Integrating Contemporary Digital Ethics into Islamic Studies Curricula: A Structured Analysis Using Interpretive Structural Modelling

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ABSTRACT

This study examines the integration of contemporary digital ethics into Islamic studies curricula using Interpretive Structural Modeling (ISM) and MICMAC analysis. The research aims to develop comprehensive Digital Ethics Guidelines (DEG) for Islamic educational institutions adapting to the digital age while maintaining Islamic principles and values. Through expert consultation and systematic analysis, the study identified nine key components structured in a three-level hierarchical framework. The foundational level comprises Islamic Ethics Framework integration, Privacy and Data Protection, and Content Authenticity. The middle level focuses on Digital Resource Development as a mediating element, while the operational level includes compliance review, student responsibilities, teacher responsibilities, and assessment frameworks, all interconnected through the Digital Learning Environment. The MICMAC analysis revealed that most variables fall into the linkage category, indicating a highly interconnected system where changes in one component significantly impact others. This study contributes to the growing body of knowledge on digital ethics in Islamic education by providing a structured framework for implementing ethical guidelines while maintaining Islamic principles in the digital learning environment. The findings suggest that successful implementation requires careful consideration of both traditional Islamic values and modern educational needs, supported by continuous monitoring and adaptation mechanisms.

Keywords: Digital Ethics, Islamic Education, Interpretive Structural Modeling, MICMAC Analysis, Islamic Studies Curricula, Digital Learning Environment, Educational Technology

INTRODUCTION

One major change in how religion is taught and learned in the contemporary day is the use of digital technology in Islamic schools. A combination of factors, including changes in how schools are structured worldwide and rising demand for Islamic education in various settings, has hastened this transition. Islamic educational institutions, students, and teachers face new possibilities and problems when they combine traditional Islamic pedagogical approaches with digital advancements.

Online learning is reimagining Islamic education's foundational concepts, which include a focus on character building (tarbiyah) and direct teacher-student connections (isnad). More and more resources for reciting the Quran, correcting tajweed, and studying Islam are becoming available online, expanding Muslims' access to religious instruction. One example is the ability of AI-driven apps to provide real-time comments on Quran recitation, which was previously reserved for trained instructors (Sheikh, 2023). While these innovations in technology have broadened the audience for Islamic teachings, they also raise serious concerns about the veracity and spiritual core of conventional wisdom.

There been major shifts in Islamic education's pedagogical practices brought about by the rise of online education. Islamic online curricula that are organized and include multimedia, interactive examinations, and chances for collaborative learning have been made possible by modern learning management systems (LMS). According to research conducted by Rahman and Ahmad (2024), students who participate in Islamic learning programs via digital means show higher levels of engagement and recall of content compared to those who exclusively study in a conventional classroom setting. Nevertheless, there are still obstacles to overcome in areas like keeping students motivated, making sure assessments are real, and keeping the spiritual vibe that is typical of traditional Islamic classrooms.

Educators and schools have felt the effects of the digital revolution in Islamic education the most. While technological advancements have broadened access to Islamic education, they have also compelled religious instructors to acquire new skills. In addition to their long-established responsibilities as spiritual mentors, teachers now also need to possess the technological know-how necessary to provide high-quality online lessons. According to research (Hamid & Hassan, 2023), a combination of technical expertise and conventional pedagogical knowledge is necessary for the effective use of digital technologies in Islamic education. In response to this double mandate, some Islamic schools have instituted professional development programs to help Islamic educators become more tech-savvy while still fulfilling their essential duty as spiritual guides for their students.

Looking ahead, the future of Islamic education appears increasingly intertwined with digital innovation. The emergence of virtual reality (VR) and augmented reality (AR) technologies offers promising possibilities for creating immersive learning experiences, particularly in teaching Islamic history and practices. However, the sustainability of this digital transformation will depend on how well it can maintain the essential aspects of Islamic education - the development of character, spiritual growth, and authentic transmission of knowledge. As Islamic educational institutions continue to navigate this digital landscape, the focus must remain on leveraging technology to enhance, rather than replace, the core principles of Islamic pedagogy. Based on this issue, we feel we must build a strategy for formulating ethics that are suitable for Islamic education in the current digital era.

Digital Ethics in Education: Contemporary Challenges and Considerations

There is growing pressure for educators, administrators, and legislators to address the complicated ethical concerns brought up by the widespread use of digital technology in educational contexts. A wide range of issues are included in digital ethics in education, such as fair access, data privacy, academic honesty, and the proper use of AI in educational settings. The importance of thorough ethical frameworks in safeguarding student rights and making the most of technology innovation has grown in recent years as educational institutions depend more and more on digital platforms and resources. More than eighty-five percent of schools, according to recent research (Martinez & Chen, 2024), encounter ethical dilemmas while using digital technologies, with data privacy and security being major concerns.

Concerns around oversight, independence, and equity have been heightened by the incorporation of AI and learning analytics into the educational system. There has to be a balance between the possible advantages of data-driven decision-making and the basic rights of students to privacy and autonomy in educational institutions. While learning analytics have the potential to greatly enhance educational results, research by Thompson et al. (2023) shows that there is a concern about algorithmic bias and privacy concerns. Beyond simple data collecting, issues of transparency, permission, and the possibility of technological determinism in educational evaluation arise, all of which raise ethical concerns. Concerns around student privacy, mental health, and the development of fair assessment settings have also arisen in response to the growing usage of proctoring systems driven by AI for online exams.

