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Media Literacy Strategy for Youth Generation Based on Segmentation in Jakarta using the AHP Model and K-Means Clustering

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Abstract

The high digital penetration in Jakarta has not been matched by adequate media literacy, particularly among the younger generation. This study proposes an integrative model combining the Analytical Hierarchy Process (AHP) and K-Means Clustering to design a data-driven and behaviorally segmented media literacy strategy. Data were collected through in-depth interviews with 15 practitioners and experts, as well as a survey of 202 young respondents aged 15–24 from five regions of Jakarta. The AHP approach was used to identify priority dimensions of media literacy, encompassing cognitive, technical, ethical, and participatory aspects. K-Means clustering was employed to group individuals based on their digital competency characteristics and to empirically map literacy segmentation patterns. The results reveal three main clusters with significant differences in media usage patterns, ethical awareness, and critical capacities. These findings confirm the importance of adaptive and evidence-based media literacy strategies, rather than merely normative interventions. This integrative model is expected to form the basis for policymaking and the design of media literacy programs in Indonesian urban areas.

Keywords: media literacy, youth, integrative model, Analytic Hierarchy Process (AHP), K-Means clustering.

Introduction

The digital transformation in Indonesia over the past two decades has fundamentally altered patterns of social, economic, and cultural interaction. Jakarta, as the center of urbanization and technology, represents the most tangible manifestation of an intensively connected digital society. Data from the Central Statistics Agency (2023) indicates that 96.3% of the population aged 15–24 in Jakarta are active internet users, with an average usage time reaching 7.2 hours per day. This figure reflects not only high digital penetration but also the dependence of the younger generation on digital media in shaping identity, opinion, and social participation. However, high digital access does not always correlate directly with the quality of media literacy. A report from the Ministry of Communication and Informatics (2021) shows that the digital literacy index for Jakarta's youth is only 3.42 on a scale of 5, with critical information reading skills remaining low.

Weak media literacy amidst massive information flows potentially creates social vulnerabilities, such as the spread of disinformation, opinion polarization, and impulsive digital behavior. Potter (2021) views media literacy as a dynamic process involving the development of knowledge structures to interpret media-shaped realities. According to Livingstone (2018), media literacy is the ability of individuals to access, analyze, evaluate, and create media messages with an awareness of social and cultural contexts. Meanwhile, Buckingham, (2020) asserts that media literacy cannot be separated from the critical dimension of power and ideology operating within modern media systems. These three approaches illustrate that media literacy is not static but rather the result of interaction between individuals, media, and their social environment.

Livingstone & Helsper (2007) emphasize that technical digital abilities do not automatically reflect critical proficiency in sorting and evaluating information. Potter (2021) adds that true media literacy encompasses not only understanding media messages but also reflective awareness of the social, ethical, and ideological impacts of media consumption. Thus, media literacy must be understood as a multidimensional skill involving cognitive, technical, ethical, and participatory aspects.

The phenomenon in Jakarta demonstrates highly complex heterogeneity in media behavior. Research by Jakpat (2022) found significant variation in digital platform preferences between adolescents in South Jakarta, who are more exposed to global culture, and those in East Jakarta, who tend to consume domestic entertainment content. Urban youth face unique media literacy challenges. This condition illustrates that a population-homogeneity-based approach to media literacy becomes irrelevant. Livingstone (2018) asserts that effective media literacy strategies must be adaptive and contextually based on socio-cultural settings, while Potter (2021) mentions the need for re-contextualizing media literacy within the continuously evolving dynamics of digital society.

Livingstone (2018) identifies that digital environments create new forms of vulnerability unaddressed by conventional approaches. Valkenburg & Peter (2013) show significant variation in vulnerability to media effects among different adolescent groups. These findings reinforce the need for strategies based on audience characteristic segmentation.

Jenkins et al. (2009) introduced the concept of participatory culture, which is the active involvement of young people in the digital ecosystem that facilitates collaboration and content production. However, this participation is often not balanced with a critical understanding of power structures and digital media algorithms (Boyd, 2014). Livingstone & Helsper (2007) state that digital natives possess high technical skills but are low in critical literacy and digital ethics. Media literacy interventions need to integrate cognitive, technical, and ethical dimensions as suggested by Potter (2021), to build more reflective awareness of the social impact of digital media.

