection used questionnaires, interviews, and documentation. Instrument validation uses internal, construct, and empirical validity. Instrument reliability testing uses internal reliability with internal consistency. This evaluation research shows that lecturers and tutors must optimally utilize the Learning Management System (LMS) in online learning. The results of this study also show that there has remained a significant change in teacher competence from students who have passed in-service teacher profession education.

**Keywords:** Program Evaluation, In-service Teacher Profession Education, Online Learning.

## 1. INTRODUCTION

The In-service Teacher Professional Education Program (PPG Daljab) is present to produce certified and professional teachers in their field. Based on the Regulation of the Director General of Teachers and Education Personnel of the Ministry of Education and Culture concerning the Technical Guidelines for the In-service Teacher Professional Education Program, it states that PPG Daljab aims to produce teachers as professional educators who fear God Almighty and have a noble character, knowledge, adaptive, creative, innovative, and competitive with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students. The PPG Daljab implementation initially involved a face-to-face (offline) and blended learning process. However, since the Covid-19 pandemic, the learning process has become virtual face-to-face (online) through the Learning Management System (LMS).

PPG Daljab learning online requires information and communication technology (ICT) and internet devices. E-learning has fixed its roots, especially in the field of modern education. The needs of modern learners are very different, and E-learning has proven useful for meeting their needs. There are still a lot of unclear concerns that need to be cleared and researched, but e-learning programs and courses are here to stay and will become more popular in the future. Students should carefully evaluate these points to ensure that they receive an online course that suits their unique requirements, skills, and professional objectives [1].

In online learning, according to Ministry Education, Culture, Research and Technology Regulation number 3-year 2020, the characteristics of interactive, holistic, integrative, scientific, contextual, thematic, effective, collaborative, and student-centred learning must be developed by lecturers. Can online learning be carried out according to the Minister of Education and Culture?

Implementing online learning during the Covid-19 pandemic is a challenge due to the unpreparedness of human resources, facilities and infrastructure, and support systems. The learning of the PPG Daljab program, which was initially carried out face-to-face (offline), has changed since the beginning of the pandemic to become online learning through the Learning Management System (LMS). During 2022, the PPG Daljab learning was carried out online. Regarding pandemic conditions, e-learning methods are simple to manage and encourage student-centred learning [2].

The important aspects in stimulating student activity in learning are (1) collaborative, social, passive, and corporate communication, (2) corporate learning, (3) support, and (4) written/informative activities [3]. Online learning is more flexible and cost-effective than traditional teaching and learning. Through online learning, students have more access to educational resources than in the past. However, there are drawbacks of online learning that relate to the misuse of technology, the adaptation of successful technology-based instruction to effective teaching methods, and bad practices in the administration of the assessment and evaluation processes of learning [4]. It is necessary to evaluate the learning process, learning models, learning methods, learning techniques, and the availability of online learning infrastructure for PPG Daljab to see the effectiveness of implementing online learning.

The online PPG Daljab learning pattern is still needs to improve, especially in the availability of internet networks in areas far from urban areas, especially in Eastern Indonesia. The Internet connection problems are often experienced by students from areas with very limited internet access. It is necessary to evaluate the learning process, learning models, learning methods, learning techniques, and the availability of online learning infrastructure for PPG Daljab to see the effectiveness of implementing online learning. Other problems that can be identified are (1) the digitization of learning tools is still not optimal, (2) the abilities of lecturers and tutors in online learning vary widely, (3) the use of IT in online learning is not optimal, (4) students are not familiar with online learning and its tools, and (5) academic support staff have not fully mastered the concept of online learning.

Evaluation of the Daljab PPG program needs to be carried out so that the constraints experienced by the organizers, students, and school partners can be identified as a means of learning practice. This evaluation uses the Antecedent, Reaction, Learning, Behavior, Outcomes (ARLeBO) approach. This study uses a mixed model between the Content Stake and Kirkpatrick models to identify and justify the problems and PPG Daljab implementing data in 2022.

The aims of this study were: (1) to find out the ideal conditions for PPG Daljab online learning following the

established criteria, (2) to analyse the obstacles, weaknesses, and advantages of the PPG Daljab program in 2022, (3) to design a PPG Daljab learning model that fits the concept of online learning, and (4) produce a picture or pattern of implementing PPG Daljab following the characteristics of uncertified teachers with ideal learning environment conditions.

### ***1.1. Online Learning***

Online learning (e-learning) is an innovative approach to conveying information using electronic media, which will increase students' knowledge, skills, and performance. Online learning influences transforming conventional education into a digital form in content and system. At present, the world community has widely accepted the concept of online learning, as evidenced by the increasing trend of e-learning implementation in educational institutions [5].

