

Uluslararası Diploma Programlarında Teknolojinin Farklılaştırılmış Öğrenmeye Yönelik Deneysel Etkileri: Öğretmen Perspektifinden Fenomenolojik Bir İnceleme

Experiential Impacts Of Technology On Differentiated Learning In International Diploma Programmes: A Phenomenological Study From Teachers' Perspectives

Sinem ARAB¹*, Demet H. SOMUNCUOĞLU ÖZERBAŞ²

ARTICLE INFORMATION:

Received: 18/08/2025

Accepted: 24/11/2025

Published: 15/03/2026

DOI: 10.33710/sduijes.1768103

AUTHOR(S) INFORMATION:

1: Gazi Üniversitesi

ORCID: 0009-0007-5779-9430

ROR ID: 054xkpr46

2: Gazi Üniversitesi

ORCID: 0000-0002-2050-1182

ROR ID: 054xkpr46

@CORRESPONDING AUTHOR:

Sinem ARAB

Gazi University

E-mail: sinemarab@gmail.com

TO CITE THIS ARTICLE:

Arab, S. ve Somuncuoğlu Özerbaş, D.H. (2026). Experiential impacts of technology on differentiated learning in international diploma programmes: A phenomenological study from teachers' perspectives. *SDU International Journal of Educational Studies*, 1, 1-18.

ÖZET

Bu çalışma, Uluslararası Bakalorya (IB) Diploma Programı öğretmenlerinin eğitim teknolojisinin farklılaştırılmış öğrenmeye entegrasyonuna ilişkin görüşlerini incelemektedir. Nitel bir fenomenolojik yaklaşım kullanılarak deneyimli yedi IB öğretmeniyle yarı yapılandırılmış görüşmeler yapılmış ve veriler betimsel fenomenolojik yöntemlerle analiz edilmiştir. Bulgular, öğretmenlerin teknoloji destekli farklılaştırılmış öğretimi genel olarak benimsediğini ve dijital araçların içeriği bireysel ihtiyaçlara uyarlamaya, öğrenci motivasyonunu artırmaya ve akademik performansı geliştirmeye yardımcı olduğunu göstermektedir. Katılımcılar, teknolojinin öğretim stratejilerini çeşitlendirdiğini, derin öğrenmeyi güçlendirdiğini ve işbirliğini teşvik ettiğini vurgulamıştır. Ancak cihazlara eşitsiz erişim, sınırlı internet bağlantısı, yetersiz teknik altyapı ve dijital yeterlilik eksiklikleri gibi zorluklar etkili uygulamayı sınırlayan engeller olarak belirlenmiştir. Genel olarak çalışma, teknolojinin yalnızca pedagojik bir destek değil, aynı zamanda kapsayıcı ve farklılaştırılmış öğrenme ortamları tasarlamada stratejik bir unsur olduğunu ortaya koymaktadır. Sürdürülebilir ve eşitlikçi teknoloji entegrasyonu için sürekli mesleki gelişim ve iyileştirilmiş altyapı önerilmektedir.

Anahtar Kelimeler: Farklılaştırılmış öğrenme, Teknoloji entegrasyonu, IB diploma programı, Öğretmen deneyimleri, Öğrenci merkezli öğrenme

ABSTRACT

This study investigates the perspectives of International Baccalaureate (IB) Diploma Programme teachers on the integration of educational technology into differentiated learning. Using a qualitative phenomenological approach, semi-structured interviews were conducted with seven experienced IB teachers, and the data were analyzed through descriptive phenomenological methods. Findings show that teachers generally support technology-enhanced differentiated instruction, noting that digital tools help tailor content to individual needs, increase student motivation, and improve academic performance. Participants emphasized that technology diversifies instructional strategies, strengthens deep learning, and encourages collaboration. However, challenges such as unequal access to devices, limited internet connectivity, inadequate technical infrastructure, and gaps in digital competence were identified as barriers to effective implementation. Overall, the study concludes that technology serves not only as a pedagogical support but also as a strategic element in designing inclusive and differentiated learning environments. It recommends ongoing professional development and improved infrastructure to ensure equitable and sustainable technology integration.

Keywords: Differentiated learning, Technology integration, IB Diploma Programme, Teacher experiences, Student-centered learning



INTRODUCTION

The International Baccalaureate is an organization that operates an international community of schools dedicated to higher standards. It supports 1,950,000 students in 5,800 schools across 162 countries through a variety of programmes, such as the PYP, MYP, DP and CP, which are intended to develop well-rounded, caring, knowledgeable and self-motivated learners (International Baccalaureate Organization, 2005). The integration of technology into International Baccalaureate (IB) programmes has become a significant factor in supporting differentiated learning strategies. Technology plays a critical role in DI by enabling teachers to work "smarter" and more efficiently, utilizing specific tools like Compass Learning software, Web Quests, and digital portfolios to vary instruction rate and modality based on student readiness and needs (Cobb, 2010; Stanford et al., 2010). According to IB on the role of technology in the Diploma Programme (DP), digital tools enable educators to personalize learning experiences to meet the diverse needs of students (International Baccalaureate Organization, 2019). Technologies such as learning management systems, multimedia resources, and adaptive software such as DreamBox Learning or Khan Academy, which adjust the difficulty and type of content in real time based on each student's responses and progress allow teachers to provide personalized content, pace, and assessment methods tailored to each student's strengths and weaknesses. By offering flexible learning pathways, technology creates a more inclusive environment, ensuring that all students, regardless of their academic abilities or learning preferences, can effectively engage with the curriculum. This personalization is vital in an IB context, where critical thinking, inquiry-based learning, and reflective practices are central to student success (Subban, 2006). However, the shift to new instructional paradigms faces significant operational hurdles, which can yield negative impacts on learning processes: research shows barriers such as teacher opposition (Tomlinson, 1995), concerns over the increased time allocated for planning (Tomlinson, 1995; Robison, 2004), and the common tendency for instructional practice to default to a "one-size-fits-all" approach (Tomlinson et al., 1998), highlighting that continuous support and successful implementation are necessary for the benefits of differentiation to endure (McAdamis, 2001).

Moreover, technology not only supports differentiation in content and presentation but also enhances formative assessment and feedback mechanisms, which are necessary to promote student autonomy and responsibility in learning. Through online assessments, peer evaluations, and interactive simulations, technology facilitates the continuous monitoring of student development (Krishan & Al-rsa'i, 2023). These tools provide real-time data that teachers can use to adjust instructional strategies, ensuring that each student receives an appropriate level of challenge and support. Furthermore, technology fosters collaboration and communication among students, enabling them to work together in diverse teams, share resources, and learn from each other's perspectives. The use of modern technological tools, such as visual materials, PowerPoint presentations, and projectors, increases students' engagement, interest, and motivation, which supports deeper comprehension and long-term retention of concepts (Raja & Nagasubramani, 2018). At the systemic level, nations develop technology policies that aim to maximize the integration of information technologies into educational institutions, responding to current societal needs and ensuring the ongoing modernization of learning environments (Tekin & Polat, 2014). Within these evolving environments, technology makes it possible to design learning experiences that address individual differences, offer dynamic and interactive content, and motivate students to participate actively in the learning process (Elvan & Mutlubaş, 2020). Additionally, wearable technologies such as augmented reality (AR) devices and Google Glass are gaining prominence as innovative tools that enhance communication and experiential learning opportunities in educational settings (Erbaş & Demirer, 2014).

