



Integrating Generative Text-to-Video AI in Linguistically Responsive Pedagogy: A Case Study of Multilingual Learners in Higher Education

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Abstract

Generative *Artificial Intelligence* (AI) has made far-reaching changes in the educational landscape in the recent years. It has the potential to automate tasks and create adaptive and personalized learning environment. A recent development is the generation of text-to-video models driven by the development of video diffusion models. This study aims to analyze how *Generative Text-to-Video (T2V) AI* can enhance *linguistically responsive teaching* in multilingual higher education settings. Using a mixed-method approach, this research evaluates the effectiveness of AI Tools in relation to the *Linguistically Responsive Teaching* (LRT) framework. The findings would help the instructors to enhance content accessibility, and foster inclusive pedagogical practices.

Keywords: Generative AI, Text-to-Video (T2V), *Linguistically Responsive Teaching* (LRT) Framework, Multilingual Learners, Higher Education

Introduction

Pakistan is a land of cultural and linguistic diversity, with over 70 languages spoken as first languages. The 2022 edition of *Ethnologue* listed 80 established languages and 68 out of these are

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indigenous and 12 are non-indigenous whereas Urdu and English are the official languages (CLEAR Global, 2023). This cultural and linguistic diversity comes along with a lot of challenges and research opportunities at the same time.

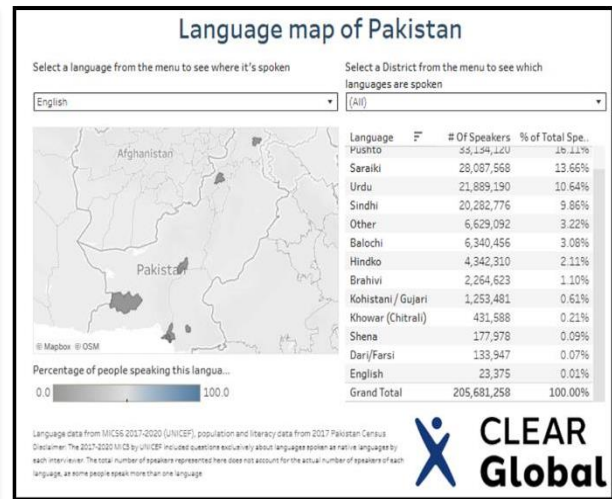
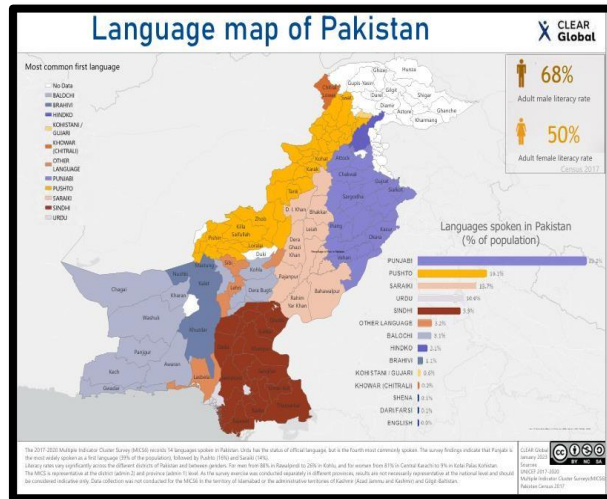


Figure 1: Language map of Pakistan Figure 2: Percentage of people speaking English language Retrieved from [Home | UNICEF MICS](#) on April 12, 2025

The 2017 – 2020 *Multiple Indicator Cluster Survey* (MICS), Punjab was conducted by Bureau of Statistics, Punjab in a joint effort with United Nations Children’s Fund (UNICEF), as part of the Global MICS Programme with the Technical support of United Nations Children’s Fund (UNICEF), and government funding and financial support of UNICEF.

Regardless of English being one of the official languages of Pakistan, only 0.01 % people spoke English fluently (CLEAR Global, 2023) highlighting the phonological and ethnic diversity of the region. When students with diverse demographics enter an educational institution, they bring their linguistic and cultural diversity along. In the previous few years, there has been an increase of *Multilingual Learners* (ML) in various higher education settings. National Science Teaching Association (NSTA) defines *Multilingual Learners* as students who are building competence to gain knowledge and enhance skills in numerous languages, including students learning English as



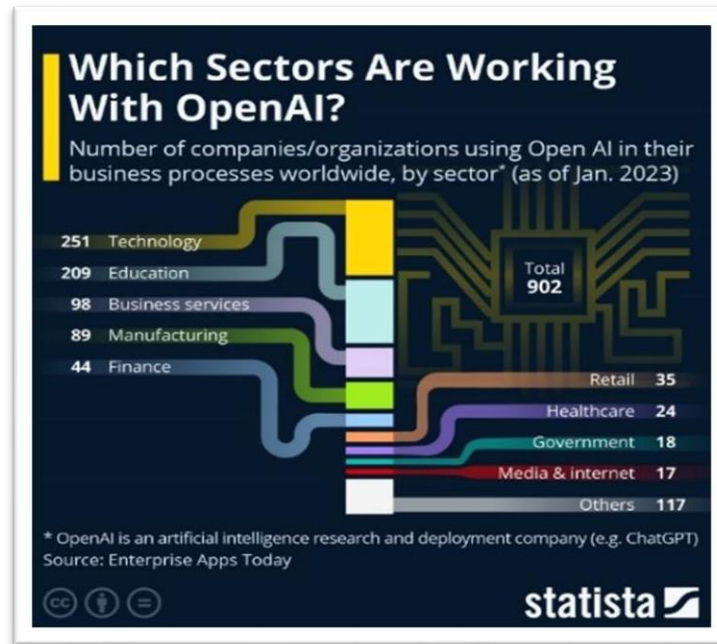
a surplus language in school (frequently mentioned as ‘English learners’ or ‘English language learners’). As English is not the first language of these students, they often face challenges to comprehend the class lectures leading to lesser student engagement and satisfaction. Coming from different linguistic and cultural backgrounds, such students require additional support to adapt to this new learning environment. Often times, the motivation of such students to attend their classes is quite low. The *Sustainable Development Goal* (SDG) 4 caters this need of the Multilingual Learners by accentuating to “Safeguard all-inclusive and impartial educational quality and foster continuous instruction prospects for everyone”.