The attractiveness of online learning, apart from appearance, user-friendliness, interaction skills, language, and completeness of the program, is also its ability to maintain students' motivation [6]. All these advantages allow for better student engagement, faster learning in shorter periods, and encourage knowledge retention. Although e-learning has various advantages and has an increasing trend in its use, many universities that provide e-learning face great difficulties in achieving strategic success, including the delivery, effectiveness, and acceptance of learning materials [7]. Yogyakarta Atmajaya University has been implementing online learning since 2007, using Moodle as the basis for its manufacture. However, after running for over 8 years, the users have only reached 40% of the total students [8]. The quality of the learning process, accessibility (including academic, technological, and administrative assistance), faculty satisfaction, and student satisfaction all play a role in how successful online learning is [9].

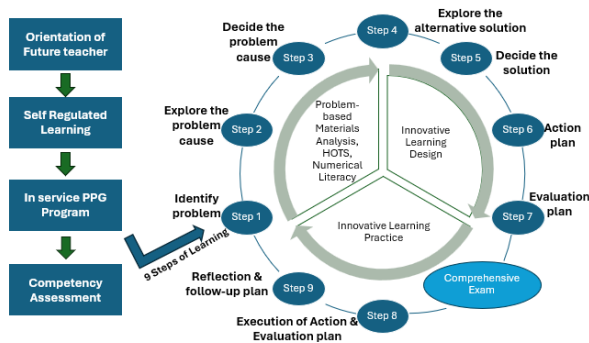
Based on the description above, various challenges must be faced by e-learning users, affecting the success of online learning. With the various advantages of using e-learning in the learning process, there are two important things: the history of the development of e-learning and the factors that support the successful use of online learning. In addition, the online learning model could be unsuitable for practical courses in laboratories. This problem is due to the unavailability of virtual laboratories for practical courses and subject competencies, which are very complex in certain skills.

### ***1.2. In-service Teacher Professional Education Program***

In-service PPG learning consists of four activities: (1) orientation about future teachers, (2) self-regulated learning, (3) main activities in the form of problem-based learning analysis, literacy, numeracy, and higher-order

thinking skills; innovative learning designs; and innovative learning practices, and (4) competency tests in the form of knowledge and performance tests. The four activities carried out substance improvements by integrating the latest issues regarding the future development of the nation and state, education, learning, and technology. The PPG Daljab program currently integrates a learning problem-solving approach. The PPG Daljab design can be seen in Figure 1.

Orientation materials and approaches to future teachers are emphasized to inspire further teachers towards contemporary concepts of education and the role of schools in building the nation's generation. The material on teacher role strategies in the future was developed using a slow thinking and growth mindset approach; this will change the mindset of teachers to become professional educators, not just ordinary jobs. Therefore, in the program, the materials, processes, presentation techniques, and presenters must have a minimum eligibility standard. This activity is carried out with measurable, structured, and systemic outputs accompanied by an assessment instrument or rubric.



**Figure 1** The Learning Design of In-service Teacher Professional Program

Independent learning activities are carried out for 3 (three) purposes: (1) to train students for independent learning, (2) to prepare students to have an entry-level that is appropriate to both subject matter and pedagogics, and (3) to equip students to pass on independent learning to their students. Also, independent learning is facilitated by the Directorate General of Teachers and Education Personnel (GTK) by providing opportunities for prospective students to access existing modules in the LMS. For this activity to be right on target, bills or output must be measurable, structured, and systemic, accompanied by an assessment instrument or rubric.

The main activities of the PPG Daljab program are in the form of analysis of learning materials, innovative learning designs, and practices, designed and implemented using a root cause analysis approach consisting of 9 (nine) steps. The entire activity uses a root cause analysis approach and integrates material analysis, learning design, and practice into one complete stage. Therefore, implementing this approach involves 3 (three)

integrated components. First, a change in mindset from a reflective mindset → to a change mindset → a growth mindset. Second, integrating abilities to become independent learners, ICT literacy, and language skills. Third, integrating the "OECD Learning Compass 2030" competencies, namely transformative competencies, creating new values, reconciling tensions and dilemmas, and taking responsibility.

