

Heutagogical Self-Directed Learning in an Indonesian Islamic Senior High School: Teacher Scaffolding, Digital Practices, and Policy Implications

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Abstract: This study explores how self-directed learning (SDL) is fostered in the digital era within State Islamic Senior High Schools (Madrasah Aliyah Negeri) in Yogyakarta. Using a qualitative descriptive approach, data were collected through interviews, classroom observations, and document analysis involving teachers, students, and school leaders. The data was analyzed using a thematic analysis approach with the interactive model of Miles, Huberman, and Saldaña through the process of data reduction, data presentation, and drawing conclusions. The findings reveal a significant shift in learning behavior, where students show increased autonomy and motivation to seek online learning resources such as YouTube, academic journals, and educational websites. Teachers' roles have evolved from traditional instructors to digital facilitators who guide students in planning, monitoring, and reflecting on their learning through platforms like Google Classroom, Padlet, and Quizizz. However, challenges remain, including inconsistent motivation among students, limited digital literacy among teachers, and unequal access to internet facilities. Cultural factors also influence the pace of transformation from teacher-centered to student-centered learning. This study is limited to several Islamic senior high schools in Yogyakarta, and the findings rely on qualitative data that may not be generalizable. Future research should involve broader school contexts, employ mixed-method approaches, and examine long-term or intervention-based efforts to strengthen self-directed learning in digital environments.

Abstrak: Penelitian ini mengeksplorasi bagaimana pembelajaran mandiri atau *Self-Directed Learning* (SDL) dipupuk dalam era digital di Madrasah Aliyah Negeri di Yogyakarta. Menggunakan pendekatan deskriptif kualitatif, data dikumpulkan melalui wawancara, observasi kelas, dan analisis dokumen yang melibatkan guru, siswa, dan pimpinan sekolah. Data dianalisis menggunakan pendekatan analisis tematik dengan model interaktif Miles, Huberman, dan Saldaña melalui proses reduksi data, penyajian data, dan penarikan kesimpulan. Temuan menunjukkan adanya pergeseran signifikan dalam perilaku belajar, di mana siswa menunjukkan peningkatan otonomi dan motivasi untuk mencari sumber belajar daring seperti YouTube, jurnal akademik, dan situs web pendidikan. Peran guru telah berevolusi dari instruktur tradisional menjadi fasilitator digital yang membimbing siswa dalam merencanakan, memantau, dan merefleksikan pembelajaran mereka melalui platform seperti Google Classroom, Padlet, dan Quizizz. Namun, tantangan masih ada, termasuk motivasi yang tidak konsisten di kalangan siswa, keterbatasan literasi digital di antara guru, dan akses yang tidak merata terhadap fasilitas internet. Faktor budaya juga memengaruhi laju transformasi dari pembelajaran yang berpusat pada guru (*teacher-centered*) menjadi pembelajaran yang berpusat pada siswa (*student-centered*). Studi ini terbatas pada beberapa MAN di Yogyakarta, dan temuannya sangat bergantung pada data kualitatif yang mungkin tidak dapat digeneralisasi. Penelitian selanjutnya harus melibatkan konteks sekolah yang lebih luas, menggunakan pendekatan metode campuran (*mixed-method*), dan menguji upaya berbasis intervensi atau jangka panjang untuk memperkuat pembelajaran mandiri dalam lingkungan digital.

1. Introduction

Technological advancement has revolutionized various fields, including education. This revolution has fostered the emergence of more active and interactive learning environments.¹ The transformation occurs through a paradigm shift from teacher-centered approaches toward more modern, student-centered learning. In this context, the concept of Self-Directed Learning (SDL) has become increasingly relevant and continues to evolve in the digital era.² SDL enables learners to take initiative in setting goals, determining strategies, and evaluating their own learning processes, thereby creating new opportunities for students to enhance their learning autonomy.³ The digital era offers tremendous potential for the development of SDL through easy access to diverse learning resources.⁴ These resources are not limited to a single platform but include a wide range of digital tools that promote SDL, such as Photomath, Zenius, Google Classroom, Zoom Meeting, Pahamify, Quizizz, Qanda, YouTube, and many others.⁵ The availability of such platforms encourages learner independence and flexibility in managing information according to individual learning styles.⁶ However, this convenience also introduces new challenges such as digital distractions, low information literacy, and disparities in digital resource management skills among learners.⁷

The digital age demands learners to be independent, creative, and capable of critical thinking.⁸ Critical thinking, in this sense, is not only relevant in academic contexts but also serves as an essential foundation for social, professional, and global engagement.⁹ Therefore, it is crucial to reconstruct the educational paradigm toward a more flexible, adaptive, and SDL-oriented model.¹⁰ This new paradigm does not merely emphasize knowledge acquisition but also focuses on developing learners' character as lifelong learners, capable of adapting to rapid social and technological changes.¹¹

¹ Hanlie Smuts, Aurna Gerber, and Alta van der Merwe, "The Society 5.0 Landscape and Research Agenda," *EPIc Series in Computing* 84 (2022): 153–68, <https://doi.org/10.29007/qz1m>.

