

Digital Pedagogy Skills: Issues and Challenges for University of Hail Faculty

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Abstract

Digital pedagogy is fast gaining ground, especially in higher education institutions. The trend has taken hold in Asian universities after the Covid-19 pandemic when teachers were forced to conduct classes from home. Now, certain features of the trend have become a requirement to improve pedagogical efficiency and effectiveness, such as the use of AI tools as teaching aids, and easy assessment, feedback and monitoring of learners' progress. However, not many teachers are prepared to handle the sophisticated technical job and lack the necessary skills the digital pedagogy requires. Often, there are no skill development initiatives from the concerned institutions. The present research looks at the issues and challenges teachers at higher education institutions face in employing digital tools without proper training. The study also examines what the essential skills are that teachers need to implement the digital pedagogy approach in their classes. The present study employed explanatory sequential mixed-methods research approach collecting data from 120 in-service teachers at a Saudi university. The obtained results show that only a little more than one third of the teacher population is digital literate. The rest two thirds face numerous issues in implementing digital pedagogy approach, and therefore, need further training. The study is very significant as the findings reveal the essential training requirements for higher education teachers to successfully integrate digital pedagogy tools with conventional pedagogy.

Keywords: AI skills development, AI tools as teaching aids, challenges of digital pedagogy, digital pedagogy, teacher-training

1. Introduction

Digital pedagogy (DP) is an offshoot of the digital transformation going on around us in every field of human activity where computers and information technology have been taking over, either replacing or aiding human effort. So, when digital information and technology tools are employed for pedagogical purposes, it is termed as "digital pedagogy" (Tan, Voogt, & Tan, 2024; Väättäjä & Ruokamo, 2021). The information and tools can be used to teach a particular subject of study and manage a class, or to teach the proper use of digital technologies in the class (Howell & McMaster, 2022) or to teach the effective leverage of the affordances of digital technologies (Tan & Subramaniam, 2009). The process took off globally on a large scale after the Covid-19 pandemic struck and on-the-spot teaching became practically impossible. In a sense, Covid-19 was a boundary-crossing event for teachers/educators (Donitsa-Schmidt & Ramot, 2022). The event not only forced teachers to shift to online teaching, it also changed teachers' self-efficacy, professional learning, and professional identities, and most importantly, it paved the way for teachers to experiment with digital pedagogy. A few experiments in online teaching method were already being conducted, much before the Covid-19 pandemic (Gopika & Rekha, 2023; Verstraeten et al., 2025), to facilitate continuous education for learners who could not afford to attend regular classes, for whatever reasons. Thus, asynchronous learning, flipped classrooms, and blended learning were already being experimented with. At the moment, the pedagogical scenario across the globe is predominantly turning digital. However, the digital transition hasn't been smooth for all teachers, irrespective of their teaching stream or subject of teaching. Digital transformation and technology integration require that teachers navigate and re-conceptualize their roles and tasks (Devika, Siddapuram, Kaur, & Bollampally, 2024; Wagner, Ley, Kammerer, & Helm, 2024) as they transition from teachers to facilitators. University teachers face a range of challenges when they go through this transition and

implement digital pedagogy in their classrooms (Amhag, Hellström, & Stigmar, 2019; Awang, Hamzah, & Zulkifli, 2025; Bećirović, 2023; Bitar & Davidovich, 2024). These challenges span technical, pedagogical, and personal dimensions, and they often require significant adaptation. Additionally, data literacy and data entry become part of teachers' job requirements (Hanč, Borovský, & Hančová, 2024). To cope with the challenges, teachers require crucial training and material support to develop their online teaching portfolio (Ceallaigh, 2022). The effectiveness of digital pedagogy largely hinges upon teachers' professional development (Bećirović, 2023). The present research is an outcome of the same thought.

1.1 Research Problem

Teaching has largely moved to digital platforms since there are several benefits of the use of technology in the classroom. For instance, the use of AI helps teachers and students in many ways, and teachers can use Apps and technology tools as teaching aids. But still so many teachers face several issues and challenges in adopting and implementing digital technology in their classes. They may not have the required digital competency, either lacking in enough training in the use of the new pedagogy techniques to teach, assess, provide feedback and monitor students' progress, or they may face technical and other related issues in adapting the technology to their purposes. They may not be tech savvy to handle the ever-evolving technical gadgets (Tiwari & Magre, 2025). The use of technology comes with several personal and professional challenges, such as cybersecurity, proper digital content creation, data privacy, lack of information literacy, the threat of plagiarism by students, misuse of AI to write essays without putting real efforts, and such related issues (Caena & Redecker, 2019). However, there is a general lack of research in this important academic area, particularly in Saudi Arabian contexts. Higher education institutions take it for granted that teachers will handle all DP related tasks without any specific training, while not everyone is ready to use the technology (Trujillo-Juárez, Chaparro-Sánchez, Morita-Alexander, Escudero-Nahón, & Delgado-González, 2025). In general, there is no provision of training in Digital Pedagogy skills and there is a paucity of research on what should go in the training modules to be developed for university teachers.

1.2 The Present Study

A preliminary review of literature on integration of DP with conventional pedagogy shows that although there exists a vast array of studies on DP and the issues arising out of its implementation, Saudi Arabia is still lagging behind others in this critical research area. Additionally, research is predominantly focused on identifying teachers' challenges in integration of technology, but suggestions for teachers' training in where they lack in the knowledge are underexplored. An informal preliminary survey with faculty members at University of Hail (UH) revealed that teachers welcomed a proposed training program in DP. In view of this, the present study was taken up with threefold objectives in mind. The primary objective of the study was to identify the issues, challenges, and areas of weakness in digital pedagogy practices of UH faculty members. This will also involve examining teachers' perceptions on digital pedagogy. A corollary objective was to prepare the outlines of a proposed training module based on the identified needs and challenges of the faculty members. Yet another objective was to contribute to the existing literature on this significant area of research. The study was conducted at the University of Hail in Saudi Arabia, but it was expected that it would offer insights that may resonate beyond the local context, as it would highlight the digital pedagogy upskilling needs of teachers across the globe. Digital pedagogy is a burgeoning global demand and digital competency among teachers has become an essential pedagogical requirement as artificial intelligence (AI) has seen rapid advancements after Covid-19. The findings of this research are expected to hold global relevance since, globally, teachers face similar issues and challenges in integrating AI tools with their regular courses.