The UNESCO Global Education Monitoring (GEM) Report further emphasizes:

Quality education ought to be imparted in the home/first language. Nevertheless, this least possible criteria remains unfulfilled for multitudes, restraining their aptitude to enhance bases for acquiring knowledge (UNESCO 2016, 1).

Addressing different student needs in a multilingual higher education setting is quite stimulating. Traditional teaching methods are usually insufficient to address the exclusive needs of MLs, who bring an array of language corpora and diverse interpersonal communication skills into the teaching space (Kanno & Kangas, 2023). Intrinsically, there is a compressing requirement to invent such instructional practices which use language and literacy in ways and means that interrupt English, unilingual obstructions in the core curriculum, teaching, and evaluation (García 2009; García & Lin, 2016). To face these difficulties, educationalists are progressively resorting to automations that propose innovative prospects for producing *linguistically responsive* learning surroundings (Daniel et al., 2016).

Digital technologies have significantly contributed in underpinning the improvement of students' linguistic and reading abilities (Liu, Reynolds et al., 2024). The recent developments in Generative AI technology has ignited substantial interest with regard to its application in language



education. The data published by the enterprise software platform *Enterprise Apps Today* (2023), demonstrate technology and education to be the sectors in all likelihood to take most gain of AI solutions: with Education being on the second number.

Figure 3: Which Sectors Are Working With OpenAI?

1.1 Significance of the research

Linguistically Responsive Teaching (LRT) plays an important role to ensure that each learner gets an equitable access to learning. Contemporary progresses in generative AI, predominantly in text-to-video applications, offer new prospects for augmenting LRT by offering multimodal, adaptive, and culturally inclusive instructional materials. This research explores how generative



text-to-video AI can support multilingual students for Linguistically Responsive Teaching in Higher Education as well as recognize the constraints associated with using such technology.

1.2 Research Questions

- 1: What *linguistically responsive teaching* practices do instructors implement in their multilingual classrooms?
- 2: What are the probable benefits of integrating *Generative text-to-video AI* in multilingual higher education settings for linguistically responsive teaching?

For this reason, the need of the hour for the instructors of Multilingual Learners is to adapt to such technology and digital tools to enhance student engagement and comprehension incorporating their linguistic and cultural diversity in higher education settings.

2. Literature Review

2.1 Multilingualism

A multilingual identity has been defined as “an ‘umbrella’ identity, where one explicitly identifies as multilingual precisely because of an awareness of the linguistic repertoire one has” (Fisher et al. 2018, 449). Supporting multilingual learners entails teachers’ sociolinguistic awareness to comprehend the link among language, culture and identity, and appreciate linguistic and cultural diversity. Teachers can promote multilingual pedagogics on dissimilar levels while producing the course material, instructional practices and language policy (Lucas et al. 2008). Teachers of MLs accommodate multilingualism in their teaching space and practices, primarily by using *bridging, scaffolding, and grouping strategies*.



Digital technologies reinforce such practices for linguistic instruction by incorporating digital books and learning platforms, technologies and apps that assist in grammar/spelling, and closed captioning/subtitling options. Machine translation is another progressively prevalent tool to bridge the communication gaps between the MLs and their instructors. Digital translation tools simplify discourse among MLs, their teachers and classmates, and support their comprehension and communication skills (Donley, 2024).

2.2 Technology Acceptance Model

Since the development of *Technology Acceptance Model* (TAM) by Fred Davis in 1989, research on acceptance of technology is being carried out, describing how individuals embrace and utilize a new technology. As per the TAM, *perceived usefulness* and *perceived ease of use* are the prime elements prompting technology adoption. The model's foundation sagacity is based on the idea that the utilization of technology is not shaped by general attitude, instead it is impacted by particular beliefs people have about using a technology. It infers that it is anticipated that if an application is easy to use, the probability is that the user will consider it beneficial and there is a reasonable chance that it will encourage the acceptance of the technology. TAM has turned out to be the framework for evaluating a widespread variety of behaviors of technology consumers, though upholding a clear and minimal approach (Davis, 1989). According to TAM, accepting a technology is a three-phase approach, in which *external factors* prompt *cognitive responses*, which in turn, form an *affective response*, shaping the behaviour of the user. It signifies behaviour as the consequence anticipated by *perceived ease of use*, *perceived usefulness* and *behavioral intention*.

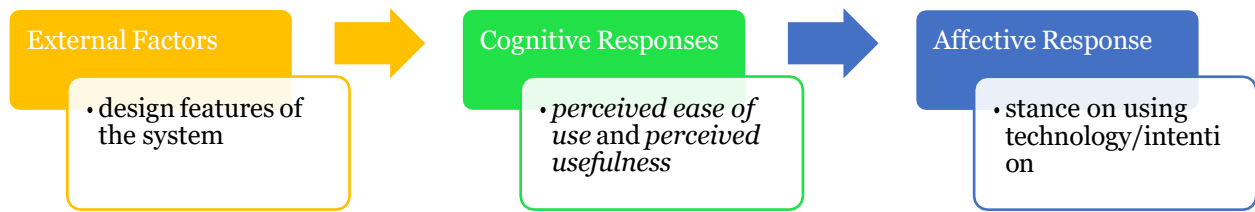


Figure 4: Three Stages of Technology Acceptance Model (Davis, 1989; Davis, 1993)

As cited by Marikyan & Papagiannidis (2024), the approval and use of information technologies at organizational and individual levels can bring instant and lasting benefits, for instance enhanced performance, monetary and time efficacy and convenience. In connection with Generative AI in education, TAM can be applied to apprehend the perception and acceptance of AI tools by the educators and students (Marikyan & Papagiannidis, 2023). *Perceived usefulness* refers to that degree to which a user think it likely that using AI will augment their teaching or learning. Studies have shown that once instructors identify the benefits of AI, such as programming administrative errands and providing personalized instruction, they are more inclined to take on these technologies (Davis, 1989). *Perceived ease of use* (PEOU) is the belief about how much effort is required to use a technology. Simplified interfaces, intuitive design, and comprehensive training can improve the PEOU, encouraging broader adoption of AI tools in educational settings (Davis, 1989).

