

Differentiated instruction in higher education: the experience and perceptions of five academics

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ABSTRACT

The increasing diversity of students in higher education presents numerous advantages for the sector, yet it also imposes substantial challenges for educators. This study explored the experiences of five academics across two countries as they strive to implement differentiated instruction (DI) to accommodate the diverse needs of students. The primary objective is to identify five aspects of DI implementation, namely teaching strategies, challenges, strategies to overcome challenges, methods to evaluate, and educators' perceptions. The study employs a qualitative research design, utilizing semi-structured interviews for data collection. The results of the study revealed that educators agreed that implementing DI requires quite a lot of resources from educators, such as time for preparation and planning, effort, and commitment. On the other hand, they also struggle with other obligations as administrators in their workplace. Experienced and junior educators employed distinct methods to address challenges, with the former utilizing forward planning and the latter concentrating on refining their skills in DI. Despite these variations, there is a common shared understanding among all educators that although implementing DI poses challenges, it remains both manageable and beneficial within the diverse higher education environment.

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1. INTRODUCTION

In light of technological advancements and the imperative of addressing the COVID-19 pandemic, an increasing number of universities are adopting online or hybrid learning systems [1]. This paradigm shift not only facilitates global access to education but also results in a more diverse student population within higher education. This diversity underscores the need for universities, particularly academics and lecturers, to move away from the traditional one-size-fits-all teaching approach [2].

Higher education is shifting to a teaching approach that can facilitate student differences, that is differentiated instruction (DI). DI is a student-centered instructional approach that focuses on optimizing learning opportunities by recognizing and addressing individual differences among students [3]. Rather than being a mere set of teaching strategies, DI embodies a philosophical framework for teaching and learning, evolving as an integral mindset for educators who aspire to adopt or are currently utilizing DI.

Despite the evident effectiveness of DI implementation in numerous studies, studies also reported that the implementation of DI is indeed challenging. Some educators believe that DI might lead to chaos [4].

This challenge is further compounded in higher education settings as we have more diverse students. In many cases, many educators lack adequate training to navigate the wide array of student diversities and possess insufficient knowledge regarding the unique characteristics and needs of their students [5]. Moreover, research on DI and its implementation in higher education is not as flourishing as its counterpart in K-12 grades [5], [6], and this potentially limits educators' understanding of how to implement DI effectively.

Although research and implementation of DI in higher education remain relatively scarce, several higher education institutes have implemented DI in learning activities. The implementation experiences at these institutions offer valuable, practice-based insights that educators across diverse higher education settings can leverage. Therefore, we, as educators in higher education, are interested in examining the experiences of lecturers engaged in DI implementation within their learning activities, contributing to a more nuanced understanding of DI in higher education.

Based on the premises mentioned above, this study addresses the following research questions:

- a) What teaching strategies are often used in implementing DI in higher education?
- b) What are the challenges in implementing DI in higher education?
- c) What strategies are used to overcome the challenges of implementing DI in higher education?
- d) What methods are used to evaluate DI practices that have been carried out in higher education?
- e) Based on the experience in implementing DI, what is the perception of educators on DI in higher education?

2. LITERATURE REVIEW

DI is a teaching approach that focuses on educators' proactive response to various student needs [2]. In DI, educators need to link five elements, namely learning environment, curriculum, assessment, instruction, and classroom leadership and management, to achieve effective differentiated teaching. It is implemented by differentiating content, process, product, and/or affect/environment aspects of teaching based on students' learning readiness, interests, and learning profile [2].

Numerous studies have reported the positive effects of DI-based teaching on student learning outcomes across different educational levels. For instance, Magableh and Abdullah [7] observed enhanced English reading comprehension in elementary students following the implementation of DI. Similarly, Smale-Jacobse *et al.* [8] reported small to moderate positive effects of DI on student achievement in secondary high school. Additional studies demonstrate favorable effects on diverse aspects of learning, including improved writing skills [9], creative thinking skills [10], as well as increased motivation and engagement at the primary school level [11]. In addition, Lai *et al.* [12] reported the effectiveness of DI interventions in enhancing mathematics self-efficacy, learning motives, and mathematical problem-solving skills in 6th-grade elementary school students.

Despite DI's documented benefits, challenges persist in its implementation. Lavanian and Nor [13] identified factors contributing to these challenges, including a lack of DI knowledge, time constraints [14], class size, school administration/facilities, and lack of resources. Moreover, the scarcity of empirical studies on DI implementations, coupled with the lack of definitions about how to differentiate, further complicates its application. At the higher education level, this problem becomes more prominent. Education at the higher education level has different characteristics from education at the primary and secondary school levels. Larger class sizes, limited contact hours with students, and the time required for multifaceted evaluation methods, coupled with lecturers' other responsibilities, such as teaching, research, and community services, create a complex environment [14]. In addition, generally, one topic is only discussed in a single meeting, so there is quite a limited opportunity to provide further explanation when the students need it. Unlike primary and secondary schools, lecturers and students also generally do not have their own classrooms, so modifications to the classroom environment are constrained [15].

