

ALIGNING MANAGEMENT OF APPLIED EDUCATION PROGRAMS IN INFORMATION AND COMMUNICATION TECHNOLOGY WITH GRAPHIC DESIGN INDUSTRY NEEDS TO ENHANCE STUDENT COMPETENCIES

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Abstrak

Integrasi teknologi dalam pendidikan vokasi menjadi kunci utama menjawab tantangan industri kreatif kontemporer. Studi ini menguraikan manajemen program pendidikan terapan teknologi informasi dan komunikasi untuk meningkatkan kompetensi desain grafis siswa di salah satu Madrasah Aliyah Negeri di Pamekasan. Menggunakan pendekatan kualitatif fenomenologi, data dikumpulkan melalui wawancara mendalam, observasi, dan dokumentasi terhadap pimpinan, pengelola, dan siswa. Analisis data mengikuti model Miles, Huberman, dan Saldana. Hasil menunjukkan manajemen program meliputi perencanaan, pelaksanaan, dan evaluasi. Perencanaan melibatkan identifikasi kebutuhan siswa dan kurikulum berbasis mitra industri. Pelaksanaan menekankan pembelajaran berbasis proyek untuk mengasah kreativitas dan teknis secara kolaboratif. Evaluasi berjalan berkelanjutan melalui penilaian formatif, sumatif, dan sertifikasi bersama mitra. Kendala sarana dan motivasi diatasi melalui strategi kolaboratif dan inovasi pembelajaran. Penelitian ini berkontribusi pada pengembangan model pendidikan terapan yang adaptif terhadap dinamika dunia kerja.

Kata kunci : Manajemen, pendidikan, teknologi, kompetensi, desain

Abstract

Aligning vocational education management with contemporary creative industry demands is crucial for successful technological integration. This study describes managing applied information and communication technology education programs to enhance student competencies in graphic design at a state Islamic senior high school in Pamekasan. Employing a qualitative phenomenological approach, data were gathered through in-depth interviews, observations, and documentation involving school leaders, program managers, and students. Data analysis followed Miles, Huberman, and Saldana's model. Results indicate program management consists of planning, implementation, and evaluation. Planning involves identifying student needs and curricula based on industry partner guidelines. Implementation focuses on project-based learning to foster creativity and technical skills within collaborative teams. Evaluation occurs continuously through partner cooperation, encompassing formative and summative assessments plus competency certification. Despite challenges like limited facilities and motivation drops, collaborative strategies involving time management and instructional innovation were applied. This research contributes to developing adaptive applied education models responsive to workforce dynamics.

Key Words: Management, education, technology, competency, design

INTRODUCTION

Aligning the management of applied education programs with industry needs is a critical factor in ensuring the relevance of competencies for information and communication technology graduates. Contemporary vocational frameworks emphasize integrating practical skills with theoretical knowledge to bridge existing gaps effectively within modern economies.¹ Effective curriculum design requires continuous feedback loops from professional sectors to maintain educational standards.² Furthermore, strategic partnerships between schools and companies enhance technical proficiency among learners through shared resources.³ Without such collaboration, skills mismatches persist in the labor market despite various interventions.⁴ The Adaptive management ensures institutional sustainability amidst rapid technological changes and evolving demands. Alignment fosters sustainable professional growth and economic stability for students entering the workforce.

The efforts to enhance student graphic design competencies often fail to achieve expected workforce readiness targets without strong integration between curriculum management and creative industry standards. Industry expectations continuously evolve, requiring educational institutions to adapt their pedagogical approaches accordingly.⁵ Research indicates that graduates frequently lack practical skills demanded by employers in creative sectors.⁶ Curriculum misalignment results in significant employment challenges for vocational program completers.⁷ Regular industry consultation mechanisms improve graduate outcomes substantially across multiple disciplines.⁸ Competency frameworks must reflect current technological tools and professional

¹ Abdel Hamid M.S. Esmail and Zahid M. Khan, "Alignment of Vocational Education Curricula with Job Requirements in Industrial Sector: Analysis Study," *World Journal of Advanced Research and Reviews* 21, no. 3 (2024): 2303–13, <https://doi.org/10.30574/wjarr.2024.21.3.1002>.

² Agus Rahayu, Lili Adi Wibowo, and Sulastri, "Skill Mismatch and Industry Involvement in Improving the Job Readiness of Vocational School Graduates," *Proceedings of the 5th Global Conference on Business, Management and Entrepreneurship (GCBME 2020)* 187, no. Gcbme 2020 (2021): 771–74, <https://doi.org/10.2991/aebmr.k.210831.145>.

³ Xueqing Zhao, "Study on the Matching Degree of Major Groups and Industrial Groups in Higher Vocational Colleges," *Heliyon* 10, no. 8 (2024): e29945, <https://doi.org/10.1016/j.heliyon.2024.e29945>.

⁴ Mustafa Kayyali, "Aligning Vocational Education With Industry Needs: Successful Partnerships and Practices," *Innovative Approaches in Vocational and Regional Education*, 2025, 1–48, <https://doi.org/10.4018/979-8-3693-9496-0.ch001>.

⁵ Poh Kiong Tee et al., "Demand for Digital Skills, Skill Gaps and Graduate Employability: Evidence from Employers in Malaysia," *F1000Research* 13 (2024): 1–19, <https://doi.org/10.12688/f1000research.148514.1>.

⁶ Md Jahangir Alam et al., "An Assessment of Graduates Skills Gap for Sustainable Employability during the 4IR in Bangladesh," *Social Sciences and Humanities Open* 12, no. July (2025): 101780, <https://doi.org/10.1016/j.ssaho.2025.101780>.

⁷ Gov. UK, "Skills Gaps and Shortages in the Creative Industries: Employer Perceptions and Actions" (London, 2025), <https://www.gov.uk/government/statistics/skills-gaps-and-shortages-in-the-creative-industries-employer-perceptions-and-actions-uk-2022/skills-gaps-and-shortages-in-the-creative-industries-employer-perceptions-and-actions-uk-2022-research-report>.

⁸ Martin Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education* (Switzerland: Springer International Publishing Switzerland, 2107), <https://doi.org/10.1007/978-3-319-41713-4>.

practices.⁹ Sustained collaboration between educators and industry practitioners remains essential for meaningful skill development and successful career transitions.

This study offers a unique perspective by examining the dynamics of applied education management within an Islamic senior high school environment that integrates Islamic values with modern technology demands. Religious educational institutions increasingly recognize the necessity of balancing traditional values with contemporary skill requirements.¹⁰ Madrasah systems worldwide are undergoing transformation to remain competitive in modern educational landscapes.¹¹ Technology integration in Islamic education requires careful consideration of ethical frameworks alongside technical competencies.¹² Management approaches in religious schools differ significantly from secular vocational institutions due to dual curriculum demands.¹³ Limited research exists examining how Islamic senior high schools manage applied technology programs specifically.¹⁴ This gap makes the current investigation particularly valuable for understanding adaptive management strategies in faith-based vocational contexts. The findings will contribute to broader discussions about religious education modernization while preserving institutional identity and values.

The urgency of this research lies in the pressing need to bridge the skills gap between secondary education graduates and expectations of the rapidly evolving graphic design industry. Global labor markets demonstrate persistent mismatches between educational outputs and employer requirements across multiple sectors.¹⁵ Digital transformation accelerates obsolescence of traditional technical skills within creative industries significantly.¹⁶ Vocational institutions struggle to update curricula fast enough to match rapid technological advancements effectively.¹⁷ Employers consistently report

⁹ Kath Dooley et al., “Mind the Gap: A Scoping Review of Skills Gaps for Graduates in the Creative Industries,” *Arts and Humanities in Higher Education* 23, no. 4 (2024): 330–49, <https://doi.org/10.1177/14740222241276166>.

¹⁰ Abdul Rohman et al., “Integrating Traditional-Modern Education in Madrasa to Promote Competitive Graduates in the Globalization Era,” *Cogent Education* 10, no. 2 (2023), <https://doi.org/10.1080/2331186X.2023.2268456>.

¹¹ Basri Ibrahim, “Madrasah Transformation Into Modern Educational Institutions During The New Order,” *Istawa: Jurnal Pendidikan Islam* 4, no. 2 (2019): 196, <https://doi.org/10.24269/ijpi.v4i2.2006>.