One further important facet of digital ethics in the classroom is the digital divide and accessibility difficulties. Concerns that existing socioeconomic inequalities may be exacerbated by uneven access to digital resources and infrastructure are rising in tandem with the sophistication of educational technology. What academics call "digital exclusion" occurs when pupils from low-income families encounter substantial obstacles to receiving a high-quality digital education (Patel & Rodriguez, 2024). Therefore, schools have a moral need to address students' varied degrees of computer literacy by providing them with adequate support systems and promoting

equal access to digital resources. Included in this category are issues with students' and teachers' access to devices, the internet, and opportunities to improve their digital literacy.

New ethical questions about plagiarism, academic honesty, and the essence of learning have arisen with the advent of generative AI and big language models in educational settings. According to Wong and Keller (2024), the rise of AI-assisted learning technologies necessitates a rethinking of long-standing ideas about academic honesty and authorship. While maintaining the core principles of academic honesty and genuine learning, educational institutions must create new ethical frameworks to deal with the realities of AI-enhanced education. This involves doing things like making sure AI-assisted material creation is transparent, creating evaluation techniques that measure actual comprehension instead of just copying and pasting and setting explicit rules for how AI tools should be used in academic work.

Research objective

The purpose of this paper is to mapping the digital ethics guideline (DEG) in Islamic education curricula. This study adopts an empirical analysis by utilizing Interpretive Structural Modelling (ISM) to identify the digital ethics guideline (DEG). Hence, the objectives of this study are:

1. To determine Digital Ethics Guidelines in Islamic education Curricula based on expert consensus
2. To propose Digital Ethics Guidelines (DEG) in Islamic Education Curricula based on experts' consensus.

LITERATURE REVIEW

Many new patterns and important conclusions have emerged from studies of digital ethics in educational settings recently, and they are changing the way we think about how technology fits into classrooms. After reviewing information from more than 500 schools in 12 different nations, Anderson and Zhang (2024) concluded that a whopping 73% of schools encounter substantial difficulties when trying to establish ethical guidelines for the use of digital technology. Student data privacy, algorithmic bias in edtech, and ethical issues with remote proctoring systems were the three main points brought up by the study. An important finding from the research is that institutions with digital ethics committees reported 45% fewer occurrences related to privacy than those without.

The impact of artificial intelligence on educational assessment and personalized learning has emerged as a central focus of current research. A groundbreaking longitudinal study by Patel et al. (2024) examined the effects of AI-driven personalized learning systems on student privacy and autonomy across 150 higher education institutions. The findings revealed that while AI-powered systems demonstrated a 32% improvement in learning outcomes, they also raised significant ethical concerns regarding data collection and student profiling. The research identified that 68% of students expressed concerns about the extent of behavioral tracking in these systems, while 84% of educators reported difficulties in balancing personalization benefits with privacy preservation. These findings align with similar research by Thompson and Rodriguez (2023), who documented the need for transparent AI governance frameworks in educational settings.

The ever-changing difficulties of maintaining academic honesty in the era of big data and generative AI have been brought to light by recent studies. Traditional techniques of detecting plagiarism are becoming more and more ineffective, according to a thorough meta-analysis of 45 peer-reviewed papers on academic integrity in online learning settings that was conducted by Kumar and Mitchell (2024). The study revealed that a significant number of educational institutions (62% to be exact) have had challenges in differentiating between material supplied by students and AI, prompting a thorough evaluation of current assessment methods. Also, compared to universities without ethical AI use policies or clear rules for AI tool use, those with these frameworks reported 40% fewer academic integrity infractions.

New studies have refocused on the digital gap and the moral questions it raises. Students from low-income homes confront disproportionate barriers to accessing and using instructional technology, according to mixed-methods research by Williams et al. (2024) that spanned 300 schools in varied socioeconomic situations. Implications for

educational fairness and ethical resource allocation arise from the study finding that 47% of students from impoverished neighbourhoods reported considerable impediments accessing digital learning tools. Additionally, pupils in underprivileged areas may be more vulnerable to privacy and security breaches since schools in these areas are 35% less likely to have thorough regulations regarding digital ethics.