### 1.3. Evaluation Model

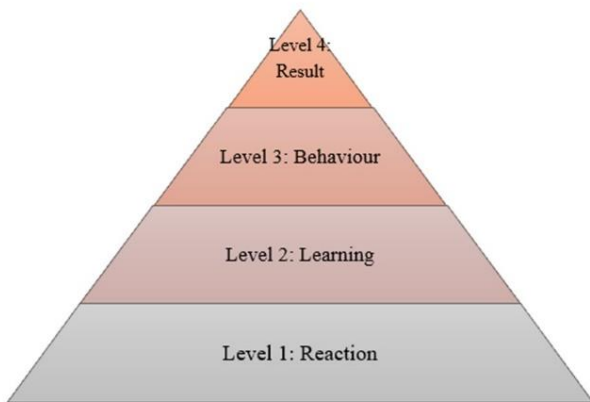
This research combines the Countenance Stake and Kirkpatrick models to develop the ARLeBO (Antecedent, Input, Transaction, Product, Outcomes) evaluation model. Combining the Countenance Stake and Kirkpatrick evaluation models is a complementary approach to evaluating the PPG Daljab program. Combining the two models can provide a thorough and in-depth evaluation and comprehensive and complementary recommendations for program sustainability.

#### 1.1.1. Kirk Patrick Evaluation Model

In the Kirkpatrick evaluation model, four stages are carried out in a training program, representing the sequence of evaluation methods. Every stage is important and has an impact on the next level. As you move from one stage to the next, the process becomes more difficult and time-consuming, but it also provides more valuable information. There is no single stage that must be passed to reach the stage that is considered the most important by a trainer/facilitator/or decision-maker. The four stages are reaction, learning, behaviour, and result. At the reaction stage, how the reaction and satisfaction of the participants towards the training were measured. The program is effective if the training process pleases the participants to be interested and motivated to learn and practice.

Conversely, if participants are not satisfied with the training process they are participating in, they will not be motivated to participate in further training [10]. Furthermore, the second stage is learning; at this stage, it is seen how the learning process of the training participants is; at the learning evaluation stage, it can be seen changes in attitude, improvement in knowledge, and or improvement in the skills of the participants after completing the training. Training participants are said to have learned if they have experienced a change in attitude, improved knowledge, or skills. These three aspects need to be measured to measure the effectiveness of training. Without a change in attitude, increased knowledge or improved skills of the training participants, the program can be said to have failed [11]. After that, the third stage is behaviour, this stage is seen how the behaviour of the trainees in their work environment after attending the training. At the behaviour evaluation stage,

this can be done by: (1) comparing the behaviour of the control group with the behaviour of program participants, (2) comparing behaviour before and after joining the program as well as, (3) using surveys/interviews with trainers, superiors, and subordinates of program participants after returning to work [11]. Moreover, the fourth is the result stage; at this stage, it is seen how the training results are, what is meant by results is the achievement of the training, and whether the program is implemented as expected, including capabilities, achievements, attitudes and goals. The stages in Kirkpatrick's evaluation model can be seen in Figure 2.



**Figure 2** The Stages of Kirk Patrick Evaluation Model

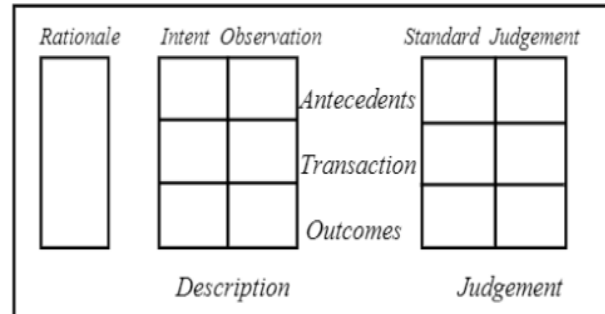
The application of Kirkpatrick's evaluation model to program is useful for (1) identifying critical performance levels, (2) eliminating or modifying ineffective programs, (3) ensuring the wise use of costs, and (4) increasing organizational impact [12]. The simplicity and ease of understanding Kirkpatrick's concept is a benefit. However, this technique also has limits when used by assessors in complex higher education contexts. By including contextual information and establishing causal linkages between levels, evaluators should consider a more suitable approach when applying Kirkpatrick's model in higher education [13]. To reduce this model's shortcomings, researchers integrate Kirkpatrick's model with other evaluation methods.

*1.1.1.2. Stake Countenance Evaluation Model*

The Countenance Stake evaluation model developed by Stake is a type of program evaluation considered sufficient to assess a complex program, activities and results [14] [15]. The content Stake evaluation model emphasizes the existence of two basic activities in evaluation, namely description and judgment and distinguishes the existence of three stages in educational programs, namely antecedent (context), transaction (process) and outcomes [16]. The description includes the purpose (intent) and the actual conditions during the

training (observation). In contrast, the considerations include the benchmarks that should be (standards) and considerations for decisions (judgments). In the description and consideration, there are three stages, namely: 1) antecedent (context; a condition that existed before instructions related to results), 2) transaction (process), which is the process of activity instructions, and 3) outcomes (results), the effect from experience, observation and results of work [17]. At the antecedent stage, it was observed how the program objectives and inputs were achieved through the training regarding the expectations and standards set. Then the transaction stage is observed, and the program implementation process through training follows the expectations and standards set.