² Taufiqurrahman Siddiq Moh Solikul Hadi, Muhammad Arif Robbani, "Konsep Pendidikan Islam Di Era Society 5.0 Perspektif Hadist" 3, no. 1 (2021): 28–39.

³ Moh Solikul Hadi, Abdul Kahfi Amrullah, and Khoerul Anwar, "Journal of Islamic Scriptures in Non-Arabic Societies Membentuk Peserta Didik Menjadi Pribadi Ulul Al-Bab Prespektif" 1, no. 1 (2024): 61–62.

⁴ Uswatun Hasanah, Duski Samad, and Zulheldi Zulheldi, "Peran Tarekat Dalam Membangun Spiritualitas Umat Islam Kontemporer," *Fikrah: Journal of Islamic Education* 8, no. 1 (2023): 56, <https://doi.org/10.32507/fikrah.v8i1.2548>.

⁵ Moh. Solikul Hadi, M. Sayyidul Abrori, and Dwi Noviatul Zahra, "Pengembangan Multimedia Interaktif Macromedia Flash Profesional 8 Pada Pembelajaran Al-Qur'an Hadis Kelas X Semester Genap Di Man 1 Yogyakarta," *At-Tajdid: Jurnal Pendidikan Dan Pemikiran Islam* 3, no. 2 (2020): 148, <https://doi.org/10.24127/att.v3i2.1123>.

⁶ Hera Antonopoulou, "The Value of Emotional Intelligence: Self-Awareness, Self-Regulation, Motivation, and Empathy as Key Components," *Technium Education and Humanities* 8 (2024): 78–92, <https://doi.org/10.47577/teh.v8i.9719>.

⁷ Jie Ma, "Will the Behavioral Strategy Used by TikTok Become a Worldwide Success? - Research Based on Chinese Users," 2020.

⁸ Evita Ariestiana, "Analysis of Drugs and Certain Medicines Circulation Through Online Media," *Indonesia Private Law Review* 1, no. 2 (2020): 65–76, <https://doi.org/10.25041/iplr.v1i2.2054>.

⁹ M Sayyidul Abrori and Moh. Solikul Hadi, "Integral Values in Madrasah: To Foster Community Trust in Education," *Istawa: Jurnal Pendidikan Islam* 5, no. 2 (2020): 160, <https://doi.org/10.24269/ijpi.v5i2.2736>.

¹⁰ Annie Botha, Charlene du Toit-Brits, and Jean Henry Blignaut, "Charting New Pathways: Unleashing the Potential of Self-Directed Learning and the Transformative Role of Teachers in Education," *Education Sciences* 15, no. 5 (2025), <https://doi.org/10.3390/educsci15050524>.

¹¹ Liyan Song and Janette R. Hill, "A Conceptual Model for Understanding Self-Directed Learning in Online Environments," *Journal of Interactive Online Learning* 6, no. 1 (2007): 27–42.

Developing SDL in the digital era is not merely an alternative instructional strategy but a fundamental necessity for cultivating a generation that is autonomous, resilient, and digitally competent.¹² Previous studies have shown strong correlations between digital literacy, self-directed learning, and problem-solving abilities. For instance, Riswanti found that learners with high digital literacy tend to exhibit stronger SDL skills.¹³ Saputra and Zayyadi reported that learners with higher levels of SDL demonstrate more effective problem-solving abilities, suggesting that learning autonomy directly contributes to critical thinking development.¹⁴ Rohmah et al. research revealed that digital technology positively influences SDL, though it did not explore its potential negative impacts.¹⁵

Previous studies have consistently demonstrated strong correlations between digital literacy, self-directed learning (SDL), and problem-solving abilities. Riswanti found that students with higher levels of digital literacy tend to exhibit stronger SDL skills, while Saputra and Zayyadi reported that higher SDL levels significantly enhance learners' problem solving capacity. Research by Rohmah and Febrianasari also confirmed that digital technology positively supports the development of SDL, although it did not examine its potential drawbacks or challenges. However, most existing studies remain limited to quantitative correlations and do not provide an in-depth understanding of how SDL is actually fostered, experienced, and practiced within real educational settings, particularly in Islamic schools in the digital era. Furthermore, prior research has not thoroughly explored the evolving role of teachers, school cultural dynamics, or structural barriers such as unequal internet access that influence the implementation of SDL. This study fills that gap by offering a qualitative exploration of SDL development in State Islamic Senior High Schools in Yogyakarta, examining the supporting factors, challenges, and paradigm shifts occurring within digital age Islamic education