¹² Nur Raihanah Amani and Mahasri Shobahiya, “Integration of Technology in Islamic Education Learning at Al Hadi Islamic Middle School in The Academic Year of 2024/2025,” *Al Ulya: Jurnal Pendidikan Islam* 10, no. 1 (2025): 1–19, <https://doi.org/10.32665/alulya.v10i1.4160>.

¹³ Dudun Ubaedullah, Rokimin, and Fajar Suryono, “Technology in Islamic Education Curriculum: Challenges and Opportunities,” *Jurnal Al Burhan* 5, no. 2 (2025): 369–91, <https://jurnal.staidaf.ac.id/jab/article/view/609>.

¹⁴ Ardhitya Furqon Wicaksono et al., “Islamic Education Policy in Yogyakarta 2020-2025: A Systematic Review of Its Implementation and Impact,” *Indonesian Journal of Islamic Educational Review* 2, no. 3 (2025): 226–40, <https://doi.org/10.58230/ijier.v2i3.407>.

¹⁵ Denise Jackson, “An International Profile of Industry-Relevant Competencies and Skill Gaps in Modern Graduates,” *The International Journal of Management Education* 8, no. 3 (2010): 29–58, <https://doi.org/10.3794/ijme.83.288>.

¹⁶ Zhao, “Study on the Matching Degree of Major Groups and Industrial Groups in Higher Vocational Colleges.”

¹⁷ Xinmiao Song and Duoduo Xu, “More Graduates, Fewer Skills? Vocational Education Expansion and Skilled Labour Shortages in China,” *China Quarterly* 260 (2024): 970–85, <https://doi.org/10.1017/S0305741023001856>.

challenges recruiting graduates with adequate practical competencies for immediate workplace contribution.¹⁸ Immediate intervention is required to align educational strategies with current professional standards accurately.¹⁹ Addressing this disparity ensures sustainable employability for graduates entering competitive creative markets today. Without action, economic productivity suffers due to underutilized human capital potential globally.

An interesting aspect of this study is how religious education institutions are able to adapt and adopt creative industry management practices within a formal academic structure. Faith-based schools increasingly integrate vocational skills to remain competitive in modern educational landscapes globally.²⁰ Management strategies in these institutions often balance ethical values with technical proficiency requirements effectively.²¹ Curriculum adaptation requires significant collaboration between religious leaders and industry practitioners across diverse regions.²² Technological integration within religious frameworks presents unique challenges for administrative leadership teams today.²³ Successful models demonstrate that spiritual identity can coexist with rigorous professional standards effectively.²⁴

The novelty of this research is found in the program management synchronization model specific to the context of madrasah-based vocational education in developing regions. According to Mardinson, existing literature predominantly focuses on secular vocational systems within developed economies extensively.²⁵ Contextual factors significantly influence educational management effectiveness across diverse cultural settings globally.²⁶ Strategic alignment models rarely address unique religious institutional constraints adequately.²⁷ Developing regions face distinct challenges

¹⁸Gopalakrishnan Soundararajan, Anitha Ravikumar, and Stephen Aro-Gordon, "Employers Perception on Graduate Skill Deficiency To Suit Productivity," *Humanities & Social Sciences Reviews* 8, no. 3 (2020): 1415–21, <https://doi.org/10.18510/hssr.2020.83142>.

¹⁹Kayyali, "Aligning Vocational Education With Industry Needs: Successful Partnerships and Practices."

²⁰Jackson, "An International Profile of Industry-Relevant Competencies and Skill Gaps in Modern Graduates."

²¹Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

²²Tee et al., "Demand for Digital Skills, Skill Gaps and Graduate Employability: Evidence from Employers in Malaysia."

²³Alam et al., "An Assessment of Graduates Skills Gap for Sustainable Employability during the 4IR in Bangladesh."

²⁴Stephen Billett, *Vocational Education: Purposes, Traditions and Prospects* (Dordrecht, The Netherlands: Springer Science+Business Media, 2011), <https://doi.org/10.1007/978-94-007-1954-5>.

²⁵Simon Marginson, "Limitations of Human Capital Theory," *Studies in Higher Education* 44, no. 2 (2019): 287–301, <https://doi.org/10.1080/03075079.2017.1359823>.

²⁶Denise Jackson and Ruth Bridgstock, "What Actually Works to Enhance Graduate Employability? The Relative Value of Curricular, Co-Curricular, and Extra-Curricular Learning and Paid Work," *Higher Education* 81, no. 4 (2021): 723–39, <https://doi.org/10.1007/s10734-020-00570-x>.

²⁷Simon McGrath et al., "Vocational Education and Training for African Development: A Literature Review," *Journal of Vocational Education and Training* 72, no. 4 (2020): 465–87, <https://doi.org/10.1080/13636820.2019.1679969>.

regarding resource allocation and industry partnership formation consistently.²⁸ Furthermore, Islamic education management studies often overlook technical vocational integration specifically.²⁹ This investigation fills critical gaps by proposing adaptable frameworks for faith-based technical institutions worldwide effectively. This study offers significant theoretical contributions relevant to similar educational contexts internationally today.

Many studies discuss vocational education; however, little literature addresses the management of information technology programs in state religious education institutions in depth. According to Guan et.al, Vocational education research predominantly examines secular institutional frameworks across developed nations extensively.³⁰ Management literature rarely incorporates religious value systems within technical curriculum design specifically.³¹ Information technology integration studies focus primarily on public school contexts rather than faith-based settings consistently.³² Islamic education research emphasizes theological subjects over vocational technical competencies frequently.³³ Comparative education analyses seldom include madrasah vocational programs in their sampling frameworks adequately.³⁴

One of the State Islamic Senior High Schools in Pamekasan demonstrates best practices through the implementation of applied education programs that are structured yet flexible to technological changes. This institution has established comprehensive management frameworks that systematically integrate industry standards into daily learning activities effectively. Program coordinators maintain continuous communication with local creative industry partners to ensure curriculum relevance throughout academic cycles. Students engage in hands-on projects using current design software and equipment that mirror professional workplace environments consistently. Teachers receive regular professional development opportunities to update their technical competencies alongside pedagogical skills systematically. The school administration allocates dedicated resources for maintaining updated technology infrastructure and learning facilities regularly. Evaluation mechanisms incorporate feedback from both industry partners and academic supervisors to measure student competency achievement accurately. These

²⁸Amanda Miller, "Development through Vocational Education. The Lived Experiences of Young People at a Vocational Education, Training Restaurant in Siem Reap, Cambodia," *Heliyon* 6, no. 12 (2020), <https://doi.org/10.1016/j.heliyon.2020.e05765>.

²⁹Hasyim Haddade et al., "Madrasah Management Strategies through Madrasah Reform Program: An Evidence from Indonesia," *International Journal of Educational Management* 38, no. 5 (May 2, 2024): 1289–1304, <https://doi.org/10.1108/IJEM-05-2023-0236>.

³⁰Shanshan Guan, Hui Jin, and Xiaoyong Tian, "Global Trends in Vocational Education: 2022–2024," *ECNU Review of Education*, no. 1550 (2025): 2022–24, <https://doi.org/10.1177/20965311251403494>.

³¹St Rodliyah et al., "Optimizing the Quality of Islamic Senior High School Graduates through Curriculum Management of Vocational Programs Based on Pesantrens in East Java, Indonesia," *Cogent Education* 11, no. 1 (2024), <https://doi.org/10.1080/2331186X.2024.2423437>.

³²T. J. D'Agostino and M. Niaz Asadullah, "Faith-Based Education and Development: Opportunities, Challenges, and Controversies," *International Journal of Educational Development* 119, no. October (2025): 103440, <https://doi.org/10.1016/j.ijedudev.2025.103440>.

³³Abdul Bashith et al., "Nexus of Economic Teaching in Religious Education: A Case Study of Islamic Boarding Schools in Indonesia," *Cogent Education* 12, no. 1 (2025), <https://doi.org/10.1080/2331186X.2025.2486633>.