Combined with specialized instructional strategies, this collaborative learning empowers students to take ownership of their learning and supports the development of Approaches to Learning (ATL) skills, which lie at the core of the IB philosophy. Additionally, technology-driven differentiated instruction significantly enhances student motivation compared to traditional teaching methods (Krishan & Al-rsa'i, 2023; IBO,

2019). Technology-supported differentiated learning strategies, particularly incorporating AI-based adaptive systems and Augmented Reality (AR) environments, significantly boost the cognitive outcomes, problem-solving skills, academic achievement, and emotional well-being of diverse students by allowing dynamic personalization of the content, process, and product (Ayaz et al., 2023; Estaiteyeh & DeCoito, 2024; Hamayun et al., 2025). The Approaches to Learning (ATL) skills, which form the foundation of IB programmes, aim to encourage students to take active responsibility for their own learning processes and to critically question the knowledge they acquire. Within this framework, students are expected to continuously evaluate their own learning processes and express their development by engaging in reflection at the end of each learning experience. ATL skills encompass multidimensional competencies such as communication, collaboration, organization, affective skills, reflection, information literacy, media literacy, critical thinking, creative thinking, and transfer skills. Each skill area is supported by sub-skills that aim to strengthen students' higher-order thinking abilities, including problem-solving, information access, analysis, and evaluation (IBO, 2014). Macharia's (2022) study emphasizes the central role of Approaches to Learning Skills (ATLS) within the International Baccalaureate (IB) curriculum, highlighting their importance in supporting transdisciplinary learning. ATLS are structured around five core areas—communication, thinking, research, self-management, and social skills—and aim to develop students' competencies in “learning how to learn.”

Technology emerges as a powerful tool in education to make instructional processes more flexible and effective by addressing students' individual differences (Schmid, Pauli, Stebler, Reusser & Petko, 2022; Şimşek & Can, 2020). Particularly in the International Baccalaureate (IB) programme, technology-supported differentiated instruction is considered a crucial strategy with the potential to provide personalized learning experiences and enhance students' academic performance (Dulfer, 2019; Özkeskin, 2024). Schmid et al. (2022) highlight that technology-supported differentiation offers materials suited to individual learning styles, enabling each student to adapt the learning process to their own pace and capacity. The strategic integration of technology into differentiated instruction allows educators to work more efficiently, varying instruction across modalities and subsequently helping to decrease achievement gaps across diverse student populations (Stanford et al., 2010). Differentiated instruction, when applied effectively, provides useful and continuous student assessment, allowing teachers to dynamically adjust lesson plans and resulting in enhanced student engagement and active participation (Palieraki & Koutrouba, 2021). Research further indicates that when teachers utilize technology as an instrument to meet diverse student needs, students become more excited, motivated, and experience increased enjoyment during their lessons (Kurniawati & Huda, 2023). The implementation of differentiated teaching plans by IB teachers through the use of technology not only engages students but also allows the development of instructional methods adapted to their pace and needs (Rao, Currie-Rubin & Logli, 2016). However, the impact on teachers and their perspectives regarding the effectiveness of technology-based differentiation plans is a subject that requires more comprehensive exploration in the literature (Cooker, Crook & Ainsworth, 2015; Ginja & Chen, 2020). In this context, the experiences and perspectives of IB teachers regarding such practices can serve as an essential reference for understanding the contribution of technology and its integration into instructional processes.

As the role of technology in education continues to grow, its impact on IB programmes emerges as a significant innovation in the differentiation of learning processes. IB programmes offer a pedagogical framework that encourages critical thinking, inquiry, and reflective practices while considering students' individual differences. The integration of technology into these programmes provides teachers with powerful tools to create both student-centered and inclusive learning environments. However, this transformation must be examined not only from the perspective of students but also in depth from the experiences and perspectives of teachers.

The aim of this study is to determine teachers' perspectives on the integration of technology into differentiated learning processes within the International Baccalaureate (IB) Diploma Programme. Accordingly, the research problem is expressed as: "According to the experiences of teachers working in the International Baccalaureate (IB) Diploma Programme, how does technology affect the integration of differentiated learning processes?" The research data are limited to those obtained from educators teaching in the IB programme, within which the interviews were conducted.

METHOD

This research is a qualitative study aiming to examine teachers' perspectives on the integration of technology into differentiated learning processes within the International Baccalaureate (IB) Diploma Programme. The study focuses on understanding how technology affects these processes based on teachers' experiences. A phenomenological approach was adopted in the research, with the primary goal of exploring the subjective experiences of participants regarding technology-supported differentiated learning strategies and the meanings they attribute to these experiences (Creswell, 2007).

This study was designed within the framework of descriptive phenomenology. Descriptive phenomenology focuses on understanding participants' perceptions of a phenomenon in their own contexts and describing these perceptions (Eberle, 2014). This approach provides a suitable framework for understanding how teachers implement technology-supported differentiated learning strategies, the challenges they encounter, and the effects of these strategies on student outcomes. Since phenomenology aims to reach the essence of individuals' perceptions and experiences regarding a particular phenomenon, it directly aligns with the purpose of this study.

Accordingly, Colaizzi's (1978) descriptive phenomenological analysis method was used in the data analysis process. This method includes a structured process consisting of identifying significant statements related to participants' experiences, forming meaning units from these statements, deriving themes, and reaching a structural description of the phenomenon. Colaizzi's method provides an appropriate theoretical and methodological framework for examining in depth the teacher experiences of technology-supported differentiated learning practices (Morrow, Rodriguez & King, 2015).

Study Group

The study group of the research consisted of 7 teachers working in the IB Diploma Programme who implemented technology-supported differentiated teaching strategies in their classrooms. Participants were selected through purposive sampling. In this method, individuals with the knowledge and experience to provide direct answers to the research questions are intentionally chosen. For this reason, it was ensured that participants had at least 5 years of IB experience. Participants were selected from teachers of different subject areas working in Istanbul, where technology is widely used, in order to ensure sample diversity.

Table 1. Demographic Information of Participant IB Teachers

Demographic Information	f	
Gender	Female	5
	Male	2
Work Experience	5- 10 years	2
	10-20 years	4
	20+ years	1

School	Private	6
	Public	1
Branch	Primary School Teacher	1
	Information Technologies & Software	2
	Mathematics	1
	Science	2
	Turkish Language and Literature	1

Data Collection Tools

In this research, a semi-structured interview form was used. Semi-structured interviews provide participants with the freedom to express their experiences while also offering the opportunity to systematically seek answers to the main research questions (Smith, Flowers & Osborn, 1997). The interview questions were designed to focus on how teachers implemented technology-supported differentiated learning strategies, the challenges they encountered in this process, and the effects of technology on student learning outcomes.