Furthermore, the outcome stage is observed in how the output or graduates of the training have a measurable impact after attending the training. The three stages in the Countenance Stake evaluation model are seen from their expectations associated with logical contingencies and the results of observations with empirical contingencies. They are then seen for suitability to be considered with existing standards. According to Stake, this type of information, for example, is related to previous teaching and learning activities [18], then how the process occurs and the outcomes from the training program.



**Figure 3** The Stake Countenance Evaluation Model

From the figure 3 above, the design of the Countenance Stake evaluation model put forward in the description matrix at the antecedent stage stated the objectives of the training program and then observed what happened. The standard conditions and judgments of the training program were explained in the judgment matrix. The same goes for the transaction and outcome stages.

The description of the data in the description matrix is analysed with two concepts, contingency and congruence. Contingency is used to analyse data vertically, looking for relationships between antecedents, transactions, and outcomes. Contingency analysis is carried out in two ways, namely logical contingency, and empirical contingency. Meanwhile, congruence is used to

analyse the suitability or differences between the objectives (intended) and the monitoring results that occur in the field (observed) at each level of antecedents, transactions, and outcomes.

## 2. METHOD

This qualitative descriptive research provides an in-depth description of the object under study based on the data collected [19, 20]. Researchers used descriptive analysis as a survey method to find out the ongoing phenomenon. The phenomenon described in this study is related to the level of service satisfaction for the 2022 Teacher Professional Education Program (PPG) implemented by Jakarta State University. The subjects in this study were 1632 students of the Teacher Professional Education Program consisting of 15 study programs. Data collection techniques using a questionnaire. The developed questionnaire has 6 indicators. The indicators in the questionnaire include (1) Learning Management System (LMS), (2) Helpdesk IT Team, (3) Instructors or Lecturers, (4) Teachers Assistant, (5) Students, and (6) Materials. The data obtained were analysed using qualitative method describing the level of service satisfaction in implementing PPG Daljab.

The Countenance Stake evaluation model is a comprehensive program evaluation, starting from precedent, transaction, and outcome. At the same time, the Kirkpatrick model evaluates the commonly used training model that is easy to implement. Judging from the strengths and weaknesses of the two evaluation models, the authors combined the two evaluation models under the name ARLeBO (Antecedent, Reaction, Learning, Behaviour, and Outcome) to evaluate the In-service Teacher Professional Education program.

## 3. RESULT AND DISCUSSION

The study of students' collaborative problem-solving skills (CPS) begins with analysing the congruence of antecedents, transactions, and outcomes. After that, a contingency analysis was carried out. Antecedent analysis in terms of students' problem-solving planning skills. Transactions in student processes solve problems. At the same time, the Outcome is viewed from the results of the problem-solving process. Table 1 below presents the congruence analysis matrix.

Table 1 shows that student antecedents are still low. This data shows that even though students can plan problems, students still need to gain the social skills expected in groups. Some research results also show similar results, the weakness of group problem-solving activities is not being able to maximize the strengths of all group members [21] and selfishness still dominates for each member [22]. This data can be seen in Social Regulation and Perspective Taking elements' common elements. The results of Social Regulation show that

students can still not take advantage of the potential for diversity to be used as a strength in problem planning. Proposed opinions from students who do not agree with other friends tend not to be accepted [22, 23], even though these opinions are suggestions that have the potential to facilitate the problem-solving process.

Transactions analysis results show that most students have medium CPS skills. This result indicates that although the problem-solving planning is good, the implementation process has many obstacles. However, the results of the CEQ questionnaire on the Generic Skills (GS) element indicate good results. Learning designs can be used to improve their problem-solving abilities. Indeed, students feel this because when viewed from the CPS skills, the Cognitive skills element has good value, but the Social Skills element still needs to be higher. This condition shows that many ideas can be used for the problem-solving process. However, students still need to be able to manage all these ideas.

Ideas taken in solving problems often turn out to be wrong, so they often find the process of solving a long one and even get stuck creating new problems. This discussion shows that students have yet to be able to analyse the strengths and weaknesses of their group [22, 23]. In addition, idea-taking is always based on the dominant opinion [23]. Especially if it turns out that during the problem-solving process, students encounter deadlocks, it is often seen that students let go of group responsibility, as if the error was caused by a group member who came up with an idea [24, 25].