³⁴McGrath et al., "Vocational Education and Training for African Development: A Literature Review."

practices create an adaptive learning ecosystem that responds dynamically to evolving graphic design industry requirements successfully. Such institutional commitment positions this madrasah as a model for similar religious vocational schools across developing regions globally.

This study aims to comprehensively describe the management of applied information and communication technology education programs in an effort to enhance student graphic design competencies. The analytical focus is directed at the planning, implementation, and evaluation stages of the program as well as mitigation strategies for challenges faced during the learning process.

METHOD

This study employs a qualitative research approach with a phenomenological design to explore the lived experiences of educational practitioners managing applied technology programs. Qualitative methodology enables deep understanding of complex educational phenomena within natural contexts.³⁵ Phenomenology examines how individuals perceive and make meaning of their professional experiences systematically.³⁶ The research was conducted at One of the State Islamic Senior High Schools in Pamekasan with participants including the head of madrasah, vice head of curriculum, teachers, and students actively involved in the graphic design program. Data collection utilized three primary techniques: in-depth interviews to capture participant perspectives, participant observation to document authentic practices, and documentation analysis to review institutional records comprehensively.³⁷ These methods triangulate evidence to ensure comprehensive understanding of program management dynamics effectively.

Data analysis followed the interactive model proposed by Miles, Huberman, and Saldana consisting of three concurrent stages: data condensation, data display, and conclusion drawing/verification.³⁸ Data condensation involves selecting, focusing, and simplifying raw information throughout the research process systematically. Data display organizes compressed information into matrices, charts, or networks for pattern recognition visually. Conclusion drawing involves interpreting displayed data while verification ensures findings remain grounded in evidence consistently.³⁹ Data trustworthiness was established through credibility strategies including prolonged engagement, persistent observation, and member checking.⁴⁰ Dependability was

³⁵Monique Hennink, Inge Hutter, and Ajay Bailey, *Qualitative Research Methods* (London: SAGE Publications Ltd, 2020), <https://www.taylorfrancis.com/books/mono/10.4324/9780080943442/research-methods-david-crowther-geoff-lancaster>.

³⁶Sharan B. Merriam and Robin S. Grenier, *Qualitative Research in Practice: Examples for Discussion and Analysis*, 2nd ed. (San Francisco, CA: Jossey-Bass, 2019).

³⁷Sarah J. Tracy, *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact*, *Handbook of Research Methods in Tourism: Quantitative and Qualitative Approaches* (West Sussex, UK: Wiley-Blackwell, 2013), <https://doi.org/10.4337/9781781001295>.

³⁸Matthew B Miles, A Michael Huberman, and Johnny Saldana, *Qualitative Data Analysis: A Methods Sourcebook*, 3rd ed. (Arizona: SAGE Publication, Inc., 2014).

³⁹Johnny Saldaña, *The Coding Manual for Qualitative Researchers*, 3rd ed. (London: SAGE Publications Ltd, 2013), <https://doi.org/10.1108/qrom-08-2016-1408>.

⁴⁰Lexy J. Moleong, *Metodologi Penelitian Kualitatif* (Bandung: Remaja Rosda Karya, 2024).

maintained through audit trails, confirmability through reflexive journaling, and transferability through thick description enabling contextual application elsewhere.⁴¹ These rigorous procedures ensure methodological integrity throughout the investigation.

RESULT AND DISCUSSION

Result

Strategic Program Planning Aligned with Industry Standards

One of the State Islamic Senior High Schools in Pamekasan implements systematic program planning through comprehensive needs assessment surveys identifying student interests and readiness in graphic design technology. Formal partnership established with Institut Teknologi Sepuluh Nopember Surabaya through Memorandum of Understanding in 2019 provides industry-aligned foundation for program implementation. Organizational structure created with clear leadership hierarchy including head of madrasah as chief coordinator, program leader, and field coordinators for graphic design, animation, robotics, and video editing ensures focused execution. Instructor capacity building through Training of Trainers facilitated by partner institution guarantees theoretical and practical competencies meet established program standards consistently. Collaborative curriculum development between madrasah and university partners allows contextual adaptation while maintaining material quality and industry relevance effectively. Integrated scheduling designed harmonizes program activities with academic calendar, considering student workload, instructor availability, and facility access appropriately. These strategic planning elements create robust foundation for sustainable program implementation aligned with professional industry expectations and student competency development goals successfully.

Implementation Practices Reflecting Professional Workflow Standards

Program implementation commenced in 2019 with flexible yet structured scheduling on Friday and Saturday afternoons to optimize student participation without disrupting core academic activities effectively. Thirty-two students selected from multiple grade levels through internal selection process considering interest, commitment, and teacher recommendations participate actively. Curriculum delivered across four to five semesters totaling twenty-five credit hours covers internet-based media, office applications, graphic design fundamentals, photo editing, vector design, illustration, and IT-entrepreneurship comprehensively. Project-based learning approach implemented with brief theory sessions followed by software demonstration, independent exploration, and collaborative design projects enhances practical competency development significantly. Real-world industry integration occurs through madrasah multimedia team participation where students create Instagram feeds, event flyers, and digital promotional materials for authentic experience. Technical software proficiency developed includes Adobe Photoshop, Adobe Illustrator, CorelDraw, Canva, and Snapseed through consistent hands-on practice sessions. Infrastructure support includes sixty laptops, thirty-six personal computers, smart TVs, and design software, though

⁴¹Uwe Flick, *The SAGE Handbook of Qualitative Data Analysis, Research Methods for Public Administrators* (London: SAGE Publications Ltd, 2014), <https://doi.org/10.4324/9781315701134-11>.

laboratory space constraints remain ongoing challenge requiring strategic management solutions continuously.

Comprehensive Evaluation Mechanisms Ensuring Competency Achievement

Continuous evaluation conducted through direct visits and remote communication with partner university ensures quality assurance and curriculum alignment throughout program implementation periodically. Dual assessment approach implemented includes formative evaluation through ongoing observation of class discussions, daily tasks, and project presentations, plus summative evaluation via final project examination comprehensively. Final competency demonstrated through capstone design projects reflecting student interests rather than traditional research papers, presented before examination panels for authentic assessment. Significant competency achievements documented include software mastery, visual principle understanding, creative thinking application, and professional work ethic development consistently across participant cohorts. IT-entrepreneurship component successfully enabled students to market design works digitally, demonstrating commercial application of acquired skills effectively. Diploma 1 competency certificates issued as valid evidence of student skill acquisition and industry readiness upon program completion. Context, Input, Process, Product evaluation model applied assessing context, input, process, and product dimensions provides comprehensive program quality measurement. Semester-end coordination meetings address challenges including facility limitations, student motivation decline, and instructional method effectiveness for continuous improvement collaboratively.

Discussion

Strategic Program Planning Aligned with Industry Standards

Planning represents the initial stage in the management process with strategic functions to establish objectives, formulate strategies, and determine operational steps required for effective and efficient goal achievement. According to educational management literature, effective planning must address key elements, including what activities should be conducted, why they are necessary, where implementation occurs, when activities take place, who holds responsibility, and how execution proceeds.⁴² These elements not only facilitate structured planning but also ensure every action has clear rationale, location, timing, personnel, and methodology, thereby increasing program success probability.⁴³ Organizational learning strategies in educational institution management emphasize that systematic planning creates a foundation for sustainable program implementation.⁴⁴

⁴²Martin Benavides and Muriel Poisson, *The Future of Educational Planning*, vol. 19 (Paris: UNESCO International Institute for Educational Planning, 2025), <https://doi.org/https://doi.org/10.54673/CATZ8771>.

⁴³Km. Savita and Ms. Geetanjali, "Principles of Educational Planning and Policy Making in Higher Education," *Madhya Bharti -Humanities and Social Sciences UGC Care Group I Journal* 83, no. 7 (2023).

⁴⁴Marita Marleni Alfaro-Rosas et al., "Organizational Learning Strategies in The Management of Educational Institutions: A Bibliometric Review in Scopus," *International Journal of Membrane Science and Technology* 10, no. 4 (2023): 399–411, <https://doi.org/10.15379/ijmst.v10i4.2051>.