State Islamic Senior High Schools in Yogyakarta offer a compelling setting for this study because they sit at the intersection of educational modernization and strong Islamic traditions. Yogyakarta is widely recognized as an innovative education hub, yet madrasahs maintain a distinctive identity rooted in Islamic values. This creates a unique environment to explore how Self-Directed Learning (SDL) is cultivated within the demands of the digital era. The diversity in students' digital access, the ongoing transformation of teachers into digital facilitators, and the varying levels of digital literacy contribute to a rich and dynamic context for investigation. The madrasah's efforts to balance technological innovation with religious values make it an ideal social laboratory for examining shifts in learning paradigms in the digital age. This study aims to provide an in-depth understanding of how Self-Directed Learning (SDL) is developed in the digital era within State Islamic Senior High Schools in Yogyakarta. Specifically, it seeks to describe changes in students' learning behavior, analyze the evolving role of teachers as digital facilitators, and identify the supporting factors and challenges whether cultural,

¹² Riswan Riswan, "The Design of Adaptive Learning Model to Support the Application of Blended Learning," *Indonesian Research Journal in Education [IRJE]* 6, no. 1 (2022): 58–70.

¹³ Riswanti Rini et al., "The Effect of Self-Directed Learning on Students' Digital Literacy Levels in Online Learning," *International Journal of Instruction* 15, no. 3 (2022): 329–44, <https://doi.org/10.29333/iji.2022.15318a>.

¹⁴ Maskhur Dwi Saputra et al., "Developing Critical-Thinking Skills through the Collaboration of Jigsaw Model with Problem-Based Learning Model," *International Journal of Instruction* 12, no. 1 (2019): 1077–94, <https://doi.org/10.29333/iji.2019.12169a>.

¹⁵ Lailati Rohmah et al., "Does Digital Literacy Influence SDL Performance of Pre-Service Educators?," *Journal of Education Technology* 6, no. 4 (2022): 663–73, <https://doi.org/10.23887/jet.v6i4.46592>.

infrastructural, or related to digital literacy that shape the effectiveness of SDL in Islamic school settings.

2. Method

This study employed a descriptive qualitative approach¹⁶ to examine how self-directed learning (SDL) is fostered within digital learning environments in State Islamic Senior High Schools (Madrasah Aliyah Negeri) in Yogyakarta. The research was conducted at MAN 1 Yogyakarta and MAN 2 Yogyakarta, both of which were selected due to their strong implementation of digital learning ecosystems, including Learning Management Systems (LMS), Chromebook integration, and technology supported autonomous learning practices. The participants consisted of school principals, teachers, and students who were actively engaged in digital based self-directed learning activities. They were selected using purposive sampling, considering their involvement in digital learning and their willingness to provide rich and meaningful information.

Data were collected through semi-structured interviews, participatory and non-participatory classroom observations, and document analysis, including lesson plans, digital modules, learning platforms, and students' digital artifacts. The data were analyzed using thematic analysis following the interactive model of Miles, Huberman, and Saldaña, involving iterative processes of data reduction, data display, and conclusion drawing.¹⁷ Coding procedures included initial coding, pattern coding, and the development of final themes, supported by a coding tree and key data excerpts as evidence.

To ensure the trustworthiness of the study, several strategies were employed, including source and technique triangulation, member checking to validate interpretations with participants, maintaining an audit trail to document the research process, and providing thick descriptions to support contextual understanding. This methodological approach enabled an in depth exploration of how teachers and students construct experiences, strategies, and meanings related to SDL in the digital era.¹⁸

3. Results

This study was conducted at Madrasah Aliyah Negeri Yogyakarta, which has integrated digital learning through platforms such as Google Classroom, Quizizz, and Madrasah E-Learning developed by the Ministry of Religious Affairs. Data were collected from 15 participants, consisting of one principal, five teachers, and nine students from different grade levels. The data analysis generated three main themes that illustrate the practices and dynamics of self-directed learning (SDL) in the digital era, students' learning initiative and internal motivation, the role of teachers as digital facilitators and mentors, and structural and cultural challenges in independent learning.

3.1. Students' Learning Initiative and Internal Motivation

Most students demonstrated an increase in learning independence after the implementation of digital learning. They became more active in seeking learning resources beyond the classroom, such as YouTube, online journals, and educational websites. One student remarked, *"Now I often look for additional materials on the internet by myself sometimes I watch videos to understand the topic better before class begins."*

¹⁶ Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D* (Bandung: Alfabeta, 2019).

¹⁷ Matthew B. Miles, A. Michael Huberman, and Johnny Saldaña, *Qualitative Data Analysis: A Methods Sourcebook* (London: SAGE Publications, 2014).

¹⁸ Corrine Glesne, *Becoming Qualitative Researchers: An Introduction* (ERIC, 2016).