To test the applicability of the interview form and eliminate potential deficiencies, a pilot study was conducted. The pilot study was carried out with two IB Digital Society teachers working in Istanbul. These teachers were selected through purposeful sampling based on two key criteria: (1) having a minimum of ten years of professional teaching experience, and (2) actively implementing differentiated instruction supported by technology in their classrooms. Istanbul was chosen as the pilot study setting because schools in this region have relatively greater access to technological infrastructure, which allowed the interview questions to be tested within a context where technology-integrated differentiated teaching is routinely practiced. Based on the pilot interviews, some questions were restructured, and the wording was made clearer. In addition to demographic information, the final interview form was outlined according to the following guiding questions:

- For what purposes and how do teachers use technology while creating differentiated learning environments?
- What are the main challenges encountered during the integration of technology into differentiated instruction, and how are these challenges addressed?
- Based on their experiences, how do teachers explain the reflections of technology-supported differentiated instruction on students' motivation, engagement, and academic achievement?

Data Collection Process

The interviews were conducted face-to-face as individual sessions. Each interview lasted an average of 35–45 minutes, and audio recordings were taken with participants' consent. The audio recordings were transcribed using the Descript application and prepared for the analysis process. In line with ethical rules, participants provided written consent forms, confidentiality principles were observed, and all data were anonymized.

Data Analysis

The collected data were analyzed in accordance with Colaizzi's (1978) descriptive phenomenological analysis method. In this process, meaningful statements were selected from participants' expressions, meaning units were derived from these statements, and common themes were created. The resulting themes were structured to reveal in depth the experiences of teachers regarding technology-supported differentiated

learning (Morrow, Rodriguez & King, 2015). Anonymized participants were coded as T1, T2, T3, T4, T5, T6, and T7.

Validity and Reliability

In this research, principles of validity and reliability were carefully observed in qualitative data collection and analysis processes. In qualitative research, validity and reliability are critical to ensure the accuracy and trustworthiness of findings (Lincoln & Guba, 1988). To ensure internal validity, data, researcher, and method triangulation was used during the data collection process (Patton, 2002). In this context, interviews were conducted with IB teachers from different subject areas to obtain various perspectives. In addition, the semi-structured interview form was developed with expert input and tested through a pilot application. Transcripts of the interviews were shared with the participants using the member-checking method, and necessary corrections were made based on their feedback. This process ensured that the data reflected the participants' actual experiences.

The Researchers' Role

The researcher took care to ensure that personal thoughts and experiences did not have a directive effect on the participants' statements.

FINDINGS

As a result of the analysis of the collected data, a total of 7 main themes were identified. Among these, the most common was the theme of "*Student-Centered Approach*," emphasized by all participants. This was followed by "*Technology Integration*" and "*Diversity of Instructional Strategies*." Other themes were highlighted to varying degrees depending on participants' contextual experiences. The themes comprehensively reflect teachers' experiences regarding technology-supported differentiated learning within the International Baccalaureate (IB) Diploma Programme

Table 2. Participant Opinions by Themes

Theme	f	%
Student-Centered Approach	7	100%
Technology Integration	6	85.71%
Diversity of Instructional Strategies	6	85.71%
Challenges and Barriers	5	71.43%
Impact on Student Achievement	5	71.43%
Teacher Competence and Professional Development	3	42.86%
Workload and Motivation	2	28.57%

As shown in Table 2, the analysis by percentages revealed that the most emphasized themes in technology-supported differentiated learning were student-centered approach (100%), technology integration (85.71%), and diversity of instructional strategies (85.71%). In addition, teachers also drew attention to important issues such as challenges in the process (71.43%) and effects on student achievement (71.43%), while factors such as professional development (42.86%) and workload (28.57%) were mentioned less frequently.

Table 3. Student-Centered Approach

Theme	Sub-Themes (Codes)	f	%
Student-Centered Approach	Considering Individual Differences	3	42.86%
	Adapting Content to Student Needs	2	28.57%
	Increasing Student Responsibility	2	28.57%
Total		7	100%

According to Table 3, the most frequently emphasized sub-theme under the student-centered approach was “*Considering Individual Differences*” (42.86%). This finding demonstrates that teachers place great importance on attending to students’ individual characteristics during technology-supported differentiated learning processes.

The other two sub-themes, “*Adapting Content to Student Needs*” and “*Increasing Student Responsibility*,” were equally represented (28.57%). This indicates that teachers not only consider individual differences but also adapt content to individual deficiencies and encourage students to take greater responsibility in their learning processes.

Participant teachers’ statements reveal that a student-centered approach is adopted in technology-supported differentiated learning processes. Within this context, the most frequently emphasized element emerged under the sub-theme “*Considering Individual Differences*.” Teachers stated that students’ learning speeds and comprehension styles differ from one another and that these differences could be managed more effectively through technological tools:

- “*I can adjust the content according to students’ levels, which helps them understand more easily*” (T1).
- “*When using technology, students take more responsibility and can manage their own learning*” (T5).
- “*When I present digital content according to individual needs, student engagement visibly increases*” (T7).

Within the sub-theme “*Adapting Content to Student Needs*,” it was emphasized that organizing digital content according to students’ deficiencies made a positive contribution to the learning process. In this regard, T2 and T4 noted that online resources, simulations, and visual materials could be tailored to individual needs, thereby enabling students at different levels to participate actively and meaningfully in the learning process.

Within the sub-theme “*Increasing Student Responsibility*,” it was observed that students assumed greater responsibility in their own learning through technology use. At the same time, T3 noted that students could plan and carry out their own projects, while T6 stated that students took more active roles in online collaborative activities.

All these findings demonstrate that the student-centered approach is strongly integrated into differentiated learning processes through technological tools.

Table 4. Technology Integration

Theme	Sub-Themes (Codes)	f	%
Technology Integration	Incorporation of Technology into the Lesson Process	3	42.86%
	Effective Use of Digital Tools	2	28.57%
	Student–Technology Interaction	2	28.57%

Theme	Sub-Themes (Codes)	f	%
Total		7	100%

As shown in Table 4, under the theme of *“Technology Integration,”* the most frequently emphasized sub-theme was *“Incorporation of Technology into the Lesson Process”* (42.86%). This demonstrates that teachers structured technology not merely as a supportive element but as an active component of the lesson. According to participants’ statements, technology was systematically integrated into the instructional process and caused fundamental changes in teaching strategies.

In addition, the sub-themes *“Effective Use of Digital Tools”* and *“Student–Technology Interaction”* were equally represented (28.57%). These findings indicate the importance attributed to the strategic and pedagogical use of digital technologies, as well as the level of interaction students establish with these technologies. Particularly, students’ active learning experiences with digital tools show that technology integration was not superficial but took place at a deeper level in IB programs.