2. Literature Review

Digital pedagogy (DP) has become an essential requirement today because the approach is, under the given circumstances, an important driving force behind the potential futuristic revolution in teaching and learning (Garcia & de Roock, 2021). There are several factors behind this argument. First, DP has narrowed down the gap between education and its affordability as anyone can learn anything from anywhere in the world, provided they can afford a reliable Internet connection and the essential paraphernalia, such as a PC/smartphone with a webcam, a quiet space, and web-surfing skills. Second, the approach has freed learners from the traditional grind to become autonomous learners accessing learning materials at their own pace, space, and need. Third, DP has also freed teachers from their role as providers of education to become facilitators of education which is liberating in many senses. Fourth, DP has also opened the space for the fulfilment of diverse learning needs of learners which has been largely restricted in the traditional learning set-ups (Aguilera, 2019). This is also related to teachers' diverse teaching potentials. However, things are not as straightforward as they look for both teachers and learners and there are a host of issues and

challenges in the use of DP in real-life situations. Findings of researchers working in this field present a plethora of valuable information on the positive as well as negative aspects of DP. In the forthcoming section we present a review of existing literature on this topic. Though the review is intended to be as exhaustive as possible, our focus has been mainly on studies closely related to the topic of our research.

Technological, Pedagogical, Content Knowledge (TPACK) framework (Mishra & Koehler, 2006; Mishra, 2019) is quite relevant to our study as the model answers questions like, what [higher education] teachers need to know so that they can appropriately integrate technology tools into their teaching, and also what resources they may find useful to develop the required knowledge (Ilahude, Inawati, & Pratolo, 2023). Research on TPACK defines its characteristics (Wagner et al., 2024) and some studies have done reappraisal of the suitability of the framework for teachers (Ilahude et al., 2023; Liando, Tatipang, & Wuntu, 2023). Investigations in teachers' self-reported TPACK knowledge (Amhag et al., 2019; Castéra et al., 2020; Kasa Aytan, 2021; Zhang & Fang, 2022) show that teachers' technological knowledge stands at a lower rank. There is a general lack of such studies in Saudi Arabia yet. However, based on present researcher's observation at the University of Hail, it may be assumed that the situation may not be very different here too, indicating a strong need of training in the field.

The ongoing research on DP has created a good body of reference literature. Most of these studies pertain to teachers' challenges in integrating technology with their regular teaching materials (Abedi, 2024; Aguilera, 2019; Dia, 2024; Hameed, 2024). These studies document pedagogical challenges, such as issues in course redesign, shift in teachers' role, and maintaining pedagogical quality; technical skill-based challenges, like digital literacy gaps among teachers, digital tools overload, and infrastructural limitations; and then there are issues that go often ignored at institutions since they can be swept under the carpet as personal problems. For example, the issues caused by teachers' increased workload and its effect on work-life balance, blurred boundaries between work and personal life, technological stress, and so on. Professional development needs, like continuous learning and emergency adaptation, are also discussed in studies (Tao & Gao, 2022). For instance, researchers find that DP directly impacts teaching quality, suggesting that an expert use of AI tools not only adds to student engagement and their classroom interactivity, but it also fills the gap created by digital divide and other barriers to learning for poor students (Yu & Wang, 2025; Zhang & Wu, 2025). The studies highlight certain crucial points on technology integration and teacher readiness for DP, such as for learners' active learning technology-oriented teaching skills are crucial, and that collaborative learning is a requirement in technology integrated environment. To that end, institutional support and infrastructure are the essential requirements (Lohr, Sailer, Stadler, & Fischer, 2024).

There are other DP-related issues too that have attracted researchers' attention, such as the tensions between various stakeholders in education, institutional hurdles, administrative policies, teacher knowledge and beliefs towards technology integration, and so on (Heard, 2025; Khurram, Chachar, & Ahmed, 2023; Mhlongo, Mbatha, Ramatsetse, & Dlamini, 2023; Shadiev, Reynolds, & Li, 2024). In general, findings of these studies reveal a dual user perspective, i.e., on the one hand teachers recognize huge potentials in employing digital tools to enhance their teaching and improve student engagement, variegating their resources, and ameliorating pedagogical outcomes, on the other hand they also display apprehensions about the associated challenges, draw attention to inadequate institutional infrastructure and support, their own lack of readiness, and curriculum alignment. There are a few studies that have explored EFL teachers' perspectives towards integrating AI tools like ChatGPT in language education (Aldawsari & Almohish, 2024; Al-Khresheh, 2024; Gao, Wang, & Wang, 2024). These studies present an ambivalent picture of the usefulness of the tool in education- useful but unsettling for both teachers and learners.

2.1 Research on DP in Saudi Arabia

The situation is no different for Saudi Arabia. Saudi education system is guided by the Kingdom's vision, and accordingly, institutional policies on requirements for teachers' technical competencies align well with the growing influence of technology in education (Alenezi, 2024; Al Khateeb, 2023; Al-Khresheh, 2024). Researchers in Saudi Arabia have documented the findings of experiments with the use of AI technologies in both secondary and tertiary classrooms (AbdAlgane & Othman, 2023; Aldawsari & Almohish, 2024; Ali, Madni, Jahangeer, & Danish, 2023; Al Khateeb, 2023; Al-Khresheh, Alshammari, & Almayez, 2025; Alnofaie, 2023; Alqarni, 2023; Hakim, 2020). Findings of these studies also show teachers' dilemma in integrating the paradoxical technology with their regular teaching as DP holds promise to facilitate a dynamic learning environment but also poses irreconcilable challenges. For instance, teachers recognize that ChatGPT holds huge potentials to help them achieve better results in their teaching performance, but they are also apprehensive about the undesired changes it will make in the overall teaching and learning atmosphere. For example, it potentially leads to cognitive decline among learners as well as teachers for lack of cognitive efforts, lack of linguistic fidelity, potential overreliance on the tool resulting in the

learners forgetting the skills, and the possibility of creativity suppression. A few research studies have also noticed teachers' general lack of preparedness to handle DP in classrooms. There are no DP-oriented training programs, and there is a lack of qualified personnel to impart such training and capacity-building (Al-Zahrani & Alasmari, 2024; Bugis & Larkins, 2020; Khan et al., 2025; Rahmatullah, Sultana, & Sultan, 2020). Some of the studies also highlight the perceived limitations of the AI tools in developing crucial critical thinking skills among the users.