In a global context, several recent studies enrich the understanding of media literacy intervention design. Che et al. (2024) highlight the necessity of developing new media literacy that balances analytical, empathetic, and participatory skills as a response to digital disinformation. Halpern, (2024) introduces the concept of critical awakening, which is the individual's reflective awareness in meaning-making and responsibly evaluating digital information. This approach views media literacy not merely as a cognitive skill but also as a process of forming ethical awareness and social responsibility in digital spaces. Research by Buchan et al. (2024) further asserts that effective media literacy interventions need to be evidence-based and tailor program design to the demographic characteristics of the target audience.

Pan et al. (2025) developed a data-driven literacy assessment model based on performative measurement to identify variations in digital abilities across age groups. Meanwhile, Wendt et al. (2023) highlight the importance of a participatory digital literacy approach, where youth are not merely objects but also subjects in designing media literacy policies. Drake et al. (2023) add that youth media literacy should be treated as a dynamic phenomenon influenced by technological, economic, and political contexts.

Recent approaches place media literacy within a multidisciplinary framework, integrating communication theory, social psychology, and data science. Considering these empirical conditions and theoretical developments, this study proposes an integrative approach based on the Analytical Hierarchy Process (AHP) and K-Means Clustering to design a media literacy strategy for youth in Jakarta. AHP is used to determine the priority weights of media literacy dimensions—cognitive, technical, ethical, and participatory—based on the perceptions of experts and practitioners.

The AHP by Saaty (2008) serves as an instrument to determine priorities or weights among criteria based on expert perceptions. AHP has been widely used in social fields to determine priority dimensions in strategic decision-making. Meanwhile, K-Means Clustering enables the grouping of individuals into homogeneous clusters based on behavioral characteristics. K-Means Clustering provides an empirical approach to identifying patterns in behavioral data (Jain, 2010). This integrative approach is expected to overcome the limitations of previous normative models and yield data-driven recommendations that are contextual to the social reality of Indonesian urban areas.

Beyond theoretical aspects, empirical approaches in media literacy research are now shifting towards data-based analysis and segmentation. Pan et al. (2025) developed a data-driven digital literacy assessment enabling quantitative cross-generational mapping based on digital behavior and motivation. Buchan et al. (2024) strengthen this argument by proving that evidence-based media literacy strategies have higher effectiveness compared to normative models. Wendt et al. (2023) add a participatory digital literacy approach where youth groups are involved in designing interventions, ensuring policies are more aligned with actual needs. This participation-based model is relevant for Jakarta given the socio-cultural diversity influencing digital behavior.

Methods

AHP (Analytical Hierarchy Process) Technique

The AHP technique was employed to determine the priority weights of media literacy dimensions based on expert views. This method was chosen for its ability to convert subjective judgments into structured numerical measurements (Saaty,

2008). AHP assists in prioritizing alternatives based on predefined criteria. After forming and normalizing the pairwise comparison matrix, priority vectors, consistency index (CI), and consistency ratio (CR) were calculated. If CR < 0.1, the weight results are considered consistent and reliable. The pairwise comparison matrix was structured as an n × n square matrix, where diagonal elements equal 1 and reciprocal relationships hold for off-diagonal elements:

$$W = \begin{bmatrix} W_{11} & W_{21} & \cdots & W_{1m} \\ W_{12} & W_{22} & \cdots & W_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ W_{1m} & W_{2m} & \dots & W_{mm} \end{bmatrix}$$

Normalization was performed by dividing each element by the sum of its respective column, and the priority vector was obtained by averaging the values across each row. To verify the consistency of expert judgments, the following formulas were applied:

$$CI = \frac{\lambda_{max}-n}{n-1}, \qquad CR = \frac{CI}{RI}$$

In these equations, λ_{max} denotes the principal eigenvalue, ***n*** is the number of criteria, and RI refers to the random index. If CR < 0.1 (10%), as recommended by Saaty (2008), the matrix is deemed consistent, and the weight results are accepted. The AHP framework offers a structured and empirical approach for strategic decision-making, ensuring clarity in prioritization. A panel of fifteen specialists in digital communication, media pedagogy, and online content governance participated as informants. Each expert conducted pairwise evaluations of four key media literacy dimensions: cognitive, technical, ethical, and participatory. This methodology aligns with Halpern (2024), who underscores the role of expert input in evaluating critical awareness—termed "critical awakening"—within media literacy instruction.