Participant teachers’ views reveal that the integration of technology into lesson processes is one of the building blocks of differentiated learning. Teachers stated that digital tools not only supported the teaching process but also transformed instructional methods.

Under the sub-theme *“Incorporation of Technology into the Lesson Process,”* teachers positioned technology as an indispensable part of lesson planning. T7 expressed that digital tools in science classes were functional in supporting experimental processes.

- *“Tools such as GeoGebra allow students to view mathematical concepts from different perspectives”* (T1).
- *“Thanks to Scratch and other platforms, they both enjoy themselves and learn algorithmic thinking”* (T4).

Under the sub-theme *“Effective Use of Digital Tools,”* attention was drawn to the importance of purposeful and conscious use of technology. T3 and T6 expressed that selecting tools suitable for students’ cognitive levels made the learning process more efficient. Participants particularly emphasized that smart boards, virtual laboratories, and coding tools added value to the learning process:

- *“Digital tools provide me with significant ease in differentiation for coding lessons”* (T6).

Within the sub-theme *“Student–Technology Interaction,”* it was stated that students demonstrated higher motivation and managed their own learning more effectively when they directly interacted with technology. T2 emphasized the contribution of rapid feedback provided by technology to the learning process, while T5 noted that student motivation increased and independent learning habits were developed:

- *“Students can instantly see the texts they write with online writing tools and receive feedback”* (T2).

These findings indicate that technology is not merely a tool but also a strategic component for differentiated learning, assuming an integrative role within the student–teacher–activity triangle.

Table 5. Diversity of Instructional Strategies

Theme	Sub-Themes (Codes)	f	%
Diversity of Instructional Strategies	Use of Differentiated Instructional Methods	3	42.86%
	Digital Games and Interactive Applications	2	28.57%
	Designing Materials and Tasks Suitable for Students	2	28.57%
Total		7	100%

Within the theme “*Diversity of Instructional Strategies*,” the most frequently emphasized element was “*Use of Differentiated Instructional Methods*” (42.86%). This finding shows that teachers utilized various methods and techniques to respond to individual learning needs and moved away from a uniform instructional structure. It was observed that teachers, especially by using technology, diversified learning pathways, increased classroom interaction, and supported individualized learning.

The sub-themes “*Digital Games and Interactive Applications*” and “*Designing Materials and Tasks Suitable for Students*” were equally represented (28.57%). This indicates that teachers considered technology not only as a presentation tool but also as a learning environment that increased student participation and interaction. Digital games, simulations, and interactive applications were found to enhance students’ motivation and active participation in learning.

Moreover, designing tasks and materials according to students’ interests, needs, and levels demonstrated that individualized learning was carried out in a more systematic way. This shows that instructional strategies were flexible and student-centered, not only in terms of methods but also in content. Participant teachers’ opinions demonstrate that instructional strategies enriched with technological tools became more flexible, student-centered, and interactive. In this regard, differentiated instruction was reshaped in various dimensions, from content delivery to task design, thanks to digital opportunities.

Under the sub-theme “*Use of Differentiated Instructional Methods*,” teachers emphasized that they could differentiate lesson content according to students’ readiness levels. T1, T4, and T7 stated that they could present the same topic with different levels of explanation and various digital content. T7 highlighted the transformative effect of technology on teaching processes. Participants also noted that by grouping students according to similar learning levels through digital platforms, they made teaching more effective:

- “*Thanks to different applications, I can explain the same topic in various ways*” (T7).

Under the sub-theme “*Digital Games and Interactive Applications*,” teachers stated that they extensively used technological tools to increase student engagement and make the learning process more interesting. T2 emphasized the contribution of digital tools to cognitive skill development, while T3 highlighted both interaction and the safety of the learning environment:

- “*With text analysis tools, I capture students’ attention and improve their interpretive skills*” (T2).
- “*When I use virtual laboratories in my classes, we can conduct experiments in a safe environment*” (T3).

Under the sub-theme “*Designing Materials and Tasks Suitable for Students*,” teachers provided tasks and materials appropriate to students’ individual differences. T5 stated that diversity positively contributed to student engagement. Together with T6, it was highlighted that especially personalized content provided through learning management systems facilitated differentiation:

- “*Through various methods such as presentations, videos, and interactive games, I can keep students active for longer periods*” (T5).

These findings show that teachers structured differentiated instruction not merely as a supportive element but by integrating it into the core of pedagogical strategies through technology. The creative practices developed demonstrate that the opportunities provided by technology were harmonized with instructional strategies, making learning processes more dynamic, individualized, and interactive.

Table 6. Challenges and Barriers

Theme	Sub-Themes (Codes)	f	%
Challenges and Barriers	Inequalities in Access	2	28.57%
	Lack of Technical Infrastructure and Support	2	28.57%
	Digital Competency Problems of Students and Teachers	2	28.57%

Theme	Sub-Themes (Codes)	f	%
	Time Management and Workload Issues in the Teaching Process	1	14.29%
Total		7	100%

According to the findings in Table 6, three sub-themes under the theme “*Challenges and Barriers*”—Inequalities in Access, Lack of Technical Infrastructure and Support, and Digital Competency Problems of Students and Teachers—emerged equally, each accounting for 28.57% of the total coding. This distribution shows that the challenges most frequently encountered by teachers in technology integration were experienced at both structural and individual levels with similar frequency.

In contrast, the sub-theme “*Time Management and Workload Issues in the Teaching Process*” accounted for only 14.29%, being emphasized less than the others, although it was not completely overlooked. Participants acknowledged that the integration of technology into teaching processes provided significant advantages, yet they also expressed that they faced various challenges. The findings revealed that these barriers were effective in both technical and pedagogical dimensions.

Under the sub-theme “*Inequalities in Access,*” it was emphasized that there were significant differences among students regarding access to digital tools and internet connectivity. T2 noted that the digital divide could negatively affect student achievement, while together with T5, they stated that such inequalities limited efforts to provide individualized support:

- “*Some students fall behind because they do not have the necessary technological equipment at home*” (T2).

Under the sub-theme “*Lack of Technical Infrastructure and Support,*” it was seen that technical problems in digital learning environments, particularly in virtual laboratories and simulation programs, disrupted the teaching process. T3 emphasized the impact of infrastructure problems on instructional flow. Along with T7, they expressed that technical support services were insufficient in such situations and that immediate solutions could not be provided:

- “*Internet outages or application errors sometimes disrupt the lesson*” (T3).

Under the sub-theme “*Digital Competency Problems of Students and Teachers,*” deficiencies in digital skills were highlighted. T4 emphasized that not only access to digital tools but also the ability to use them effectively was important. Together with T6, it was stressed that teachers struggled to keep up with technological developments, which limited digital integration:

- “*Not all students adapt to digital tools at the same pace, sometimes this process slows down*” (T4).