This independence emerged due to the easy access to digital information and a strong intrinsic drive to achieve. However, several students admitted that they still needed teacher guidance in managing their study schedules and maintaining consistency in self-learning. As one student noted, *"My motivation sometimes goes up and down. When teachers set clear targets and give quick feedback, I feel more motivated to study on my own."*

These findings indicate that while students' self-regulation skills are improving, they still require structured support and planned feedback from teachers. This aligns with self-regulated learning theory, which emphasizes the importance of external support during the initial stages of developing learning autonomy. Field data also reveal a clear shift in the locus of learning control from external (teacher-driven) to internal (student-driven). The availability of diverse digital learning resources allows students to explore subjects based on their interests and cognitive needs. The statement *"I often look for additional materials on the internet by myself"* reflects an intrinsic learning initiative a hallmark of a self-directed learner, as described by Knowles, namely the ability to take full responsibility for one's own learning process.

Overall, the analysis shows that students' autonomy at the madrasah remains situational it thrives when digital support and teacher guidance are present but declines when these supports weaken. Therefore, strengthening self-directed learning requires gradual scaffolding, enabling students to achieve sustainable learning autonomy in the digital era. The findings of this study reveal that students at Madrasah Aliyah Negeri Yogyakarta have begun to exhibit higher levels of learning autonomy following the implementation of digital learning platforms. This aligns closely with Knowles' theory of Self-Directed Learning (SDL), which emphasizes that learners should take initiative in diagnosing their learning needs, setting goals, identifying resources, and evaluating their progress. Students' increasing engagement with digital resources such as YouTube, online journals, and educational websites illustrates a tangible move toward learner autonomy, where they are no longer fully dependent on teachers as primary sources of knowledge.

The behavioral shift from teacher dependency to learner agency can also be interpreted through the lens of Deci and Ryan's Self-Determination Theory, which posits that intrinsic motivation arises when individuals experience autonomy, competence, and relatedness.¹⁹ Students' statements about feeling more motivated when teachers provide timely feedback suggest that while intrinsic motivation is developing, extrinsic supports remain vital to sustain engagement.²⁰ Thus, SDL in this context does not occur in isolation but within a structured and supportive digital ecosystem facilitated by teachers.²¹

Moreover, the fluctuation in students' motivation levels reflects Zimmerman's Self-Regulated Learning (SRL) model, which highlights the cyclical process of forethought (goal setting and planning), performance (strategy use and monitoring), and self-

¹⁹ Richard M. Ryan and Edward L. Deci, "Intrinsic and Extrinsic Motivation from a Self-Determination Theory Perspective: Definitions, Theory, Practices, and Future Directions," *Contemporary Educational Psychology* 61 (2020), <https://doi.org/10.1016/j.cedpsych.2020.101860>.

²⁰ Nidhi Gupta et al., "Beyond Autonomy: Unpacking Self-Regulated and Self-Directed Learning through the Lens of Learner Agency- a Scoping Review," *BMC Medical Education* 24, no. 1 (2024), <https://doi.org/10.1186/s12909-024-06476-x>.

²¹ Dkk Dzulfian Syafrian, "Exploring Instructional Strategies Through The Lens Of Self-Determination Theory: Supporting Student Motivation In Online College Courses," *Sustainability (Switzerland)* 11, no. 1 (2025): 1-14.

reflection (evaluation).²² In this study, students demonstrated emerging competence in the forethought phase taking initiative to explore materials independently but continued to struggle with performance consistency and reflective regulation. This indicates that students are transitioning from externally regulated learning to self-regulated learning, a key developmental stage in achieving full autonomy.²³ The results also align with Garrison's model of SDL, which integrates three interdependent dimensions: *self-management*, *self-monitoring*, and *motivation*. Students' proactive efforts to seek materials online demonstrate self-management, while their dependence on teacher feedback highlights the ongoing need for scaffolding to enhance self-monitoring and intrinsic motivation.²⁴

In this light, SDL among students at the madrasah can be described as situational autonomy a form of conditional independence that develops under supportive digital and pedagogical conditions. Consistent with Vygotsky's concept of the Zone of Proximal Development (ZPD), the teacher's role remains crucial in providing scaffolding that gradually shifts responsibility for learning from teacher to student.²⁵ Without such structured support, students' learning autonomy risks stagnation or regression due to motivational and self-regulatory fluctuations.²⁶ Therefore, the analysis underscores that fostering SDL in Islamic educational contexts requires a balanced integration of digital facilitation, teacher scaffolding, and motivational reinforcement. The digital environment serves as an enabler, but it is the pedagogical design and relational guidance that ultimately determine the sustainability of learners' self-directed growth.²⁷

3.2. The Role of Teachers as Digital Facilitators and Mentors

Teachers at *Madrasah Aliyah Negeri Yogyakarta* no longer act as the sole source of information but rather as facilitators who help students design and monitor their own learning processes. As one teacher expressed, "*We try to guide students to know how to learn, not just what to learn.*" Their tasks are now more exploratory and guiding in nature. Teachers utilize various digital platforms such as Google Classroom, Padlet, and Quizizz to promote reflection, collaboration, and self-evaluation. Common strategies include project-based learning, self-assessment, and weekly digital learning journals, which encourage students to engage in continuous self-reflection and responsibility for their learning progress.