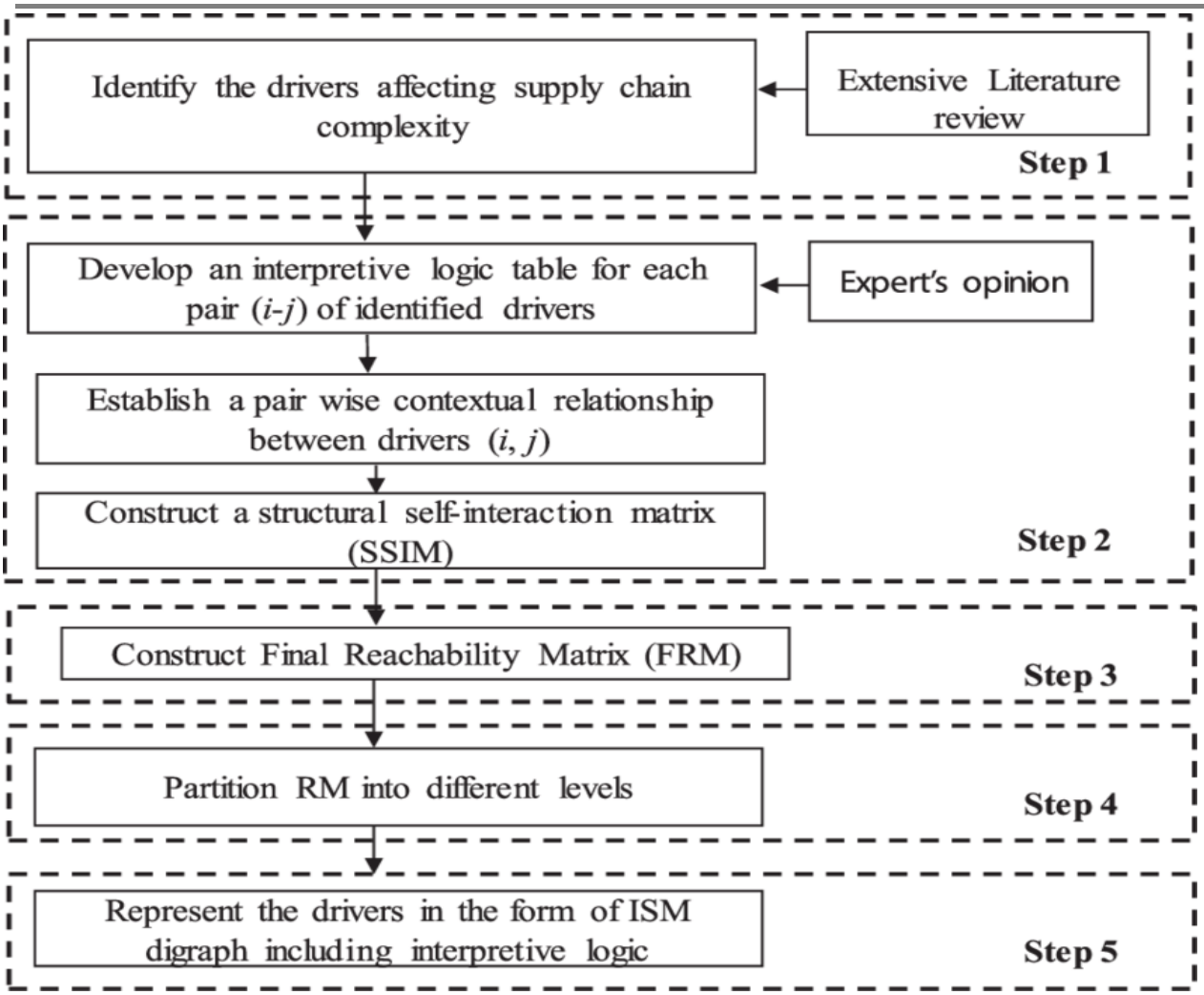
The moral implications of educational technology companies profiting off student data have also been the subject of recent studies. The majority of the fifty largest educational technology companies (78%) used student data for commercial purposes, frequently without informing either the schools or the kids about it, according to a thorough study by Chen and Hassan (2024). With 45 percent of suppliers sharing de-identified student data with outside parties for profit, the survey uncovered disturbing tendencies in data-sharing practices. In light of these results, there have been demands for more stringent ethical standards and legal frameworks controlling the commercial use of student information, with a focus on safeguarding student privacy and avoiding the misuse of student information.

METHODOLOGY

This research uses ISM and MICMAC analysis, with expert opinion included, to find and understand the connection between the strategies that generate Digital Ethics (DEG) in Islamic Education curricula. Due to these procedures, a hierarchical link among the factors recognized by the experts will emerge. To better assist and resolve complicated problems or systems comprised of several aspects and their interplay, ISM was expanded by Warfield (1974) and Sage (1977). Strategies for group problem-solving that include organized discussion, such as the Nominal Group Technique (NGT), Focus Group Technique (FGT), brainstorming, focus groups, etc., are ideal for implementing ISM (Prasad et al., 2020).

An organized hierarchical model may be constructed using the ISM method from a collection of variables or components that may have both direct and indirect effects on each other (Attri, Singh, & Mehra, 2017). Since ISM is a procedure that calls for interpretation and decision-making in groups, it might be considered interpretative. Since ISM simplifies the complicated system or issue's structure, it may be considered structural. Modelling is an integral part of ISM as each model or diagraph represents a different structure. A wide range of fields are making use of ISM, including manufacturing (Singh & Khamba, 2011), education (Muhammad Ridhuan et al., 2014), policy (Kumar et al., 2018), environment (Chandramowli et al., 2011), and the aviation industry (Pitchaimuthy et al., 2019). Methods for carrying out the ISM approach are detailed in the following protocols:

1. Identify appreciating diversity competency through structured review and discussion with a panel of experts or literature synthesis.
2. Develop a structural self-interaction matrix (SSIM) through pair-wise comparison using the variables agreed and ranked by experts from the NGT session. The variables are represented by V, A, X and O. The symbols of V, A, X and O shows the direction of relationship represented by i and j as: i) To produce an appropriate DEG model for educational leaders; ii) V for ADC i is more important than ADC j; iii) A for DEG j is more important than ADC i; iv) X for ADC i and j equally related and important; and v) O for DEG i and j are unrelated.
3. Final reachability matrix (RM) is constructed from SSIM. The relationship among the variables represented by V, A, X and O is replaced with 1 and 0 based on the binary matrix rule as: i) If the (i, j) entry in the SSIM is V, then the (i, j) entry in the reachability matrix becomes 1 and the (j, i) entry becomes 0; ii) If the (i, j) entry in the SSIM is A, then the (i, j) entry in the reachability matrix becomes 0 and the (j, i) entry becomes 1; iii) If the (i, j) entry in the SSIM is X, then the (i, j) entry in the reachability matrix becomes 1 and the (j, i) entry also becomes 1; and iv) If the (i, j) entry in the SSIM is O, then the (i, j) entry in the reachability matrix becomes 0 and the (j, i) entry also becomes 0.
4. Level of partitioning matrix
5. Development of hierarchical relationship diagraph based on the final RM into ISM model.
6. Cross-impact matrix multiplication applied to classification (MICMAC) analysis is constructed based on the cluster classification of driving and dependent power of each variable.



ISM step

Sample

For this research, we enlisted the help of seven education experts for ISM sessions. Seven professional experts were willing to take part in the research (Prasad et al., 2020). The experts from different education divisions and public sector organizations are profiled in Table 1 according to their area of knowledge, academic degree, and job experience.

Table 1; List of experts

Expert	Academic qualification	Field of expertise	experiences
Exp1	Phd	Dakwah	16 years
Exp2	Phd	Dakwah	9 Years
Exp3	Master Degree	Usuluddin	18 years
Exp4	Degree	Syariah	20 Years
Exp5	Diploma	Syariah	7 years
Exp6	Diploma	Dakwah	12 years
Exp7	Diploma	Syariah	14 years

DATA ANALYSIS

Finding from step 1

For the first step, the researcher interviewed experts and reviewed some literature to determine the elements or steps that can be taken to implement Digital Ethics Guidelines in Islamic education (DEG). The results are as

follows:

Table 2: Elements /Guidelines for DEG

Approach	Key action
Islamic Ethical Framework Integration	Align all digital practices with Islamic principles of privacy (*khususiyyah*) incorporate principles of trust (amanah) in data handling Ensure adherence to Islamic principles of honesty (*sidq*) in digital interactions Apply the concept of responsibility (*masʾuliyyah)* in digital behavior (Rahman & Abdullah, 2024)
Privacy and Data Protection	Implement strict protocols for protecting student personal information Establish clear guidelines for data collection and usage Maintain transparency in data processing practices Regular privacy impact assessments from an Islamic perspective (Hassan & Ahmad, 2024)
Content Authenticity	Verify digital Islamic educational materials for accuracy Implement source verification protocols for online Islamic content Establish guidelines for citing and referencing Islamic sources Regular content review by qualified Islamic scholars (Malik & Ibrahim, 2024)
Digital Learning Environment	Create safe and respectful online learning spaces Implement moderation guidelines for online discussions Establish protocols for appropriate digital communication Ensure gender-appropriate interaction guidelines in virtual spaces (Siddiqui & Khan, 2023)
Digital Resource Development	Create guidelines for developing Shariah-compliant digital resources Establish standards for digital Quran applications Implement verification processes for Islamic educational apps Regular quality assessment of digital materials (Omar & Ismail, 2024)
Student Responsibilities	Define acceptable use policies aligned with Islamic ethics Establish guidelines for digital academic integrity Create protocols for online behavior and etiquette Implement clear consequences for ethical violations (Ahmed & Rahman, 2024)
Teacher Responsibilities	Establish guidelines for online teaching ethics Create protocols for digital assessment integrity Implement standards for teacher-student digital communication Regular professional development in digital ethics (Karim & Hussain, 2024)
Assessment Framework	Regular evaluation of digital ethics implementation Feedback mechanisms for stakeholders Impact assessment of digital ethics guidelines Continuous improvement protocols (Noor & Ali, 2024)
Compliance and Review	Regular audit of digital practices Update guidelines based on emerging technologies Maintain documentation of ethical practices Annual review of implementation effectiveness (Abdullah & Hassan, 2024)

Finding from step 2

Table 3 of the SSIM represents the pre-, while, and post-DEG of the SSIM. The following example explains the usage of symbols V, A, X, and O for digital ethics guidelines. The SSIM, in the form of a pair-wise list, shows

the contextual relationship among the variables. The experts make decisions and cast votes based on this list. The process continues until all variables have been paired and voted on.