To summarize, the review of existing literature shows that although DP has generated a flurry of research activities in documenting the pros and cons of DP and the essential requirements for teacher preparedness, the research area is still in its nascent state in Saudi Arabian contexts. There are still gaps in research in this significant academic field, and the present study is a modest attempt to address that lacuna. Moreover, the existing gap between knowledge and integration of technology indicates the need for teachers' training in technology.

2.2 Research Questions

Keeping in view the identified research gap and the objectives of the present study, the research was designed to answer the following research questions:

RQ 1: What are Hail University teachers' perceptions of the skills development in DP?

RQ 2: What issues and challenges do Hail University teachers face, or perceive to face, in the implementation of GP in their classrooms?

RQ 3: What potential solutions do Hail University teachers suggest to overcome the perceived issues and challenges in implementing DP?

3. Methodology

3.1 Research Design and Procedure

Explanatory Sequential Mixed-Methods Research methodology was determined to be the most suitable approach to achieve the objectives of the present study. The research involved different ways of knowing, making interpretations, and therefore, mixing methods (McCrudden, Marchand, & Schutz, 2019; Timans, Wouters, & Heilbron, 2019). Quantitative data were collected using a survey questionnaire, while structured interviews were conducted to collect perception-based qualitative data. The data were collected online (Google Forms). The survey questionnaires, along with consent forms, were posted to a purposively selected cohort of UH faculty members from all study streams in the University email list. Interviews were conducted after the questionnaires were received and studied. For interviews, 20 teachers were selected (stratified sampling) based on the relevance of their responses to the research theme expressed in the questionnaire, especially their level of digital competency and understanding of the stakes involved in integrating technology with education. Moreover, the selected interviewees also represent participation across streams and digital competency levels. The interviews were conducted using videoconferencing (Zoom) and participants' responses were recorded with their permission. Each interview lasted for roughly 45 minutes, and mainly English was used as the medium, though sometimes the interviewees used Arabic, too. The focus of the interviews was to elicit responses on technology challenges, evolving risks, personal adjustments, and suggestions for the components of a proposed DP training program. The recorded interviews were transcribed verbatim, in English, with the exception that the occasional Arabic speech was translated into English. The transcripts were analysed employing thematic analysis model proposed by Braun and Clarke (2006). Quantitative data were analysed statistically. Methods were mixed wherever required and the findings were interpreted qualitatively to be presented in a narrative format.

3.2 Research Participants

Purposive sampling strategy was used in this research. The rationale for the sampling was to ensure diverse perspective, generalizability, and inclusivity. Study participants were selected following a predefined set of criteria that aligned with the objectives of this study. Invitations were sent to 200 Hail University faculty members, from various (18 in total) colleges and departments, while only 120 teachers responded favorably and were recruited as participants. They were both male (20%) and female (80%) teachers, in the age range 32-67 years, with varying degrees of experience (5-20 years) teaching their corresponding subjects of study employing DP, with varying degrees of digital skills (beginners to experts) and in need of further training. The teachers were mostly bilingual, speaking Arabic and English. Participants' descriptive demographics are presented in Table 1, given below.

Table 1. Participants' Demographic Data

Data Collection Instrument	Participants' Teaching Stream	Gender	N	Age Range	Language Background	Experience at UH (Years)	Total service experience (Years)	Digital Skills Level
Questionnaire	Various	Male	23	42-67	Arabic /	5-20	5-20	Intermediate
		Female	97	32-60	English			
Interview	Various	Male	23	42-67	Arabic /	5-20	5-20	Intermediate
		Female	97	32-60	English			

N=120

3.3 Research Instruments

For quantitative data collection, a survey questionnaire was used. The questionnaire contained 12 items that were formulated taking cues from survey items validated in guiding studies on technology content knowledge, such as Nguyen, Mouw, Mali, Strijbos, and Korpershoek (2024), Schmid, Brianza, and Petko (2020), and Wagner et al. (2024). The adapted version of the questionnaire was reviewed by experts from IT department and teachers' training college at UH for relevance and clarity, and their suggested feedback was incorporated into the final version (see Appendix A). The numerical results were used for both quantitative and qualitative purpose. The number of participants facing a particular type of issue or challenge was obtained as were the number of participants offering a particular suggestion to tackle the issue/challenge. The questionnaire was piloted with 10 teachers before it was finally administered, and its internal consistency was checked using Cronbach's Alpha test. Participants' responses were rated on a three-point scale (a) Yes, (b) No, (c) I have never designed/used... etc. The consent form sent along with the questionnaire also collected information on demographic variables, such as participants' age, gender, department, length of service at UH, and total service experience.

For qualitative data collection, structured interviews were conducted with a selected cohort of 20 participants. The interview format contained 16 questions which were the same for all participants (see Appendix B). The questions focused on eliciting information on teachers' challenges in integrating DP technology in their classes, issues in transition, designing new study materials, self-evaluation of their digital literacy level, technical issues, and suggestions for proposed training program components. Recorded interview transcripts were analysed thematically. Qualitative data were also obtained from the survey questionnaires as it focused on the present state of participants' digital teaching skills, and the issues and challenges they face now or expect to face during the training programme.

4. Results

Piloting the questionnaire and subsequent analysis of the results obtained confirmed the relevance, clarity, and internal consistency of the instrument items (Cronbach's Alpha .71). Further analysis of the data obtained from the survey questionnaire and interviews is presented in the following sub-sections.