2.3 Generative AI

In 1956, John McCarthy initiated the academic conference on this topic and devised the term *artificial intelligence* (AI). It is defined as: “*The capacity of computers or other machines to exhibit or simulate intelligent behavior; the field of study concerned with this*” (Oxford English Dictionary). Starting within the field of Computer Science, Generative AI is now revolutionizing higher education by creating new content based on patterns learned from existing datasets.



GAI is a set of AI algorithms which uses current content like text, audio files, or images to generate something new (Mittal et al., 2024). It permits computers to identify the underlying patterns related to the input and then use it to produce parallel subject matter. Unlike traditional AI, GenAI can generate text, images, music, code, and other data, making it a powerful tool for creative and educational purposes. Popular GenAI tools like ChatGPT, MS Copilot, Gemini, Claude, Jasper, DALL E, and Midjourney are transforming teaching and learning methods. In the educational context, GenAI can generate multimedia content, summarize or translate text, explain complex concepts, and provide personalized learning experiences. It has been assigned three roles in teaching which are: providing adaptive instruction strategies, augmenting teachers' skills to teach, and supporting their professional development. AI tools offer diverse ways to engage, represent, and express (Delisio & Butaki, 2019). There is an immense variety of AI tools that can dramatically change the way we teach and learn in higher education such as: natural language understanding, multimodal content generation, contextual adaptability, automated summarization and paraphrasing, personalized learning, evaluation and performance, accessibility and inclusivity, and strengthening various skills. Channeled by Borgmann's theory, in language learning *Generative AI* should function as a scaffold amplifying human communication and cultural literacy, and not as a replacement for human interactions.

2.4 Text-to-video (T2V)

The field of computer vision is undergoing rapid advancements, with text-to-image generation emerging as a focal area of research (Liu, 2024). Diffusion models (DMs) are a class of generative models that learn to synthesize realistic data by adding and removing noise iteratively. They have been widely used for video synthesis tasks, such as text-to-video generation, video inpainting, and



video super-resolution. Ho et al. (2022a) draws attention to the tremendous progress Generative modeling has made with recent text-to-image systems like DALL-E 2, Imagen, Parti and Latent Diffusion. Diffusion models have precisely found substantial accomplishment in manifold generative modeling tasks together with *density estimation*, *text-to-speech*, *image-to-image*, *text-to-image* and *3D synthesis*. Image Diffusion *Text-to-image* (T2I) generation is a challenging task that focuses to synthesize realistic images from natural language descriptions. In the course of training, individual images are regarded as single frame videos. This is acquired by storing individual independent images into a sequence of the same length as a video, and evading the temporal convolution residual blocks by masking out their computation path. This strategy allows to train the video models on image-text datasets that are considerably larger and more diverse than available video-text datasets (Ho et al., 2022b). The joint training with images significantly increases the overall quality of video samples and the knowledge transfer from images to videos. Resultantly, this joint training empowers the model to generate stimulating video dynamics in diverse styles. Video Diffusion although text-to-image (T2I) technologies have made considerable progress, their text-to-video (T2V) counterparts still grapple with data scarcity, temporal consistency, and computational resource intensity challenges. Video Diffusion Model was among the first to generate low-resolution videos through Diffusion Models (DMs) and a space-time factorized U-Net architecture. To generate high-definition videos, Imagen Video advanced the field with cascaded diffusion models and a unique v-prediction parameterization technique. Although a contemporary occurrence, AI in education is an expanding research area highlighting its potential to transmute teaching and learning practices in many settings (Limna et al., 2022).



3. THEORETICAL FRAMEWORK

3.1 Linguistically Responsive Teaching Framework (LRT)

Linguistically Responsive Teaching Framework was developed by Lucas and Villegas in 2011 consisting of three *orientations* and of the *knowledge and skills* that are obligatory for linguistically responsive teachers. It described education as requiring three key areas of teaching expertise: (a) awareness of students' language and academic backgrounds, (b) understanding the language requirements of classroom activities, and (c) the ability to provide effective support to help bilingual learners take part successfully in those activities.

Orientations: “inclinations or tendencies toward particular ideas and actions, influenced by attitudes and beliefs” (Lucas & Villegas 2011, 56)

Knowledge and skills: “the complex and interconnected disciplinary knowledge, pedagogical content knowledge, knowledge of learners, and pedagogical skills” (Lucas & Villegas 2011, 56)

UNESCO emboldens nations to implement mother tongue-based bilingual or multilingual methodologies in education where pertinent – to support inclusion and provide quality education.

For UNESCO, ‘*multilingual education*’ refers to using at least three languages in education: the mother tongue, a regional or national language and an international language. (Dash & Das, 2020).

This research proposes a conceptual framework of *Linguistically Responsive Teaching Framework* for Multilingual Contexts using Generative Text-to-Video AI and identify how Generative AI caters these orientation and knowledge and skills.



3.2 Conceptual Framework of Linguistically Responsive Teaching for Multilingual

Contexts using Generative Text-to-Video AI based on Lucas and Villegas (2011)

Table 1 Conceptual Framework of Linguistically Responsive Teaching for Multilingual Contexts using Generative Text-to-Video AI - based on Lucas and Villegas (2011)

	LRT Principle	Variable	Concept/Relationship
Orientation	<i>Sociolinguistic Consciousness</i>	Teachers apprehend that their students speak dependent languages and besides the challenge of learning a second language, they face political and social issues (p. 59).	Does Generative AI comprehend the relation among language, culture and identity?
	<i>Values for Linguistic Diversity</i>	Teachers display respect and interest in students' native languages (p. 60).	Is Generative AI cognizant of the sociopolitical scopes of the use of language and its education?
	<i>Inclination to Advocate for Language Learners</i>		