Finally, under the sub-theme “*Time Management and Workload Issues in the Teaching Process,*” it was stated that the use of technology extended teachers’ preparation time. T1 noted that producing digital content created an additional workload in terms of time management:

- “*Preparing materials for the lesson takes a lot of time; sometimes I need to work extra outside of class*” (T1).

These findings reveal that strengthening systemic support is necessary for the sustainability of technology-supported teaching and that digital transformation requires not only instrumental but also structural and competence-based interventions.

Table 7. Impact on Student Achievement

Theme	Sub-Themes (Codes)	f	%
Impact on Student Achievement	Increase in Academic Achievement	3	42.86%
	Deep Engagement in the Learning Process	2	28.57%
	Development of Problem-Solving and Creativity	2	28.57%

Theme	Sub-Themes (Codes)	f	%
Total		7	100%

According to Table 7, the sub-theme “*Increase in Academic Achievement*” was the most frequently mentioned element in participant opinions, accounting for 42.86% of the total coding. This rate indicates that teachers believed technology-supported instruction had a direct positive effect on academic performance.

The other two sub-themes, “*Deep Engagement in the Learning Process*” and “*Development of Problem-Solving and Creativity*,” were equally represented (28.57%). These rates demonstrate that teachers believed the use of technology not only enhanced achievement but also contributed to students’ active participation in the process and the development of higher-order cognitive skills.

Overall, the table suggests that technology-supported instruction contributed to student achievement in multiple dimensions, both measurable (academic) and qualitative (engagement, creativity). Teachers’ statements revealed that technology in differentiated learning processes not only facilitated teaching but also directly influenced student success. Findings indicated that this effect was multidimensional, encompassing academic performance as well as deep learning and cognitive skill development.

Under the sub-theme “*Increase in Academic Achievement*,” teachers especially emphasized that digital content facilitated students’ comprehension processes. T1 stressed that digital tools positively influenced learning speed. T3 stated that technology-supported learning environments created a positive difference in students’ academic performance. Together with T5, they noted that significant progress was particularly observed among low-achieving students:

- “*Especially low-achieving students learn faster with technological support*” (T1).
- “*They find opportunities to learn by making mistakes in virtual experiment environments, which increases their interest and achievement*” (T3).

Under the sub-theme “*Deep Engagement in the Learning Process*,” it was seen that the use of technology increased students’ interest in the lesson and encouraged them to participate more responsibly. T2 highlighted the supportive role of technology for individual skills. Together with T6, they emphasized that students took more active roles in the learning process through technology, which fostered deeper learning:

- “*With reading–writing applications, students’ writing skills improved*” (T2).

Under the sub-theme “*Development of Problem-Solving and Creativity*,” it was stated that digital tools provided students with opportunities to create their own projects, which in turn developed their problem-solving and creative thinking skills. T4 emphasized the motivating effect of productivity-based technological applications, while together with T7, they observed that this effect was particularly evident in STEM-based digital content:

- “*When they can create their own projects—even through technology—children become more motivated and take greater ownership of the lesson*” (T4).

These findings demonstrate that technology is not only a tool for transmitting knowledge but also a learning environment that holistically contributes to students’ academic, cognitive, and affective development.

Table 8. Teacher Competence and Professional Development

Theme	Sub-Themes (Codes)	f	%
Teacher	Development of Technology Use Skills	2	28.57%
Competence and	Need for In-Service Training	1	14.29%
Professional	Participation in Professional Learning	1	14.29%
Development	Communities		

Theme	Sub-Themes (Codes)	f	%
Total		4	57.15%

As seen in Table 8, the sub-theme “*Development of Technology Use Skills*” was the most frequently emphasized element, with 28.57%. This rate shows that teachers primarily saw the need to improve their digital skills in order to effectively integrate technology.

The other two sub-themes, “*Need for In-Service Training*” and “*Participation in Professional Learning Communities*,” were equally represented (14.29%). These rates indicate that teachers required not only individual but also institutional and community-based support mechanisms in adapting to technological transformation.

Although the total coding frequency of this theme was relatively low compared to other themes, the findings revealed that professional development was still considered a critical element for sustainable technology integration.

Some participants emphasized that teacher competence was a determining factor in the effective integration of technology into differentiated instruction. Teachers’ ability to use digital tools effectively and integrate them pedagogically was largely associated with access to professional development opportunities.

Under the sub-theme “*Development of Technology Use Skills*,” teachers expressed that mastering digital tools was a process developed over time. T3 noted that this process was reinforced through experience. T6 emphasized the need for continuous improvement, stating that teachers needed to make individual efforts to use technology effectively:

- “*At first I struggled, but over time I learned which tools to use for what purpose*” (T3).

Under the sub-theme “*Need for In-Service Training*,” it was noted that existing training sessions did not sufficiently contribute to classroom practices. T5 stressed that in-service training content should be practical and functional. This highlighted teachers’ expectations for systematic and ongoing support in adapting to technological innovations:

- “*The training we receive on technology is insufficient; it should have more practical content*” (T5).

Under the sub-theme “*Participation in Professional Learning Communities*,” it was observed that collaborating with colleagues and sharing knowledge and experiences effectively contributed to developing digital skills. T4 emphasized that learning communities provided a functional platform for improving teacher competence:

- “*Sharing application suggestions with my colleagues contributed a lot to me*” (T4).

These findings show that technology integration is not only tool-based but also human resource-based, and that teachers’ professional development processes directly influence the success of integration. It was revealed that comprehensive support mechanisms, both individual and institutional, needed to be established for effective technology use.

Table 9. Workload and Motivation

Theme	Sub-Themes (Codes)	f	%
Workload and Motivation	Technology Use Extends Preparation Process	1	14.29%
	Increase/Decrease in Motivation	1	14.29%
	Sense of Satisfaction Despite Difficulties in the Teaching Process	1	14.29%
Total		3	42.86%

Some participants stated that the integration of technology into differentiated instruction had an impact on teachers' workload and motivation levels. In this context, three sub-themes under the theme "*Workload and Motivation*" were equally emphasized, each represented by 14.29%.

Under the sub-theme "*Technology Use Extends Preparation Process*," T1 noted that preparing digital content took significant time and increased teachers' existing workload, highlighting the time-consuming nature of the process:

- "*Preparing the content takes hours; this workload is truly exhausting*" (T1).

Under the sub-theme "*Increase/Decrease in Motivation*," T2 stated that receiving positive feedback from students when technology was effectively used increased motivation, but also noted that technical problems could negatively affect motivation:

- "*When I use technology, positive feedback from students motivates me more*" (T2).

Under the sub-theme "*Sense of Satisfaction Despite Difficulties in the Teaching Process*," T6 emphasized that despite all difficulties, seeing the contribution of technology to student learning increased satisfaction in the teaching role:

- "*Despite everything, seeing that students are learning makes all the difficulties worthwhile*" (T6).