4.1 Quantitative Analysis: Results Obtained from the Questionnaire

Table 2, given below, presents the data obtained from the analysis of the number of respondents indicating their choice to questionnaire statements. The figures are also expressed in percentage.

Table 2. Participants' Responses to Questionnaire Statements (Number and Percentage)

No	Statement Questions	Response	Nr.	%
1.	Have you faced any issues and challenges redesigning your course to integrate digital tools?	Yes	48	40
		No	40	33
		I've never redesigned my course.	32	27
2.	Have you ever faced challenges in transitioning and adopting new teaching strategies?	Yes	44	37
		No	56	47
		I manage with my conventional teaching strategies.	20	16

Table 2. Participants' Responses to Questionnaire Statements (Number and Percentage)(continued)

No	Statement Questions	Response	Nr.	%
3.	Have you ever designed any new learning materials to teach digitally?	Yes	58	48
		No	41	34
		I've never designed any learning materials.	21	18
4.	Did you face challenges in designing new materials suitable for digital pedagogy?	Yes	34	28
		No	48	40
		I've never designed any learning materials.	38	32
5.	In your opinion, are you competent enough to use digital pedagogy?	Yes	82	68
		No	20	17
		I haven't employed digital pedagogy yet.	18	15
6.	Do you feel you are digital literate?	Yes	51	42
		No	24	20
		I am in the process of being digitally literate.	45	38
7.	Do you feel overwhelmed by digital platforms and tools and find it difficult to choose and master the right one for your purpose?	Yes	34	28
		No	36	30
		I am learning more about the right digital tools.	50	42
8.	Do you feel the basic infrastructure is a limiting factor for you to use digital pedagogy?	Yes	58	48
		No	24	20
		My institution is building the required infrastructure.	38	32
9.	Does the increased workload affect your digital pedagogy or your regular teaching?	Yes	35	29
		No	34	28
		I can manage the increased workload.	51	43
10.	Do you feel stressed out when you practice digital pedagogy?	Yes	36	30
		No	47	39
		I feel stressed out, but I can manage it.	37	31
11.	Do you feel technical issues cause stress, and constantly looking at the screen also causes eye fatigue?	Yes	48	40
		No	35	29
		I feel stressed out, but I can manage it	37	31
12.	Does your institution support teachers' professional development?	Yes	95	79
		No	10	8
		I don't know.	15	13

N = 120

For an easy grasp, the information presented in Table 2, above, can be graphically represented as in Figure 1, given below.

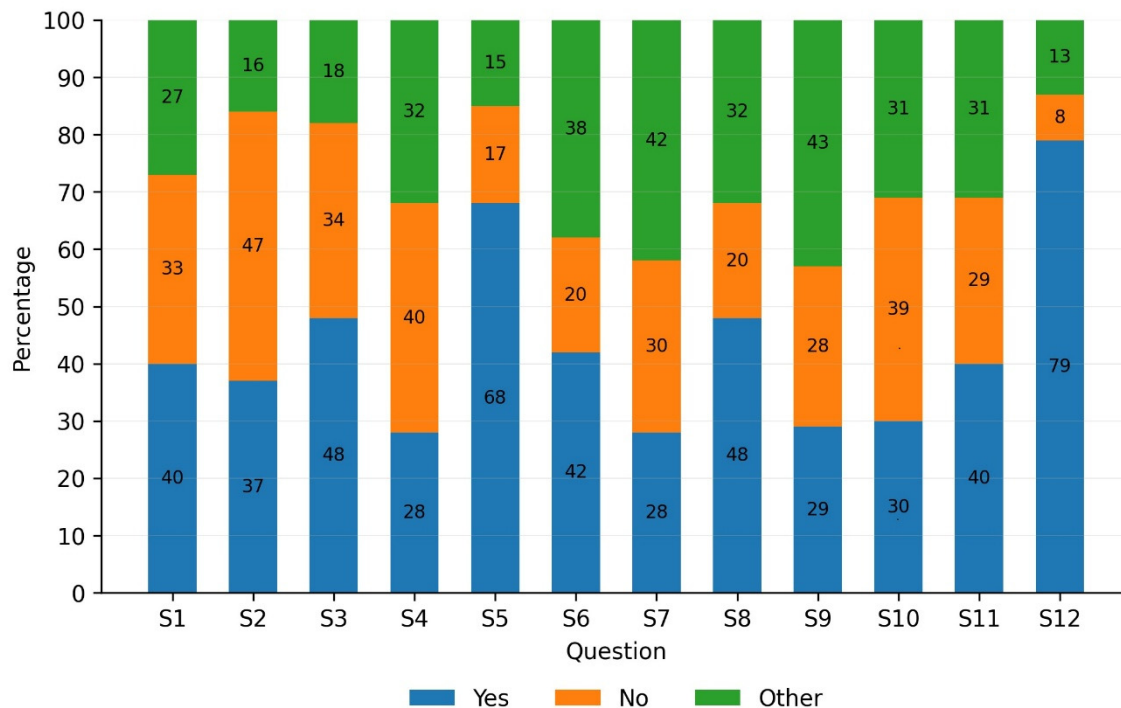


Figure 1. Graphic Representation of Participants' Responses to Questionnaire Statements

4.2 Qualitative Analysis: Results from Interviews

Participants' responses in interviews were categorized into eight broad themes:

1. Issues and challenges before them who have been using DP for quite some time (3 to 10 years), such as course redesigning challenges, transition challenges, and so on
2. Issues and challenges before them who haven't used DP yet
3. Difficulties in choosing online learning Apps
4. Infrastructural challenges
5. Additional pressures and workload
6. Work/life balance
7. Technical issues, and
8. Inclusivity and cultural sensitivity issues

The participating teachers have endorsed in the interview responses their opinions expressed in the questionnaire, albeit more explicitly. The major point that emerged in the responses is that adequately computer-literate teachers or teachers working in IT field do not face challenges in implementing DP in their classes as they can easily redesign their courses and choose from suitable online learning Apps, but others do face challenges. For instance, one teacher said that,

"It (DP) makes learning easier but consumes more time."