Furthermore, studies on DI at the higher education level are also notably limited compared to the primary and secondary education levels [5], [6], exacerbating the challenges faced by higher education institutions [15]. Despite these challenges, the demand for the implementation of DI in higher education persists, driven by an increased awareness of individual differences and evidence supporting its effectiveness. Therefore, the exploration of DI and its implementation at the higher education level remains critical.

In this study, we offer our reflections as lecturers and researchers at the higher education level who have implemented DI in our careers. Therefore, the aim of this study is twofold: First, to explore challenges and solutions in implementing DI in higher education; Second, to explore our experiences and perceptions, as lecturers and researchers, regarding DI in higher education. The outcomes of this study will address existing gaps in the literature related to DI at the higher education level.

3. METHOD

3.1. Research design

The study employed a qualitative methodology, utilizing case studies to capture the perspectives of researchers who are also educators in higher education and have implemented DI in their classrooms. Case studies are instrumental in examining how procedures are influenced by their specific contexts [16]. Participants were provided with open-ended questions to gain a comprehensive understanding of the strategies and challenges encountered during the implementation of DI. The interviews were transcribed and analyzed to identify emerging themes.

3.2. Participants and data collection

This study used the purposive sampling method to sample participants. The sample in this study consisted of 5 participants (4 females and 1 male). The adequacy of the sample size in this study was determined based on the principle of adequacy. This principle supports the notion that smaller sample sizes can be sufficient when they provide enough information to answer the research questions and achieve data saturation. In qualitative research, especially in homogeneous populations or studies with a specific focus, a small sample size can still yield rich, in-depth insights and meaningful themes [17], [18]. In this study, the sample size of five participants was adequate to thoroughly explore their experiences and derive significant conclusions about the implementation of DI.

Table 1 shows the details of participant information. All participants were lecturers in two universities at the undergraduate level, with experience in teaching for 1-20 years. They all have implemented DI in some of their classes. Participants used either online or hybrid (combination of online and onsite) learning systems while implementing DI in their class, and the class size is approximately 5-120 students.

Table 1. Participant information

Participants	Gender	Higher education subjects	Teaching experience	Class size (students)
Paris*	Female	Education psychology	21 years	20-120
Nick*	Male	Educational psychology	20 years	5-55
Lucy*	Female	Research methodology	1 year	30-50
Anne*	Female	Social psychology	1 year	35-70
Nancy*	Female	Industrial organizational psychology	1 year	40-70

*Pseudonyms

Through an online semi-structured interview method, data was collected by providing the participants with several pre-prepared open-ended questions as a guide (e.g., “How was your previous experience with DI?” and “What challenges (internal and external) did you face in implementing DI?”). During the interviews, probing helped to obtain more in-depth data. Prior to starting the interviews, participants received a briefing on the research objectives and the purpose of their recruitment as participants. Once participants consented to take part, the interviews were scheduled at mutually agreed times. Each interview lasted approximately 2 hours per participant. The recorded interviews with the five participants were subsequently compiled for analysis.

3.3. Data analysis

The data analysis adhered to the systematic approach, specifically employing the sixth-step thematic analysis guidance from Braun and Clarke [19]. Initially, the data immersion process involved multiple iterations of reading and documenting significant ideas extracted from the interview results. This iterative procedure aimed to foster familiarity among the research team with the data and to ensure the comprehensive capture of pertinent information. Subsequently, collaborative sessions were convened to discuss and code the interview results, incorporating the compiled significant ideas, key quotes, and their corresponding codes into a structured spreadsheet. The analysis involved scrutinizing key quotes and initial codes to identify potential themes, detect gaps, and recognize challenges within the dataset. Addressing overlapping ideas, a judicious determination was made to allocate concepts to the most fitting themes, ensuring a comprehensive yet focused thematic framework. Following this, the team critically reviewed the potential themes, aligning them with the research questions and objectives, and ultimately confirmed the definitive themes. Each theme was meticulously defined and labeled in accordance with the specific aspects of the data encapsulated by that theme. Subsequently, leveraging these themes, the research team conducted the final analysis and articulated the results in the subsequent write-up.

4. RESULTS

4.1. DI teaching strategies

The interviews revealed a rich tapestry of strategies employed by the participants, with a clear emphasis on the differentiation of the instructional process to cater to diverse student needs. The strategy of grouping emerged as a predominant theme, albeit with variations in its application among the participants. Senior and junior educators alike prioritized grouping but diverged in their specific approaches. Paris, an experienced educator, articulated a preference for flexible grouping, which she leverages to scaffold learning and students' enjoyment. Her strategy highlights the importance of student agency and comfort in the learning process, fostering an environment where collaborative learning can thrive. She elucidated:

"I also utilize flexible grouping, often allowing students to choose their own learning partners, since this is easier to navigate than having to nominate students into groups... to create different scaffolds for students. Often, students will choose groups based on their preferences and according to their friends' choices - I do not see this as a challenge since students who enjoy working together are likely to produce better outcomes."