These findings demonstrate that while technology integration increases teachers' workload, it also strengthens their professional satisfaction and motivation when it contributes positively to students' learning processes.

CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

This study employed a descriptive phenomenological approach to explore the experiential perspectives of teachers working in the International Baccalaureate (IB) Diploma Programme regarding the role of technology in differentiated learning. The findings revealed that technology functions as a critical pedagogical tool that enables teachers to design learning environments that are responsive to students' individual needs, interests, readiness levels, and learning styles. This capacity for personalization aligns with Dulfer's (2019) emphasis on the value of "personalized digital content," as well as research by Cooker, Crook, and Ainsworth (2015), which highlighted the ability of digital tools to adapt to learners' pace. The experiences shared by teachers consistently illustrated that technology supports the implementation of diverse instructional strategies and thus enhances the flexibility and responsiveness of teaching practices.

Furthermore, the integration of technology was found to significantly transform assessment processes. Teachers reported utilizing online writing tools to provide students with instant feedback, thereby facilitating rapid-cycle formative assessment. Likewise, virtual experimental environments enabled students to learn through trial and error in a low-risk context, reinforcing process-based evaluation and reducing performance anxiety. These results correspond with the findings of Ginja and Chen (2020), who noted the contribution of technology to formative assessment practices. Teachers also observed increased student motivation and collaborative engagement, as learners took more active roles in online group work and project-based digital applications. This observation aligns with the conclusions of Rao, Currie-Rubin, and Logli (2016), who argued that technology strengthens collaboration-oriented learning environments. In this regard, technology not only reinforced differentiated instruction but also contributed to student-centered learning, the development of collaborative culture, and the cultivation of individual responsibility.

However, for these benefits to be sustained, several structural and pedagogical challenges must be addressed. Teacher experiences indicated continuing disparities in students' access to digital devices and reliable internet connectivity, which risk widening the digital divide. Additionally, technical disruptions and gaps in digital competence among both teachers and students were reported as recurring obstacles that hinder instructional continuity and reduce the effectiveness of integration. While teachers noted that preparing digital materials often increases workload, many also emphasized the professional satisfaction derived from observing the positive impact of technology on student learning.

The findings of this study indicate that technology not only enhanced individualized learning but also played a significant role in fostering a robust culture of collaboration within the classroom. Teachers reported using platforms such as *Google Classroom*, *Padlet*, *Canva Whiteboard*, *FigJam*, and *Nearpod Collaborate Boards* to promote cooperative knowledge construction and peer-supported learning. For instance, Padlet's real-time co-editing features enabled students to contribute to shared tasks simultaneously, facilitating collective idea generation. Likewise, digital whiteboard tools such as Canva Whiteboard and FigJam allowed students to jointly engage in problem-solving processes and co-design learning artefacts. Furthermore, Google Classroom's group-assignment functions supported distributed responsibility by enabling learners to take on differentiated roles within collaborative tasks. Collaboration was found to be particularly beneficial in heterogeneous classroom contexts—especially for learners with limited language proficiency, low academic motivation, or those from vulnerable groups such as refugee students. These students frequently relied on peer interaction and multimodal digital supports to engage meaningfully with instructional content. Teachers emphasized that such tools strengthened differentiated instruction by enabling students to interact not only with the material but also with one another in accessible, visually supported, and socially engaging learning environments.

In light of these findings, the study proposes several key recommendations. First, continuous and practice-oriented professional development should be prioritized to enhance teachers' technological pedagogical integration skills. Second, infrastructure investments must be strengthened to guarantee equitable access to digital tools such as learningapps, nearpod, mentimeter, Google Apps, AI tools and connectivity. Third, the development and dissemination of high-quality, personalized digital learning materials should be supported to ensure sustainability. Finally, establishing designated in-school technical support units is essential for ensuring uninterrupted instructional processes.

Overall, this research contributes important insights for educators, policymakers, and teacher education programs by emphasizing that effective and sustainable technology-supported differentiated learning depends not only on the availability of digital tools but, critically, on systemic support, infrastructure equity, and ongoing professional development.

In conclusion, this study demonstrated that technology strengthened not only differentiated instruction but also student-centered learning, a culture of collaboration, and a sense of individual responsibility. However, for this transformation to be sustainable, professional development for teachers, accessibility of digital content, and strengthening of technical infrastructure are essential.

In line with the findings of this research, several recommendations are presented for the effective implementation of technology-supported differentiated learning. First, continuous and practice-oriented professional development programs should be provided to enable teachers to develop technology integration skills. It is important that these programs focus on integrating pedagogical competence with technological knowledge and skills. In addition, investments should be made in infrastructure to ensure that all students have equal access to digital tools and the internet, which is essential for equality of opportunity.

Developing personalized digital content suitable for students' learning pace and style and making it available for both teachers and students will further support learning processes. Furthermore, the effective use of technology to create collaborative learning environments and provide instant feedback will increase students' active participation in lessons. Finally, the establishment of in-school support units to address technical problems encountered in technology integration will be a significant requirement for the sustainability of the process.

These recommendations may contribute to teachers working in the IB Diploma Programme to use technology in differentiated learning more effectively and sustainably. Moreover, the study provides

specific and actionable data—such as disparities in digital access, gaps in technological competence, and the need for ongoing technical support—that can inform educational policy decisions and strengthen teacher education programs.