Similarly, responding to the question 'Do you face any issues and challenges redesigning your course to integrate digital tools,' one of the teachers said,

"Not really because with adapting progress in IT and AI things are becoming much easier. When it comes to teaching English, incorporating digital tools is something frequent and somehow mandatory."

Though a few teachers resented the *"loss of face-to-face interaction and find new ways to assess students and foster community in a virtual environment."*

Those who have been using DP for some time report that they face such challenges as,

“Finding good resources. The overload of data; the amount of data is huge, and we need to check its accuracy. In assignments it is hard to monitor plagiarism and cheating in exams or in submitted essays.”

They also realize that,

“In the beginning, teaching students how to use such tools is a little bit time-consuming. Also, the limited support provided by the university (Old projectors, poor board quality, too bright classrooms with absence of curtains, etc.) is a hurdle.”

Another teacher was more explicit and listed the challenges, as follows:

“1. Technological adaptation- learning to use new digital platforms and tools effectively. 2. Student engagement – finding innovative ways to keep students motivated and active in online environments. 3. Assessment methods – ensuring fairness and academic integrity in digital assessments. 4. Time management – balancing the increased preparation time required for online teaching materials.”

The main challenges faced by some teachers were related to technical issues, limited digital literacy among some students, and the need to adapt traditional content into interactive formats. For instance, one teacher added that,

“It was also difficult to maintain student engagement in online or blended environment. Additionally, balancing the workload between preparing digital materials and delivering regular lectures was demanding.”

To the question ‘Feel overwhelmed?’ many teachers responded in the affirmative. One of them said,

“Yes, sometimes. Trying multiple tools and deciding what is more useful for me and effective for the students. This is how I manage the overload of digital platforms.”

Of course, Infrastructure is a limiting factor to many teachers. As regards work/life balance, and continuous learning, one teacher commented that,

“Work-life balance is, of course, disturbed as constant connectivity often blurs the line. However, I am comfortable with continuous learning. Unfortunately, it becomes a must. Adopt or fail.”

To keep up with new feature challenges, one of the teachers suggested that,

“The university should shift towards a more student-centred approach, blending traditional methods with digital tools. This includes adopting flexible learning models promoting active learning, integrating digital assessments, and supporting faculty with continuous training and resources.”

Inclusivity and cultural sensitivity also attract teachers' attention as one of them added that,

“Yes, inclusivity and cultural sensitivity are essential. Digital pedagogy must ensure equal access for all students, accommodate diverse learning needs, and be mindful of cultural differences in communication, content, and engagement styles.”

5. Discussion: Findings of the Study

5.1 Teachers' Perceptions of Skills Development in DP

A look at Table 2, above, reveals that teachers have expressed mixed feelings towards digital pedagogy skills development. The results show that only 42% teachers say they are digital literate, although 68% of teachers say they are competent enough to use digital pedagogy. This is a bit contradictory and the question is: is it feasible to segregate digital literacy from competency to use digital pedagogy? The answer is ‘No.’ To resolve the contradiction, we need to rethink of the ways participants are using digital technology and what they consider as “digital literacy.” Also, there are cultural and social factors that influence perceptions of competence and digital literacy. However,

there is a considerably high number of participants who say they have faced challenges redesigning their courses to integrate digital tools (40%), faced challenges transitioning and adopting new teaching strategies (37%), have never designed any learning materials to teach digitally (32%), and to whom the basic infrastructure at their institution is a limiting factor to use digital pedagogy (48%). Although roughly an equally high number of participants say they did not face any challenges redesigning their courses (33%), didn't face issues in adopting new teaching strategies (47%), no challenges in designing new materials for digital pedagogy (40%), do not feel overwhelmed by digital platforms (30%), or do not feel stressed out practicing digital pedagogy (39%). The inference we can derive from this is that roughly one third of the teacher participants are digital pedagogy savvy, but rest two thirds need digital training to enhance their skills. 38% of the participants declare they are in the process of being digitally literate, which means digital pedagogy training will help them a lot.

5.2 Teachers' Issues/Challenges in Implementing DP

A closer look at Table 2, above, shows that in adopting and implementing digital pedagogy in their classes, the major challenges before many of the teachers are the following:

1. They have never redesigned their teaching course adapted to digital pedagogy requirements (27%). They lack digital skills to perform the task, and if the need arises, they use predesigned course materials.
2. They have never designed any learning materials (18%). This group also uses predesigned learning materials, which may or may not fit their requirements.
3. They have not employed digital pedagogy yet (15%). The reason for their lagging behind in the use of digital pedagogy is that either their digital pedagogy skills are not adequately developed yet, or they are not comfortable with using digital technology tools in class.
4. They are in the process of being digitally literate (38%). This clearly indicates DP training is needed for their professional development.
5. They are learning more about the right digital tools suitable for themselves (42%). Which means they are confused by the overwhelming number of online learning sites and applications and find it difficult to choose the ones perfect for their requirements.
6. They face infrastructural limitations and bureaucratic hurdles (48%) in implementing DP in their classes, although an overwhelming majority (79%) say their institutions support their professional development.

In essence, the challenges may be summarized as (a) technical and skill-based challenges, (b) wellbeing and workload challenges, and (c) professional development challenges. These challenges owe to digital literacy gap since not all faculty members possess the needed skills, and there is an abundance of online platforms and tools, which hampers progress. Continuous learning and emergency adaptation is the need for them.

5.3 Teachers' Suggestions

Digitally literate teachers who have faced challenges suggested a few practical points to overcome the perceived issues and challenges in implementing DP at Hail University. Their opinions are already discussed above in interview responses, and can be summarized as follows:

(a) There is a need for professional development training for teachers, (b) Infrastructure and resource support should be made more readily available, (c) Pedagogical reframing is required to integrate technology with the traditional course designs, (d) Inclusive and culturally sensitive course design is also required, and (e) Policy and administrative support is to be extended.

5.4 Gender-wise Differences

To understand the gender-wise differences in digital literacy, digital competency, DP use and challenges faced by teachers, the data analysis presented in Table 3, given below, is very helpful.

