







## RESEARCH ARTICLE

# Online Training Design: Improve Teachers Performance to Develop Inclusive Class Activity for Student with Disabilities

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## Abstract

**Background and Aims:** Teachers play an important role in the success of class activities, especially physical activity that encourages student involvement in learning. Therefore, there is a need for systematic, effective, and efficient professional development. This study explores teachers' preferences for online training activities and the training materials they need. An online training platform with content on inclusive education was piloted. **Method:** The respondents involved were 45 teachers and principals from 14 elementary schools representing three sub-districts in Mojokerto City. Data was collected using a Likert scale questionnaire and analyzed quantitatively descriptively with Chi-Square. **Result:** The results of this study prove that teachers prefer asynchronous video explanations as online training activities, and teachers prefer synchronous video conferences less. Teachers need basic knowledge and inclusive classroom management skills. Meanwhile, teachers need intervention materials for students with disabilities in various ways. The Chi-Square test did not show any relationship (sign.  $P = 0,05$ ) between online training experience and preferences for online learning activities. **Conclusion:** Thus, it can be concluded that there is no evidence of a relationship between experience in inclusive education training and preferences for inclusive education training materials. Therefore, it is recommended that local governments collaborate with competent universities to build accurate training designs.

## Keywords

Inclusive Education, Professional Development, Online Learning, Learning and Teaching Materials

## INTRODUCTION

In recent years, the Indonesian education system has had more inclusive schools welcoming students with disabilities in both primary and secondary levels. By 2022, 37,502 such schools were supporting 130,500 students with disabilities. This figure excludes students in Islamic schools overseen by the Ministry of Religion and other inclusive schools, where another 144,782 students were receiving support. Altogether, this totals 275,282 students. However, this only covers around 40% of all school-aged children with disabilities. This reveals a considerable difference disabilities.

Teachers performance are a challenge in implementing effective class activities in inclusive schools. Research indicates that teachers generally view inclusive education positively, to some extent, which is influenced by their experience and training (Ediyanto et al., 2021; Junaidi et al., 2021). However, they face challenges in feeling confident and knowledgeable about using teaching methods such as differentiated and collaborative learning (Kurniawati, 2021). This aligns with global findings as highlighted in a 2018 OECD report, where educators across various countries expressed similar concerns, feeling unprepared to cater to diverse student needs and requesting a need for

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further training (Thomson & Hillman, 2019).

Ensuring effective inclusive education relies on creating a supportive learning atmosphere that meets the needs of all students. This requires teachers in regular schools to improve their teaching skills, addressing challenges such as understanding student with disability characteristics, using different teaching methods, and doing suitable assessments (Widajati et al., 2020; Wulandari & Hendriani, 2021). Research confirms these difficulties, with studies showing that teachers struggle with managing various learning styles and adapting teaching for specific disabilities (Damayanti et al., 2017; Mumpuniarti et al., 2020; Winarsih, 2013). Therefore, it's essential for teachers to undergo professional development focused on class activities of inclusive schools. This development should involve changing attitudes, expanding knowledge, and acquiring skills related to teaching diverse learners (Edwards et al., 2006). Important competencies include assessment, adapting teaching, managing classrooms, and collaborating (Khotimah & Reza, 2022; Krisyanto et al., 2023; Majoko, 2019). Ideally, teachers should continuously enhance their professional skills through ongoing learning activities (Darling-Hammond et al., 2017; Postholm, 2012).

Various approaches exist for organizing professional development, including induction, mentoring, and in-service training (Nguyen et al., 2023). School-based models promise comprehensive and ongoing professional development tailored to the school's and its teachers' specific needs, potentially involving collaboration with teacher education institutions (Forlin & Sin, 2017; Juliana et al., 2021). The Indonesian Ministry of Education has implemented online training programs for teachers on inclusive education since 2020. These programs aim to equip teachers with skills in identifying students with special needs, conducting assessments, and developing individualized learning plans. While online training offers convenience and broad reach, its effectiveness remains limited by uneven accessibility, as demonstrated in Mojokerto, where only five elementary school teachers out of 378 have received the Ministry's training. This underscores the need for research to explore teachers' preferences and develop effective online training programs that cater to their diverse needs and learning styles (Dash et al., 2012; Koehler & Mishra, 2005; Lay et al., 2020; Rhode et al., 2017).