REFERENCES

- Ayaz, B., Ramazanoğlu, M., & Uluyol, Ç. (2023). Identification the Impact of Differentiated Digitally Supported Learning Environments. *Ahmet Keleşoğlu Eğitim Fakültesi Dergisi (AKEF) Dergisi*, 5(3), 853–867.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage Publications, Inc.
- Cobb, A. (2010). To differentiate or not to differentiate. *Quarterly Review of Distance Education*, 11(1), 37-45.
- Cooker, L., Cooker, C., & Ainsworth, S. (2015). *The Integration of Technology in the International Baccalaureate Diploma Programme*. International Baccalaureate. <https://ibo.org/globalassets/new-structure/research/pdfs/technology-in-the-dp-report-en.pdf>
- Dulfer, N. (2019). Differentiation in the international baccalaureate diploma programme. *Journal of Research in International Education*, 18(2), 142-168.
- Eberle T. S. (2014). Phenomenology as a research method. In Flick U. (Ed.), *The SAGE handbook of qualitative data analysis* (pp. 184-202). Sage Publications. <https://doi.org/10.4135/9781446282243>
- Elvan, D., & Mutlubaş, H. (2020). Eğitim-Öğretim Faaliyetlerinde Teknolojinin Kullanımı Ve Teknolojinin Sağladığı Yararlar. *Mustafa Kemal Üniversitesi Eğitim Fakültesi Dergisi*, 4(6), 100–109.
- Erbaş, Ç., & Demirer, V. (2014). Eğitimde Artırılmış Gerçeklik Uygulamaları: Google Glass Örneği. *Journal of Instructional Technologies & Teacher Education*, 3(2), 8–16.
- Estaitteyeh, M., & DeCoito, I. (2024). Technology-enhanced differentiated instruction in STEM Education: Teacher candidates' development and curation of learning resources. *Contemporary Issues in Technology and Teacher Education*, 24(3), 291–312.
- Ginja, T. G., & Chen, X. (2020). Teacher educators' perspectives and experiences towards differentiated instruction. *International Journal of Instruction*, 13(4), 781-798.
- Hamayun, M., Saeed, A., Amin, I., & Chapra, L. (2025). AI Supported Differentiated Instruction Cognitive and Emotional Outcomes for Diverse Learners. *The Critical Review of Social Sciences Studies*, 3(3), 469–486.
- Keleş, E., Dündar Öksüz, B., & Bahçekapılı, T. (2013). Teknolojinin Eğitimde Kullanılmasına İlişkin Öğretmen Görüşleri: Fatih Projesi Örneği. *Gaziantep University Journal of Social Sciences (Technology Special Issue)*, 12(2), 353–366.
- Krishan, I. Q., ve Al-rsa'i, M. S. (2023). The effect of technology-oriented differentiated instruction on motivation to learn science. *International Journal of Instruction*, 16(1), 962-982.
- Kurniawati, R., & Huda, T. (2023). *The impact of technology in differentiated learning*. The 2nd English National Seminar English Education Study Program STKIP PGRI PACITAN.
- Lincoln, Y. S., & Guba, E. G. (1988). Criteria for Assessing Naturalistic Inquiries as Reports.
- Macharia, N. (2022). *International Baccalaureate Teachers' Perspectives on Integrating Approaches to Learning Skills to Enhance Transdisciplinary Learning* (Doctoral dissertation, Walden University).
- McAdamis, S. (2001). Teachers tailor their instruction to meet a variety of student needs. *Journal of Staff Development*, 22(2), 1-5.
- Morrow, R., Rodriguez, A., & King, N. (2015). Colaizzi's descriptive phenomenological method. *The psychologist*, 28(8), 643-644.
- IBO. (2005). *The International Baccalaureate (IB)*. <https://www.ibo.org/>. Retrieved November 3, 2025, from <https://www.ibo.org/>
- IBO. (2014). *Programme standards and practices*. Retrieved from <https://www.ibo.org/globalassets/publications/become-an-ib-school/programmestandards-and-practices-en.pdf>
- IBO. (2014). *Programme standards and practices*. Retrieved from

- <https://www.ibo.org/globalassets/publications/become-an-ib-school/programmestandards-and-practices-en.pdf>
- Özkeskin, H. (2024, February). Leading with an IB mindset: Cultivating leadership skills in the international baccalaureate programmes. In *International Conference on Lifelong Education and Leadership for All (ICLEL 2023)*, Springer Nature. 17(1), 98-160
- Palieraki, S., & Koutrouba, K. (2021). Differentiated instruction in information and communications technology teaching and effective learning in primary education. *European Journal of Educational Research*, 10(3), 1487–1504. <https://doi.org/10.12973/eu-jer.10.3.1487>
- Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative Social Work*, 1(3), 261-283
- Raja, R., & Nagasubramani, P. C. (2018). Impact of modern technology in education. *Journal of Applied and Advanced Research*, 3(Suppl. 1), S33–S35. <https://doi.org/10.21839/jaar.2018.v3S1.165>
- Rao, K., Currie-Rubin, R., & Logli, C. (2016). UDL and inclusive practices in IB schools worldwide. https://burnabyschools.ca/wpcontent/uploads/2014/09/adaptations_and_modifications.pdf
- Robison, E. M. (2004). Teacher decision-making in utilising differentiated instruction. Unpublished PhD thesis. Marywood University
- Schmid, R., Pauli, C., Stebler, R., Reusser, K., & Petko, D. (2022). Implementation of technology-supported personalized learning: Its impact on instructional quality. *The Journal of Educational Research*, 115(3), 187-198.
- Smith, J. A., Flowers, P., & Osborn, M. (1997). Interpretative phenomenological analysis and the psychology of health and illness 1. In Yardley L. (Ed.) *Material discourses of health and illness* (pp. 68-91). Routledge.
- Subban, P. (2006). Differentiated instruction: A research basis. *International Education Journal*, 7(7), 935-947.
- Stanford, P., Crowe, M. W., & Flice, H. (2010). Differentiating with technology. *TEACHING Exceptional Children Plus*, 6(4), n4.
- Şimsek, I., & Can, T. (2020). Using tablets for technology integration in classroom differentiation. *The Role of Technology in Education*, 1–20. <https://doi.org/10.5772/intechopen.85713>.
- Tekin, A., & Polat, E. (2014). Technology policies in education: Turkey and several other countries (Eğitimde teknoloji politikaları: Türkiye ve bazı ülkeler). *Eğitimde Kuram ve Uygulama / Journal of Theory and Practice in Education*, 10(5), 1254–1266.
- Tomlinson, C. A. (1995). Deciding to differentiate instruction in the middle school: One school's journey. *Gifted Child Quarterly*, 39(2), 77-114.
- Tomlinson, C. A., Moon, T. R., and Callahan, C. M. (1998). How well are we addressing academic diversity in the middle school? *Middle School Journal*, 29(3), 3-11.

EXTENDED ABSTRACT

Experiential Impacts Of Technology On Differentiated Learning In International Diploma Programmes: A Phenomenological Study From Teachers' Perspectives

Introduction: This research investigates the role of technology in differentiated learning from the perspectives of teachers working in the International Baccalaureate (IB) Diploma Programme. In contemporary educational contexts, technology has been recognized as a central element in providing personalized learning opportunities and in responding to the diverse needs of students. The IB framework emphasizes learner-centered pedagogies and international-mindedness, requiring teachers to develop flexible and adaptive instructional strategies. Within this framework, differentiated learning plays a vital role in ensuring equality of opportunity and fostering student motivation. This study aims to explore teachers' lived experiences with integrating digital tools into differentiated instruction and to analyze the challenges and opportunities that arise from such practices.

Method: The study employed a descriptive phenomenological design, which is particularly effective in capturing the lived experiences of individuals. Seven teachers, each with at least five years of experience in the IB Diploma Programme, participated in semi-structured interviews. The participants represented diverse subject areas, including mathematics, sciences, business management, and information technologies. Data collection involved audio-recorded interviews, which were later transcribed verbatim. The data were analyzed using descriptive phenomenological analysis, allowing key themes to emerge related to teachers' perceptions of technology integration into differentiated learning.