Consistent with these principles, effective program planning must progress through critical stages, including forecasting, objective setting, program development, and scheduling.⁴⁵ These stages aim to ensure that designed programs remain proactive and measurable in addressing existing challenges and needs.⁴⁶ Research on vocational education management confirms that collaborative curriculum development underscores the importance of aligning educational content with industrial needs through joint design processes.⁴⁷ Industry collaboration through joint curriculum development plays a crucial role in bridging gaps between educational outputs and workforce requirements.⁴⁸

As a technology-adaptive educational institution, One of the State Islamic Senior High Schools in Pamekasan designs Education Programs in the Information and Communication Technology program planning systematically and structurally. The planning process begins with the forecasting stage through student needs identification conducted via internal surveys. This survey aims to explore students' interests, potential, and readiness in information technology, particularly in graphic design. Survey results were subsequently discussed in internal discussions involving madrasah leadership, educators, and the implementation team. Similar curriculum development studies in Islamic education contexts demonstrate the importance of stakeholder engagement in program design phases.⁴⁹ Discussions address opportunities and challenges in program implementation, including human resource readiness, infrastructure, and future program development directions. Based on identification and discussion results, the madrasah takes a strategic step by establishing a partnership with Institut Teknologi Sepuluh Nopember Surabaya, an institution with high technology competency. This partnership was formalized through a Memorandum of Understanding signed in 2019, becoming the foundation for Education Programs in Information and Communication Technology implementation at One of the State Islamic Senior High Schools in Pamekasan as a flagship program for strengthening student competencies in the digital era. School-industry collaboration in vocational education serves as a key strategy in strengthening vocational program quality through formal partnership agreements.⁵⁰

⁴⁵Mahla Salajegheh, "Effective Factors in Planning, Implementation, and Management of Educational Program Evaluation in Medical Sciences: A Practical Guide," *Journal of Education and Health Promotion* 13, no. 1 (2024), https://doi.org/10.4103/jehp.jehp_308_23.

⁴⁶OECD, *Trends Shaping Education 2025* (Paris: OECD Publishing, 2025), <https://doi.org/https://doi.org/10.1787/ee6587fd-en>.

⁴⁷Slamed Riyanto et al., "Transforming Vocational Education Management Towards Link and Match with Industry 4.0," *Journal of Social Research* 4, no. 8 (2025): 2233–42, <https://doi.org/10.55324/josr.v4i8.2729>.

⁴⁸Marlissa Omar and Fathiyah Mohd Kamaruzaman, "Technical and Vocational Education Training and Industry Collaboration: A Bibliometric Review," *Journal of Education and Learning* 18, no. 4 (2024): 1582–92, <https://doi.org/10.11591/edulearn.v18i4.21120>.

⁴⁹Asip Ependi et al., "Studi Tentang Pengembangan Kurikulum Pendidikan Agama Islam (PAI) Di Sekolah Dan Madrasah," *Re-JIEM (Research Journal of Islamic Education Management)* 7, no. 2 (2024), <https://doi.org/https://doi.org/10.19105/re-jiem.v7i2.15803>.

⁵⁰Hidayah Uswatun Kasanah et al., "School-Industry Collaboration in Vocational Education: Partnership Management at SMKN Windusari," *Curricula: Journal of Curriculum Development* 4, no. 2 (2025): 1229–40, <https://doi.org/https://doi.org/10.17509/curricula.v4i3.88563>.

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Following the MoU signing, the next stage involves the formation of Education Programs in Information and Communication Technology program management organizational structure. This structure consists of the head of madrasah as primary coordinator, Education Programs in Information and Communication Technology program chair, and coordinators in each field, including graphic design, office computing, animation, robotics, and video editing. This organizational structure is designed to ensure program implementation remains focused and directed in each field. Research on university organizational structures indicates that clear hierarchical arrangements enhance operational effectiveness and accountability.⁵³ Additionally, all instructors are required to participate in Training of Trainers facilitated by ITS. This training aims to equip instructors with theoretical understanding and practical skills matching program standards, ensuring optimal and consistent learning processes. Training of trainers programs significantly improve pedagogical skills and instructional competency among

⁵¹Ependi et al., "Studi Tentang Pengembangan Kurikulum Pendidikan Agama Islam (PAI) Di Sekolah Dan Madrasah."

⁵²Denise Jackson and Michael Tomlinson, "Career Values and Proactive Career Behaviour among Contemporary Higher Education Students," *Journal of Education and Work* 32, no. 5 (2019): 449–64, <https://doi.org/10.1080/13639080.2019.1679730>; OECD, *The Landscape of Providers of Vocational Education and Training* (Paris: OECD Publishing, 2022), https://www.oecd-ilibrary.org/education/the-landscape-of-providers-of-vocational-education-and-training_a3641ff3-en.

⁵³Susana Rodríguez Medero, María Rosa Naranjo Llupart, and Norberto Pelegrín Entenza, "Organizational Structure of Universities. Research Trends in Scopus over the Last Decade," *Revista Venezolana de Gerencia* 30, no. 13 (2025): 556–72, <https://doi.org/10.52080/rvgluz.30.especial13.36>.

academic personnel.⁵⁴ Professional development training helps teachers build resilience and effectiveness in delivering technical content.⁵⁵

The program objective setting stage becomes a crucial step in Education Programs in Information and Communication Technology planning. This objective is important so the program has a clear direction and is capable of meeting student needs in technology skill mastery, particularly in graphic design. The main education programs in Information and Communication Technology at One of the State Islamic Senior High Schools in Pamekasan equip students with technology competencies matching industry needs, preparing them for workforce competition or higher education continuation. Additionally, the program is expected to improve madrasah graduate quality, parallel to vocational school graduates. Studies on graduate competence partnerships reveal that clear program objectives aligned with industry expectations enhance student employability outcomes.⁵⁶ Strategic leadership in improving student competitiveness during the digitalization era requires explicit competency targets connected to labor market demands.⁵⁷

Curriculum development conducted collaboratively between the madrasah and ITS to ensure taught materials are relevant to student needs and industry developments. Although referencing the curriculum framework developed by ITS, the madrasah gives space for adjustments according to student characteristics and local needs, making the curriculum more contextual without reducing material quality. Co-creating curricula with industry partners can be both relevant and rigorous when balancing standardization with contextual adaptation.⁵⁸ The role of industry in unlocking curriculum potential reveals dynamic connections between vocational education and industry stakeholders that enhance curriculum management effectiveness.⁵⁹ Transforming vocational education management towards industry linkages requires collaborative approaches that maintain quality while allowing localization.⁶⁰

The final planning stage involves activity scheduling implementation, holding an important role in ensuring program smoothness without disrupting madrasah academic activities. Schedule developed considering various factors, including student academic agenda, instructor availability, and supporting facilities. Intensive coordination between

⁵⁴Bayram Özer, Volkan Duran, and Mustafa Tekke, "Training of Trainers: An Action-Based Research for Improving the Pedagogical Skills of Academicians," *International Journal of Evaluation and Research in Education* 9, no. 3 (2020): 704–15, <https://doi.org/10.11591/ijere.v9i3.20327>.

⁵⁵Dariyash D. Shakimova, Kehinde C. Lawrence, and Zhanat K. Aubakirova, "Professional Development Training Can Help Teachers to Build Resistance against Teaching Associated Stress," *Cogent Education* 11, no. 1 (2024), <https://doi.org/10.1080/2331186X.2024.2346049>.

⁵⁶Tri Suminar et al., "Determinant Model of Graduate Competence Partnership-Based Life Skills Training in the Industry 4.0 Era," *Journal of Nonformal Education* 10, no. 1 (2024): 195–209, <https://doi.org/10.15294/jone.v10i1.1658>.

⁵⁷Ependi et al., "Studi Tentang Pengembangan Kurikulum Pendidikan Agama Islam (PAI) Di Sekolah Dan Madrasah."

⁵⁸Samir Shrivastava et al., "Co-Creating Curricula with Industry Partners: A Case Study," *International Journal of Management Education* 20, no. 2 (2022): 100646, <https://doi.org/10.1016/j.ijme.2022.100646>.

⁵⁹Yoto et al., "The Role of Industry to Unlock the Potential of the Merdeka Curriculum for Vocational School," *Cogent Education* 11, no. 1 (2024), <https://doi.org/10.1080/2331186X.2024.2335820>.