Teachers' professional development policies at the basic education level are the authority of the district or city government. This is in line with the provisions in Law of the Republic of Indonesia Number 23 of 2014 concerning Regional Government. In connection with the policy of increasing teacher competency in implementing inclusive education, district or city governments, especially in East Java Province, face the challenge of unclear inclusive education management policies, especially concerning the readiness and availability of competent teachers in inclusive education (Junaidi, 2019). This research aims to improve inclusive education in Indonesia by exploring teachers' preferences regarding online training materials and activities. The findings will inform the development of a comprehensive professional development program for teachers in inclusive schools, potentially serving as a model for broader implementation across the country.

## MATERIALS AND METHODS

### *Participant*

The study involved 45 participants, including 14 school principals and 31 teachers from 14 elementary schools across three sub-districts in Mojokerto City. Of the participants, 36 were female and 9 were male (Table 1. Participants Demographic). The majority, 40 participants, had an undergraduate education background, while 5 held master's degrees.

### *Research Procedure*

Research Ethics Committee from Universitas Negeri Malang has certify the research procedur that involving teachers as participant with the number 15.10.7/UN32.14/PB/2024. The research was conducted through a structured survey, where participants were invited to complete a questionnaire aimed at assessing their preferences regarding training materials and online training activities specifically related to inclusive education. Initially, participants received a brief orientation on the purpose of the study and were informed about the topics covered in the questionnaire, which included online learning and inclusive education training content. The survey was distributed online to ensure accessibility and ease of completion. Participants were given two weeks to respond to the questionnaire, with reminders sent periodically to maximize response rates. Upon completion,

responses were collected and organized for statistical analysis.

**Data Collection**

Data was collected using a Likert scale questionnaire designed to assess teacher preferences for online training activities and specific training materials related to inclusive education. The questionnaire comprised 23 items, divided into three sections: 8 items focused on understanding inclusive education, 7 items assessed teaching skills specific to inclusive classrooms, and 8 items evaluated skills for teaching students with disabilities. The content of the material is coded based on aspect groups, Inclusive Education Knowledge A (A1-A8), Teaching Skills in Inclusive Class B (B1-B7), and Teaching Skill for Disability Student C (C1-C8). Additionally, the questionnaire included 6 items that explored participants' preferences for various aspects of online learning activities. This instrument has a value of 0.964 which can be interpreted as having good reliability (Table 2. Reliability Statistics). Subsequently, this instrument also underwent a validity test to ensure the alignment of each item with the aspects intended to be measured. The assessment indicated a sufficiently strong item-total correlation for the majority of the items, signifying

that these items possess good validity in assessing preferences for various types of training materials. The correlation values range from 0.551 to 0.874. Most items exhibit an item-total correlation above 0.7, indicating that these items are highly associated with the overall construct being measured, which is the preference for training materials (Table 3. Validity Test).

**Statistical Analysis**

The data were analyzed using descriptive quantitative methods and inferential statistics. Descriptive statistics were employed to summarize and interpret the distribution of responses concerning teachers' preferences for online learning activities and inclusive education training materials. To examine potential relationships and dependencies, Chi-Square tests were conducted. These tests explored associations between several variables, including teachers' prior experiences with online courses, their interest in various online learning activities, their training backgrounds in inclusive education, and their preferences for specific training materials. The Chi-Square analysis provided insights into whether particular characteristics were related to preferences in training content and delivery methods. All statistical analyses were carried out using SPSS, with significance levels set to 0.05.

**Table 1.** Participants demographic

Parameter	Frequency	Percentage
<b>Gender</b>		
Male	9	20%
Female	36	80%
<b>Education Grade</b>		
Undergraduate	40	88,9%
Graduate	5	11,1%
<b>Position/Role</b>		
Teachers	31	68,9%
Headmasters	14	31,1%
<b>Trainig</b>		
Trained (10-60 credit)	17	37,8%
Untrained	28	62,2%
<b>Employment Status</b>		
Government Employees	34	75,5%
Self Employees (Honorary)	11	24,5%