The impact is very visible on the results of problem-solving. The results show a fairly high failure rate. Many students have the potential for cognitive abilities in solving problems. This data is shown in the students' Cognitive Skills scores which are quite good. However, contrary to the value of Social Skills, which could be higher. If students can manage and exploit the potential of cognitive skills, then problem-solving activities can produce optimal solutions [22].

The results of the connection between antecedents, transactions and outcomes can be seen in the observations in Table 1. When the planning of the problem-solving process runs optimally, the problem-solving process will be smooth. Thus, the final result of the problem-solving process cannot be resolved optimally.

The less optimal planning process can be seen from implementing problem-solving. Very often, students do trial and error in its implementation. This data indicates that the plan made by the group needs to describe the clear stages of the problem-solving procedure fully. In addition, when facing a deadlock, students have yet to have other alternative ideas. So, they have to start all over again in the process of solving the problem. Finally, a

significant impact was seen on the group's need for more success in solving the problem.

The results of contingency and congruence analysis of students' CPS skills provide findings about a new framework for problem-solving skills. Various ideas expressed by students during the planning and implementation of problem-solving indicate a student's thought process to provide solutions. Making decisions or ideas must be based on students' logical thinking when facing a particular phenomenon. Thus, the logic of students' reasoning greatly affects the quality of ideas or decisions.

The main factor of student failure in solving problems is strongly influenced by the quality of the ideas taken as solutions. When students encounter problems in the problem-solving process, alternative ideas are needed. However, many students never estimate the possibility that the solutions taken may not go according to plan. Therefore, students' creative thinking in finding other solutions is very important in the problem-solving process [26, 27]. However, the research findings show a need for more student creativity in problem-solving. Even though creative thinking is needed when used in the framework of carrying out a task [27-29].

#### 4. CONCLUSION

The evaluation results using ARLeBO at PPG Daljab Category 1 of 2022 can be concluded that the program's implementation has positive things and is still experiencing some obstacles. The positive things that support the program from the antecedent and learning aspects are the availability of policy documents, technical instructions for program implementation, and an LMS-based learning system that supports learning. From the reaction aspect, the service support provided by lecturers, tutors, managers, and IT admins in PPG learning is very good. Some of the problems in the antecedent aspect are that the parties need to understand the technical guidelines that contain the mechanisms and procedures for implementing the program. Barriers to the learning aspect, namely many participants from remote areas, experience problems with internet signal disturbances during online learning, and the time and burden of completing assignments are not proportional. From the behavioural aspect, the PPG learning steps do not all refer to completing the 7 learning achievement indicators. In the outcome aspect, the competence of teachers who passed PPG to become professional teachers has remained the same. The ARLeBO evaluation model implemented for PPG Daljab Category 1 is suitable for the PPG's characteristics because this model combines the Content Stake and Kirkpatrick models.

#### REFERENCES

- [1] M. Sadeghi, A shift from classroom to distance learning: Advantages and limitations, *Int. J. Res. English Educ.*, 4(1), 2019, pp. 80–88.
- [2] K. Mukhtar, K. Javed, M. Arooj, and A. Sethi, Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era, *Pakistan J. Med. Sci.*, 36, 2020, pp. 27-31. DOI: <https://doi.org/10.12669/pjms.36.COVID19-S4.2785>
- [3] D. Yildirim and S. S. Seferoglu, Evaluation of the effectiveness of online courses based on the community of inquiry model, *Turkish Online J. Distance Educ.*, 22(2), 2021, pp. 147–163. DOI: 10.17718/tojde.906834
- [4] G. Debeş, Distance learning in higher education during the COVID-19 pandemic: advantages and disadvantages: Distance learning in higher education during the COVID-19 pandemic, *Int. J. Curric. Instr.*, 13(2), 2021, pp. 1109–1118. DOI: <https://doi.org/10.3389/feduc.2022.822958>
- [5] V. Singh and A. Thurman, How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018), *Am. J. Distance Educ.*, 33(4), 2019, pp. 289–306. DOI: <https://doi.org/10.1080/08923647.2019.1663082>
- [6] S. R. Harandi, Effects of e-learning on Students' Motivation, *Procedia-Social Behav. Sci.*, 181, 2015, pp. 423–430. DOI: <https://doi.org/10.1016/j.sbspro.2015.04.905>
- [7] R. G. Saadé, Web-based educational information system for enhanced learning, *EISEL: Student assessment, J. Inf. Technol. Educ. Res.*, 2(1), 2003, pp. 267–277.
- [8] D. B. Setyohadi, M. Aristian, B. L. Sinaga, and N. A. A. Hamid, Social critical factors affecting intentions and behaviours to use E-Learning: An empirical investigation using technology acceptance model, *Asian J. Sci. Res.*, 10(4), 2017, pp. 271–280. DOI: 10.3923/ajsr.2017.271.280
- [9] S. N. Armstrong, K. Lupinski, M. M. Burcin, K. Kato, and M. Kaufman, Evaluation of a teaching assistant program in online education, *J. Educ. Res. Pract.*, 11(1), 2021, pp. 46-63.
- [10] R. F. Catalanello and D. L. Kirkpatrick, Evaluating Training Programs-State of Art, *Train. Dev. J.*, 22(5), 1968, pp. 2–9.
- [11] D. Kirkpatrick and J. Kirkpatrick, Evaluating training programs: The four levels. Berrett-Koehler Publishers, 2006.
- [12] T. G. Reio, T. S. Rocco, D. H. Smith, and E. Chang, A Critique of Kirkpatrick's Evaluation