Nancy's perspective aligns with the flexible grouping model, albeit with a nuanced emphasis on student autonomy in task selection. She stated, *"...one of my ways to handle this is by grouping them into several characteristics in general and giving them the possibility to choose the way to do their task. I try to ask them whether they want to choose their own group or be grouped; ask them how they want to finish their given task."* Lucy also embraces flexible grouping, tailoring the learning process to individual student interests and readiness levels. She explained, *"In this course, I differentiated the process based on students' interests and readiness to learn. I gave them the freedom to form their own group..."* Conversely, Nick opts for ability grouping, a method he believes structures the learning process more effectively: *"At that time, I apply the ability grouping in arranging the process of learning."*

Besides grouping, participants employed other differentiation of process strategies, such as flipped classroom, peer tutoring, project-based learning, and other nameless strategies. However, these strategies were used only on some occasions. Paris stated that she used the flip classroom strategy only twice in each semester. She explained:

"I utilize the flipped classroom as a teaching method at least twice in the semester - allowing me to free up time in the classroom for more hands-on discussion and learning. I do not utilize this method too frequently since it places pressure on students who cannot process at the same speed as their peers."

Nick used peer tutoring based on the student's needs, *"I also apply the peer tutoring to provide help for students who needed."* This method leverages student collaboration for mutual benefit, enhancing understanding through peer interaction. Lucy integrated project-based learning, which is especially conducive to courses that support such an approach while also emphasizing the value of student choice and relevance, connecting learning to personal interests and strengths. She noted:

"... I tried to implement DI in other courses based on project-based learning since the course allowed me to do so... I gave them the freedom to form their own group, choose a topic that they are good at or enjoy as their project."

4.2. Challenges in implementing DI

Based on the data collection, most of the participants stated that the main challenge in implementing DI is the limited time to prepare or design the lesson plan, either individually or collaboratively with their colleagues. Lucy stated that the role and responsibilities of a lecturer are among the reasons for her difficulties in finding the time. Moreover, she expressed that this challenge affects her motivation to implement DI:

"...limited time to prepare DI-based lesson plans. With so many roles and job descriptions as a lecturer, I find it difficult to spare time to focus on studying DI more deeply, as well as time to design lesson plans with varied materials and assignments... Sometimes, the motivation to learn and prepare for these things also decreases."

Nancy acknowledged that more time is needed to prepare DI as she stated, *"I feel that we need to invest more time in preparing DI and implementing it in class..."* Paris corroborated the statement that she

perceives time management and time coordination as a substantial obstacle in effectively implementing DI in their teaching practices:

“One of the greatest challenges that I have faced when I differentiate instruction is finding the time to consider the various elements associated with differentiation. Additionally, if I am teaching with my peers, identifying time to collaborate is also challenging since each of them has their own time commitments.”

In addition to time constraints, the extra workload and effort to prepare for DI-based learning was a second major challenge for participants. Paris mentioned, *“Differentiation also involves more work, and during rushed periods of the academic semester, it is sometimes easier to choose the traditional route rather than differentiate instruction.”* The extra effort also came as a challenge for Anne: *“My internal challenges when implementing DI is how I think it will take so much effort to make the module and many activities for my students...”* Nick added that the need for extra effort, in turn, affects lecturer motivation in implementing DI:

“The other challenge is related to the teacher motivation. As the DI implementation requires extra effort, only highly motivated teachers will willingly implement the DI. Teacher who has high motivation will have a high willingness to implement the DI in their teaching and learning activities. Meanwhile, teachers with low motivation are usually reluctant to implement the DI.”

The lack of experience in implementing DI also stands out as an obstacle. Specifically, they find it challenging to facilitate the characteristics and needs of students in a big class size. This challenge is especially the case for participants who have just become lecturers and are trying to implement DI. Furthermore, they added that this challenge mainly occurs in online classes when the interaction between lecturers and students is limited. Lucy explained:

“Some of the internal challenges I experienced in implementing DIs were my limited knowledge and experience in implementing DIs...my lack of experience as a lecturer and getting to know various students. I feel that I am still not good enough at facilitating students with low learning ability/readiness and quiet students.... Especially when I take online classes, I really don't pay attention to students who are not active.”

This challenge affects their self-efficacy in implementing DI. Even though she had received professional development in DI, Nancy still feels unconfident: *“I joined the DI training with Monash in 2021. I don't feel really confident in implementing DI.”* Nick corroborated this view through his years of experience and previous research:

“According to my experience, the challenge from the internal side is the self-efficacy of the teacher. According to the many available research on DI, the proof shows that teacher self-efficacy has a significant role in relation to DI implementation. The higher the teacher's self-efficacy, the higher the possibility of implementing the DI. The lower teacher self-efficacy, the lower the possibility of implementing the DI.”

4.3. Strategy to overcome challenges in implementing DI

Overcoming the challenges of implementing DI requires a multifaceted approach, integrating personal, institutional, and pedagogical strategies. Participants in our study employed various methods to address these challenges, demonstrating a proactive commitment to enhancing their DI practices. The majority of the participants underscored the importance of continuous learning and professional development to deepen their understanding of DI conception and implementation. For instance, Anne mentioned, *“... I also joined DI courses from Harvard University to sharpen my understanding about the concept and how to implement DI in class.”* Meanwhile, Lucy dedicated her personal time to learning about and designing DI lesson plans: *“... is by managing my time and sacrificing my weekend time... to read examples of existing DI implementations, and to design DI-based lesson plans for the courses I teach.”*

Nick combined independent learning, discussion, and professional development to expand his knowledge about DI approaches. This strategy shows that collaboration among colleagues is a crucial strategy for overcoming the practical challenges of DI. He stated, *“... I learned again about DI. I joined the course to sharpen my understanding of the concept of DI and its implementation. I also discussed with my colleagues to receive the feedback in implementing the DI.”* This collegial support network proved instrumental in refining teaching approaches and sharing best practices.