**Table 2.** Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.964	.969	23

**Table 3.** Validity test

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Content_A1	77.89	96.965	.734	.	.962
Content_A2	77.80	96.982	.762	.	.962
Content_A3	77.78	97.222	.678	.	.963
Content_A4	77.82	95.422	.840	.	.961
Content_A5	77.76	96.462	.848	.	.962
Content_A6	78.00	96.864	.554	.	.964
Content_A7	77.78	97.949	.668	.	.963
Content_A8	77.89	94.192	.874	.	.961
Content_B1	77.84	96.998	.742	.	.962
Content_B2	77.80	95.436	.848	.	.961
Content_B3	77.78	96.086	.793	.	.962
Content_B4	77.87	95.436	.824	.	.961
Content_B5	77.93	95.109	.735	.	.962
Content_B6	77.93	95.109	.735	.	.962
Content_B7	77.78	96.859	.788	.	.962
Content_C1	78.36	93.689	.613	.	.965
Content_C2	78.33	94.227	.551	.	.966
Content_C3	78.09	92.856	.810	.	.961
Content_C4	77.82	96.331	.749	.	.962
Content_C5	77.69	98.446	.678	.	.963
Content_C6	78.16	92.907	.722	.	.963
Content_C7	77.87	95.664	.743	.	.962
Content_C8	77.82	95.013	.814	.	.961

Inclusive Education Knowledge A (A1-A8); Teaching Skills in Inclusive Class B (B1-B7); Teaching Skill for Disability Student C (C1-C8).

## RESULTS

All participants in the research have varying experiences in online courses, with different accumulations of instructional hours or learning courses. The majority, 86.6%, have engaged in online learning for 10 to 30 hours, while 13.4% have spent more than 30 hours. Table 4 displays six different online learning activities, along with the preferences expressed by respondents in percentages. Respondents were given four options to indicate their preferences: (1) not interested; (2) less interested; (3) interested; (4) very interested. 66.7% of respondents indicated a preference for reading text materials online, with 20% indicating

they are very interested, and 13.3% indicating they are less interested. Viewing infographic online materials is preferred by 66.7%, with 31.1% of respondents indicating they are very interested. Listening to explanations from facilitators or speakers in video format asynchronously is highly preferred by respondents with a percentage of 55.6% and 44.4% indicating they are interested. Engaging in online discussions through chatting is favored by 55.6% of respondents, with 31.1% indicating they are very interested. Participating in synchronous learning activities through video conferencing is preferred by 57.8% of respondents, with 22.2% indicating they are very interested. Engaging in independent tasks such as project

assignments is favored by 73.3% of respondents, with 17.8% indicating they are very interested.

The six online learning activities, ranked in order of preference based on average percentage scores from most to least preferred by respondents, are as follows. First is watching explanatory videos from speakers or facilitators; Second, reading infographic materials; Third, engaging in online discussions or chatting through discussion forums; Fourth, working on tasks or projects independently;

Fifth, reading text materials; Sixth, participating in synchronous video conferences. The Chi-Square test results regarding the correlation between experience in online learning participation and the variable of preferences for online learning activities across the six tested activities indicated no significant relationship. This means that teachers' experience in participating in online learning is not related to teachers' preferences for preferred online learning activities.

**Table 4.** Percentage of Preference for Online Learning Activities

Online Learning Activity	Scale			
	1	2	3	4
Text reading	0 %	13.3 %	66.7 %	20 %
Infography reading	0 %	2.2 %	66.7 %	31.1 %
Video presentation	0 %	0 %	44.4 %	55.6 %
Online discussion	0 %	13.3 %	55.6 %	31.1 %
Synchronous (web meeting)	0 %	20 %	57.8 %	22.2 %
Task	0 %	8.9 %	73.3 %	17.8 %

The eight training materials presented in Table 5 on knowledge and understanding of inclusive education received preferences deemed highly needed by respondents ranging from 51.1% to 68.9%. These preferences were categorized into four groups: (1) not needed; (2) less needed; (3) needed; (4) highly needed. Respondents expressed a need for all eight materials related to knowledge and understanding of inclusive education, with percentages ranging from 28.9% to 44.5%. There is one material specifically about strategies for involving communities in the development of inclusive schools, which was deemed not needed by 2.2% of respondents. When ranked based on respondent preferences, the correct sequence is A5, A3, A7, A2, A4, A8, A1, and A6. Meanwhile, training materials on teaching skills in the classroom received assessments with over 55.6% of respondents expressing a high need for them. The sequence of materials based on respondent preferences is B3, B7, B2, B1, B4, B5, and B6.