K-Means Clustering Technique

The K-Means Clustering algorithm was used to identify media literacy segmentation patterns based on survey results from 202 young respondents aged 15–24 from five administrative regions of Jakarta. Data were collected through an online questionnaire with 26 items adapted from Potter's (2021) digital literacy competency model, as well as digital behavior indicators developed by Pan et al. (2025) and Drake et al. (2023)

K-Means is an *unsupervised learning* algorithm widely used for discovering hidden structures within datasets due to its simplicity and computational efficiency (Han et al., 2011). The algorithm aims to minimize the within-cluster variance by optimizing the following objective function:

$$J = \sum_{j=1}^{k} \sum_{x_1 \in C_j} \left|\left| x_i - \mu_j \right|\right|^2$$

where x_i denotes a data vector, μ_j represents the centroid of cluster j, and C_J is the set of data points assigned to that cluster (MacQueen, 1967)

The clustering process consists of five iterative steps:

1. The number of clusters *k* is determined.
2. Initial centroids are randomly assigned.
3. Each observation is allocated to the cluster with the nearest centroid, measured by Euclidean distance:

$$d(x_i, \mu_j) = \sqrt{\sum_{d=1}^{D} (x_{id} - \mu_{jd})^2}$$

4. Centroids are recalculated as the arithmetic mean of all points within each cluster:
5.

$$\mu_j = \frac{1}{|C_J|} \sum_{X_I \in C_J} x_i$$

6. Steps 3 and 4 are repeated until convergence, indicated by negligible changes in centroid positions or the objective value *J*.

The final output yields *k* distinct clusters characterized by high intra-group similarity and significant inter-group dissimilarity. This method is particularly effective for applications such as market segmentation, spatial analysis, and behavioral data exploration (Tan et al., 2019).

The K-Means algorithm was selected for its efficiency in grouping large data into several homogeneous segments based on digital behavior characteristics (Kakushadze & Yu, 2017; Zubair et al., 2024). The optimal number of clusters was determined using the elbow method and silhouette coefficient. The iterative process of the algorithm followed the recommendations of Nadu (2009), and the validation procedures outlined by Burkardt (2009) in the basic K-Means model.

To test the validity of the clustering results, a one-way ANOVA test was performed on each media literacy dimension with a significance level of $\alpha = 0.05$. Effect size analysis used eta-squared values to measure the extent to which cluster membership influences variations in media literacy levels. The validity of the clustering results was then evaluated through substantive interpretation based on the theory of differential susceptibility to media effects (Valkenburg & Peter, 2013), which explains differences in media vulnerability among individuals.

Integrative Design

This AHP–K-Means integrative model not only combines two analytical approaches but also unites deductive and inductive logic in social research. This approach aligns with the principles of hybrid modeling in digital education research (Pan et al., 2025), which emphasize the need for multidimensional validation between empirical data and theoretical frameworks. The final outcome of this integration is an evidence-based segmentation map of media literacy and strategic priority weights that can be used by government institutions and civil society organizations in designing media literacy programs for youth in Indonesian urban areas.

Results and Discussion

AHP Analysis Results

The Analytical Hierarchy Process (AHP) involved 15 experts with diverse backgrounds, encompassing academics, media practitioners, and media regulators. The selection of these experts was conducted using purposive criteria to ensure that the respondents genuinely possessed deep competence and experience related to media literacy issues. To maintain the validity of the assessments, the consistency of each expert's responses was tested, and the results met strict requirements with a Consistency Ratio (CR) value of 0.038. This value is well below the tolerance limit of 0.1 established by Saaty (2008), the foundation of AHP methodology, indicating a very high level of assessment consistency. This in-depth assessment process was conducted through two series of Focus Group Discussions (FGDs) held during the June-July 2025 period.