Time constraints were a significant challenge for participants implementing DI. Paris addressed this by engaging in forward planning, allowing her to allocate time effectively for DI preparation. She meticulously scheduled her week to balance administrative duties and teaching responsibilities, ensuring dedicated slots for DI lesson planning and material preparation. She mentioned: *“I find that forward planning is usually quite helpful in determining how time can be invested.”*

To effectively manage the diverse needs of students efficiently, Nancy implemented a strategy that centers on providing autonomy in the learning process. Nancy gave her students the autonomy to choose their group and task approach, enhancing their engagement and ownership of the learning process. She observed that this approach yielded mixed results, with some students actively leveraging the opportunity to explore their interests and collaborate effectively while others adhered strictly to the assigned tasks without extra initiative. Nancy reflected:

“One of my ways to handle this is by ... give them the possibility to choose the way to do their task. I try to ask them whether they want to choose their own group or be grouped; ask them how they want to finish their given task. Sometimes, it works for those who really want to explore their interest in finishing their task. But for some groups, it seems that are only doing their task as it is, without any willingness to give extra effort.”

Incorporating reflective practices and seeking feedback from students was also pivotal in refining DI strategies. Lucy regularly conducted reflective sessions to assess the effectiveness of her DI methods, making adjustments based on student feedback, which also served as a stimulant for students who wanted to improve their learning. This iterative process ensured that her instructional methods remained responsive to student needs and educational outcomes. She mentioned:

“...occasionally I give quizzes (such as through Google form), which can be done 3 or 5 times. The opportunity to take the quiz repeatedly is expected to help improve their understanding of the material ... encourage them to actively ask questions and participate in class discussions to get additional points. These points can later be used to increase their score on assignments, mid-term exams, or final exams.”

Meanwhile, Anne proactively addressed the inherent challenges of DI by thoughtfully designing her DI modules from the outset. She acknowledged the diversity of student needs and backgrounds as a critical factor in her planning process. Anne stated, *“I realized that I could cater to some student's needs, not all. If I keep in mind their various background in designing sessions.”* By prioritizing the most significant needs, she aimed to construct an educational environment that, while not perfect for everyone, significantly enhanced accessibility and engagement for a broad range of students.

4.4. Method to evaluate the implementation of DI

The evaluation of DI implementation is pivotal for assessing its effectiveness and identifying opportunities for improvement. Educators in this study utilized various methods to evaluate their DI strategies, providing insights into the impact and areas needing improvement. Feedback from students emerged as a crucial element in this evaluative process.

Educators like Nick sought direct feedback from students to gauge the effectiveness of DI practices. He stated, *“I ask for feedback from my students. I also ask for feedback from my colleagues.”* Some of the participants expressed that feedback from students was collected to know whether the DI that has been implemented enhances students' interest in the material. Most of Nancy's students stated that they feel attracted to the varied ways of learning:

“I evaluate my DI implementation by giving them a survey about their perspective in the DI (different learning way) that has been implemented. Many of them say that the varied ways of learning have helped them to be more attracted to the material and not bored during the learning time. However, some of them give a neutral response, such as “it is good,” and “too many tasks to do.”

Peer review was another method employed by educators to evaluate their DI strategies. Anne, for example, emphasized the significance of collegial feedback in refining her DI approach. She noted, *“To evaluate my learning strategy with DI, I ask for feedback from students. I also ask for feedback from my colleagues when we do a peer review.”* This method was collected through peer review and was aimed to obtain views from other educators regarding the DI process that has been implemented, as expressed by Lucy:

"Evaluation is also carried out through periodic evaluations which we refer to as peer reviews... I share the process and results of the implementation of DIs that have been carried out. From the questions that were asked by my colleagues, I made more evaluations on some other aspects that were missed..."

In addition to feedback, some participants realize how important it is to get a more structured and comprehensive evaluation. Nick, as a senior lecturer, has even conducted the structured evaluation by collecting and comparing his students' achievements. He stated, *"Related to the student achievement, I analyzed the scores of student exams before and after implementing the DI."* Lucy expressed her intent to conduct a quantitative and qualitative evaluation:

"In the future, I would like to conduct a more systematic and objective evaluation, such as by comparing test scores before and after using DI or between groups of students using DI and other teaching approaches, as well as conducting interviews with students."

The diverse methods used by educators to evaluate DI highlight the multifaceted nature of effective educational assessment. By integrating student feedback, peer review, and performance analysis, educators can obtain a holistic view of their DI strategies' efficacy. This thorough evaluation is essential for continuous improvement and for validating the positive impact of DI on student learning in higher education.

4.5. Academic perception on DI

The perception of DI among academics in our study varied, reflecting a spectrum of experiences and understanding. While some educators viewed DI as a challenging yet feasible approach to teaching, others regarded it as a complex strategy that requires careful planning and execution. The intricacies of DI, encompassing the need to cater to diverse student needs within the constraints of higher education, were a common theme in the educators' reflections.