- Model, *New Horizons Adult Educ. Hum. Resour. Dev.*, 29(2), 2017, pp. 35–53. DOI: 10.1002/nha3.20178.
- [13] M. Cahapay, Kirkpatrick Model: Its Limitations as Used in Higher Education Evaluation, *International Journal of Assessment Tools in Education*, 8(1), 2021, pp. 135–144. DOI: <https://doi.org/10.21449/ijate.856143>
- [14] R. E. Stake, Program evaluation, particularly responsive evaluation, *Evaluation in Education and Human Services*, 2000, pp. 287–310. DOI: [https://doi.org/10.1007/978-94-009-6669-7\\_17](https://doi.org/10.1007/978-94-009-6669-7_17)
- [15] R. E. Stake, Program evaluation particularly responsive evaluation, *J. Multidiscip. Eval.*, 7(15), 2011, pp. 180–201.
- [16] E. P. Widoyoko, *Evaluasi program pelatihan*, Yogyakarta: Pustaka Pelajar, 2017.
- [17] R. E. Stake, The countenance of educational evaluation, *Teach. Coll. Rec.*, 68(7), 1967, pp. 1–15.
- [18] D. L. Stufflebeam, A. J. Shinkfield, D. L. Stufflebeam, and A. J. Shinkfield, An analysis of alternative approaches to evaluation, *Syst. Eval. A Self-Instructional Guid. to Theory Pract.*, 1985, pp. 45–68.
- [19] D. Sugiyono, *Metode penelitian kuantitatif, kualitatif dan R & D*/Sugiyono, Bandung Alf., 2018.
- [20] C. Glesne, *Becoming qualitative researchers: An introduction*, ERIC, 2016.
- [21] A. H. Abdullah, T. K. Neo, and J. H. Low, Weak and strong ties and its connection to experts' problem-solving styles in scaffolding students' PBL activities on social media, *F1000Research*, vol. 10, 2021.
- [22] F. Hesse, E. Care, J. Buder, K. Sassenberg, and P. Griffin, A framework for teachable collaborative problem solving skills, *Assess. Teach. 21st century Ski. Methods approach*, 2015, pp. 37–56.
- [23] S. Greiff, D. Holt, and J. Funke, Perspectives on problem solving in cognitive research and educational assessment: analytical, interactive, and collaborative problem solving, *J. Probl. Solving*, 5, 2013, pp. 71–91.
- [24] R. N. Balliet, E. M. Riggs, and A. V. Maltese, Students' problem solving approaches for developing geologic models in the field, *J. Res. Sci. Teach.*, 52(8), 2015, pp. 1109–1131. DOI: <https://doi.org/10.1002/tea.21236>
- [25] J. Broadbent and W. L. Poon, Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review, *The Internet High. Educ.*, vol. 27, pp. 1–13, 2015. DOI: <https://doi.org/10.1016/j.iheduc.2015.04.007>
- [26] K. J. Gilhooly, L. J. Ball, and L. Macchi, *Insight and creativity in problem solving*, Routledge, 2019.
- [27] K. J. Gilhooly, L. J. Ball, and L. Macchi, *Insight and creative thinking processes: Routine and special*, *Thinking & Reasoning*, 21(1), 2015, pp. 1–4. DOI: <https://psycnet.apa.org/doi/10.1080/13546783.2014.966758>.
- [28] N. Barr, G. Pennycook, J. A. Stolz, and J. A. Fugelsang, The brain in your pocket: Evidence that Smartphones are used to supplant thinking, *Comput. Human Behav.*, 48, 2015, pp. 473–480. DOI: <https://doi.org/10.1016/j.chb.2015.02.029>.
- [29] S. Robson and V. Rowe, Observing young children's creative thinking: engagement, involvement and persistence, *Int. J. Early Years Educ.*, 20(4), 2012, pp. 349–364. DOI: <https://doi.org/10.1080/09669760.2012.743098>