Results: The findings revealed that teachers viewed technology as a powerful enabler of differentiated instruction. Through the use of digital tools, teachers were able to design learning environments tailored to students' interests, readiness levels, and learning styles. Participants emphasized that technology provided flexibility in adapting teaching strategies to students' individual needs, thereby fostering motivation and academic achievement. This finding aligns with Dulfer's (2019) emphasis on the role of personalized digital content and with Cooker, Crook, and Ainsworth's (2015) research highlighting the adaptability of digital tools to student learning pace. Another key result was the transformation of assessment practices. Teachers reported that digital tools supported both formative and summative assessments by enabling immediate feedback and more effective tracking of student progress. This result corresponded with Ginja and Chen's (2020) findings regarding the contribution of technology to formative assessment processes. Moreover, teachers noted that technology strengthened collaborative learning, facilitated peer interaction, and enhanced student engagement. This observation resonated with Rao, Currie-Rubin, and Logli's (2016) conclusions about technology's capacity to enrich collaboration-based learning environments.

Conclusion: The study concludes that technology is not only an essential element in supporting differentiated learning but also a catalyst for enhancing student-centered instruction, collaborative culture, and personal responsibility. However, for these benefits to be sustainable, professional development opportunities for teachers, equitable access to digital resources, and robust technical infrastructure must be ensured. Recommendations include providing continuous practice-oriented professional development, investing in infrastructure to ensure equal access, and creating personalized digital content adaptable to students' needs. Additionally, establishing school-based support units to resolve technical issues would enhance sustainability. This research contributes valuable insights for IB educators, policymakers, and teacher education programs by highlighting both the transformative potential and the limitations of technology in differentiated learning practices.

Keywords: Differentiated learning, Technology integration, IB Diploma Programme, Teacher experiences, Student-centered learning

Uluslararası Diploma Programlarında Teknolojinin Farklılaştırılmış Öğrenmeye Yönelik Deneysel Etkileri: Öğretmen Perspektifinden Fenomenolojik Bir İnceleme

Giriş: Bu araştırma, Uluslararası Bakalorya (IB) Diploma Programı'nda görev yapan öğretmenlerin bakış açısıyla teknolojinin farklılaştırılmış öğrenmedeki rolünü incelemektedir. Günümüz eğitim bağlamında teknoloji, kişiselleştirilmiş öğrenme fırsatları sunmada ve öğrencilerin farklı ihtiyaçlarına yanıt vermede temel bir unsur olarak görülmektedir. IB çerçevesi, öğrenci merkezli pedagojileri ve uluslararası bakış açısını vurgulamakta, öğretmenlerden esnek ve uyarlanabilir öğretim stratejileri geliştirmelerini beklemektedir. Bu bağlamda, farklılaştırılmış öğrenme fırsat eşitliğini sağlamada ve öğrenci motivasyonunu artırmada kritik öneme sahiptir. Çalışmanın amacı, öğretmenlerin dijital araçları farklılaştırılmış öğretime entegre etme konusundaki deneyimlerini ortaya koymak ve bu süreçte karşılaşılan fırsatları ve zorlukları incelemektir.

Yöntem: Araştırmada, bireylerin yaşantılarını anlamada etkili olan betimsel fenomenolojik desen kullanılmıştır. IB Diploma Programı'nda en az beş yıllık deneyime sahip yedi öğretmen yarı yapılandırılmış görüşmelere katılmıştır. Katılımcılar; matematik, fen bilimleri, işletme yönetimi ve bilişim teknolojileri gibi farklı branşlardan seçilmiştir. Veriler, ses kaydı alınan görüşmelerin yazıya dökülmesiyle toplanmış ve betimsel fenomenolojik analiz süreciyle çözümlenmiştir. Bu sayede, öğretmenlerin teknoloji entegrasyonuna ilişkin algılarına dair temalar belirlenmiştir.

Bulgular: Araştırma bulguları, öğretmenlerin teknolojiyi farklılaştırılmış öğretimi güçlendiren önemli bir araç olarak gördüklerini ortaya koymuştur. Dijital araçlar sayesinde öğretmenler, öğrencilerin ilgi alanlarına, hazırbulunuşluk düzeylerine ve öğrenme stillerine uygun öğrenme ortamları tasarlayabilmiştir. Katılımcılar, teknolojinin öğretim stratejilerinde esneklik sağladığını ve bu durumun öğrenci motivasyonunu ve akademik başarıyı artırdığını belirtmiştir. Bu sonuç, Dulfer'in (2019) "kişiselleştirilmiş dijital içerik" vurgusuyla ve Cooker, Crook ve Ainsworth'un (2015) dijital araçların öğrenme hızına uyum sağlama kapasitesine dikkat çeken çalışmalarıyla örtüşmektedir. Önemli bir diğer bulgu, ölçme-değerlendirme süreçlerinin dönüşümüdür. Öğretmenler, dijital araçların biçimlendirici ve sonuç değerlendirici süreçleri desteklediğini, anlık geri bildirim ve öğrenci gelişimini daha etkin izleme olanağı sağladığını belirtmiştir. Bu bulgu, Ginja ve Chen'in (2020) çalışmasıyla paralellik göstermektedir. Ayrıca, öğretmenler teknolojinin iş birliğine dayalı öğrenmeyi güçlendirdiğini, akran etkileşimini kolaylaştırdığını ve öğrenci katılımını artırdığını vurgulamıştır. Bu gözlem, Rao, Currie-Rubin ve Logli'nin (2016) "teknolojinin iş birliği temelli öğrenme ortamlarını güçlendirdiği" yönündeki bulgularıyla örtüşmektedir.

Sonuç: Araştırma, teknolojinin yalnızca farklılaştırılmış öğrenmeyi desteklemekle kalmayıp aynı zamanda öğrenci merkezli öğretimi, iş birliği kültürünü ve bireysel sorumluluk bilincini de güçlendirdiğini ortaya koymuştur. Ancak, bu dönüşümün sürdürülebilir olabilmesi için öğretmenlere yönelik mesleki gelişim fırsatlarının sağlanması, dijital kaynaklara eşit erişim ve teknik altyapının güçlendirilmesi gerekmektedir. Öneriler arasında, uygulamaya dönük sürekli mesleki gelişim programlarının sunulması, tüm öğrencilerin dijital araç ve internete eşit erişimi için altyapı yatırımları yapılması ve kişiselleştirilmiş dijital içeriklerin geliştirilerek kullanımına sunulması yer almaktadır. Ayrıca, okul içi teknik destek birimlerinin kurulması sürecin sürdürülebilirliği açısından önemli bir gereklilik olarak görülmektedir. Bu araştırma, IB Diploma Programı'nda görev yapan öğretmenlerin teknolojiyi farklılaştırılmış öğrenmede daha etkili ve sürdürülebilir bir şekilde kullanmalarına katkı sağlayabilecek öneriler sunmaktadır. Aynı zamanda, eğitim politikaları ve öğretmen yetiştirme programları için yol gösterici nitelikte veriler sağlamaktadır.

Anahtar Kelimeler: Farklılaştırılmış öğrenme, Teknoloji entegrasyonu, IB Diploma Programı, Öğretmen deneyimleri, Öğrenci merkezli öğrenme