⁶⁰Riyanto et al., "Transforming Vocational Education Management Towards Link and Match with Industry 4.0."

program managers and the academic team is highly necessary so the Education Programs in Information and Communication Technology program schedule integrates well within the madrasah education calendar. This approach ensures program implementation runs effectively and harmoniously, achieving student competency enhancement objectives without compromising the main learning processes. Effective factors in planning, implementation, and management of educational programs emphasize that scheduling coordination prevents conflicts and optimizes resource utilization.⁶¹

Implementation Practices Reflecting Professional Workflow Standards

Implementation represents a crucial stage in program management as it becomes the starting point for realizing all plans designed during the planning phase. According to Mulder, program success is heavily determined by the extent to which implementation runs according to objectives, targets, and strategies structured systematically.⁶² In Applied Education Programs in Information and Communication Technology, the program was implemented based on technical guidelines prepared by Institut Teknologi Sepuluh Nopember as partnership collaborator, while considering student conditions and needs within the madrasah environment. Implementation quality depends on alignment between planned objectives and actual execution practices consistently.⁶³

Applied Education Programs in Information and Communication Technology officially commenced in 2019 following the signing of a Memorandum of Understanding between One of the State Islamic Senior High Schools in Pamekasan and Institut Teknologi Sepuluh Nopember Surabaya. Since then, the program became a concrete form of technology-based vocational education implementation aiming to enhance students' practical competencies, particularly in graphic design. According to educational management literature, program implementation is classified into two levels: school-level implementation covering macro management and organization, including activity scheduling and facility utilization, plus classroom-level implementation focusing on micro learning processes.⁶⁴ Vocational program effectiveness depends on multi-level coordination between administrative and instructional dimensions.⁶⁵

One fundamental aspect of program implementation is activity scheduling. Fu, et.al describes, considering the program is conducted outside regular class hours, proper timing planning becomes very important to ensure the learning process continuity without disrupting the main student academic activities.⁶⁶ At one of the State Islamic Senior High Schools in Pamekasan, Applied Education Programs in Information and Communication Technology, graphic design activity scheduling was designed flexibly yet structured, considering various factors including madrasah academic calendar, internal school

⁶¹ Salajegheh, "Effective Factors in Planning, Implementation, and Management of Educational Program Evaluation in Medical Sciences: A Practical Guide."

⁶² Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

⁶³ OECD, *The Landscape of Providers of Vocational Education and Training*.

⁶⁴ Marginson, "Limitations of Human Capital Theory."

⁶⁵ McGrath et al., "Vocational Education and Training for African Development: A Literature Review."

⁶⁶ Yangyang Fu et al., "Unlocking Academic Success: The Impact of Time Management on College Students' Study Engagement," *BMC Psychology* 13, no. 1 (2025), <https://doi.org/10.1186/s40359-025-02619-x>.

activity intensity, and human resource readiness from both students and educators. Activity implementation is scheduled on Friday and Saturday from 13:00-14:00. Day selection is based on the consideration that student activity load on Friday and Saturday is relatively lighter compared to other days, enabling students to focus more on training.⁶⁷ Meanwhile, 13:00 timing is considered ideal after students complete morning learning activities and Friday prayers. This time provides sufficient rest breaks for students while preventing too long gaps, potentially reducing student motivation and participation due to the tendency to feel tired or reluctant to return to the madrasah environment after going home.⁶⁸ Thus, the scheduling strategy is designed not only to adjust to student activity rhythm but also to minimize potential participation barriers, ensuring program implementation runs optimally and sustainably.⁶⁹

The number of students participating in Applied Education Programs in Information and Communication Technology and graphic design, was recorded at 32 students. Program participants come from grades X, XI, and XII, selected through an internal selection process by the madrasah together with the program implementation team. This selection considers several aspects, including interest in the graphic design field, commitment to follow activities consistently, and recommendations from homeroom teachers and related instructors.⁷⁰ Student involvement from various grade levels shows the program is inclusive and open to all education levels within the madrasah, providing equal opportunities for students to develop potential in information and communication technology.⁷¹ Additionally, grade level diversity within one training group enables positive interaction and social dynamics among participants, such as sharing experiences, building cooperation, and strengthening cross-generation learning spirit in a productive and collaborative environment.⁷²

Teaching materials in curriculum implementation become a fundamental component in the training process as they directly reflect competency achievements intended to be formed in participants.⁷³ In Applied Education Programs, graphic design implementation at One of the State Islamic Senior High Schools in Pamekasan, teaching materials are arranged systematically based on technical modules designed by Institut Teknologi Sepuluh Nopember as curriculum development partner. According to Billett, material structure designed to be completed gradually and hierarchically, starting from basic technology mastery, graphic design principles, and software introduction, until final

⁶⁷Miller, "Development through Vocational Education. The Lived Experiences of Young People at a Vocational Education, Training Restaurant in Siem Reap, Cambodia."

⁶⁸Alam et al., "An Assessment of Graduates Skills Gap for Sustainable Employability during the 4IR in Bangladesh."

⁶⁹OECD, *The Landscape of Providers of Vocational Education and Training*.

⁷⁰Haddade et al., "Madrasah Management Strategies through Madrasah Reform Program: An Evidence from Indonesia."

⁷¹Miller, "Development through Vocational Education. The Lived Experiences of Young People at a Vocational Education, Training Restaurant in Siem Reap, Cambodia."

⁷²D'Agostino and Asadullah, "Faith-Based Education and Development: Opportunities, Challenges, and Controversies."

⁷³Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

work development as a comprehensive skill evaluation form.⁷⁴ Curriculum structure in Applied Education Programs in Information and Communication Technology is generally designed to be completed within four to five semesters with a total load of 25 credit hours adjusted to student conditions to remain aligned with the main madrasah curriculum.⁷⁵

Learning methods play a strategic role in determining curriculum implementation effectiveness, especially in vocational education emphasizing technical and practical competency achievement.⁷⁶ In an information and communication technology-based education context, according to educational research, the approach used must be based on a competency-based curriculum designed to enable students to master skills applicable to digital industry needs.⁷⁷ Based on that framework, learning methods applied in graphic design Applied Education Programs at One of the State Islamic Senior High Schools in Pamekasan were designed prioritizing a contextual approach and direct practice. Miller says, that project-based learning approach becomes the main strategy in program implementation, where students are encouraged to learn through experience, completing design tasks that are real and relevant to the workplace.⁷⁸

Each learning session begins with a basic theory explanation delivered briefly by the instructor, then continues with a design software usage demonstration as a concrete example.⁷⁹ Subsequently, students are directed to conduct independent exploration and group work to complete graphic design projects, which not only sharpen technical skills but also encourage creative thinking, collaboration, and problem-solving abilities.⁸⁰ Group discussions, questions and answers, direct practice, and assignments become important elements in this method, which is overall designed to create a holistic and transformative learning experience.⁸¹ Thus, learning methods in this program not only realize competency-based curriculum achievements but also foster student readiness in facing challenges in the continuously developing creative industry world.⁸²

One prominent characteristic in Applied Education Programs in Information and Communication Technology graphic design implementation at One of the State Islamic Senior High Schools in Pamekasan is integration between technical learning and practical experience relevant to creative industry needs. Jackson describes, students not only learn graphic design theory and basic skills inside the classroom but also are directly involved

⁷⁴ Billett, *Vocational Education: Purposes, Traditions and Prospects*.

⁷⁵ McGrath et al., "Vocational Education and Training for African Development: A Literature Review."

⁷⁶ Marginson, "Limitations of Human Capital Theory."

⁷⁷ OECD, *The Landscape of Providers of Vocational Education and Training*.

⁷⁸ Fu et al., "Unlocking Academic Success: The Impact of Time Management on College Students' Study Engagement."

⁷⁹ Miller, "Development through Vocational Education. The Lived Experiences of Young People at a Vocational Education, Training Restaurant in Siem Reap, Cambodia."

⁸⁰ Alam et al., "An Assessment of Graduates Skills Gap for Sustainable Employability during the 4IR in Bangladesh."