The hierarchy of criteria was structured collaboratively through a Delphi method process with the experts. This structure consists of four sequential levels: the main objective (strengthening media literacy), dimension criteria (four main competencies), sub-criteria, and alternative strategies. In the FGDs, each expert performed pairwise comparisons of each element using the fundamental Saaty scale, which compares the relative importance of one criterion against another. To minimize individual bias and produce a solid group consensus, the aggregation of all expert assessments was performed using the geometric mean method.

Table 1. Priority Weights for Media Literacy Criteria Based on Expert Assessment

Criteria	Priority Weight	Consistency Ratio
Cognitive Competency	0.412	0.032
Ethical Behavior	0.288	0.041
Social Participation	0.193	0.029
Technical Ability	0.107	0.035

Source: Processed AHP Data (2025)

The final analysis results yielded a very clear priority map. The cognitive competency dimension ranked highest with a weight of 0.412. This finding is highly aligned with Potter (2021) emphasis on the importance of developing analytical capacity and critical reasoning amidst the digital information deluge. The experts in the FGD argued that the ability to analyze, evaluate source credibility, and deconstruct media messages is a non-negotiable foundation. This discovery is also supported by Che et al. (2024) who emphasize the importance of strengthening new literacy for the younger generation to use the internet critically and responsibly. Halpern, (2024) adds that empowering students critically through media literacy enhances their ability to make socially impactful decisions.

The ethical behavior dimension obtained the second priority weight of 0.288. This reinforces Buckingham's (2020) statement that media literacy is not only about understanding but must also include moral consideration and responsibility in interacting in digital spaces. Pan et al. (2025) emphasize that digital literacy must include evaluative skills that guide individuals to behave ethically in the cyber world. Meanwhile, the social participation dimension with a weight of 0.193 supports Jenkins et al. (2009) theory of participatory culture, which emphasizes the importance of the ability not only to actively consume but also to contribute positively to the digital ecosystem.

Buchan et al. (2024) add that successful digital literacy programs incorporating social participation can increase student engagement in community-based projects and online collaboration. Technical ability became the dimension with the lowest weight (0.107), which aligns with Livingstone's (2018) view that technical skills are a basic foundation that needs to be mastered before developing more complex capacities, such as critical thinking and participation. Wendt et al. (2023) also note that strong technical ability does not always mean high critical literacy skills, affirming the need for content-based interventions and critical pedagogy.

To test the reliability of these results, a sensitivity analysis was conducted by varying the criterion weights by ±10%. The simulation results showed stable priorities in all scenarios; cognitive competency remained the most important. This stability indicates that the experts' preference for the cognitive dimension is highly robust and not easily changed by minor fluctuations, thus providing a strong foundation for formulating sustainable media literacy strategies.

K-Means Clustering Analysis Results

K-Means Clustering analysis was performed on data collected from 202 young generation respondents in Jakarta with diverse demographic characteristics. A total of 52% of respondents were aged 17-21 and 48% were aged 22-25. The geographical distribution included 28% from South Jakarta, 24% from East Jakarta, 20% from West Jakarta, 16% from North Jakarta, and 12% from Central Jakarta. A total of 64% of respondents were students and 36% were employed.

Table 2. Demographic Characteristics of Research Respondents

Variable	Category	Count	Percentage
Age	17-21 years	105	52%
	22-25 years	97	48%
Location	South Jakarta	56	28%
	East Jakarta	48	24%
	West Jakarta	40	20%
	North Jakarta	31	16%
	Central Jakarta	25	12%
Status	Student	129	64%
	Employed	73	36%

Source: Primary Research Data (2025)

The average internet usage rate reached 6.8 hours per day. A total of 89% of respondents accessed YouTube daily, 78% used Instagram, and 65% were active on TikTok. Only 32% of respondents routinely accessed formal news platforms. This media consumption pattern shows a dominance of entertainment content over educational information. Drake et al. (2023) emphasize that understanding social media use must be expanded with critical literacy assessment to avoid the spread of misinformation.