Table 3. Gender-wise Differences in Participants' Perception of Challenges in Using DP

Statement	Response	Number		%	
		M	F	M	F
S1: Have you faced any issues and challenges redesigning your course to integrate digital tools?	Yes	12	36	52	37
	No	7	33	30	34
	I've never redesigned my course.	4	28	13	29
S2: Have you ever faced challenges in transitioning and adopting new teaching strategies?	Yes	9	35	39	36
	No	13	43	56.5	44
	I manage with my conventional teaching strategies.	1	19	4.5	19.5
S3: Have you ever designed any new learning materials to teach digitally?	Yes	10	48	43	49.5
	No	8	33	35	34
	I've never designed any learning materials.	5	16	22	16.5
S4: Did you face challenges in designing new materials suitable for digital pedagogy?	Yes	6	28	26	29
	No	12	36	52	37
	I've never designed any learning materials.	5	33	22	34
S5: In your opinion, are you competent enough to use digital pedagogy?	Yes	19	63	82.5	65
	No	2	18	8.5	18.5
	I haven't employed digital pedagogy yet	2	16	8.5	16.5
S6: Do you feel you are digital literate?	Yes	14	37	60.8	38
	No	5	19	22	19.5
	I am in the process of being digitally literate.	4	41	13	42
S7: Do you feel overwhelmed by digital platforms and tools and find it difficult to choose and master the right one for your purpose?	Yes	9	25	39	26
	No	9	27	39	28
	I am learning more about the right digital tools.	5	45	22	46
S8: Do you feel the basic infrastructure is a limiting factor for you to use digital pedagogy?	Yes	15	43	65	44
	No	5	19	22	19.5
	My institution is building the infrastructure.	3	35	13	36
S9: Does the increased workload affect your digital pedagogy or your regular teaching?	Yes	10	25	43	26
	No	7	27	30	28
	I can manage the increased workload.	6	45	26	46
S10: Do you feel stressed out when you practice digital pedagogy?	Yes	10	26	43	27
	No	8	39	35	40
	I feel stressed out, but I can manage it.	5	32	22	33
S11: Do you feel technical issues cause stress, and constantly looking at the screen also causes eye fatigue?	Yes	12	36	52	37
	No	8	27	35	28
	I feel stressed out, but I can manage it.	3	34	13	35
S12: Does your institution support teachers' professional development?	Yes	22	73	95.5	75
	No	0	10	0	10
	I don't know.	1	14	4.5	15

A quick glance at Table 3, above, reveals that compared to female participants male participants are better placed as regards digital literacy (M = 60.8%, F = 38%) and digital pedagogy competence (M = 82.5%, F = 65%). They are also more active in receiving institutional support for their digital mission and are more positive about the role their institutions play in teachers' digital professional development (M = 95.5%, F = 75%), though there are more female teachers who have redesigned their courses to fit in digital pedagogy and created new learning materials (M = 43%, F = 49.5%). Similarly, a higher percentage of male teachers face challenges redesigning their courses to integrate digital tools than female teachers (M = 52%, F = 37%) and face challenges in transitioning and adopting new teaching strategies (M = 39%, F = 36%). Again, a higher percentage of male teachers feel overwhelmed by digital

platforms and tools and find it difficult to choose and master the right one for their purpose ($M = 39\%$, $F = 26\%$), and compared to female teachers, more male teachers are frustrated by the basic infrastructure at their institution to use digital pedagogy ($M = 65\%$, $F = 44\%$). The increased workload also affects the digital pedagogy and regular teaching of more male teachers ($M = 43\%$, $F = 26\%$), and compared to female teachers, a lower percentage of male teachers say they can manage the increased workload ($M = 26\%$, $F = 46\%$). Similarly, the percentage of male teachers who feel stressed out when practicing digital pedagogy is on the higher side compared to female teachers ($M = 43\%$, $F = 27\%$), and a lower percentage of male teachers assert that though they feel stressed out, they can manage the digital stress ($M = 22\%$, $F = 33\%$). Once again, more male teachers feel that technical issues cause stress, and constantly looking at the screen also causes eye fatigue ($M = 52\%$, $F = 37\%$), and a very low percentage of males are able to manage this stress and eyestrain ($M = 13\%$, $F = 35\%$).

For ease of understanding, the differences in participants' perception on DP issues can be graphically represented as in figure 2, given below.

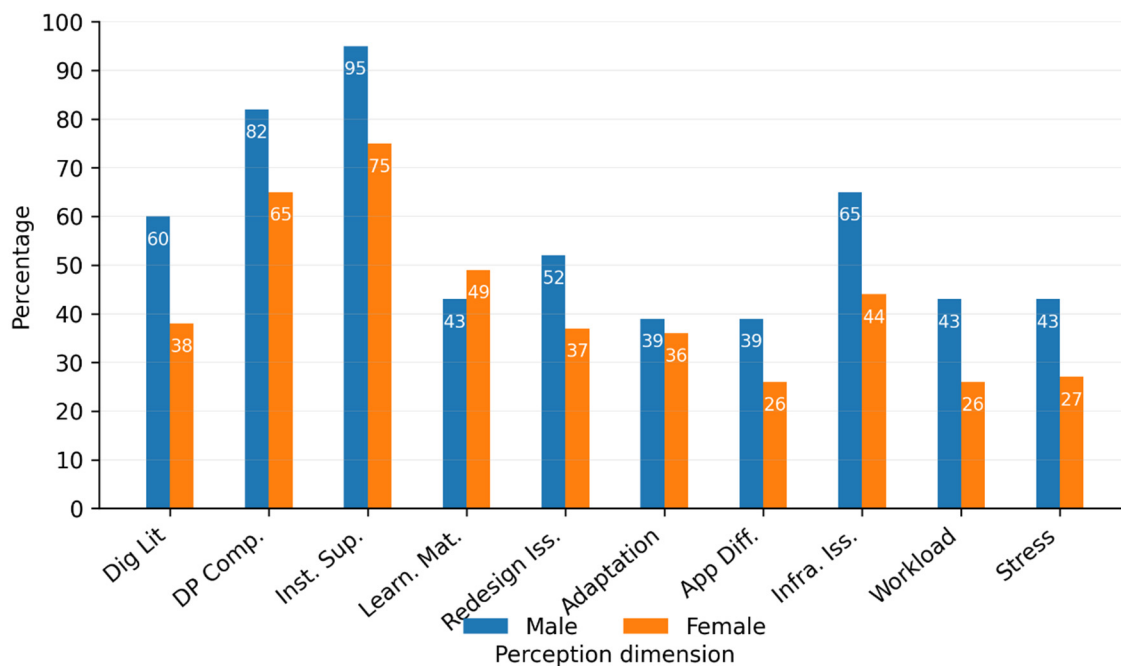


Figure 2. Graphic Representation of Gender-wise Differences in Perception of Issues