However, several teachers admitted that assessing students' self-directed learning activities objectively remains challenging, especially due to limited time and infrastructure. "*We can see their activity on the platform, but it doesn't always reflect their real engagement. Sometimes they log in but don't actually study,*" one teacher noted. This highlights the need for further professional training in process-oriented assessment,

²² Ernesto Panadero and Jesús Alonso-Tapia, "How Do Students Self-Regulate? Review of Zimmerman," *Anales De Psicología* 30, no. 2 (2014): 450–62.

²³ Timothy J. Cleary and Peter Platten, "Examining the Correspondence between Self-Regulated Learning and Academic Achievement: A Case Study Analysis," *Education Research International* 2013 (2013): 1–18, <https://doi.org/10.1155/2013/272560>.

²⁴ Endah Susaeni, Endang Fauziati, and Endang Setyingsih, "Unveiling Success: An Exploration of Self-Directed Learning among TOSE Students," *Jurnal Kependidikan* 13, no. 001 (2024): 1397–1403.

²⁵ Deborah J Leong and Elena Bodrova, "Vygotsky ' S Zone of Proximal Development" 2, no. 4 (2024): 0–2.

²⁶ Nebi Sümer Mehmet Harma, Büşra Aktas, "Behavioral but Not Psychological Control Predicts Self-Regulation , Adjustment Problems and Academic Self-Efficacy Among Early Adolescents," n.d.

²⁷ Agus Fawait and Safaruddin, "Factors Affecting Self-Regulation of Students in Indonesian Traditional Muslim Schools," *IJORER: International Journal of Recent Educational Research* 2, no. 6 (2021): 721–30, <https://doi.org/10.46245/ijorer.v2i6.66>.

enabling teachers to evaluate not only learning outcomes but also the learning process, including reflection, persistence, and autonomy.

The findings demonstrate a pedagogical transformation from the traditional role of knowledge transmitters to that of digital facilitators and mentors. The statement *"guiding students to know how to learn"* represents a paradigm shift toward the "learning how to learn" principle, which lies at the core of self-directed learning (SDL). Teachers at MAN Yogyakarta actively integrate digital tools such as Google Classroom, Padlet, and Quizizz to cultivate a collaborative and reflective learning environment. Strategies like project-based learning, self-assessment, and learning journals exemplify constructivist pedagogy, in which students construct knowledge through meaningful and authentic learning experiences.

From a theoretical perspective, this phenomenon supports the concept of blended pedagogy, emphasizing the importance of balancing online and face-to-face learning to maintain social interaction, direct feedback, and moral-ethical supervision.²⁸ Teachers in Islamic schools must therefore be equipped with digital assessment literacy, enabling them to evaluate the *process* of learning such as reflection, consistency, and responsibility rather than focusing solely on measurable products or test outcomes.²⁹

3.3. Structural and Cultural Challenges in Self-Directed Learning

Although the digital ecosystem at *Madrasah Aliyah Negeri* Yogyakarta has developed considerably, there are still challenges in ensuring consistency and equitable access. Some students from rural or suburban areas face limited internet connectivity or lack of digital devices. As one student shared, *"Since the signal at home is weak, I usually download the materials at school so I can study at night."* In addition, many students still exhibit a learning culture that depends heavily on teachers' guidance. According to the principal, the shift from a teacher-centered to a student-centered learning paradigm is still in progress. *"Digital transformation cannot happen instantly. We are changing mindsets, not just switching media,"* he emphasized.

The analysis indicates that the success of Self-Directed Learning (SDL) is strongly influenced by institutional readiness, the availability of digital infrastructure, and the presence of a learning culture that emphasizes personal responsibility. Structurally, not all students have equal opportunities to engage with digital learning. The student's statement about downloading materials due to poor internet access highlights the digital divide between urban and rural learners. This implies that self-directed learning ability is not only determined by individual capacity but also shaped by socioeconomic conditions and technological infrastructure. Culturally, the persistence of teacher-centered learning traditions within the madrasah environment poses a barrier to the internalization of SDL principles. The principal's remark that *"digital transformation cannot happen instantly we are changing mindsets, not just tools"* reflects the critical distinction between digitalization (the adoption of technology) and digital transformation (the shift in pedagogical mindset). Without this mindset shift, technology

²⁸ Nanda van der Stap et al., "Fostering Online Interaction in Blended Learning through Social Presence and Convergence: A Systematic Literature Review," *Journal of Computer Assisted Learning* 40, no. 4 (2024): 1712–26, <https://doi.org/10.1111/jcal.12981>.