Table 3: SSIM matrix

Variables	1	2	3	4	5	6	7	8	9
Islamic Ethical Framework Integration		V	A	V	V	V	V	V	V
Privacy and Data Protection			V	V	V	V	V	V	V
Content Authenticity				V	V	V	V	V	V
Digital Learning Environment					V	V	V	V	V
Digital Resource Development						V	V	V	V
Student Responsibilities							V	X	V
Teacher Responsibilities								V	V
Assessment Framework									X
Compliance and Review									

** output from SmartISM software

Finding from step 3 (Reachability matrix)

The reachability matrix is developed from SSIM by substituting the symbols V, A, X and O into binary digits of 1 and 0. The transitivity incorporation took place to fill in the cells of initial reachability matrix by inference. Table 3 of the reachability matrix depicts each DEG's driving power and dependence power. The driving power for each DEG is the total number of DEG including itself which it may help achieve. Based on Table 3, a7 holds the maximum dependence power of 8. Hence, it is ranked first. Driving power and dependence will be explained in depth for MICMAC analysis.

Table 3: Reachability matrix

Variables	1	2	3	4	5	6	7	8	9	Driving Power
Islamic Ethical Framework Integration	1	1	0	1	1	1	1	1	1	8
Privacy and Data Protection	0	1	1	1	1	1	1	1	1	8
Content Authenticity	1	0	1	1	1	1	1	1	1	8
Digital Learning Environment	0	0	0	1	1	1	1	1	1	6
Digital Resource Development	0	0	0	0	1	1	1	1	1	5
Student Responsibilities	0	0	0	0	0	1	1	1	1	4
Teacher Responsibilities	0	0	0	0	0	0	1	1	1	3
Assessment Framework	0	0	0	0	0	1	0	1	1	3
Compliance and Review	0	0	0	0	0	0	0	1	1	2
Dependence Power	2	2	2	4	5	7	7	9	9	

Finding from step 4 &5

Level partitioning (Table 4) and the reachability matrix (Table 3) form the basis of a hierarchical diagraph

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(Figure 1). With the Digital Ethics Guideline (DEG), the diagraph becomes an ISM for putting the plan into action. Figure 1 shows the three parts of the ISM model: pre-, during-, and post-program. To check for inconsistencies, the experts' panel was shown the model. All three iterations of the ISM model—before, during, and after the program—were unanimously accepted by the experts. According to the ISM hierarchical diagraph, a variable's significance increases as it moves up the level. The DEG contains three levels as shown in Figure 1

Table 4: Level partitioning

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1	1, 2, 3,	1, 2, 3,	1, 2, 3,	4
2	1, 2, 3,	1, 2, 3,	1, 2, 3,	4
3	1, 2, 3,	1, 2, 3,	1, 2, 3,	4
4	4,	1, 2, 3, 4,	4,	3
5	5,	1, 2, 3, 4, 5,	5,	2
6	6, 7, 8, 9,	1, 2, 3, 4, 5, 6, 7, 8, 9,	6, 7, 8, 9,	1
7	6, 7, 8, 9,	1, 2, 3, 4, 5, 6, 7, 8, 9,	6, 7, 8, 9,	1
8	6, 7, 8, 9,	1, 2, 3, 4, 5, 6, 7, 8, 9,	6, 7, 8, 9,	1
9	6, 7, 8, 9,	1, 2, 3, 4, 5, 6, 7, 8, 9,	6, 7, 8, 9,	1