Findings of the current research could not be studied in comparison to findings of previous research since there are no previous similar research studies in Saudi Arabian contexts, though there are a few studies on the experiments with the use of AI technologies in classrooms. (e.g. AbdAlgane & Othman, 2023; Aldawsari & Almohish, 2024; Ali et al., 2023; Al Khateeb, 2023, and so on). Findings of these studies highlight teachers' dilemma in integrating the AI technology with their regular teaching since the technology holds promise to facilitate learning environment, but it also poses irreconcilable challenges in implementation.

6. Conclusions

The findings of this empirical study throw ample light on the issues and challenges faced by university teachers in integrating digital pedagogy practices into their regular teaching schedule. Particularly, Hail University teachers perceive digital pedagogy skills as essential requirements to keep abreast of the latest developments in pedagogy practices and they advocate for further training courses in skills development in DP. There is concrete evidence in the study findings that support a case for a proposal for a training course for digital pedagogy skills development for the Hail University faculty. A considerably high number of participants say they have faced challenges redesigning their courses to integrate digital tools, faced challenges transitioning and adopting new teaching strategies to their regular teaching schedules, have never designed any learning materials to teach digitally, and to whom the basic infrastructure at their institution is a limiting factor to use digital pedagogy. The major issues and challenges before

Ha'il University teachers in the implementation of GP in their classrooms are difficulties in choosing from online learning Apps, infrastructural challenges (such as old technical gadgets and dysfunctional tools), additional pressures and workload, and disturbed work/life balance. The other issues raised by participants were, technological adaptation, low student engagement, lack of up-to-date assessment tools for the new pedagogy and lack of time management. The potential solutions to overcome the perceived issues suggested by Hail University teachers touch upon factors such as a shift towards a more student-centred approach, blending traditional methods with digital tools and adopting flexible learning models promoting active learning. However, supporting the faculty with continuous training and resources emerged as the most practical solution of the persistent problem.

6.1 Limitations of the Study

The present study had its own peculiar limitations. One of the limitations was that the researcher did not receive full responses from all the participants. The questionnaire was posted to 200 prospective participants but only 120 teachers responded and returned the filled-in survey. This, in a sense, is less than expected number of participants for this kind of study to derive widely applicable conclusions. Moreover, the scope of conclusions is also limited by the fact that they are primarily derived based on Hail University faculty opinions.

The second limitation of the study is that there exists only limited research on the topic in Saudi Arabia. So, not many studies in Saudi context were there to see the findings in a comparative perspective.

6.2 Implications and Further Research Recommendations

The current study is highly significant in Saudi Arabian academic contexts as there is a growing demand for digital pedagogy while a very low percentage of teachers are technically prepared for the big shift. The findings of the study indicate that a comprehensive training program in digital pedagogy is the need of the hour. The findings imply that policymakers and stakeholders at the University need to look at the challenges closely and provide more infrastructural support for the implementation of the new pedagogy.

Future researchers in this area may want to explore the impacts of relevant training programs on the digital pedagogy skills development of university teachers.

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Appendix A

Survey Questionnaire

Consent Form

Dear colleague,

We are collecting data for a research study titled **Digital Pedagogy Skills: Issues and Challenges for University of Hail Faculty**. The objective of the research is to investigate the issues and challenges faced by teachers in higher education in general and by Hail University faculty in particular, in implementing digital pedagogy as a teaching approach. This research is part of a proposal for digital pedagogy skills development training program for Ha'il

University faculty members. If you have been using, or have used in the past, digital pedagogy skills and tools to teach a class, we invite you to share your views. Your incites will be helpful in designing the proposed training course materials.

Your responses to the statements in the survey questionnaire will remain anonymous and at no point during this research are they going to be shared or published in any form. Your participation in this research is purely voluntary, and you may choose to opt out any time. For any questions/enquiries about the research, please write to: w.alotabi@uoh.edu.sa

If you consent to take part in this research, please sign this form and return it as email attachment to: w.alotabi@uoh.edu.sa

Thank you for agreeing to be part of this research. We appreciate your valuable time and efforts.

Sincerely,

Name _____ Age _____ Gender: __ M/F _____

Department _____

Years of service at UoH _____ Total service experience _____

Signature _____

Questionnaire

If you have been using, or used in the past, digital pedagogy as teaching approach and have faced issues or challenges in integrating the approach to teach a class, please answer the following questions. To mark your response, tick one of the given choices.

1. Using digital pedagogy requires substantially redesigning the courses to integrate digital tools meaningfully. Have you faced any issues and challenges redesigning your course to integrate digital tools?
Yes (b) No (c) I've never redesigned my course
2. To implement digital pedagogy, instructors have to transition from their traditional role as lecturers to being facilitators, which demands new teaching strategies. Have you ever faced challenges in transitioning and adopting new teaching strategies?
Yes (b) No (c) I manage with my conventional teaching strategies
3. Digital pedagogy needs designing new learning materials. Have you ever designed any new learning materials to teach digitally?
Yes (b) No (c) I have never designed any learning materials
4. Did you face challenges in designing new materials suitable for digital pedagogy?
Yes (b) No (c) I have never designed any learning materials.