Lucy's initial perception of DI was marked by skepticism, viewing it as overly complex and difficult to implement in regular classroom settings. Despite her reservations, her understanding deepened after participating in professional development, although her views on the complexity of DI remained the same. She remarked:

"Before getting professional development in DI, I only had a little knowledge about the concept of DI from my undergraduate and postgraduate course materials. In my opinion, DI is complicated and only suitable for inclusive classes, not regular classes. ... From the training, I understand more about the concept of DI, but I don't understand how to implement DI in higher education. So, after participating in professional development, my perception of how complicated the implementation of DI remains the same."

Anne, similarly, initially faced challenges in grasping the full scope of DI. She reflected on her early perceptions, stating, *"Before I gained knowledge and experience about DI, I had the perception that this strategy for teaching was quite hard to understand or even to implement... It was a lot for me to accommodate, and I need extra time to make it work."* Even for participants who have studied and implemented DI in higher education for most of their careers, DI is still perceived as a challenging approach. Nick explained, *"I have been involved in various research related to DI. However, in implementing the DI always there is a challenge... in implementing the DI, there is always room for improvement..."* Paris added that DI is often a subject of controversy because of the demanding nature of differentiation, which requires significant planning, collaboration, and time:

"I have published widely in this field, but I'm aware that DI is often quite controversial. The controversy arises from the fact that differentiation requires considerable planning, collaboration, and time. It can often be labor intensive - as a result, practitioners often abandon DI since they are inundated with so many other administrative demands... Personally, I have implemented DI as an educator in my higher education classroom. This has not been without challenge and has required considerable amounts of time."

Participants, over time, demonstrated an evolving awareness of DI, recognizing its potential benefits and expressing a readiness to weave its principles into their pedagogical practices thoughtfully and strategically. Their growing understanding of DI's flexibility, and its pivotal role in enhancing teaching effectiveness and learning outcomes, reflects a positive and adaptive mindset. This shift was particularly noticeable among junior participants, who moved from a basic understanding of DI to a more nuanced appreciation of its application in the educational setting.

While Lucy may still perceive DI as complex and complicated, she now possesses a better understanding of how to navigate this complexity. She has gained insights into specific strategies and forms of support that can be employed to effectively implement DI in their teaching practice. Furthermore, she also gained a more fundamental and philosophical understanding of the importance of DI, particularly in acknowledging and addressing individual differences among students:

“... perception of the complexity of DI remains the same, but what is different is that now I know better how to unravel the complexity with certain strategies and support... I also understand better that even in regular classes, students still vary, and we need to facilitate these differences. Having knowledge about DI also opened my eyes about my students... After learning about DI, I realized the importance of including these differences in teaching to help students improve in academic and non-academic aspects.”

Anne’s familiarity with DI has grown, leading her to understand its dynamic application, which can be both comprehensive and selective, depending on classroom and student requirements. Her insights illustrate the adaptable nature of DI and its integration into various teaching scenarios to enhance educational outcomes. She shared:

“But the more I know, the more I realize that I already applied or implemented a part of DI in my class... I also know that we do not have to use DI in every session, but we can use it all or just part of the aspects to make teaching and learning in class more optimal for students.”

Nick, as a senior lecturer, acknowledges the significant value and impact of DI on teaching quality, suggesting a strong belief in its effectiveness and its role in enriching student learning experiences. He posited, *“DI is promising and can be the important key to improve the quality of teaching...”* Likewise, Paris values DI for its ability to address the unique needs and goals of each student, promoting personalized learning and development. She remarked:

“... utilizing DI, sometimes called differentiated teaching, will ensure that every student meets their individual goals and objectives and continues to develop personally, not necessarily with the entire class. DI ensures that individual student objectives are being met.”

5. DISCUSSION

In this study, we explored the implementation of DI in higher education, focusing on the experiences and perceptions of five academics. Specifically, we examined: i) the teaching strategies used, ii) the challenges and obstacles encountered, iii) the strategies used to overcome these challenges, iv) the methods of evaluation, and v) the perception of DI and its implementation.

First, regarding the teaching strategies used to implement DI, the result of this study revealed that most of the participants utilized various grouping strategies, with flexible grouping being the most common. This finding is in line with the study from [20], [21], and also [22] that emphasized the benefits of flexible grouping in facilitating differentiated learning. Flexible grouping allows educators to adjust group compositions based on student needs, fostering a dynamic learning environment. However, it is important to consider recent research that suggests while flexible grouping can promote engagement and tailor learning experiences, it may also inadvertently reinforce achievement gaps if not carefully managed [5].

Another strategy identified was ability grouping, a commonly employed approach within DI, as noted in [23]. Despite its popularity, ability grouping remains a contentious strategy. While Steenbergen-Hu *et al.* [24] highlight its potential benefits, including tailored instruction to students’ proficiency levels, they also caution that this approach can sometimes lead to social segregation and self-fulfilling prophecies in academic performance. The mixed results from various meta-analyses suggest that while ability grouping can be beneficial, its effectiveness is highly context-dependent, necessitating careful consideration of the specific classroom dynamics. Peer tutoring emerged as another frequently used strategy, echoing the findings of Alegre-Ansuategui *et al.* [25], who demonstrated the positive impact of peer tutoring on student achievement. Peer tutoring not only supports the academic development of tutees but also reinforces the tutor’s understanding, creating a mutually beneficial learning environment. Recent studies further suggest that peer tutoring, when combined with reflective practices, can significantly enhance student engagement and foster a sense of community within the classroom [26].