Participating in synchronous learning activities through video conferencing is preferred by 57.8% of respondents, with 22.2% indicating they are very interested. Engaging in independent tasks such as project assignments is favored by 73.3% of respondents, with 17.8% indicating they are very interested.

The six online learning activities, ranked in order of preference based on average percentage scores from most to least preferred by respondents, are as follows. First is watching explanatory videos from speakers or facilitators; Second, reading infographic materials; Third, engaging in online discussions or chatting through discussion forums; Fourth, working on tasks or projects independently; Fifth, reading text materials; Sixth, participating in synchronous video conferences. The Chi-Square test results regarding the correlation between experience in online learning participation and the variable of preferences for online learning activities across the six tested activities indicated no significant relationship. This means that teachers' experience in participating in online learning is not related to teachers' preferences for preferred online learning activities.

The eight training materials presented in Table 2 on knowledge and understanding of inclusive education received preferences deemed highly needed by respondents ranging from 51.1% to 68.9%. These preferences were categorized into four groups: (1) not needed; (2) less needed; (3) needed; (4) highly needed. Respondents expressed a need for all eight materials related to knowledge and understanding of inclusive education, with percentages ranging from 28.9% to 44.5%. There is

one material specifically about strategies for involving communities in the development of inclusive schools, which was deemed not needed by 2.2% of respondents. When ranked based on respondent preferences, the correct sequence is A5, A3, A7, A2, A4, A8, A1, and A6. Meanwhile, training materials on teaching skills in the classroom received assessments with over 55.6% of respondents expressing a high need for them. The sequence of materials based on respondent preferences is B3, B7, B2, B1, B4, B5, and B6.

The distribution of respondent preference percentages regarding training materials related to teaching skills for students with disabilities is as follows. Five training material items received the highest rate of "highly needed" preferences: C5 75.5%; C8 66.7%; C4 64.5%; C7 62.3%; and C3 46.7%. The material on intervention for teaching children with Autism received equal preferences between "highly needed" and "needed" by respondents, at 44.5%. Two other materials received the highest percentage of "needed" preferences, precisely 42.2% for material on intervention for teaching children with visual impairments and intervention for teaching children with hearing impairments. Chi-square tests were conducted to determine the relationship between the variable of training experience in inclusive education and training material preferences and between the variable of respondent position, as teachers or school principals, and training material preferences. There are two categories of training experience: those who have not undergone training in inclusive education and those who have undergone training in inclusive education. A total of 28 respondents or 62.2% stated they had never participated in inclusive education training, while 17 respondents or 38% stated they had been involved in training in inclusive education.

This analysis proves that the eight materials on knowledge and understanding of inclusive education have a significance value of less than 0.005. This suggests that teachers' experience in attending inclusive education training influences their preferences for training materials. Teachers who have participated in inclusive education training determine the eight materials on knowledge and understanding of inclusive education as highly needed. The difference in respondents' positions as teachers and school principals is not related to their preferences for the eight materials on knowledge and understanding of inclusive education. Although

respondents in the position of school principals tend to rate the materials on knowledge and understanding of inclusive education as highly needed, the Chi-Square results do not prove that there is a relationship between respondents' positions as school principals and teachers and their preferences for materials on knowledge and understanding of inclusive education. Similarly, the position of respondents as teachers and school principals does not affect their preferences for training materials on teaching skills in inclusive classrooms.

Testing between the variable of respondents' training experience and their preferences for instructional materials on teaching skills in inclusive classrooms indicates that four instructional materials have significance values lower than 0.05. This implies that the preferences of respondents for these four materials are shaped by their training background. This result suggests that respondents with training exposure in inclusive education favor these four materials related to teaching skills in inclusive classrooms.