5. Digital pedagogy needs digital competence. In your opinion, are you competent enough to use digital pedagogy?
Yes (b) No (c) I haven't employed digital pedagogy yet
6. Digital literacy gap is a major issue faced by teachers who try to use digital pedagogy. Do you feel you are digital literate?
Yes (b) No (c) I am in the process of being digital literate
7. Abundance of digital platforms and tools is overwhelming to many teachers. Do you feel overwhelmed by digital platforms and tools and find it difficult to choose and master the right one for your purpose?
Yes (b) No (c) I am learning more about the right digital tools for me
8. Lack of required infrastructure at their institutions is a limitation for many teachers. Do you feel the basic infrastructure is a limiting factor for you to use digital pedagogy?
Yes (b) No (c) My institution is building the required infrastructure
9. Digital pedagogy practice leads to increased workload for teachers. Does the increased workload affect your digital pedagogy or your regular teaching?
Yes (b) No (c) I can manage the increased workload
10. Teachers using digital pedagogy tend to lose work-life balance because of constant connectivity, leading to stress and fatigue. Do you feel stressed out when you practice digital pedagogy?
Yes (b) No (c) I feel stressed out, but I can manage it
11. Many teachers using digital pedagogy report stress caused by technological issues and screen fatigue. Do you feel technical issues cause stress, and constantly looking at the screen also causes eye fatigue?
Yes (b) No (c) I feel stressed out, but I can manage it
12. Integration of digital pedagogy requires teachers to engage in continuous learning and professional development to keep up with ever-evolving technology. Does your institution support teachers' professional development?
(a) Yes (b) No (c) I don't know

Thank You

Appendix B

Interview Format

Interview Consent Form

Dear colleague,

We are collecting data for a research study titled **Digital Pedagogy Skills: Issues and Challenges for University of Hail Faculty**. The objective of the research is to investigate the issues and challenges faced by teachers in higher

education in general and by Hail University faculty in particular, in implementing digital pedagogy as a teaching approach. This research is part of a proposal for digital pedagogy skills development training program for Ha'il University faculty members. If you have been using, or have used in the past, digital pedagogy skills and tools to teach a class, we invite you to share your views. Your incites will be helpful in designing the proposed training course materials.

Your responses to the questions in this interview will remain anonymous and at no point during this research will they be shared or published in any form without your consent. If your response, or any part thereof, is quoted, your name will be masked by a pseudonym. Your participation in this interview is purely voluntary, and you may choose to opt out any time. For any questions/enquiries about the research, please write to: w.alotabi@uoh.edu.sa

If you consent to be interviewed for this research, please sign this form and return it as email attachment to: w.alotabi@uoh.edu.sa

Thank you for agreeing to be part of this research. We appreciate your valuable time and efforts.

Sincerely,

Name _____ Age _____ Gender: __ M/F _____

Department _____

Years of service at UoH _____ Total service experience _____

Signature _____

Interview Format

If you have been using, or used in the past, digital pedagogy integrated with your regular teaching approach, please answer the following questions.

1. Have you been using digital pedagogy, or used the approach in the past, to teach?

2. How long have you practised the digital approach?

3. Do you face any issues and challenges redesigning your course to integrate digital tools? Please elaborate.

4. What challenges have you faced in your transition to digital pedagogy and adopting new teaching strategies?

5. Have you designed new materials to teach digitally? What are the challenges involved?

6. In your opinion, are you competent enough to use digital pedagogy, or you feel that you need further training? Please elaborate.

-
7. Do you feel you are digital literate? Or digital literacy gap is a major issue for you to not use digital pedagogy?
-
8. Do you feel overwhelmed by digital platforms and tools available on the Net these days? Do you find it difficult to choose and master the right one for your purpose?
-
9. Do you feel lack of infrastructure is a limiting factor for you to use digital pedagogy?
-
10. Do you feel digital pedagogy practice leads to increased workload for teachers? If yes, does the increased workload affect your digital pedagogy or your regular teaching?
-
11. Do you feel you are losing work-life balance because of constant connectivity, and stressed out because the boundary between work and home is dissolved?
-
12. Do you feel technical issues related to digital pedagogy cause stress, and constantly looking at the screen also causes (eye) fatigue?
-
13. Are you comfortable with the idea of continuous learning and professional development to keep up with ever-evolving technology?
-
14. According to you, what should be the essential components of a professional development & training program in digital pedagogy for university teachers?
-
15. What pedagogical reframing does the university require to incorporate to integrate digital pedagogy with the existing pedagogy model?
-
16. Are there any inclusivity and cultural sensitivity issues also to be considered before digital pedagogy is integrated with the conventional pedagogy model?
-

Thank you

Appendix C

Table C1. Pilot Test Results

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	
4	1	1	1	1	1	1	1	1	1	1	1	1	1	12
5	2	2	1	3	3	2	2	1	2	1	1	2	1	21
6	3	1	2	2	3	2	2	1	1	2	1	1	1	19
7	4	1	1	1	1	1	3	3	3	1	1	1	1	18
8	5	3	1	3	3	3	3	3	1	3	3	1	1	28
9	6	1	2	1	1	2	1	2	3	2	1	3	1	20
10	7	2	1	3	3	3	2	3	2	1	3	2	1	26
11	8	1	2	2	3	2	3	2	1	3	1	1	2	23
12	9	1	1	1	2	2	1	1	3	1	1	2	1	17
13	10	1	1	3	3	2	3	3	1	2	2	1	3	25
14														
15	Mean	1.4	1.3	2	2.3	2	2.1	2	1.8	1.7	1.5	1.5	1.3	20.9
16	SD	.699	.483	.942	.948	.666	.875	.942	.918	.823	.849	.707	.674	4.77
	Var.	.44	.21	.8	.81	.4	.69	.8	.76	.61	.65	.45	.41	20.49
	K	10												
	Σ var	7.03												
	Var.	20.49												
	α	.716												

N= 10

$$\alpha = (k/k-1) \times (1 - \Sigma \text{var}/\text{Var.})$$

$$= .71$$

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Obtained.

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Data sharing statement

No additional data are available.

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