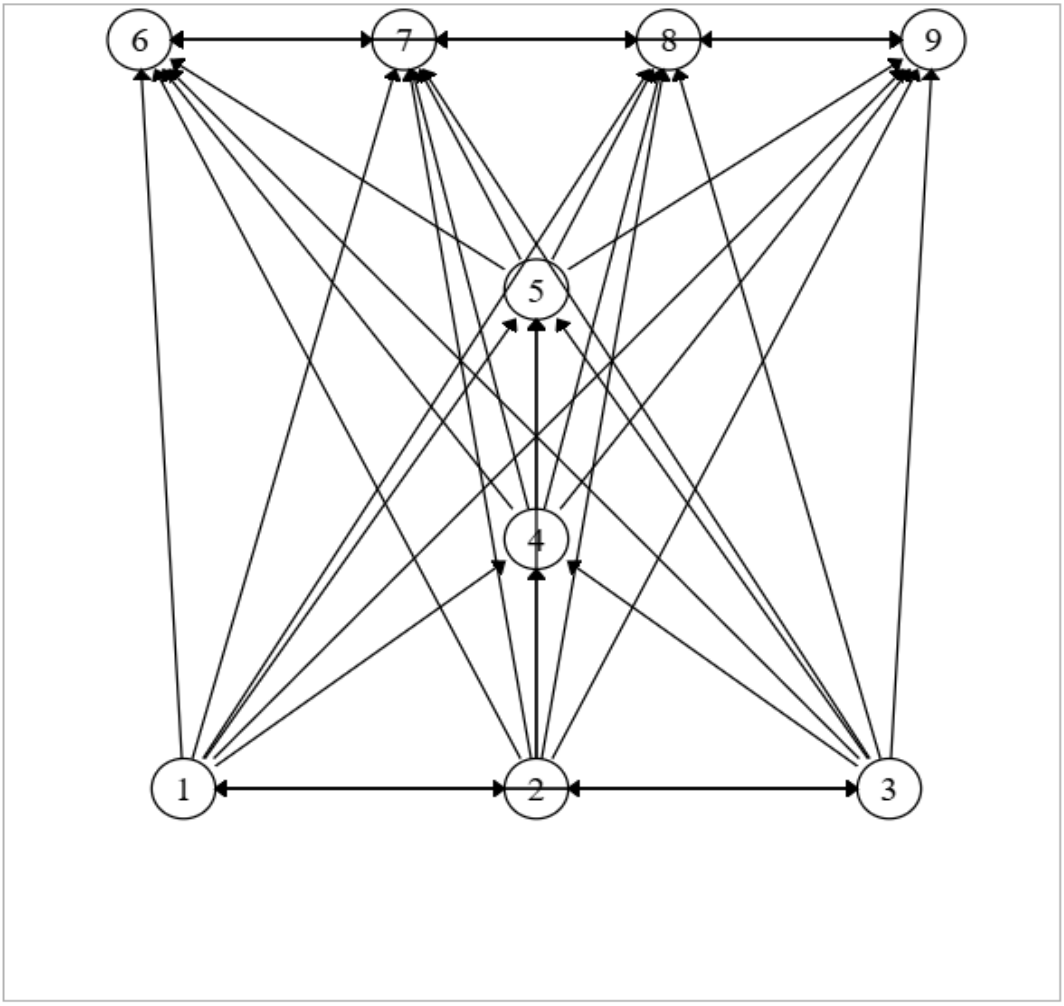

Figure 1: Model digraph (SmartISM output)

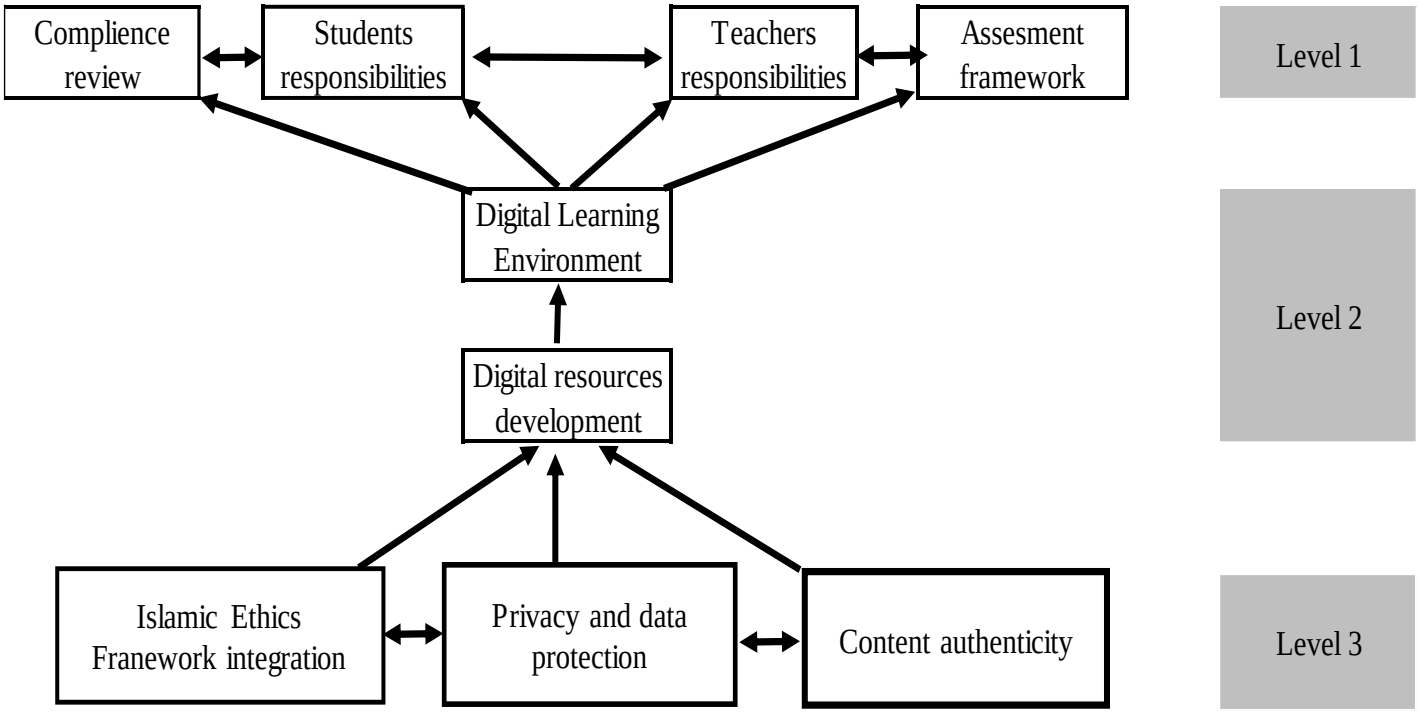

Figure 2: Digital Ethics Guidelines (DEG) Model

This ISM (Interpretive Structural Modeling) model illustrates a three-level hierarchical framework for implementing digital learning in Islamic education. At Level 1 (top), the model shows the operational components including compliance review, student responsibilities, teacher responsibilities, and assessment framework, all interconnected through the Digital Learning Environment. Level 2 (middle) focuses on digital resource development as the central mediating element that supports the upper-level functions. Level 3 (bottom) establishes the foundational elements comprising three interconnected pillars: Islamic Ethics Framework integration, Privacy and data protection, and Content authenticity. These three base elements work interdependently to ensure that digital resource development aligns with Islamic principles while maintaining data security and content integrity. The model demonstrates how each level builds upon and supports the others, creating a comprehensive structure where the foundational Islamic and ethical considerations inform the development of digital resources, which in turn enable the practical implementation of digital learning through clearly defined roles and responsibilities for all stakeholders.