Referring to Table 2, it is evident that respondents' training experience influences their preferences for materials on intervention for slow learners and specific learning difficulties. Both of these materials have significance values below 0.05. However, respondents' preferences for other materials are not significantly influenced by their training experience. Specifically, 94.1% of respondents with training experience express a high need for materials on intervention for slow learners, while 64.3% of respondents without training experience also express a high need for this material. Similarly, for materials on intervention for students with specific learning difficulties (such as dyslexia, dyscalculia, and dysgraphia), 88.2% of respondents with training experience express a high need for these materials, compared to 46.4% of respondents without training experience. The Chi-Square test on the relationship between respondents' roles as teachers or school principals and their preferences for materials on teaching skills in inclusive classrooms and teaching skills for students with disabilities did not show significant results. However, school principals tend to rate these materials as highly needed.

**Table 5.** Material Preferences and Chi Square Test

Materials	Preference Scores (%)				Chi Square	
	1	2	3	4	Value	Asym. Sig.
Inclusive Education Concept, Philosophy, Legal Standing (A1)	0	0	44.4	55.6	16.454 <sup>a</sup>	.000*
Inclusive education benefits, theory and research results (A2)	0	0	35.6	64.4	10.499 <sup>a</sup>	.001*
School's Inclusive environment strategy (A3)	0	2.2	28.9	68.9	8.137 <sup>a</sup>	.017*
Inclusive Policy Development strategy (A4)	0	2.2	33.3	64.5	10.517 <sup>a</sup>	.005*
Educational practice strategy (A5)	0	0	31.1	68.9	12.339 <sup>a</sup>	.000*
Public engagement strategy (A6)	2.2	2.2	44.5	51.1	14.037 <sup>a</sup>	.003*
Support system and networking strategy (A7)	0	0	33.3	66.7	13.661 <sup>a</sup>	.000*
Instructional design development (A8)	0	4.5	35.6	60	9.194 <sup>a</sup>	.010*
Recognizing the diversity and learning needs of students with disabilities (B1)	0	0	40	60	5.688 <sup>a</sup>	.017*
Developing academic assessment instruments for children with special needs (B2)	0	2.2	31.1	66.7	9.285 <sup>a</sup>	.010*
Developing Individual Educational Program (IEP) (B3)	0	2.2	28.9	68.9	2.521 <sup>a</sup>	.283
Developing Adaptive Learning Plan in an inclusive class (B4)	0	2.2	37.8	60	1.624 <sup>a</sup>	.444
Developing Compensatory Programs for students with disabilities (B5)	0	2.2	42.2	55.6	8.047 <sup>a</sup>	.018*
Developing Learning Media for students with disabilities (B6)	0	2.2	42.2	55.6	8.047 <sup>a</sup>	.018*
Developing Developmental Assessment Instrument (B7)	0	0	33.3	66.7	5.720 <sup>a</sup>	.017*
The Intervention for student with visual impairment (C1)	4.4	17.8	42.2	35.6	3.605 <sup>a</sup>	.307
The Intervention for deaf student (C2)	6.7	13.3	42.2	37.8	5.039 <sup>a</sup>	.169
The Intervention for student with motoric disabilities (C3)	2.2	6.6	44.5	46.7	2.701 <sup>a</sup>	.440
The Intervention for student with intellectual disability (C4)	0	2.2	33.3	64.5	3.984 <sup>a</sup>	.136
The Intervention for student with slow learner (C5)	0	0	24.5	75.5	5.097 <sup>a</sup>	.024*
The Intervention for student with autism (C6)	4.4	6.6	44.5	44.5	4.372 <sup>a</sup>	.224
The Intervention for student with specific learning disabilities (C7)	0	4.4	33.3	62.3	7.999 <sup>a</sup>	.018*
The Intervention for student with ADHD (C8)	0	4.4	28.9	66.7	3.418 <sup>a</sup>	.181

*Inclusive Education Knowledge A (A1-A8); Teaching Skills in Inclusive Class B (B1-B7); Teaching Skill for Disability Student C (C1-C8).*

## DISCUSSION

Referring to the findings of this research, the most preferred online training activities are watching explanatory videos from speakers or facilitators, reading infographic materials, engaging in online discussions or chatting through discussion forums, working on tasks or projects independently, reading text materials, and participating in synchronous video conferences. It is acknowledged that there is a scarcity of studies focusing on the quality of online teacher professional development (Meyer et al., 2023; Irvan et al., 2021). Teachers' preferences for these online training activities could provide a reference in the development of learning platforms for teacher competency development. The most favored activity among teachers is watching videos for explanations of materials by speakers, which correlates with the nature of online learning. In this context, participants have the flexibility to access materials at their convenience,

replay them as needed, and choose their preferred learning environment (Degeng et al., 2023; Parsons et al., 2019).