²⁹ Amrullah, Eka Apriani, and Muhammad Idris, "Enhancing Pedagogical Competence of Pre-Service Islamic Education Teachers through Peer Assessment and Constructive Feedback" 14, no. 1 (2025): 191–208.

integration risks becoming superficial, reproducing old teaching patterns through new media.³⁰

From the perspective of educational change theory, the successful implementation of SDL requires systemic transformation across three interdependent layers: institutional structures, teachers' professional competence, and students' learning culture.³¹ These layers are mutually reinforcing; without supportive policies, continuous teacher training, and the cultivation of responsibility-oriented values, SDL will remain unsustainable. In the context of Islamic education, the success of self-directed learning depends on the synergy between digital readiness and cultural readiness.³² Technology integration must go hand in hand with the cultivation of spirituality, discipline, and self-responsibility, aligning with the Islamic educational principle of *ta'dīb* the holistic formation of intellect, character, and moral responsibility.³³

The findings of this study indicate that Self-Directed Learning (SDL) at Madrasah Aliyah Negeri Yogyakarta is not merely a pedagogical shift toward autonomy, but a holistic educational process grounded in Islamic values. From the perspective of *ta'dīb*, SDL is understood as more than technical independence; it involves cultivating adab, responsibility, and spiritual maturity. When students take initiative to seek additional digital resources, such behavior reflects the *adab* of learning curiosity, seriousness, and moral readiness to engage in the pursuit of knowledge.³⁴ Digital learning also demands adherence to media ethics (*akhlaq al-ilm*), including discernment in selecting credible sources, avoiding harmful content, and using technology responsibly. Teachers, acting as *murabbi*, emphasize moral awareness, academic honesty, and ethical digital conduct.³⁵ These elements align with the *maqāsid al-tarbiyah*, which focus on intellectual development (*tanmiyah al-'aql*), moral refinement (*tahdhīb al-akhlaq*), and spiritual purification (*tazkiyah al-nafs*). Hence, digital technology serves not as a neutral tool but as a means to support integral Islamic education.

The results of the study reveal that SDL development at the madrasah aligns with three key SDL indicators: agency, self-regulation, and reflection. *First*, agency is reflected in students' proactive efforts to explore external digital resources. This demonstrates their capacity to make learning decisions, take initiative, and assume responsibility consistent with Islamic concepts of *ikhtiyar* (choice) and personal effort. *Second*, self-regulation appears in students' attempts to organize their study schedules, manage digital resources, and sustain motivation despite fluctuations. However, these skills remain in a transitional phase and require structured teacher support to become

³⁰ Sabingatun Dewi Masitoh and Dwi Purbowati, "Enhancing Teacher Professionalism in Indonesia : Challenges and Strategies for Digital Technology Utilization in the Society 5 . 0 Era," *Heutagogia: Journal of Islamic Education* 4, no. 2 (2024): 219–36.

³¹ Lucía Lomba-Portela, Sara Domínguez-Lloria, and Margarita Rosa Pino-Juste, "Resistances to Educational Change: Teachers' Perceptions," *Education Sciences* 12, no. 5 (2022): 1–12, <https://doi.org/10.3390/educsci12050359>.

³² Susi Ernawati et al., "Islamic Education Management Strategy in the Digital Era : Governance Transformation to Increase Effectiveness and Accessibility," *International Journal of Islamic Educational Research* 1, no. 3 (2024): 28.

³³ Isri Nafisah et al., "The Concept of Morality, Ihsan and Ta'dib in the Formation of Islamic Character and Malay Culture," *Lentera Pendidikan : Jurnal Ilmu Tarbiyah Dan Keguruan* 28, no. 1 (2025): 217–27, <https://doi.org/10.24252/lp.2025v28n1i12>.

³⁴ Syamsul Huda et al., "Erratum to 'Character and Adab Education in Indonesia, Turkey, and Japan: A Comparative Study' [Islamic Guidance and Counseling Journal 6(1) 2023, 1–17. 10.25217/Igcj.V6i1.2973]," *Islamic Guidance and Counseling Journal* 6, no. 2 (2023), <https://doi.org/10.25217/0020236391400>.

³⁵ Vincent Tinto, "Exploring the Character of Student Persistence in Higher Education : The Impact of Perception , Motivation , and Engagement," 2022.

consistent and internalized. *Third*, reflection is evident in digital learning journals, feedback cycles, and students' self-assessment activities. This mirrors the Islamic practice of *muhasabah*, where learners evaluate themselves and strive for continuous improvement. Within the framework of *tarbiyah*, the teacher's role transforms into that of a coach, mentor, and scaffolder, offering graduated assistance through clear targets, feedback, structured guidance, and moral support. Teachers guide students through stages of dependency to autonomy, consistent with Vygotsky's Zone of Proximal Development and the Islamic concept of gradual scaffolding (*tadarruj*). Thus, SDL is cultivated not only cognitively but also ethically and spiritually, making it deeply rooted in the *tarbiyah* tradition of holistic learner development.