⁸¹ Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

⁸² Jackson and Bridgstock, "What Actually Works to Enhance Graduate Employability? The Relative Value of Curricular, Co-Curricular, and Extra-Curricular Learning and Paid Work."

in real projects through active participation in the madrasah multimedia team.⁸³ In this team, students contribute to creating visual content such as Instagram feed designs, event flyers, and other digital promotional materials used by the school.⁸⁴ These activities strengthen design software mastery, including Adobe Photoshop, Adobe Illustrator, CorelDraw, Canva, and Snapseed.⁸⁵ This approach aligns with constructivist learning theory, emphasizing the importance of active participant involvement in building understanding through real experience.⁸⁶ According to vocational education research, involvement in workplace-based projects becomes an effective means to strengthen information technology skills while making the learning process more meaningful, contextual, and applicable.⁸⁷

Facilities and infrastructure become an important component in supporting applied education program implementation, including Applied Education Programs in Information and Communication Technology graphic design at Islamic Senior High School One Pamekasan. Generally, madrasahs have provided adequate supporting facilities, including around 60 laptop units, 36 personal computers, multimedia devices in the form of smart TVs, and graphic design software such as Canva, Adobe Photoshop, Adobe Illustrator, CorelDraw, and Snapseed. However, program implementation still faces constraints in the practice room aspect.⁸⁸ From three available computer laboratories, only one can be used because two others are under renovation.⁸⁹ An active laboratory also often diverts for other needs, such as Computer Based Test and tryout, so the graphic design practice schedule must adjust with room usage. Additionally, many participants do not yet have computer or laptop devices at home, limiting their ability to repeat materials independently outside class hours.⁹⁰ These limitations become a particular challenge in ensuring the effectiveness and continuity of practice-based learning.⁹¹

Comprehensive Evaluation Mechanisms Ensuring Competency Achievement

Evaluation represents a systematic and continuous process aiming to assess program effectiveness, efficiency, and relevance in achieving established objectives.⁹² In the Applied Education Programs graphic design context at one of the State Islamic Senior

⁸³Jackson and Tomlinson, "Career Values and Proactive Career Behaviour among Contemporary Higher Education Students."

⁸⁴OECD, *The Landscape of Providers of Vocational Education and Training*.

⁸⁵Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

⁸⁶Marginson, "Limitations of Human Capital Theory."

⁸⁷McGrath et al., "Vocational Education and Training for African Development: A Literature Review."

⁸⁸Miller, "Development through Vocational Education. The Lived Experiences of Young People at a Vocational Education, Training Restaurant in Siem Reap, Cambodia."

⁸⁹D'Agostino and Asadullah, "Faith-Based Education and Development: Opportunities, Challenges, and Controversies."

⁹⁰Tee et al., "Demand for Digital Skills, Skill Gaps and Graduate Employability: Evidence from Employers in Malaysia."

⁹¹Alam et al., "An Assessment of Graduates Skills Gap for Sustainable Employability during the 4IR in Bangladesh."

⁹²Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

High Schools in Pamekasan, evaluation was conducted comprehensively through close collaboration with Institut Teknologi Sepuluh Nopember Surabaya as curriculum development partner. Evaluation process conducted both directly through routine madrasah visits and indirectly via remote communication, including telephone and messaging.⁹³ This evaluation encompasses learning process monitoring, student work assessment, and constructive feedback provision as a program development foundation.⁹⁴ Through continuous evaluation, madrasahs can reflect on achievements and implementation challenges while formulating strategic steps for sustainable learning quality improvement.⁹⁵

Evaluation implementation in Applied Education Programs, graphic design at One of the State Islamic Senior High Schools in Pamekasan, focuses not only on final achievement but also encompasses overall learning process monitoring. According to Jackson, assessed aspects include active student involvement during learning, material understanding ability, task completion independence, and creativity in graphic design projects.⁹⁶ Educational evaluation encompasses two forms, namely formative and summative assessment.⁹⁷ Formative evaluation is conducted continuously during learning through student activity observation, including class discussions, daily assignments, and project presentations.⁹⁸ Summative evaluation applied at program end through Final Task Examination realized as a capstone project reflecting learned skill application.⁹⁹ Final project developed under instructor guidance, communicated through written reports and presented before an examination panel as program completion requirement.¹⁰⁰

Following formative and summative evaluation of Applied Education Programs' graphic design at One of the State Islamic Senior High Schools in Pamekasan, student competency achievements demonstrate significant results. Participants master various graphic design software, including Canva, Adobe Photoshop, Adobe Illustrator, CorelDraw, and Snapseed, while understanding visual principles and applying creative thinking in work production. IT-entrepreneurship material successfully encouraged students to develop entrepreneurial potential through digital work marketing.¹⁰¹ This success is supported by Diploma 1 competency certificates serving as valid evidence of student skill mastery. Program success is assessed comprehensively using the v evaluation model covering context, input, process, and product dimensions, measuring technical competencies, certification, and workforce readiness. This approach provides a

⁹³OECD, *The Landscape of Providers of Vocational Education and Training*.

⁹⁴Tee et al., "Demand for Digital Skills, Skill Gaps and Graduate Employability: Evidence from Employers in Malaysia."

⁹⁵Haddade et al., "Madrasah Management Strategies through Madrasah Reform Program: An Evidence from Indonesia."

⁹⁶Jackson and Bridgstock, "What Actually Works to Enhance Graduate Employability? The Relative Value of Curricular, Co-Curricular, and Extra-Curricular Learning and Paid Work."

⁹⁷Billett, *Vocational Education: Purposes, Traditions and Prospects*.

⁹⁸Marginson, "Limitations of Human Capital Theory."

⁹⁹Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

¹⁰⁰D'Agostino and Asadullah, "Faith-Based Education and Development: Opportunities, Challenges, and Controversies."

¹⁰¹OECD, *The Landscape of Providers of Vocational Education and Training*.

comprehensive overview plus improvement recommendations for future quality enhancement.¹⁰²

As a quality control and improvement effort, Applied Education Programs' graphic design evaluation at One of the State Islamic Senior High Schools in Pamekasan, is conducted periodically and structured. Marginson says that, evaluation is generally executed through coordination forums held each semester end, plus incidentally when specific constraints requiring immediate handling arise.¹⁰³ Evaluation meetings involve various program implementation elements, including program chair, subject teachers, and madrasah leadership.¹⁰⁴ Various issues were discussed comprehensively, ranging from facility limitations, especially computer laboratory space constraints, student learning motivation decline, to applied learning method effectiveness.¹⁰⁵ Evaluation meeting results become the basis for drafting improvement steps, including practice activity rescheduling, student activity reorganization, preventing excess, and more innovative learning approach development.¹⁰⁶ This process was conducted collaboratively, maintaining program sustainability while continuously improving implementation quality.¹⁰⁷

CONCLUSIONS

This study concludes that aligning applied education management with industry needs significantly enhances student graphic design competencies. Strategic planning through needs assessment and formal partnerships with Institut Teknologi Sepuluh Nopember establishes robust industry-aligned foundations. Implementation practices reflect professional workflow standards via flexible scheduling, project-based learning, and real-world multimedia team integration, ensuring practical skill acquisition. Comprehensive evaluation mechanisms, including formative and summative assessments using the Context, Input, Process, Product model, ensure continuous competency achievement. These interconnected management stages create a sustainable ecosystem where curriculum relevance, instructional effectiveness, and systematic evaluation collectively bridge the gap between educational outputs and creative industry expectations, ultimately preparing students for workforce readiness and entrepreneurial ventures in the digital era.

Future research should expand partnerships to include multiple industry partners, diversifying competency scopes. Implications suggest that madrasahs adopt similar industry-aligned management models to enhance vocational relevance within religious education contexts. Policymakers should support infrastructure development addressing laboratory constraints identified in this study. However, limitations exist as findings

¹⁰² Haddade et al., "Madrasah Management Strategies through Madrasah Reform Program: An Evidence from Indonesia."

¹⁰³ Marginson, "Limitations of Human Capital Theory."

¹⁰⁴ D'Agostino and Asadullah, "Faith-Based Education and Development: Opportunities, Challenges, and Controversies."

¹⁰⁵ Billett, *Vocational Education: Purposes, Traditions and Prospects*.