Skills/knowledge	<i>Learning about Diverse Students' Language Backgrounds, Experiences, and Proficiencies</i>	Being considerate of the student need to form connections between their preceding knowledge and experience and new concepts (p. 61).	Does Generative AI comprehend that conversational language proficiency and academic language proficiency are not the same?
	<i>Identifying the Language Demands of Classroom Discourse and Tasks</i>		Does Generative AI provide coherent input or is it further than the existing level of student proficiency?
	<i>Applying Key Principles of Second Language Learning</i>	Understanding the approach of learning a second language and use this knowledge during instruction (p. 62).	
	<i>Scaffolding Instruction to Promote Students' Learning</i>	Being able to provide temporary support to help a learner complete the learning tasks beyond her/his current capability (p. 65)	



4. Research Design

As the aim of the research is to explore how generative text-to-video (T2V) AI can support multilingual students for Linguistically Responsive Teaching in Higher Education as well as recognize the constraints associated with using such technology, the researcher has employed a mixed-method approach to collect, analyze and interpret the data. To address RQ1: What linguistically responsive teaching practices do instructors implement in their multilingual classrooms? A qualitative research method (focus group) has been adapted using nonprobability sampling to collect primary data and thematic analysis has been applied to interpret and identify the themes. To address RQ2: What are the potential benefits of integrating Generative text-to-video AI in multilingual higher education settings for linguistically responsive teaching? A quantitative research method (survey - questionnaire) has been adapted using probability sampling to acquire ordinal data through Likert scale questions to collect student responses. This data will be evaluated using the method of Perceived Inception Score (PIS).

4.1 *Perceived Educational Inception Score (PEIS)*

With the emergence and use of AI tools, it is equally important to evaluate and assess the quality and output of these tools to make certain the effective and ethical use of these tools. Different AI tools are evaluated based on their function such as Coherence and Relevance, Fluency and Grammar, Diversity and Creativity, Realism and Authenticity, Consistency and Stability, Ethics and Bias Evaluation and User Satisfaction and Engagement. This research focuses on the It is not a score that can be directly computed from a questionnaire, instead it evaluates the quality of generated images based on recognizable objects, with higher scores indicative of clearer, more accurate outputs.

As the focus of this research is to assess how students perceive or evaluate the effectiveness of generative text-to-video AI tools (e.g., in teaching multilingual learners), the researcher has adapted the *Perceived Educational Inception Score* (PEIS) method which balances quality and diversity—into a student-perception-based framework.

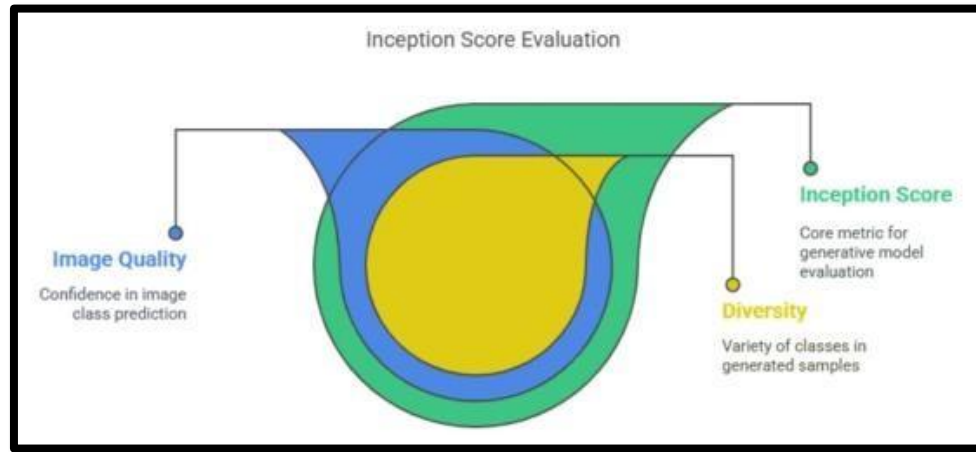


Figure 5: Inception Score Evaluation

While assessing the Quality and Diversity of the AI generated Text-to-Videos, the researcher classified the student responses into two categories stated below:

- Quality: How well each generated video produced meaningful, clear, and classifiable content (i.e., coherence, relevance and clarity).
- Diversity: How varied the generated outputs are (i.e., not all videos look or sound the same, inclusiveness).

Application of PEIS (*Perceived Educational Inception Score*): PEIS = Mean Quality x Mean

Diversity

$$\frac{1}{n} \sum_{i=1}^n Q_i$$



Mean Quality Score: where Q_i is the average of all quality related Likert responses for student i .

$$\frac{1}{n} \sum_{i=1}^n D_i$$

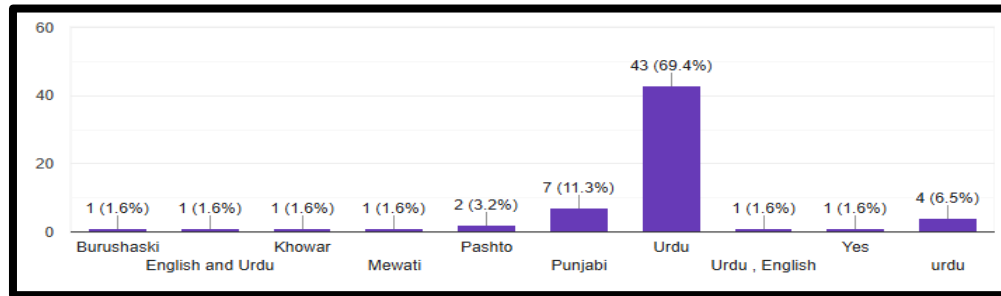
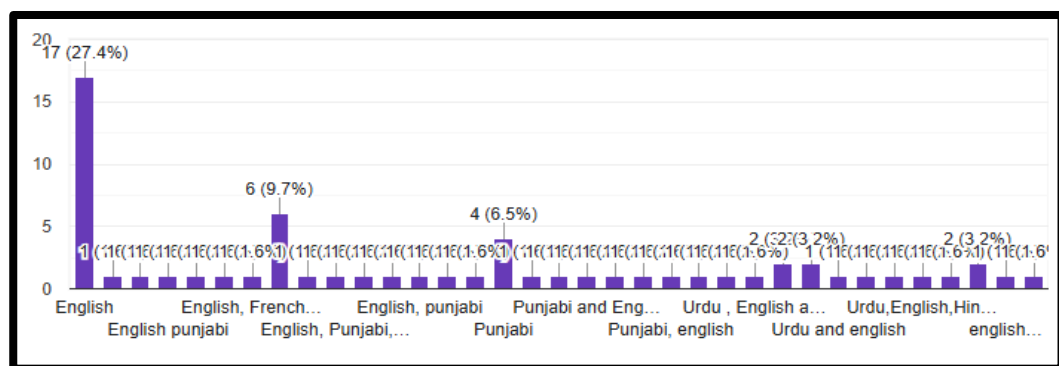
Mean Diversity Score: where D_i is the average of all diversity related Likert responses for student i .