Second, challenges and obstacles to implement the DI. In the beginning, most of the participants said that DI implementation is not an easy task; it requires sufficient time for good planning and sharpening

the understanding of the concept of DI. The result of this study is relevant to the study of [13], [14], who also mentions that the constraints of DI implementation are related to limited time, as the teacher also has other administrative tasks. Moreover, the complexity of DI requires ongoing professional development to ensure that educators not only grasp the principles but can also effectively integrate them into their teaching practices. This need for continuous learning highlights the importance of institutional support in providing resources and time for educators to refine their DI strategies.

Third, to overcome the challenges associated with DI, participants emphasized the importance of forward planning and a robust understanding of DI principles. The concept of forward planning, while traditionally associated with production and project management [27], has been effectively adapted to educational settings as a means of organizing instructional activities in a coherent and sequential manner. Starting from a known starting point, activities and possible buffers are then scheduled logically and chronologically until the end of the project. The study also found different responses between experienced lecturers and new lecturers, where experienced educators favored forward planning, while new lecturers struggled with diverse classroom dynamics, underscores the role of experience in DI implementation. Recent studies suggest that mentorship programs can bridge this gap by pairing novice educators with experienced colleagues, thereby facilitating the transfer of practical DI strategies [28].

Fourth, regarding the evaluation of DI, the study found that most participants relied on feedback from students and colleagues. Feedback from students and colleagues was also involved in developing the lecturers' skills in implementing the DI. This result is in line with the study of Mirawati *et al.* [29], which highlights that the feedback from students and their willingness to engage with DI can serve as indicators of success. Surveys, interviews, and focus groups can be used to gather students' perspectives on the effectiveness of DI in meeting their individual learning needs and preferences. Furthermore, integrating student feedback and peer review reflects an ongoing dialogue between educators and learners, which is essential for refining and enhancing teaching practices. This participatory evaluation model aligns with contemporary educational paradigms that emphasize learner-centered approaches and continuous feedback mechanisms, supporting the ongoing implementation of DI by underscoring the importance of adaptability and responsiveness in teaching practices [30].

Fifth, the perception of DI and its implementation varied among participants, with most acknowledging its challenges but recognizing its value in addressing diverse learning needs. More specifically, junior educators initially perceiving DI as daunting, gradually appreciated its importance as they gained experience, reflecting the transformative potential of DI when adequately supported. This shift in perception is consistent with recent studies that emphasize the importance of initial professional development and ongoing support in the development of knowledge and skills in implementing DI [31]. Senior educators, despite their extensive experience, also acknowledged the complexity of DI but recognized its strategic value in enhancing educational quality and student outcomes. This nuanced perception suggests that while DI is challenging, its benefits in promoting equity and inclusivity in education are well worth the effort, a sentiment echoed in the broader educational discourse [30].

5.1. Implication

The implications derived from this study are multifaceted. Firstly, it underscores the importance of understanding the concept of DI and its implementation, and continuously accumulating experience in implementing DI to improve the effectiveness of our implementation. This understanding proves pivotal in identifying appropriate teaching strategies, navigating challenges, and bolstering self-efficacy in executing DI. Given the limited studies on DI within higher education, this study emphasizes the urgency for additional studies on DI in higher education. Particularly, there is a pressing need for investigations that delve into designing effective DI modules tailored for extensive classes, as well as the diverse array of student needs typical in higher education settings. The findings advocate for educators' proactive initiatives and advocate for institutional support, such as formal training and endorsing DI initiatives, as essential elements for a more fruitful implementation.

Considering the large size of classes in higher education, careful and thorough planning, as well as collaboration with colleges, emerge as critical components for the successful implementation of DI. Deliberate allocation of time for planning and collaborative discourse with colleagues becomes paramount, given that time is a major constraint in DI implementation. Furthermore, seeking collaboration and feedback from DI experts represents an instrumental step toward acquiring insights into effective DI implementation strategies.

Lastly, given the vast spectrum of student needs and our limitations as educators in higher education, this study highlights the necessity of discerning and prioritizing specific needs that align with learning objectives. This implies the need for educators to exercise attentiveness, a caring disposition, and creative approaches to refining their DI implementation. Ultimately, this multifaceted set of implications delineates a roadmap for educators to navigate the complexities of DI in higher education effectively, emphasizing the importance of ongoing learning, collaboration, and a nuanced understanding of student needs.

5.2. Limitation and recommendation

While this study provides valuable insights into DI implementation in higher education, certain limitations warrant consideration. The participant pool, drawn from two universities, could be bigger, potentially constraining the generalizability of the study's findings. Additionally, the significant disparity in teaching experience among participants, ranging from 1 year to over 20 years, introduces a notable confounding factor. Teaching experience inherently influences perceptions and approaches to DI implementation. To address these limitations, future research endeavors should strive for a more extensive and diversified participant sample encompassing various teaching experience brackets (e.g., 5, 10, and 15 years). This would facilitate a nuanced exploration of how evolving experience impacts DI practices.