¹⁰⁶ Mulder, *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*.

¹⁰⁷ McGrath et al., "Vocational Education and Training for African Development: A Literature Review."

derive from a single institutional context, potentially limiting generalizability across diverse regions. Facility constraints and varying student access to home technology influence implementation consistency. Despite this, the conceptual framework offers replicable strategies for similar institutions seeking to integrate technical vocational programs within formal academic structures while maintaining educational quality and industry responsiveness throughout evolving technological landscapes globally.

REFERENCES

- Alam, Md Jahangir, Shiblee Noman, Md Nurul Islam Mujib, and Wasik Sajid Khan. "An Assessment of Graduates Skills Gap for Sustainable Employability during the 4IR in Bangladesh." *Social Sciences and Humanities Open* 12, no. July (2025): 101780. <https://doi.org/10.1016/j.ssaho.2025.101780>.
- Alfaro-Rosas, Marita Marleni, Teresita del Rosario Merino-Salazar, Lizbany Sujej Cardoza-Sernaqué, Henry Eduardo Salinas-Ruíz, Henry Alberto Chero-Valdivieso, Cynthia Catherine García-Ventura, and Jackeline Margot Saldaña-Millan. "Organizational Learning Strategies in The Management of Educational Institutions: A Bibliometric Review in Scopus." *International Journal of Membrane Science and Technology* 10, no. 4 (2023): 399–411. <https://doi.org/10.15379/ijmst.v10i4.2051>.
- Amani, Nur Raihanah, and Mahasri Shobahiya. "Integration of Technology in Islamic Education Learning at Al Hadi Islamic Middle School in The Academic Year of 2024/2025." *Al Ulya: Jurnal Pendidikan Islam* 10, no. 1 (2025): 1–19. <https://doi.org/10.32665/alulya.v10i1.4160>.
- Bashith, Abdul, Ramadhani Lausi Mkumbachi, Muh Yunus, Saiful Amin, Dwi Sulistiani, and Abdul Malik Karim Amrullah. "Nexus of Economic Teaching in Religious Education: A Case Study of Islamic Boarding Schools in Indonesia." *Cogent Education* 12, no. 1 (2025). <https://doi.org/10.1080/2331186X.2025.2486633>.
- Benavides, Martín, and Muriel Poisson. *The Future of Educational Planning*. Vol. 19. Paris: UNESCO International Institute for Educational Planning, 2025. <https://doi.org/https://doi.org/10.54673/CATZ8771>.
- Billett, Stephen. *Vocational Education: Purposes, Traditions and Prospects*. Dordrecht, The Netherlands: Springer Science+Business Media, 2011. <https://doi.org/10.1007/978-94-007-1954-5>.
- D'Agostino, T. J., and M. Niaz Asadullah. "Faith-Based Education and Development: Opportunities, Challenges, and Controversies." *International Journal of Educational Development* 119, no. October (2025): 103440. <https://doi.org/10.1016/j.ijedudev.2025.103440>.
- Dooley, Kath, Fanke Peng, Sarah Neville, and Jordan McKibbin. "Mind the Gap: A Scoping Review of Skills Gaps for Graduates in the Creative Industries." *Arts and Humanities in Higher Education* 23, no. 4 (2024): 330–49. <https://doi.org/10.1177/14740222241276166>.
- Ependi, Asip, Agus Pahrudin, Agus Jatmiko, and Koderi. "Studi Tentang Pengembangan

- Kurikulum Pendidikan Agama Islam (PAI) Di Sekolah Dan Madrasah.” *Re-JIEM (Research Journal of Islamic Education Management)* 7, no. 2 (2024). <https://doi.org/https://doi.org/10.19105/re-jiem.v7i2.15803>.
- Esmail, Abdel Hamid M.S., and Zahid M. Khan. “Alignment of Vocational Education Curricula with Job Requirements in Industrial Sector: Analysis Study.” *World Journal of Advanced Research and Reviews* 21, no. 3 (2024): 2303–13. <https://doi.org/10.30574/wjarr.2024.21.3.1002>.
- Flick, Uwe. *The SAGE Handbook of Qualitative Data Analysis. Research Methods for Public Administrators*. London: SAGE Publications Ltd, 2014. <https://doi.org/10.4324/9781315701134-11>.
- Fu, Yangyang, Qiuju Wang, Xiaofeng Wang, Haoxuan Zhong, Junqi Chen, Haoyu Fei, Yipeng Yao, Yao Xiao, Wenfu Li, and Na Li. “Unlocking Academic Success: The Impact of Time Management on College Students’ Study Engagement.” *BMC Psychology* 13, no. 1 (2025). <https://doi.org/10.1186/s40359-025-02619-x>.
- Gov. UK. “Skills Gaps and Shortages in the Creative Industries: Employer Perceptions and Actions.” London, 2025. <https://www.gov.uk/government/statistics/skills-gaps-and-shortages-in-the-creative-industries-employer-perceptions-and-actions-uk-2022/skills-gaps-and-shortages-in-the-creative-industries-employer-perceptions-and-actions-uk-2022-research-report>.
- Guan, Shanshan, Hui Jin, and Xiaoyong Tian. “Global Trends in Vocational Education: 2022–2024.” *ECNU Review of Education*, no. 1550 (2025): 2022–24. <https://doi.org/10.1177/20965311251403494>.
- Haddade, Hasyim, Askar Nur, Andi Achruh, Muhammad Nur Akbar Rasyid, and Andi Ibrahim. “Madrasah Management Strategies through Madrasah Reform Program: An Evidence from Indonesia.” *International Journal of Educational Management* 38, no. 5 (May 2, 2024): 1289–1304. <https://doi.org/10.1108/IJEM-05-2023-0236>.
- Hennink, Monique, Inge Hutter, and Ajay Bailey. *Qualitative Research Methods*. London: SAGE Publications Ltd, 2020. <https://www.taylorfrancis.com/books/mono/10.4324/9780080943442/research-methods-david-crowther-geoff-lancaster>.
- Ibrahim, Basri. “Madrasah Transformation Into Modern Educational Institutions During The New Order.” *Istawa: Jurnal Pendidikan Islam* 4, no. 2 (2019): 196. <https://doi.org/10.24269/ijpi.v4i2.2006>.
- Jackson, Denise. “An International Profile of Industry-Relevant Competencies and Skill Gaps in Modern Graduates.” *The International Journal of Management Education* 8, no. 3 (2010): 29–58. <https://doi.org/10.3794/ijme.83.288>.
- Jackson, Denise, and Ruth Bridgstock. “What Actually Works to Enhance Graduate Employability? The Relative Value of Curricular, Co-Curricular, and Extra-Curricular Learning and Paid Work.” *Higher Education* 81, no. 4 (2021): 723–39. <https://doi.org/10.1007/s10734-020-00570-x>.