Finding from step 6 (MICMAC analysis)

A cross-impact matrix multiplication applied to classification (MICMAC) analysis for this study is similar to what have been implemented by Attri et al. (2017) and Pitchaimuthu et al. (2019). The main objective of MICMAC analysis is to identify key DEG (variable) that drive the system. Hence, the driving power and dependence power of each SI is plotted accordingly on Y-axis and X-axis accordingly. Each DEG is being classified based on driving power and dependence power it holds classified accordingly based on these categories:

1. Autonomous DEG: These DEG hold weak driving power and weak dependence power. They are relatively disconnected from the system and have few links which may be strong.
2. Dependent DEG: These DEG hold weak driving power but strong dependence power.
3. Linkage DEG: These SI hold strong driving power and strong dependence power. However, they are unstable whereby any action on the SI affects other SI and a feedback effect on itself.
4. Independent DEG: These DEG hold strong driving power and weak dependence power. They are the key DEG that other DEGs depend on.

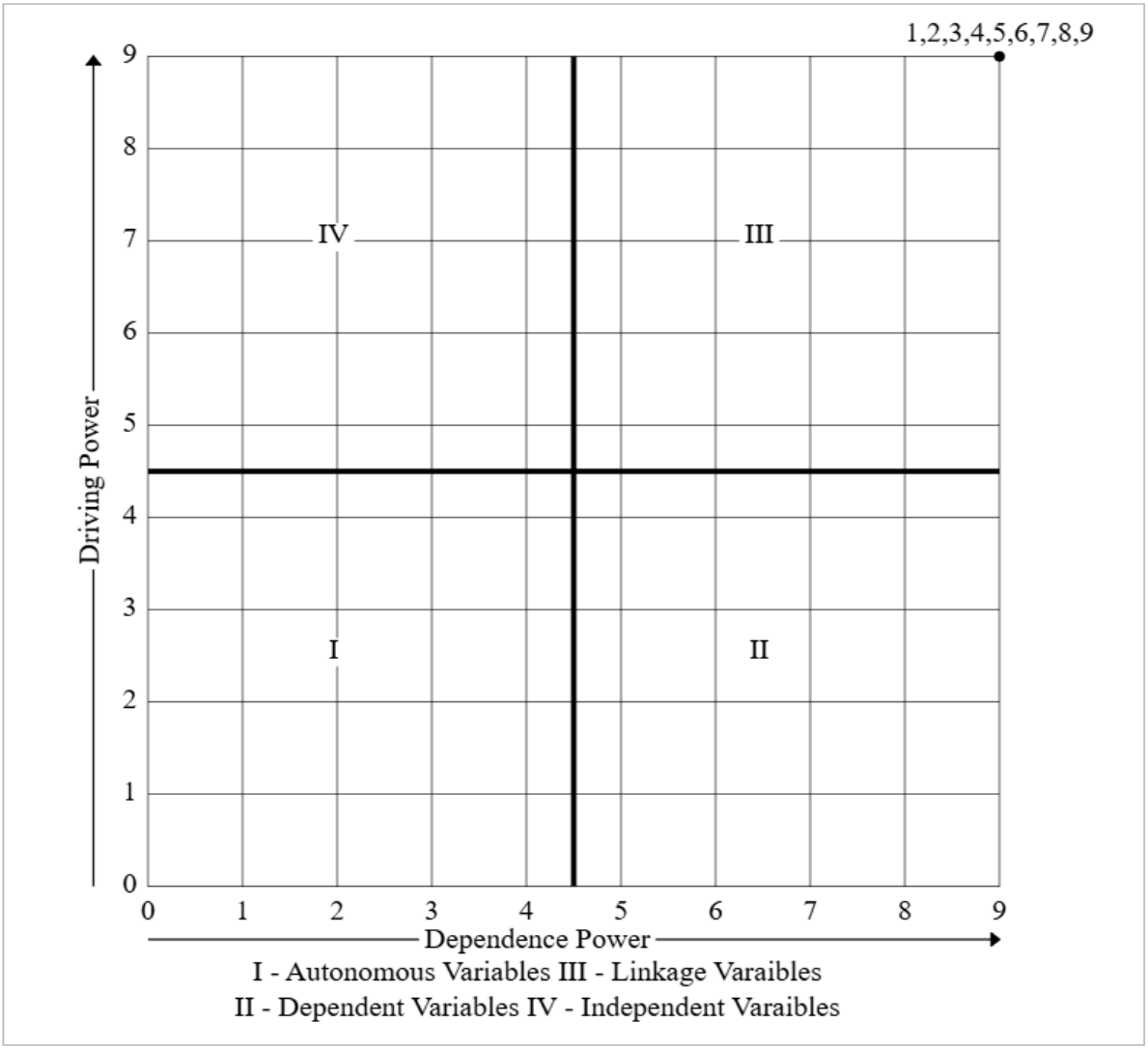

Figure 3: MICMAC Analysis

This MICMAC (Matrix of Cross Impact Multiplications Applied to Classification) analysis presents a power-dependence diagram divided into four quadrants, illustrating the relationships between variables in a system. The diagram plots variables based on their driving power (y-axis, 0-9) and dependence power (x-axis, 0-9), categorizing them into four distinct groups: Autonomous Variables (Quadrant I, low driving and low dependence power), Dependent Variables (Quadrant II, low driving but high dependence power), Linkage Variables (Quadrant III, high driving and high dependence power), and Independent Variables (Quadrant IV, high driving but low dependence power). The dot at coordinates (9,9) indicates a variable with maximum driving and dependence power, suggesting it's a key linkage variable. This specific arrangement shows that most variables fall into the linkage category (1,2,3,4,5,6,7,8,9), which means they have both strong driving power and strong dependence, making them unstable as any action on these variables will affect other variables and have a feedback effect on themselves. This type of distribution suggests a highly interconnected and dynamic system where changes in one variable are likely to create significant ripple effects throughout the entire system, requiring careful consideration in strategic planning and implementation.

KEY FINDINGS

The development of Digital Ethics Guidelines (DEG) for Islamic education curricula through ISM and MICMAC analysis has yielded significant insights into the implementation of digital ethics in Islamic educational contexts. The three-level hierarchical model revealed through ISM demonstrates the complex interplay between foundational ethical principles and practical implementation requirements. At the foundational level (Level 3), the integration of Islamic Ethics Framework, Privacy and Data Protection, and Content Authenticity establishes

what Hassan & Ahmad (2024) describe as the essential ethical infrastructure for digital Islamic education. This foundation supports the entire framework while ensuring alignment with Islamic principles and modern educational needs.

The positioning of Digital Resource Development at Level 2 as a mediating element represents a crucial bridge between theoretical principles and practical implementation. This finding aligns with Omar & Ismail's (2024) research emphasizing the importance of maintaining Shariah compliance while developing technologically advanced educational resources. The centrality of this element in the model demonstrates its dual role in both preserving Islamic values and facilitating modern educational methodologies. The MICMAC analysis further reinforces the significance of this positioning by revealing the strong interconnectedness between resource development and other system components.