Moreover, to enhance the robustness and objectivity of research in this domain, more comprehensive investigations into educators' experiences with DI are needed. A nuanced examination of strategies and challenges, particularly within specific contextual settings such as science versus social courses, would provide a more thorough understanding. This recommendation underscores the importance of tailoring DI research to contextual nuances within higher education, fostering a more nuanced comprehension of its implementation challenges and facilitating the development of targeted strategies to mitigate these challenges effectively.

6. CONCLUSION

This study provides valuable insights into the implementation of DI in higher education, an area previously marked by a significant research gap. By focusing on the perceptions and experiences of five educators who have integrated DI into their teaching, this study highlights the unique challenges faced in higher education, such as managing student diversity and large class sizes. Educators often resort to strategies like grouping and peer tutoring to mitigate these challenges. However, the study also underscores the substantial time and effort required to prepare and design effective DI strategies, a task complicated by the additional administrative responsibilities borne by higher education instructors.

A notable finding of this study is the divergent approaches adopted by experienced versus junior educators in implementing DI. While seasoned educators often rely on proactive planning and well-established strategies, junior educators are observed to be in the process of understanding DI concepts and honing their implementation techniques. Despite these differences, there is a shared understanding among all educators that while DI is a challenging instructional approach, it is also manageable and beneficial for the diverse higher education landscape.

The study further reveals that continuous professional development and a willingness to experiment are essential for educators at all levels to successfully navigate the complexities of DI. Notably, institutional support is identified as a critical factor in supporting this continuous learning process. The findings of this study underscore the potential of sustained institutional backing to significantly enhance the effectiveness and long-term viability of DI practices in higher education settings. This study, therefore, not only contributes to the academic discourse on DI but also offers practical guidance for its successful implementation in the dynamic and diverse environment of higher education.

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REFERENCES

- [1] C. Hodges, S. Moore, B. Locke, T. Trust, and A. Bond, "The difference between emergency remote teaching and online learning," *EDUCAUSE Review*, Accessed: Jun. 25, 2024. [Online]. Available: <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>
- [2] C. A. Tomlinson, *Everybody's classroom: differentiating for the shared and unique needs of diverse students*, Teachers College Press, 2022.
- [3] M. N. Suprayogi, T. S. Siregar, and M. Preston, "The effectiveness of differentiated instruction, implementation in Indonesia higher education: a literature review," in *Proceedings of the Online Conference of Education Research International (OCERI 2023)*, 2023, pp. 374–389, doi: 10.2991/978-2-38476-108-1_37.
- [4] A. T. Aldossari, "The challenges of using the differentiated instruction strategy: a case study in the general education stages in Saudi Arabia," *International Education Studies*, vol. 11, no. 4, p. 74, Mar. 2018, doi: 10.5539/ies.v11n4p74.
- [5] M. T. Jørgensen and L. Brogaard, "Using differentiated teaching to address academic diversity in higher education empirical evidence from two cases," *Learning and Teaching*, vol. 14, no. 2, 2021, doi: 10.3167/latiss.2021.140206.
- [6] M. Darra and E.-M. Kanellopoulou, "The implementation of the differentiated instruction in higher education: a research review," *International Journal of Education*, vol. 11, no. 3, 2019, doi: 10.5296/ije.v11i3.15307.
- [7] I. S. I. Magableh and A. Abdullah, "Effectiveness of differentiated instruction on primary school students' English reading comprehension achievement," *International Journal of Learning, Teaching and Educational Research*, vol. 19, no. 3, pp. 20–35, Mar. 2020, doi: 10.26803/ijter.19.3.2.