- Jackson, Denise, and Michael Tomlinson. "Career Values and Proactive Career Behaviour among Contemporary Higher Education Students." *Journal of Education and Work* 32, no. 5 (2019): 449–64. <https://doi.org/10.1080/13639080.2019.1679730>.
- Kasanah, Hidayah Uswatun, Maya Novita Sari, Tarso, and Edi Purwanto. "School-Industry Collaboration in Vocational Education: Partnership Management at SMKN Windusari." *Curricula: Journal of Curriculum Development* 4, no. 2 (2025): 1229–40. <https://doi.org/https://doi.org/10.17509/curricula.v4i3.88563>.
- Kayyali, Mustafa. "Aligning Vocational Education With Industry Needs: Successful Partnerships and Practices." *Innovative Approaches in Vocational and Regional Education*, 2025, 1–48. <https://doi.org/10.4018/979-8-3693-9496-0.ch001>.
- Marginson, Simon. "Limitations of Human Capital Theory." *Studies in Higher Education* 44, no. 2 (2019): 287–301. <https://doi.org/10.1080/03075079.2017.1359823>.
- McGrath, Simon, Presha Ramsarup, Jacques Zeelen, Volker Wedekind, Stephanie Allais, Heila Lotz-Sisitka, David Monk, George Openjuru, and Jo Anna Russon. "Vocational Education and Training for African Development: A Literature Review." *Journal of Vocational Education and Training* 72, no. 4 (2020): 465–87. <https://doi.org/10.1080/13636820.2019.1679969>.
- Merriam, Sharan B., and Robin S. Grenier. *Qualitative Research in Practice: Examples for Discussion and Analysis*. 2nd ed. San Francisco, CA: Jossey-Bass, 2019.
- Miles, Matthew B, A Michael Huberman, and Johnny Saldana. *Qualitative Data Analysis: A Methods Sourcebook*. 3rd ed. Arizona: SAGE Publication, Inc., 2014.
- Miller, Amanda. "Development through Vocational Education. The Lived Experiences of Young People at a Vocational Education, Training Restaurant in Siem Reap, Cambodia." *Heliyon* 6, no. 12 (2020). <https://doi.org/10.1016/j.heliyon.2020.e05765>.
- Moleong, Lexy J. *Metodologi Penelitian Kualitatif*. Bandung: Remaja Rosda Karya, 2024.
- Mulder, Martin. *Competence-Based Vocational and Professional Education: Bridging the Worlds of Work and Education*. Switzerland: Springer International Publishing Switzerland, 2107. <https://doi.org/10.1007/978-3-319-41713-4>.
- OECD. *The Landscape of Providers of Vocational Education and Training*. Paris: OECD Publishing, 2022. https://www.oecd-ilibrary.org/education/the-landscape-of-providers-of-vocational-education-and-training_a3641ff3-en.
- . *Trends Shaping Education 2025*. Paris: OECD Publishing, 2025. <https://doi.org/https://doi.org/10.1787/ee6587fd-en>.
- Omar, Marlissa, and Fathiyah Mohd Kamaruzaman. "Technical and Vocational Education Training and Industry Collaboration: A Bibliometric Review." *Journal of Education and Learning* 18, no. 4 (2024): 1582–92.

<https://doi.org/10.11591/edulearn.v18i4.21120>.

- Özer, Bayram, Volkan Duran, and Mustafa Tekke. "Training of Trainers: An Action-Based Research for Improving the Pedagogical Skills of Academicians." *International Journal of Evaluation and Research in Education* 9, no. 3 (2020): 704–15. <https://doi.org/10.11591/ijere.v9i3.20327>.
- Rahayu, Agus, Lili Adi Wibowo, and Sulastri. "Skill Mismatch and Industry Involvement in Improving the Job Readiness of Vocational School Graduates." *Proceedings of the 5th Global Conference on Business, Management and Entrepreneurship (GCBME 2020)* 187, no. Gcbme 2020 (2021): 771–74. <https://doi.org/10.2991/aebmr.k.210831.145>.
- Riyanto, Slamed, Sisilia Silifensi Sidok, Siti Ariah, and Irpan Hasanudin. "Transforming Vocational Education Management Towards Link and Match with Industry 4.0." *Journal of Social Research* 4, no. 8 (2025): 2233–42. <https://doi.org/10.55324/josr.v4i8.2729>.
- Rodliyah, St, Moh Khusnuridlo, Imron Fauzi, and Hasan Baharun. "Optimizing the Quality of Islamic Senior High School Graduates through Curriculum Management of Vocational Programs Based on Pesantrens in East Java, Indonesia." *Cogent Education* 11, no. 1 (2024). <https://doi.org/10.1080/2331186X.2024.2423437>.
- Rodríguez Medero, Susana, María Rosa Naranjo Lluport, and Norberto Pelegrín Entenza. "Organizational Structure of Universities. Research Trends in Scopus over the Last Decade." *Revista Venezolana de Gerencia* 30, no. 13 (2025): 556–72. <https://doi.org/10.52080/rvgluz.30.especial13.36>.
- Rohman, Abdul, Siti Muhtamiroh, Ali Imron, and Noor Miyono. "Integrating Traditional-Modern Education in Madrasa to Promote Competitive Graduates in the Globalization Era." *Cogent Education* 10, no. 2 (2023). <https://doi.org/10.1080/2331186X.2023.2268456>.
- Salajegheh, Mahla. "Effective Factors in Planning, Implementation, and Management of Educational Program Evaluation in Medical Sciences: A Practical Guide." *Journal of Education and Health Promotion* 13, no. 1 (2024). https://doi.org/10.4103/jehp.jehp_308_23.
- Saldaña, Johnny. *The Coding Manual for Qualitative Researchers*. 3rd ed. London: SAGE Publications Ltd, 2013. <https://doi.org/10.1108/qrom-08-2016-1408>.
- Savita, Km., and Ms. Geetanjali. "Principles of Educational Planning and Policy Making in Higher Education." *Madhya Bharti -Humanities and Social Sciences UGC Care Group I Journal* 83, no. 7 (2023).
- Shakimova, Dariyash D., Kehinde C. Lawrence, and Zhanat K. Aubakirova. "Professional Development Training Can Help Teachers to Build Resistance against Teaching Associated Stress." *Cogent Education* 11, no. 1 (2024). <https://doi.org/10.1080/2331186X.2024.2346049>.
- Shrivastava, Samir, E. Anne Bardoel, Nikola Djurkovic, Diana Rajendran, and Tim

- Plueckhahn. "Co-Creating Curricula with Industry Partners: A Case Study." *International Journal of Management Education* 20, no. 2 (2022): 100646. <https://doi.org/10.1016/j.ijme.2022.100646>.
- Song, Xinmiao, and Duoduo Xu. "More Graduates, Fewer Skills? Vocational Education Expansion and Skilled Labour Shortages in China." *China Quarterly* 260 (2024): 970–85. <https://doi.org/10.1017/S0305741023001856>.
- Soundararajan, Gopalakrishnan, Anitha Ravikumar, and Stephen Aro-Gordon. "Employers Perception on Graduate Skill Deficiency To Suit Productivity." *Humanities & Social Sciences Reviews* 8, no. 3 (2020): 1415–21. <https://doi.org/10.18510/hssr.2020.83142>.
- Suminar, Tri, Yudi Siswanto, Sri Wardani, Amin Yusuf, and Islahuddin Islahuddin. "Determinant Model of Graduate Competence Partnership-Based Life Skills Training in the Industry 4.0 Era." *Journal of Nonformal Education* 10, no. 1 (2024): 195–209. <https://doi.org/10.15294/jone.v10i1.1658>.
- Tee, Poh Kiong, Ling Chai Wong, Morakinyo Dada, Bee Lian Song, and Chee Pung Ng. "Demand for Digital Skills, Skill Gaps and Graduate Employability: Evidence from Employers in Malaysia." *F1000Research* 13 (2024): 1–19. <https://doi.org/10.12688/f1000research.148514.1>.
- Tracy, Sarah J. *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact. Handbook of Research Methods in Tourism: Quantitative and Qualitative Approaches*. West Sussex, UK: Wiley-Blackwell, 2013. <https://doi.org/10.4337/9781781001295>.
- Ubaedullah, Dudun, Rokimin, and Fajar Suryono. "Technology in Islamic Education Curriculum: Challenges and Opportunities." *Jurnal Al Burhan* 5, no. 2 (2025): 369–91. <https://jurnal.staidaf.ac.id/jab/article/view/609>.
- Wicaksono, Ardhitia Furqon, Sri Wahyu Budoyo Kusumo, Judi Antono, Arraywed Yudita Wibowo, and Katty Febriliani Rahayu. "Islamic Education Policy in Yogyakarta 2020-2025: A Systematic Review of Its Implementation and Impact." *Indonesian Journal of Islamic Educational Review* 2, no. 3 (2025): 226–40. <https://doi.org/10.58230/ijier.v2i3.407>.
- Yoto, Marsono, Agus Suyetno, Puteri Ardista Nursisda Mawangi, Achmad Romadin, and Paryono. "The Role of Industry to Unlock the Potential of the Merdeka Curriculum for Vocational School." *Cogent Education* 11, no. 1 (2024). <https://doi.org/10.1080/2331186X.2024.2335820>.
- Zhao, Xueqing. "Study on the Matching Degree of Major Groups and Industrial Groups in Higher Vocational Colleges." *Heliyon* 10, no. 8 (2024): e29945. <https://doi.org/10.1016/j.heliyon.2024.e29945>.