**Table 1.** The congruence analysis matrix ... (continue)

Description Matrix		Judgement Matrix	
Intens	Observation	Standard	Judgement
<p><i>Antecedent (Input)</i></p> <ol style="list-style-type: none"> <li>2022 PPG Daljab Category 1 policy materials and recommendations.</li> <li>Online learning systems and networks.</li> <li>Managers, instructors, mentor teachers, IT administrators, and students know how PPG Daljab works.</li> </ol>	<p><i>Observation and Interviews Results:</i></p> <ol style="list-style-type: none"> <li>The policy documents and regulations for conducting PPG are available in complete form.</li> <li>Not all PPG management elements fully understand the contents of the policy and the implementation guidelines for PPG Daljab Category 1 in 2022.</li> <li>The management is not consistent in providing information related to the implementation of PPG.</li> <li>There are no rules or guidelines for PGP participation in PPG Daljab.</li> <li>Some remote areas are facing difficulties in accessing strong internet connections.</li> <li>An LMS system is available for the learning of PPG Daljab Category 1 in 2022.</li> </ol>	<ol style="list-style-type: none"> <li>Teacher Education Standards Regulation 55 of 2017, Minister of Research, Technology, and Higher Education.</li> <li>Directorate General of Teachers and Educators Regulation Number 3826/B/HK.04.01/202, Technical Implementation Guidelines for the Professional Teacher Education Program for Teachers Appointed until 2015.</li> <li>LMS online learning guidelines.</li> </ol>	<ol style="list-style-type: none"> <li>Category 1 PPG Daljab will use policy documents in 2022.</li> <li>LMS-based online learning systems aid learning.</li> <li>Management, lecturers, mentor instructors, students, and IT administrators don't completely understand the PPG implementation and learning requirements.</li> <li>PPG teacher facilitators do not have rights or responsibilities.</li> <li>Management rarely follows PPG rules.</li> <li>Remote PPG participants still have internet signal issues.</li> </ol>
<p><i>Transaction:</i></p> <p>a. <i>Reaction</i></p> <ol style="list-style-type: none"> <li>GTK services in Category 1 PPG Daljab policy;</li> <li>University services in online learning;</li> <li>Services by managing lecturers, lecturers, mentor teachers, and IT administrators.</li> </ol>	<p><i>Observation and Interviews Results:</i></p> <ol style="list-style-type: none"> <li>LMS-based Category 1 Daljab works well for online learning.</li> <li>GTK's 2022 Category 1 PPG Daljab policy information services are still lacking.</li> <li>PPG management provides great student services.</li> <li>Category 1 PPG Daljab 2022 information is complete.</li> <li>PPG Daljab 2022's online LMS offerings aid learning.</li> <li>PPG Daljab IT administrators give outstanding online learning services.</li> <li>Lecturers' LMS and vicon services are superb.</li> <li>Mentor instructors provide great Teaching Practicum guidance.</li> </ol>	<ol style="list-style-type: none"> <li>Online learning and PPG have an LMS.</li> <li>Virtual face-to-face learning is available via vicon.</li> <li>The LMS provides PPG learning content.</li> <li>GTK and LPTK management share Category 1 PPG Daljab organization information.</li> <li>Management offers LMS-based online learning.</li> <li>Lecturers teach.</li> <li>Mentors advise pupils.</li> <li>IT administrators implement PPG.</li> </ol>	<ol style="list-style-type: none"> <li>LMS content is practical and user-friendly.</li> <li>GTK policy and regulation information services need improvement.</li> <li>PPG professors are great.</li> <li>Mentor instructors give great advice.</li> <li>PPG management and IT admins deliver amazing services.</li> </ol>