4.2 Participants and Sampling

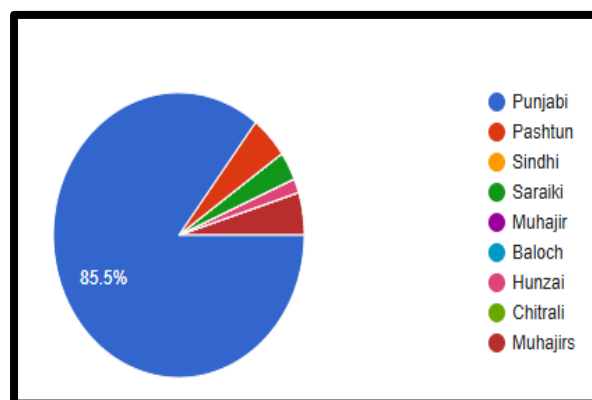
This research has been conducted at Forman Christian College (A Chartered University), Lahore, Punjab, Pakistan. Founded in 1864, FCCU is an American-style Liberal Arts education, currently home to 9000 students from all backgrounds and regions. Forman is also Pakistan's only member of the Global Liberal Arts Alliance (GLAA), an international partnership of colleges and universities advancing liberal arts education while sharing resources, best practices, and expertise with 50% + faculty with PhDs.

4.2.1 Student Participants:

- Who are they: Freshmen - Second semester students of Writing and Communication Course – WRCM 102
- Sample size: 55
- Sampling technique: Probability convenience sampling
- Inclusion criteria: Multilingualism: the first language (L1) of 76% of the participants is Urdu and the second languages (L2) are English, Punjabi, Saraiki, Farsi, Hindi, French and Chinese.

**Figure 6: L1 of the student participants****Figure 7: L2 of the student participants**

The ethnicity of 85.5% participants is Punjabi, whereas 4.8% are Pashtun, 3.2 % Saraiki, 1.6 % Hunzai and 4.8% are Muhajirs.

**Figure 8: Ethnicity of student participants**

**4.2.2 Instructor Participants:**

- Who are they: The faculty members have been chosen from the Department of English, Mass Communication, Mathematics, Religious Studies and School of Life Sciences.
- Sample size: 05
- Sampling technique: Non- probability convenience sampling
- Inclusion criteria: 05 to 10 years of experience of teaching multilingual students

4.3 Data Collection Instruments and Procedures**4.3.1 Quantitative Instruments**

- The student questionnaires available at these links <https://forms.gle/sLfZuA2yhrAukpd59> and <https://forms.gle/6J5gd5LVTCidJm7CA> were self-developed using pretest-posttest and Likert scale design. The principles of LRT Framework were incorporated in both questionnaires. Two pilot studies with the title of “DEI & Student Engagement” (2022) and “Student Engagement within a UDL framework” (2024) have been conducted previously and are available at the below links. Each study contains a component of using AI tools for student engagement ensuring diversity, equity and inclusion.

<https://youtu.be/Lh7OVFuoGw0?feature=shared> - DEI & Student Engagement

<https://youtu.be/VROA6TcrTsk?feature=shared> - Student Engagement within a UDL framework

4.3.2 Qualitative Instruments

- A structured questionnaire available at this link <https://forms.gle/p2TEkwwTVVrDS1ak7> was shared with the instructors.
- The focus group questions contained open-ended questions giving the instructors the autonomy to share in-depth insights and observations based on their real experiences in their classrooms.



- The written responses were then coded, patterns were identified to generate common themes and reviewed.
- Methodological Triangulation method was used to ensure validity.

4.3.3 Selection of Generative AI T2V Tool

An identical prompt was given to 9 different Generative Text-to-Video AI tools and based on the successful output, the video generated by *Invideo AI* app has been used in the research.

Prompt: Create a video for undergrad multilingual learners about research data collection methods and tools using the Linguistically Responsive Teaching framework.

Table 2 List of AI Tools with their merits and demerits

AI Tool	Function	Merits	Demerits
<u>Imagen Video</u>	a text-conditional video generation system	Generates high resolution videos with accurate depiction.	The output of the prompt generated video was more like a GIF format which cannot be used for an interactive class lecture.
<u>DALL•E 3</u>	image-generating platform created by OpenAI	Improved text to image generation	A user can get 115 credits for \$15. Each prompt costs 1 credit and results in 4 results.
<u>Make-A-Video</u>	generates video from text	Provides several options for customization (for e.g. surreal, realistic, stylized, static, motion)	Requires Facebook /Instagram login to download the video.
<u>Sora</u>	Turns text into videos	Generates high resolution images/videos.	The duration of the clip is very short (05 seconds).



<u>Google AI studio</u>	Create generative media	Generates high resolution images/videos with advanced settings.	The duration of the clip is very short (08 seconds).
<u>Fliki</u>	Generates video with VideoGen	Provides a variety of options to create a video	The video adds a picture which keeps on floating on the screen as

		and ready-made video templates are available as well.	an avatar. The voice over is monotone and some of the slides were entirely blank. The video duration was 01 min and 17 sec.
<u>Steve AI</u>	Customized image generation to video	Generates the video based on the prompt selecting the images and the voice-over script on its own.	The video duration was 5 minutes, however, downloading the video requires an upgrade. The script and images are incoherent to each other.
<u>Pictory</u>	Creates videos from text	Generates the video based on the prompt selecting the images and plays music as a voice-over with no script.	After the expiry of free trial, to download videos and unlock premium tools, an upgrade is required. The video duration was 01 min and 26 sec.
<u>Invide o AI</u>	Makes videos based on text. The prompt instruction can be given with a word limit of 32000 characters.	Several Plugin options such as voices, text to clip, text to image, photo to clip and text to title clip.	Voice-over script and images lack coherence. Some of the images were entirely irrelevant to the topic.