Reliability measurement of the instrument showed a Cronbach's alpha value of 0.87 for all constructs. The composite reliability value for each dimension was in the range of 0.82-0.89. The average variance extracted (AVE) exceeded the threshold value of 0.5 for all constructs. These results meet the criteria for convergent and discriminant validity according to the standards of Fornell & Larcker (1981). This assessment is consistent with the recommendation of Gerigk et al. (2025), who affirm the importance of empirical evaluation for evidence-based media literacy programs.

Clustering analysis using the K-Means algorithm produced three optimal segmentations. The determination of the number of clusters was based on the elbow method and silhouette analysis. The average silhouette width value reached 0.72, indicating excellent clustering quality (Kaufman & Rousseeuw, 2009). The clustering results met the internal validity criteria with a stable within-cluster sum of squares. Zubair et al. (2024) add that optimizing the K-Means algorithm through modern methods improves clustering accuracy and minimizes classification errors.

Table 3. Cluster Characteristics Based on Media Literacy Dimensions

Dimension	Cluster 1 (Advancer)	Cluster 2 (Intermediate)	Cluster 3 (Basic)
Cognitive Competency	4.32	3.15	2.18
Ethical Behavior	3.98	3.42	2.05
Social Participation	3.75	4.21	1.87
Technical Ability	4.56	4.32	3.94
Number of Members	69	94	39
Percentage	34%	47%	19%

Source: K-Means Clustering Analysis Results (2025)

Cluster 1 consists of 69 respondents (34%). This group shows the most comprehensive media literacy profile. The cognitive competency score reaches 4.32 and technical ability 4.56. Cluster 1 is dominated by undergraduate and postgraduate students from leading universities. About 82% of members of this cluster are active in campus organizations, digital communities, and have had internships at large companies. Helsper & Eynon (2013) also mention the existence of digital natives with high critical capacities. Halpern (2024) adds that critical engagement with media content strengthens social analysis skills and ethics among adolescents.

Cluster 2 has 94 members (47%). This group excels in the social participation dimension (4.21) but has moderate cognitive competency (3.15). This characteristic reflects a pattern of participatory culture without adequate critical depth. About 75% of the members of this cluster are active social media users for entertainment and socialization purposes. Mihailidis (2018) also emphasizes connected learning without critical engagement in some community groups. Pan et al. (2025) highlight the importance of performance-based assessment to improve the critical literacy of intermediate groups, including interactive simulations and structured case studies.

Cluster 3 consists of 39 respondents (19%). This group shows limited media literacy levels across all dimensions. The cognitive competency score is only 2.18 and social participation is 1.87. Cluster 3 is dominated by respondents from suburban areas with limited access to education. About 73% of members of this cluster admitted to having shared unverified information. This result is consistent with the UNESCO (2021) report on the digital literacy gap in urban areas. Meyrer & Kersch (2022) emphasize that interventions in vulnerable clusters should emphasize basic critical education to prevent the spread of misinformation.

Inter-Cluster Variance Analysis

ANOVA test was conducted to measure the significance of differences between clusters. The research results show highly significant differences ($p < 0.001$) in all aspects of media literacy: cognitive competency, ethical behavior, social participation, and technical ability. This confirms the existence of significant heterogeneity in the media literacy abilities of Jakarta's youth.

Post-hoc test using Tukey HSD confirmed that all cluster pairs were significantly different. This means that each pair of clusters among the three groups indeed possesses unique characteristics and differs from one another in terms of media literacy ability. Effect size analysis using eta-squared showed a value of 0.682 for cognitive competency, falling into the large effect category according to Cohen (1988). This result indicates that cluster membership can explain 68.2% of the variance in cognitive competency, strengthening the validity of the grouping.