- [8] A. E. Smale-Jacobse, A. Meijer, M. Helms-Lorenz, and R. Maulana, "Differentiated instruction in secondary education: a systematic review of research evidence," *Frontiers in Psychology*, vol. 10, 2019, doi: 10.3389/fpsyg.2019.02366.
- [9] S. Ismail, "Impact of differentiated instruction on the writing process of ESL learners," *ELF-Annual Research Journal*, 2019. [Online]. Available: <https://www.researchgate.net/publication/341358142>
- [10] S. Zubaidah, N. M. Fuad, S. Mahanal, and E. Suarsini, "Improving creative thinking skills of students through differentiated science inquiry integrated with mind map," *Journal of Turkish Science Education*, vol. 14, no. 4, pp. 77–91, Dec. 2017, doi: 10.12973/tused.10214a.
- [11] B. S. Wong, K. L. Chue, R. B. Ali, and P. Lee, "Differentiated instruction: a comparison of motivation and perceived competence between students with high and low readiness levels," *Educational Research for Policy and Practice*, vol. 22, no. 1, pp. 139–151, 2023, doi: 10.1007/s10671-022-09323-2.
- [12] C.-P. Lai, W. Zhang, and Y.-L. Chang, "Differentiated instruction enhances sixth-grade students' mathematics self-efficacy, learning motives, and problem-solving skills," *Social Behavior and Personality: An International Journal*, vol. 48, no. 6, pp. 1–13, 2020.
- [13] M. Lavania and F. B. M. Nor, "Barriers in differentiated instruction: a systematic review of the literature," *Journal of Critical Reviews*, vol. 7, no. 6, pp. 293–297, 2020, doi: 10.31838/jcr.07.06.51.
- [14] R. Moallemi, "The relationship between differentiated instruction and learner levels of engagement at university," *Journal of Research in Innovative Teaching & Learning*, vol. 17, no. 1, pp. 21–46, Jan. 2024, doi: 10.1108/JRIT-07-2022-0041.
- [15] W. D. Turner, O. J. Solis, and D. H. Kincade, "Differentiating instruction for large classes in higher education," *International Journal of Teaching*, vol. 29, no. 3, pp. 490–500, 2017.
- [16] J. W. Creswell and C. N. Poth, *Qualitative inquiry and research design: Choosing among five approaches*, 5th ed. SAGE Publications, 2024.
- [17] K. Vasileiou, J. Barnett, S. Thorpe, and T. Young, "Characterising and justifying sample size sufficiency in interview-based studies: systematic analysis of qualitative health research over a 15-year period," *BMC Medical Research Methodology*, vol. 18, no. 1, p. 148, 2018, doi: 10.1186/s12874-018-0594-7.
- [18] C. R. Boddy, "Sample size for qualitative research," *Qualitative Market Research: An International Journal*, vol. 19, no. 4, pp. 426–432, Jan. 2016, doi: 10.1108/QMR-06-2016-0053.
- [19] V. Braun and V. Clarke, "Toward good practice in thematic analysis: avoiding common problems and be(com)ing a knowing researcher," *International Journal of Transgender Health*, vol. 24, no. 1, pp. 1–6, Jan. 2023, doi: 10.1080/26895269.2022.2129597.
- [20] M. Shareefa, "Using differentiated instruction in multigrade classes: a case of a small school," *Asia Pacific Journal of Education*, vol. 41, no. 1, pp. 167–181, 2021, doi: 10.1080/02188791.2020.1749559.
- [21] A. Laari, S. Lakkala, and S. Uusiautti, "'For the whole grade's common good and based on the student's own current situation': differentiated teaching and the choice of methods among Finnish teachers," *Early Child Development and Care*, vol. 191, no. 4, pp. 598–611, 2021, doi: 10.1080/03004430.2019.1633314.
- [22] I. S. I. Magableh and A. Abdullah, "On the effectiveness of differentiated instruction in the enhancement of Jordanian students' overall achievement," *International Journal of Instruction*, vol. 13, no. 2, pp. 533–548, 2020, doi: 10.29333/iji.2020.13237a.
- [23] L. Hu, "Utilization of differentiated instruction in K-12 classrooms: a systematic literature review (2000–2022)," *Asia Pacific Education Review*, vol. 25, no. 2, pp. 507–525, 2024, doi: 10.1007/s12564-024-09931-y.
- [24] S. Steenbergen-Hu, M. C. Makel, and P. Olszewski-Kubilius, "What one hundred years of research says about the effects of ability grouping and acceleration on k-12 students' academic achievement: findings of two second-order meta-analyses," *Review of Educational Research*, vol. 86, no. 4, pp. 849–899, Nov. 2016, doi: 10.3102/0034654316675417.
- [25] F. J. Alegre-Ansuategui, L. Moliner, G. Lorenzo, and A. Maroto, "Peer tutoring and academic achievement in mathematics: a meta-analysis," *Eurasia Journal of Mathematics, Science and Technology Education*, vol. 14, no. 1, pp. 337–354, 2018, doi: 10.12973/ejmste/79805.
- [26] B. E. Kuhr, "Dr. Carol Ann Tomlinson: a legacy of differentiated instruction and empathetic classrooms," in *The Palgrave Handbook of Educational Thinkers*, B. A. Geier, Ed., Cham: Springer International Publishing, 2022, pp. 1–14, doi: 10.1007/978-3-030-81037-5_193-1.
- [27] C. A. Tomlinson and J. M. Jarvis, "Differentiation: making curriculum work for all students through responsive planning & instruction," in *Systems and models for developing programs for the gifted and talented*, Routledge, 2023, pp. 599–628.
- [28] G. Scarparolo and P. Subban, "A systematic review of pre-service teachers' self-efficacy beliefs for differentiated instruction," *Teachers and Teaching*, vol. 27, no. 8, pp. 753–766, Nov. 2021, doi: 10.1080/13540602.2021.2007371.
- [29] I. G. A. Mirawati, N. K. A. Suwastini, N. D. Haryanti, and I. G. A. S. R. Jayantini, "Differentiated instructions: relevant studies on its implementation," *Prasi*, vol. 17, no. 1, pp. 11–21, Jun. 2022, doi: 10.23887/prasi.v17i1.41867.
- [30] M. Pozas, V. Letzel, K.-T. Lindner, and S. Schwab, "DI (differentiated instruction) does matter! the effects of DI on secondary school students' well-being, social inclusion and academic self-concept," *Frontiers in Education*, vol. 6, 2021, doi: 10.3389/educ.2021.729027.
- [31] M. van Geel, T. Keuning, and I. Safar, "How teachers develop skills for implementing differentiated instruction: helpful and hindering factors," *Teaching and Teacher Education: Leadership and Professional Development*, vol. 1, p. 100007, Dec. 2022, doi: 10.1016/j.tatelp.2022.100007.

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