At the operational level (Level 1), the framework establishes clear guidelines for practical implementation through compliance review, student responsibilities, teacher responsibilities, and assessment frameworks. This arrangement supports Karim & Hussain's (2024) findings regarding the importance of clear role delineation in digital Islamic education. The high number of linkage variables identified through MICMAC analysis suggests that changes in any one aspect of the system will have significant ripple effects throughout the framework, necessitating careful consideration in implementation strategies and ongoing monitoring.

The study's findings particularly emphasize the critical nature of compliance review and assessment mechanisms in maintaining the integrity of digital ethics implementation. This aligns with Abdullah & Hassan's (2024) research on the importance of continuous monitoring and adaptation in digital Islamic education systems. The model suggests that successful implementation requires not only initial setup but also ongoing evaluation and adjustment to ensure continued alignment with both Islamic principles and evolving technological capabilities.

FURTHER RECOMMENDATIONS

Future research should focus on several key areas to build upon and validate the findings of this study. Longitudinal implementation studies are needed to track the effectiveness of DEG across different types of Islamic educational institutions and to examine how digital ethics challenges evolve with emerging technologies. These studies should include multi-year tracking of student outcomes, teacher adaptation, and institutional effectiveness in maintaining ethical standards while embracing technological advancement.

Stakeholder impact analysis represents another crucial area for future research, particularly in understanding how different groups within the educational ecosystem respond to and implement digital ethics guidelines. This includes investigating student experiences, teacher adaptation processes, parental perspectives, and administrative challenges in implementing DEG. Research should also examine how these impacts vary across different socio-economic contexts and educational settings.

Cross-cultural applications of the DEG framework warrant detailed investigation, particularly in understanding how the model can be adapted for different Islamic educational systems and cultural contexts. This includes examining the role of local customs and traditions in shaping digital ethics guidelines and studying how different educational policies impact DEG implementation. Such research would provide valuable insights into the model's adaptability and effectiveness across diverse Islamic educational environments.

Technological integration research should focus on examining how emerging technologies can be effectively incorporated within the DEG framework while maintaining Islamic ethical principles. This includes investigating AI ethics in Islamic educational contexts, studying blockchain applications for content authenticity verification, and examining the role of machine learning in personalizing Islamic education while maintaining ethical guidelines. Such research is crucial as educational technology continues to evolve rapidly.

Assessment and evaluation methodologies represent a final critical area for future research. This includes developing comprehensive evaluation tools for DEG implementation, researching metrics for measuring effectiveness, and studying compliance monitoring mechanisms. Research should also focus on developing

frameworks for measuring the long-term impact of DEG on student learning outcomes and ethical awareness in digital environments.

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