4. Discussion

The findings indicate that the implementation of Self-Directed Learning (SDL) in the digital era at the *Madrasah Aliyah Negeri* (State Islamic Senior High School) in Yogyakarta has significantly shifted the learning paradigm from teacher-centered to student-centered instruction. This transformation aligns with Knowles' concept of SDL, which defines it as a process in which individuals consciously take the initiative in planning, executing, and evaluating their learning activities either independently or with minimal guidance from others.

Field observations revealed that the integration of digital technologies such as Google Classroom, Quizizz, and Madrasah E-Learning (Kemenag platform) has created more flexible, interactive, and personalized learning environments.³⁶ Students no longer depend solely on teachers as the main source of knowledge; instead, they actively seek additional learning materials through various online media.³⁷ This finding reinforces Siemens' theory of connectivism, which posits that learning in the digital age occurs through networks of interconnected resources rather than through linear knowledge transmission from teacher to learner. The results also highlight varying levels of student competence in managing their self-directed learning processes.³⁸ While most students demonstrated initiative and enthusiasm for independent learning, many still struggled with time management, self-discipline, and goal setting.³⁹ These challenges reflect a transitional phase from guided learning to autonomous learning, as described by Candy a developmental process where learner autonomy gradually emerges through structured guidance and sustained mentorship.⁴⁰

³⁶ Ika Damayanti and Sisca Rahmadonna, "Integrating Quizizz and Google Classroom: A Case Study of the ASSURE Model in Science Learning for Fifth-Grade Digital Classrooms," *AL-ISHLAH: Jurnal Pendidikan* 17, no. 2 (2025): 3040–56, <https://doi.org/10.35445/alishlah.v17i2.6800>.

³⁷ Ignatius Septo Pramesworo et al., "Relevance between Blended Learning and Students' Independent Learning Curriculum: An Overview of Digital Age Education, Student and Teacher Engagement, Technological Resources.," *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran* 9, no. 3 (2023): 858, <https://doi.org/10.33394/jk.v9i3.8320>.

³⁸ Balázs Vaszkun and Katalin Mihalkov Szakács, "Looking for Student Success Factors Outside of the Educators' Scope: The Effect of Digital Literacy, Personal Skills, and Learning Habits and Conditions on Self-Evaluated Online Learning Effectiveness in Management Education," *International Journal of Management Education* 23, no. 2 (2025), <https://doi.org/10.1016/j.ijme.2025.101188>.

³⁹ Anis Firdatul Rochma, "Assessing Undergraduate Students' Level of Independent Learning as a Manifestation of Learner Autonomy," *LingTera* 10, no. 1 (2023): 87–100, <https://doi.org/10.21831/lt.v10i1.59870>.

⁴⁰ Khulaiyah et al., "Autonomous Learning Activities: The Perceptions of English Language Students in Indonesia," *Pegem Egitim ve Ogretim Dergisi* 11, no. 3 (2021): 34–49, <https://doi.org/10.14527/pegegog.2021.00>.

In this context, the teacher's role remains central but has undergone a significant redefinition. Teachers have transformed into facilitators, mentors, and designers of digital learning experiences.⁴¹ They function as guides who foster reflective awareness, provide constructive feedback, and create learning environments conducive to independent exploration.⁴² This perspective aligns with the digital andragogy model proposed by *Merriam and Baumgartner*, which emphasizes learner autonomy while maintaining essential pedagogical support from teachers.⁴³ Several structural and cultural challenges continue to hinder the optimal implementation of SDL.⁴⁴ Unequal access to technology, limited digital competence among some teachers, and an instructional culture that remains heavily teacher directed constitute significant obstacles. These findings corroborate those of *Sari and Huda (2023)*, who observed that the implementation of SDL in religious schools is often constrained by inadequate infrastructure readiness and academic cultures that have not yet fully adapted to learner autonomy.⁴⁵

The development of SDL within Islamic educational institutions such as *madrasahs* therefore requires systemic transformation not merely the provision of digital tools. It must include school policy reform, project-based curriculum design, and teacher training in formative and metacognitive assessment. Furthermore, integrating Islamic spiritual values into SDL is crucial to ensure that learner autonomy does not evolve into individualism but remains grounded in *ta'dib* the Islamic principle of ethical and civilized education.⁴⁶ This study reinforces the concept of Self-Directed Learning within Islamic education by incorporating spiritual and moral dimensions as integral elements of learner autonomy.⁴⁷ In the Islamic worldview, independence in learning is not merely intellectual freedom but a form of self-governance guided by religious and ethical values.⁴⁸ Thus, SDL in *madrasahs* should be understood as Integrated Self-Directed Learning (iSDL) a model of autonomous learning that harmonizes spirituality, ethics, and social responsibility within the digital learning ecosystem.