The integration of AHP and K-Means Clustering results shows that the priority of the cognitive dimension is not merely an expert opinion, but is also reflected in the actual behavior of the younger generation. This finding is consistent with

research by Higdon, (2022) and Wendt et al. (2023), who emphasize the positive relationship between the development of critical literacy and the ability to verify digital content.

Table 4. Results of ANOVA Test Between Clusters

Dimension	F-value	p-value	Significance
Cognitive Competency	48.732	<0.001	Significant
Ethical Behavior	36.185	<0.001	Significant
Social Participation	42.963	<0.001	Significant
Technical Ability	25.417	<0.001	Significant

Source: Statistical Processing Results (2025)

Segmentation-Based Media Literacy Strategy

To build digital resilience, a uniform approach to media literacy has often proven ineffective. The younger generation, although seemingly homogeneous as "digital natives," possesses highly diverse levels of understanding, skills, and vulnerabilities. The integration of the Analytic Hierarchy Process (AHP) and K-Means Clustering models successfully maps this diversity into three main segments, thereby enabling the design of differentiated and targeted media literacy strategies. Each cluster receives interventions tailored to its characteristics and needs, with reference to recommendations from experts and related institutions to ensure the effectiveness and relevance of the strategies.

Cluster 1 (Advancer)

This cluster consists of individuals who already have a fairly good foundation in media literacy. The strategy for them no longer focuses on basic education, but on strengthening digital leadership capacity. The goal is to create "digital champions" who can become agents of change in their communities. The model suitable for this cluster, according to Hobbs 92017), is train-the-trainer and peer education. This community-based approach has proven more effective because the message is delivered by trusted parties who understand the same social context. Che et al. (2024) add that this group is capable of expanding the reach of media literacy through mentoring and peer-to-peer collaboration. Members of this cluster will be trained to become facilitators who not only master the material but are also able to encourage critical discussions and lead media literacy initiatives in their environments, such as in schools, campuses, or community organizations. This integration strengthens high ethical awareness, social participation, and cognitive competence.

Cluster 2 (Intermediate)

This cluster is the middle group that is technically proficient but still lacking in critical analytical skills regarding media content. They are easily exposed to information but have not yet fully become skeptical consumers. Mihailidis (2018) discusses engaging the younger generation through gamification approaches. Therefore, media literacy games and interactive content such as hoax identification quizzes, echo chamber simulations, or role-playing games can be effective methods. The content is designed to develop skeptical consumption without reducing the entertainment element. Halpern (2024) emphasizes the importance of combining experiential learning with interactive technology to enhance critical awareness. Through this approach, they are invited to actively and enjoyably question the motives, sources, and impacts of information, thus gradually building habits of independent verification.

Cluster 3 (Basic)

This cluster is the group most vulnerable to the negative impacts of digital media as they possess very limited basic competencies. They require fundamental intervention through basic digital literacy programs. The UNESCO (2021) guide on media literacy for vulnerable groups states that the approach to this cluster should be through simple offline and online channels that are easily accessible. Face-to-face workshops and intensive mentoring are key. The main material includes digital ethics education, basic security such as creating strong passwords, and simple yet applicable information verification techniques, such as checking news dates or looking for a second source. Drake et al. (2023) and Mesquita et al. (2024) emphasize the importance of building initial critical literacy to prevent the spread of hoaxes and increase ethical awareness. The goal is to equip them with minimum digital literacy competence to participate safely in digital spaces.

The integration of AHP and K-Means Clustering yields strategies based on expert judgement and empirical evidence. This combination of hybrid methods overcomes the weaknesses of a single approach in formulating media literacy

policies (Chen, 2020). The clustering results confirm the heterogeneity of media literacy capacity among Jakarta's youth, making a uniform approach ineffective, in accordance with the theory of differential susceptibility to media effects from Valkenburg & Peter (2013).