**Table 1.** The congruence analysis matrix... (continue)

Description Matrix		Judgement Matrix	
Intens	Observation	Standard	Judgement
<p><i>b. Learning</i></p> <ol style="list-style-type: none"> <li>1. Workload of Category 1 PPG Daljab</li> <li>2. Online learning process based on LMS</li> <li>3. Competence in online learning by all parties involved in PPG</li> </ol>	<p><i>Observation and Interviews Results:</i></p> <ol style="list-style-type: none"> <li>1. 12-credit assignment has 9 sections in 3 stages: problem-based instructional material analysis, innovative instructional design, and innovative instructional practice.</li> <li>2. Problem-based instructional material analysis, innovative instructional design, and innovative instructional practice take 12–14–31 days, respectively.</li> <li>3. LMS learning doesn't match the 9-step technical guidelines.</li> <li>4. Instructors and mentors have not maximized LMS-based online learning.</li> <li>5. The 9-step learning procedure does not meet CP.</li> <li>6. Worksheet billing does not match LMS content or invoice categories.</li> <li>7. The participant's dashboard and mentor instructor or lecturer's LMS assessment display don't match.</li> <li>8. LMS lockouts make uploading worksheets and assignments difficult.</li> </ol>	<ol style="list-style-type: none"> <li>1. The learning workload of 12 credits is conducted in 3 stages: problem-based instructional material analysis, innovative instructional design, and innovative instructional practice.</li> <li>2. The problem-based instructional material analysis stage takes 12 days to identify, explore, and determine problem causes.</li> <li>3. Exploration, solution determination, action plan formulation, and assessment plan creation take 14 days in creative instructional design.</li> <li>4. The innovative instructional practice stage comprises 31 days and includes action plan implementation, evaluation, and final reflection and follow-up.</li> <li>5. LMS-based learning is evaluated for compliance.</li> <li>6. PPG components can participate in LMS-based online learning.</li> </ol>	<ol style="list-style-type: none"> <li>1. 3 levels with 9 phases make up the 12-credit workload.</li> <li>2. Problem-based instructional material analysis takes 12 days, innovative instructional design 14 days, and innovative instructional practice 31 days.</li> <li>3. The RPP paper, supporting materials, and peer-teaching activities cannot be completed in the creative instructional design stage due to time constraints.</li> <li>4. LMS-based learning does not follow PPG standards.</li> <li>5. PPG learning results do not match the nine steps.</li> <li>6. LMS learning does not follow Category 1 PPG Daljab 2022 PPG criteria.</li> <li>7. The LMS is underutilized by lecturers and mentor teachers.</li> <li>8. All PPG members succeed in LMS-based online learning.</li> </ol>

**Table 1.** The congruence analysis matrix

Description Matrix		Judgement Matrix	
Intens	Observation	Standard	Judgement
<p><i>Behaviors</i></p> <ol style="list-style-type: none"> <li>1. Student participation in Category 1 PPG Daljab.</li> <li>2. Ability to implement the 3 learning stages in 9 steps.</li> <li>3. Complete the 7 learning outcomes.</li> </ol>	<p><i>Observation and Interviews Results:</i></p> <ol style="list-style-type: none"> <li>1. 66% of students have good LMS-based learning skills.</li> <li>2. Good students understand 78% of the profession's concepts and procedures.</li> <li>3. 76% of students can create learning outcome indicators, which is excellent.</li> <li>4. Excellent students master advanced instructional content at 80%.</li> <li>5. Excellent TPACK learning design proficiency is 80%.</li> <li>6. Excellent problem-based learning proficiency is 75%.</li> <li>7. 77% of students evaluate learning well.</li> <li>8. 89% of students' self-development is outstanding and constant.</li> </ol>	<ol style="list-style-type: none"> <li>1. The passing threshold for the learning process (comprehensive assessment) is 70.</li> <li>2. The passing threshold for the performance assessment is 70.</li> <li>3. The passing threshold for the knowledge assessment is 70.</li> </ol>	<ol style="list-style-type: none"> <li>1. The average passing rate of Category 1 PPG Daljab graduates in 2022 is above 70%.</li> <li>2. The average proficiency in online learning is 66%.</li> <li>3. The average proficiency in completing assignments/invoices is excellent.</li> <li>4. The students' ability to complete the 7 learning outcomes is excellent.</li> </ol>
<p><i>a. Outcomes</i></p> <ol style="list-style-type: none"> <li>1. Change in attitude after participating in Category 1 PPG Daljab learning.</li> <li>2. Impact of Category 1 PPG Daljab learning outcomes (innovative teaching practices, classroom management, collaboration, school environment, and personal development).</li> </ol>	<p><i>Observation and Interviews Results</i></p> <ol style="list-style-type: none"> <li>1. The average impact on students' attitude changes after participating in PPG Daljab is 35%, which is categorized as excellent.</li> <li>2. The average impact on learning proficiency after participating in PPG Daljab is 41%, which is categorized as excellent.</li> </ol>	<ol style="list-style-type: none"> <li>1. Having innovative learning abilities that can be applied in schools.</li> <li>2. Classroom management skills.</li> <li>3. Ability to develop online learning.</li> <li>4. Transforming into an engaging and authoritative teacher.</li> </ol>	<ol style="list-style-type: none"> <li>1. PPG graduates who become teachers have not improved.</li> <li>2. Though not all graduates are engaging and authoritative teachers, attitudes have changed.</li> <li>3. Technology has changed learning.</li> </ol>

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