5. Data Analysis

5.1 Quantitative Analysis

To assess the potential benefits of integrating Generative text-to-video AI in multilingual higher education settings for linguistically responsive teaching, the student participants filled a 5 point Likert Scale questionnaire based on the following themes:

- Awareness of Linguistic Diversity with AI Tools
- Language Accessibility and Clarity in AI Tools
- Instructional Scaffolding and Flexibility in AI Tools
- Leveraging Students' Linguistic Resources using Generative Text-to-Video AI
- Use of Generative Text-to-Video AI for Linguistic Support

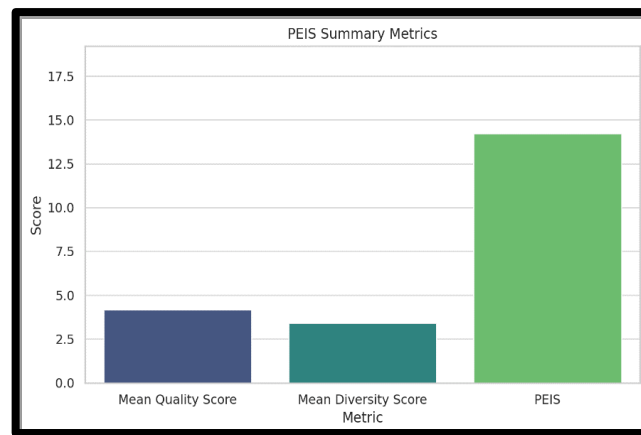


Figure 9: PEIS Summary Metrics

Metric	Value
Mean Quality Score	4.16487455197133
Mean Diversity Score	3.41590909090909
PEIS	14.2268328445748

**As per the above figure:**

- The Mean Quality Score (~4.2) reveal the students' by and large positive perceptions of the coherence, relevance and clarity and instructional usefulness of the generative AI videos. Quality here typically includes clarity of visuals and narration, alignment with course content and comprehensibility.
- The Mean Diversity Score (~3.4) reflect modest perceptions of cultural and linguistic inclusivity (e.g. relatable images, diverse cultural perspectives). Diversity includes cultural representation, multilingual support (subtitles, examples in different languages) and inclusion of varied perspectives.
- The resulting PIES score (~14.3) calculated by multiplying the mean quality and diversity scores, suggests that students overall found the AI-generated videos to be both pedagogically effective and reasonably inclusive.

This metric helps operationalize linguistically responsive video integration, demonstrating that generative AI tools can support learning when both quality and cultural inclusivity are present. The PEIS thus offers a useful evaluative model for further AI-enhanced instructional design in multilingual contexts. The entire datasets of the Mean Quality and Diversity Score to calculate PIES score are available at this link

<https://drive.google.com/drive/folders/1-ESPMwK0r7O9fqLRdMaqayWjBLtNEpW0?usp=sharing> .

5.2 Qualitative Analysis

To evaluate the linguistically responsive teaching practices instructors implement in their multilingual classrooms, the instructor participants responded to an open-ended questionnaire



and following themes were identified in relation to the LRT framework after conducting the thematic analysis.

Question 2	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
What kinds of linguistic and cultural diversity do you see among your students?	My students come from a wide range of linguistic backgrounds including Urdu, Punjabi, Pashto, Sindhi, and English. Culturally, they represent diverse regions of Pakistan and bring varied perspectives into the classroom.	Majority of the students are from Punjab and speak Urdu, English and Punjabi. However, I deal with a diverse group of students with different cultural backgrounds that spread across the globe, in general, due to my wide connectivity in the	Majority with a background of cultural diversity of native languages (Urdu, Punjabi, Pashto, Balochi etc.) but English in the classrooms.	My students come from diverse linguistic and cultural backgrounds, mostly speaking Urdu, Punjabi, Siraiki, Sindhi, Balochi, Pashto and English, which brings a rich mix to the classroom.	I do see cultural and linguistic diversity on the campus as our institute encourages diversity and caters to students from all over Pakistan, so we a lot of regional languages on the campus.



		field of Food and Nutrition			
Initial Codes	wide range, diverse groups, cultural diversity, linguistics diversity	Theme	Multilingualism & Cultural Language Inclusivity Varied Demographics	LRT Principle	Recognition of Linguistic and Cultural Diversity
Question 3	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5

Does student multilingualism influence your planning or instruction? If so, how?	Yes, it does. I often use simple language and rephrase complex mathematical ideas when needed. In informal settings, I allow students to clarify or ask questions in the language they're most comfortable with to ensure their understanding	I usually discuss with the students in the opening class activity and decide which language to use for better communication and learning experience of the students. Most of the instructions are in English or any common language	No, they equally enjoy learning in the English language	Yes it does. I try to use simple English and give context in local examples to make sure students from all backgrounds can follow	Yes, it does. Our university encourages monolingualism which confuse me at certain times. I rarely code switch if required and usually teach only in English. In particular, I explain in Urdu only when it comes to assigning any assignment or assessment and the instructions
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		that the students in that cohort may understand			need to be made clear
Initial Codes	use simple language and rephrase, decide which language to use for better communication and learning experience, equally enjoy learning in the English language, use simple English and give context in local examples, monolingualism, rarely code switch	Theme	Language flexibility, simplification and choice for effective communication and clarity monolingual teaching approach	LRT Principle	Multilingual Flexibility in Instruction & Institutional Constraints