The findings indicate that Self-Directed Learning (SDL) in the digital era at Madrasah Aliyah Negeri in Yogyakarta has shifted classroom practices from teacher-centered to student-centered learning. This shift addresses the research question and aligns with Knowles' framework of learner autonomy. Digital platforms such as Google

⁴¹ Cong Khanh Ly, "Teachers' Roles on English Language Teaching for Promoting Learner-Centered Language Learning: A Theoretical Review," *International Journal of TESOL & Education* 4, no. 2 (2024): 78–98, <https://doi.org/10.54855/ijte.24425>.

⁴² Noora Bosch, Tellervo Härkki, and Pirita Seitamaa-Hakkarainen, "Teachers as Reflective Learning Experience Designers: Bringing Design Thinking into School-Based Design and Maker Education," *International Journal of Child-Computer Interaction* 43, no. September 2024 (2025), <https://doi.org/10.1016/j.ijcci.2024.100695>.

⁴³ El-Amin Abeni, "Andragogy: A Theory in Practice in Higher Education," *Journal of Research in Higher Education* 4, no. 2 (2020): 54–69, <https://doi.org/10.24193/jrhe.2020.2.4>.

⁴⁴ Susan M. Holloway and Patricia A. Gouthro, "Multimodal Adult Learning through Arts-Based Organisations," *Australian Journal of Adult Learning* 64, no. 1 (2024): 12–32.

⁴⁵ Rivo Nugroho et al., "Self-Directed Learning: Strategy to Increase Digital Literacy in Suburban Society," *Mimbar Ilmu* 29, no. 1 (2024): 163–72, <https://doi.org/10.23887/mi.v29i1.64372>.

⁴⁶ Rayani Rayani, "The Integration of Self-Directed Learning and Mind Skills in the Development of Islamic Character among Guidance and Counseling Students," *International Journal of Innovation and Thinking* 2, no. 4 (2025): 222–29, <https://doi.org/10.71364/ijit.v2i4.57>.

⁴⁷ Mitra Sasmita et al., "Islamic Education As the Spiritual and Moral Foundation of the Young Generation," *Indonesian Journal of Education (INJOE)* 4, no. 3 (2024): 857–71.

⁴⁸ Rayani, "The Integration of Self-Directed Learning and Mind Skills in the Development of Islamic Character among Guidance and Counseling Students."

Classroom, Quizizz, and Madrasah E-Learning have fostered more flexible and interactive learning environments, though students exhibited varying levels of self-regulation, time management, and goal setting.⁴⁹ These results support Siemens' connectivism theory while also confirming challenges previously identified by Sari and Huda, particularly in terms of infrastructure and teacher-centered academic culture. Teachers' roles have evolved into facilitators and mentors, reinforcing the digital andragogy principles proposed by Merriam and Baumgartner, although disparities in digital competence and access remain obstacles. The significance of these findings lies in showing that effective SDL depends not merely on digital tools but on broader cultural, pedagogical, and institutional transformation. The study highlights crucial implications, including the need for project-based curriculum design, teacher professional development, and the integration of Islamic spiritual values so that learner autonomy remains grounded in *ta'dib*, ensuring that independence in learning aligns with ethical and moral responsibility.

5. Conclusion

This study aimed to examine how Self-Directed Learning (SDL) is fostered within digital learning environments in State Islamic Senior High Schools (Madrasah Aliyah Negeri) in Yogyakarta. The findings reveal a significant shift from teacher-centered instruction to student-centered learning, supported by the use of digital platforms such as Google Classroom, Quizizz, and Madrasah E-Learning. While students demonstrated initiative in autonomous learning, challenges persisted in areas such as self-regulation, time management, and goal setting. The implications of these findings suggest that effective SDL in Islamic schools requires more than technological adoption; it demands cultural change, enhanced teacher competence, and the integration of spiritual values to ensure that learner autonomy remains aligned with ethical and moral responsibility. This study contributes to strengthening value-oriented SDL within Islamic education. Nevertheless, the study is limited by the relatively small number of participants and its focus on public madrasahs within a single region, which restricts the generalizability of the results. Future research is recommended to include broader institutional contexts, such as private madrasahs or schools in other regions, to develop value-integrated SDL models, and to evaluate the impact of pedagogical interventions such as project-based learning or metacognitive training on students' autonomous learning skills.

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⁴⁹ Viva Fadma Onilivia and Noptario Noptario, "Educator Excellence in the Era of Society 5.0: A Hadith Perspective," *HEUTAGOGIA: Journal of Islamic Education* 4, no. 1 (June 2024): 47–58, <https://doi.org/10.14421/hjie.2024.41-04>.

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