Table 5. Matrix of Segmentation-Based Media Literacy Strategies

Cluster	Priority Strategy	Implementation Method	Target Outcome
Advancer	Strengthening digital leadership capacity	Train-the-trainer, peer education	Digital champions
Intermediate	Enhancing critical competencies	Gamification, interactive content	Critical consumers
Basic	Fundamental digital literacy	Workshop, Mentoring	Digital literacy competence

Source: Integration of AHP and Clustering Results (2025)

Conclusion

This study successfully developed a model for segmentation-based media literacy strategy through the integration of Analytic Hierarchy Process (AHP) and K-Means Clustering methods. The main findings reveal three clusters of Jakarta's youth, distinguished by differences in cognitive, ethical behavior, social participation, and technical skills. The Advancer cluster demonstrates high cognitive and technical competence and possesses strong critical analysis abilities to evaluate the credibility of digital information. The Intermediate cluster exhibits robust social participation but limited critical competency, rendering them more susceptible to misinformation. In contrast, the Basic cluster requires fundamental intervention across all dimensions, as limited cognitive, ethical, and technical skills increase their vulnerability to false information.

The AHP analysis identified cognitive competency as the most critical dimension with a weight of 0.412, emphasizing analytical capacity as the cornerstone of media literacy, consistent with Potter (2021). Ethical behavior received a weight of 0.288, reinforcing Buckingham's (2020) argument that media literacy encompasses moral responsibility, not merely technical proficiency. Social participation and technical ability were weighted at 0.193 and 0.107, respectively, highlighting the necessity of balancing active engagement with mastery of foundational skills, in line with Livingstone (2018) and Jenkins et al. (2009)

Integration of AHP and K-Means Clustering produced differentiated strategies for each cluster. The Advancer cluster focuses on strengthening digital leadership through train-the-trainer and peer education models, cultivating “digital champions” capable of driving community-level change. The Intermediate cluster benefits from gamification, interactive content, and simulations, encouraging skeptical yet engaged media consumption. The Basic cluster receives intensive workshops and mentoring aimed at foundational digital literacy, equipping participants with the minimal skills required for safe and responsible online participation, in accordance with UNESCO (2021) This tiered approach embodies scaffolded learning and demonstrates the practical relevance of segmentation-based, rather than uniform, media literacy strategies.

A key finding is the dominance of cognitive competency, which underscores the necessity of critical thinking in media literacy. Potter (2021) emphasizes that understanding media impacts requires more than technical skill—it demands analytical evaluation. Pan et al. (2025) further stress the importance of performance-based assessments that combine cognitive evaluation with real-world simulations to enhance youth media literacy.

The study also highlights the integration of ethical behavior and social participation as essential dimensions. Buckingham (2020) asserts that moral considerations are fundamental, while Buchan et al. (2024) illustrate how online social interactions can be leveraged for critical learning. Accordingly, Advancer strategies emphasize mentorship and digital leadership, and Intermediate strategies apply gamified learning to cultivate critical habits.

The heterogeneity of media consumption among youth reinforces the need for tailored interventions. Data indicates that entertainment content dominates over formal news, necessitating context-sensitive strategies. Wendt et al. (2023) advocate for approaches aligned with actual media habits, while Mesquita et al. (2024) emphasize the role of fact-checking and case-based learning to improve literacy, particularly for Intermediate and Basic clusters.

The hybrid AHP-Clustering approach proves highly effective, combining expert-driven priority setting with empirical identification of heterogeneous groups. Higdon, (2022) recommends evidence-based approaches to maximize literacy impact, and Gerigk et al. (2025) stress continuous evaluation to align content with participants' evolving abilities, especially in vulnerable populations. Additional analysis indicates a positive correlation between cognitive competency and social participation ($r=0.67$, $p<0.001$), supporting Jenkins et al. (2009) and Helsper & Eynon, (2013) in demonstrating that critical engagement enhances literacy while mitigating misinformation risks.

Practically, a cluster-based strategy allows policymakers to design targeted interventions: Advancer participants become mentors, Intermediate focuses on fostering digital skepticism, and Basic receives foundational literacy support. Halpern (2024) confirms that adaptive approaches outperform uniform strategies in heterogeneous urban youth populations. This method aligns with scaffolded learning principles, guiding participants progressively from basic competencies to advanced critical and participatory skills.

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