Question 4	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
Does your teaching materials and examples reflect the diversity of your classroom?	Yes, I try to include relatable, context-based examples that resonate with students' daily lives and cultural realities. In quantitative reasoning, for instance, I use datasets or scenarios familiar to them.	I usually use multiple sources and diversified teaching and instructional material. Based on the diversity of students, I may change the teaching material and instructional resources.	No, it doesn't impact my teaching however I put any example hardly in Urdu.	Yes, I use case studies, news stories, and local references that reflect the different cultures and languages of my students.	Yes, my teaching materials and examples reflect the diversity of my classroom. I keenly take care of this while lesson planning and use humor in particular contexts being mindful of different cultural beliefs.
Initial Codes	include relatable, context-based examples that resonate, use multiple sources and diversified teaching and instructional material, it doesn't impact my teaching, use case studies, news stories, and local references that reflect the different	Theme	Contextualized and Relatable Teaching Instructional Material Diversity Cultural and Linguistic Representation Perceived Impact on Teaching Practices	LRT Principle	Culturally Relevant Instruction



	cultures and languages, my teaching materials and examples reflect the diversity of my classroom				
Question 5	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
What strategies do you use to ensure that students with different language backgrounds understand your lectures, assignments, and assessments?	I use visual explanations, scaffolding, and peer discussions. I also repeat key instructions, encourage clarifying questions, and share written summaries or annotated slides.	I usually discuss with the students in the opening class activity and decide which language to use for better communication and learning experience of the students. Most of my assignments are of a practical nature so language doesn't affect the performance of the students in the tasks.	Students do understand the rubrics, assignments, and group projects in the English language easily. Most students come with English medium schooling so nothing is beyond their understanding	I speak slowly, repeat key points, and sometimes provide notes in Urdu or bilingual slides to help them understand better	I encourage them to come up with their issues with regard to language barrier and provide them advising sessions in my office to help them improve English language skills.



Question / Analysis	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
Participant Response	Mathematics assignments are typically in English, but during oral discussions or tutorials, I allow flexibility. If a student is struggling to express something in English, I encourage them to explain in Urdu or another language they're more fluent in.	I offer students the chance to interact in any language that we mutually understand. Since I have been in an environment of diversified languages, it is easy for me to understand the students' responses most of the time.	No, they remain easy and enjoy their learning in the English language.	Yes, I allow students to give presentations or write reflections in the language they're most comfortable with, when possible.	No, as my course is Writing and Communication course, I discourage them to speak in any other language than English.
Initial Codes	Oral discussion/tutorial flexibility; allowing Urdu or another fluent language; support for struggling English expression.	Interaction in mutually understood language; diversified language environment; understanding students' responses.	Comfort with English language; enjoyment of learning in English; limited perceived language barrier.	Presentations in comfortable language; written reflections in preferred language; student language choice.	English-only communication; discouraging other languages; course-based language restriction.
Theme	Flexible Instructional Approaches; Autonomy in Language Expression.	Flexible Instructional Approaches; Autonomy in Language Expression.	Positive Student Attitudes Toward English.	Autonomy in Language Expression; Flexible Instructional Approaches.	Tensions in Language Policy.
LRT Principle	Multilingual Flexibility in Instruction.	Multilingual Flexibility in Instruction.	Multilingual Flexibility in Instruction.	Multilingual Flexibility in Instruction.	Multilingual Flexibility in Instruction.



Question 7	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
Do you encourage students to use their home languages, bilingual resources, or translanguaging strategies in your classes? Why or why not?	Yes, especially when it helps students bridge their understanding. I believe language should not be a barrier to learning, and using bilingual strategies can build confidence and engagement.	As per the cohort, I allow students to interact multilingually if they want to express their thoughts in a more coherent way. Since education is connected to promote learning and improving the thought process of the students and the teacher should facilitate in this regard.	Absolutely not because we follow the university's medium (English) of learning and teaching.	Yes I believe students should feel confident using their home languages where it helps them express ideas better. It builds inclusivity.	Bilingual resources are encouraged only during class discussions but not for graded assignments and assessments. I discourage students to use their home language so they may focus on learning English language.



Initial Codes	when it helps students bridge their understanding, bilingual strategies, interact multilingually if they want to express their thoughts in a more coherent way, follow the university's medium (English) of learning and teaching, feel confident using their home languages, discourage students to use their home language	Theme	Use of Bilingual/Multilingual Strategies Translanguaging as a Learning Bridge Institutional Language Expectations Mixed Attitudes Toward Home Language Use	LRT Principle	Support for Multilingual Classrooms
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Question 8	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
What are your thoughts on the role of AI in promoting or hindering linguistic equity in higher education?	AI has the potential to promote equity if used thoughtfully—for example, through translation tools, voice-to-text, or multilingual support systems. But it also risks reinforcing English-dominance if local language tools aren't developed and integrated.	The AI provides a solution to overcome language barriers for students who are not good at certain languages. However, I feel that AI may disrupt the student's own ability to generate creative write-ups. In this regard, training of students is necessary to effectively use AI while improving their critical and creative thinking skills	AI has put a positive role in learning and teaching with the thought that we need to prepare ourselves to incorporate AI in the age of the modern digital age. We (teachers) must have a good understanding of prompting to achieve standard level results by applying any application of AI in our teaching and learning.	AI can be helpful by offering translation tools and writing support but it also needs careful use to avoid reinforcing bias or inequality.	Yes, AI can help in promoting linguistic equity in higher education by using different AI tools for research and language acquisition.
Initial Codes	AI has the potential to promote equity when used thoughtfully, training of students is necessary to effectively use AI, a positive role in learning and teaching, can be helpful	Theme	Equity and Inclusion through AI Pedagogical Enhancement Digital Preparedness	LRT Principle	Generative AI as a Tool for Linguistic Equity



	by offering translation tools and writing support, AI can help in promoting linguistic equity in higher education				
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Question 9	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
What kinds of support (professional development, tools, and institutional policies) would help you better serve multilingual learners?	Workshops on multilingual pedagogy, access to inclusive AI tools, and flexibility in institutional policies for assessments and content delivery would be helpful.	I usually use diversified teaching content which is mostly in the language that students understand. It totally depends on the cohort of the students that what do they need for better learning	The university arranged a course on AI for its faculty and it has impacted positives to integrate the things accordingly. It also helps to cop up various linguistic challenges	Workshops on inclusive teaching and access to bilingual resources would really help. Peer sharing sessions with other faculty would also be great.	Until the institutional policies encourages us to be bilingual in the classroom, we need to adhere to the policy of being monolingual in English/ Writing and Communication classrooms.
Initial Codes	Workshops on multilingual pedagogy, flexibility in institutional policies, diversified	Theme	Institutional Policy and Flexibility Capacity Building for	LRT Principle	Need for Professional Development



	teaching content, university arranged a course on AI for its faculty, Workshops on inclusive teaching, institutional policies encourages us to be bilingual		Inclusive Teaching		
			Pedagogical Diversity		