Based on the findings of the previous studies, the variety of material formats significantly influences students' motivation to access each content. This includes various forms of materials such as videos, texts, audio, graphics, and animations (Rosli et al., 2021; Setyosari et al., 2022). The availability of these types of materials allows users to choose the type of information according to their needs. However, the situation changes if users encounter limitations in accessing all available content. Users with proficient computational skills demonstrate enhanced navigation abilities, thus benefiting from this learning design (Shahlan et al., 2021).

The results of this research align with previous studies regarding the effectiveness of online teacher training. Via online training, educators could engage in reflective practices to

gain insights from their teaching experiences (Nugraha et al., 2022; Rienties et al., 2013; Irvan et al 2021., & Jauhari, 2018). Additionally, online learning enables teachers to engage in discussions with communities or peers to discover and acquire new knowledge (Rodesiler, 2017; Yang, 2024). Online learning activities make it easier for teachers to organize their learning process according to their needs (Wynants & Dennis, 2018).

The next finding discusses respondents' preferences toward training materials. Respondents were presented with three sets of training materials: specifically training resources related to knowledge and understanding of inclusive education, training materials on teaching skills in an inclusive classroom, and training materials on teaching skills for students with disabilities. Each group consists of seven to eight specific items of materials. Based on the findings, respondents' training experiences were influencing their preference toward training materials on inclusive education (Prasetyo et al., 2021; Rasmitadila et al., 2023), especially in the groups of materials concerning knowledge and understanding of inclusive education and teaching skills in inclusive classrooms. This indicates that educators who have received training exhibit higher preferences and indicate a strong need for both sets of materials. The category of training materials on teaching skills for students with disabilities showed a strong preference, specifically for slow learners and students with specific learning difficulties. This correlation could be linked to the notable prevalence of slow learners and specific learning disorder observed within elementary school (Mumpuniarti et al., 2020).

Overall, there is a need to enhance the knowledge and skills of teachers working in inclusive schools using more relevant strategies to effectively support students (Prasetyo et al., 2021; Rasmitadila, R et al., 2023) This, of course, relies on the characteristics of the human resources in the area (Boyle et al., 2020; Wilson et al., 2020; Wilson et al., 2018; Irvan et al., 2023). The research findings shed light on the necessity of improving teacher competencies in providing inclusive education at elementary levels. As a result, there is a necessity for policies aimed at enhancing teacher competencies in elementary schools, which should be both practical and strategic, considering teachers' needs and the feasibility of program implementation. These findings could serve as a foundation for local governments' policymaking in

implementing online teacher competency training programs.

## Conclusion

The research findings conclude that teachers show a preference for asynchronous learning, particularly through watching explanatory videos from speakers, while synchronous video conferencing is less favored. Teachers highly need training materials on basic knowledge and management skills for inclusive class activities. Based on the training experience undergone by the teachers, they need knowledge regarding various interventions in supporting students with disabilities. The Chi-Square test did not show a significant relationship between online training experience and preferences for online learning activities. Similarly, there was no evidence of a relationship between respondents' positions as teachers or school principals and their preferences for training materials. According to the Chi-Square test between training experience in inclusive education and preferences for training materials, there is a correlation for materials on knowledge and understanding of inclusive education, most materials on skills for conducting learning in inclusive classrooms, and only on two items of material on interventions for slow learners and specific learning difficulties. The follow-up plan for this training involves establishing a collaborative partnership with the Mojokerto City Government to enhance teachers' proficiency in inclusive education.

## Ethical considerations

**Ethical Considerations** This study was conducted with the approval of Research Ethics Committee Universitas Negeri Malang with the reference number 15.10.7/UN32.14/PB/2024.

## Conflict of Interest

The authors declare no conflict of interest.

## Author Contributions

Conceptualization, A.R.J., M.I. and P.S.; methodology, I.N.S.D.; software, M.D.K.D.; Formal analysis, P.S. and M.D.K.D.; Writing original draft preparation, A.R.J. and M.I.; Writing review and editing, I.N.S.D, M.I and MNJ. All authors have read and agreed to the published version of the manuscript.



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