Question 10	Participant Response				
	Instructor 1	Instructor 2	Instructor 3	Instructor 4	Instructor 5
Are you interested in having multilingual classrooms? Yes or no, why?	Yes. Multilingual classrooms enrich discussions, reflect real-world diversity, and allow students to express themselves more authentically. They foster a more inclusive and empowering learning environment.	Yes. It encourages respecting diversity and promote an inclusive environment .	I think a unified language is good for learning and teaching so the answer comes with NO.	Yes, multilingual classrooms promote empathy and broader understanding. They prepare students for diverse workplaces and real world communication .	Yes, because it helps to foster student engagement and boosts their confidence.
Initial Codes	Multilingual classrooms enrich discussions, reflect real-world diversity, foster a more inclusive and empowering learning environment, encourages respecting diversity and promote an inclusive environment, a unified language is	Theme	Multilingualism as an Educational Asset Inclusive Pedagogies Student-Centered Outcomes Empathy and Intercultural Awareness	LRT Principle	Support for Multilingual Classrooms



	good for learning and teaching so the answer comes with NO, promote empathy and broader understanding and prepare students for diverse workplaces and real world communication , it helps to foster student engagement and boosts their confidence.		Language Policy Contradictions		
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Table 3Thematic Analysis of the responses of the instructor participants based on deductive approach

Theme	Theme Title	Agreement Level
1	Recognition of Linguistic and Cultural Diversity	High
2	Linguistically Responsive Teaching Practices	Mixed
3	Culturally Relevant Instruction	High
4	Multilingual Flexibility in Instruction	Mixed
5	Generative AI as a Tool for Linguistic Equity	Generally Positive
6	Institutional Constraints	Recurring Concern
7	Need for Professional Development	High
8	Support for Multilingual Classrooms	Mostly Positive



The agreement level of the instructor participants is cognizant of the fact that they distinguish the linguistic and cultural diversity in their classrooms, hence, the instruction material is culturally relevant. However, there's a strong emphasis on the professional development of the faculty to inculcate Generative AI into their classrooms. Also, the institutional policies restrict the instructors to acclimatize to bilingual pedagogy. Furthermore, flexibility in a multilingual classroom and using Linguistically Responsive Practices is subject to the course being taught. Overall, there is a positive response to support multilingual classrooms and use Generative AI as a tool for linguistic equity. The responses of the instructor participants are available at this link <https://drive.google.com/drive/folders/1-ESPMwK0r7O9fqLRdMaqayWjBLtNEpW0?usp=sharing>.

5.3 Ethical Considerations

Ethical approval

This is to confirm that the research study titled “Integrating Generative Text-to-Video AI in Linguistically Responsive Pedagogy: A Case Study of Multilingual Learners in Higher Education” has adhered to all applicable ethical standards and guidelines throughout the research process. This research has been deemed exempt from the IRB review, as it posed minimal risk to participants and did not involve the collection of identifiable information.

Informed consent

Prior to commencing data collection, the participants were provided with detailed information about the study's procedures and fully informed about the purpose of the research and the study's aims, their rights as respondents (including the right to refuse participation or withdraw from the study at any time), and the measures taken to ensure their confidentiality and anonymity. An informed consent was obtained from all participants before taking part in the study avoiding any form of coercion or undue influence in securing participation.



Furthermore, the researcher confirms that the study adheres to the relevant ethical guidelines for human participants, and that it followed ethical measures in compliance with institutional and international guidelines, including: The research involved analysis of anonymized, aggregated data obtained from classroom activities for educational research purposes. No personal or identifying information or direct identifiers such as name, roll number, contact number, email address or program major of the student participants was collected, acquired, or utilized at any stage of this study. The research concentrated on instructional strategies to compare the instructional techniques while using Generative T2V AI. The information obtained through focus group with the instructor participants does not help to ascertain their identities, directly or indirectly through identifiers linked to the subjects. All instructor data has been entirely de-identified (individual responses were stripped of names and unique identifiers) ensuring the complete anonymity and privacy of all participants. The research posed no more than minimal risk and was conducted in a manner that fully protected the rights and welfare of the participants involved.

6. Conclusion

This study explored the linguistically responsive teaching practices instructors implement in their multilingual classrooms and how generative AI—specifically text-to-video tools—can support linguistically responsive teaching (LRT) for multilingual undergraduate students in higher education settings.

6.1 Quantitative Highlights ((from students))

The students reported positive perceptions of AI-generated video tools in terms of clarity, comprehensibility, and engagement. The *Perceived Educational Inception Score* (PEIS) indicated a moderately high educational impact, especially when diversity and quality were jointly



considered.

6.2 Contribution to the field

This study extends the concept of *Linguistically Responsive Teaching* by integrating generative AI as a pedagogical aid. It proposes PEIS as a novel metric to evaluate student perceptions of AI-enhanced multilingual learning.

6.3 Pedagogical Implications

Institutions should consider training instructors in AI-supported multilingual teaching practices. Generative AI tools must be developed with cultural and linguistic sensitivity, including multilingual capabilities. Curriculum design should allow flexibility for translanguaging and inclusive media.

6.4 Limitations of the study

The advanced features of AI tools are behind paywall and cannot be accessed. The AI tool exposure lacks context-specific video production. Furthermore, these findings may not generalize across institutions with different linguistic policies. Although 15 instructors were reached out to, but only 05 responded is another limitation factor impeding the sample size of the focus group.

6.5 Future Directions

Longitudinal studies on student performance using AI-generated content can be explored along with the development of localized AI tools for non-English dominant educational environments along with cross-disciplinary research combining linguistics, AI, and pedagogy. Overall, the findings suggest that with intentional design and pedagogical alignment, generative AI—particularly text-to-video tools—can enhance linguistically responsive teaching. However, institutional support, ethical considerations, and inclusive AI development remain critical to its meaningful integration in multilingual higher education contexts.



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