Article

Using Instructional Technologies to Cater for Individual Learner Differences

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Abstract
This paper seeks to guide teachers on how to integrate technology into their teaching in ways which allow them to tailor instruction to individual learners' needs. It considers the importance of awareness of individual learner differences and how can teachers respond to these differences through the considered and flexible use of technology in their teaching. It is based on a study of teachers and learners studying English in a University setting in Algeria, with data collected through interviews and from learners' diaries. The findings indicate that greater teacher awareness of and responsiveness to individual learner differences can help with learner engagement in classes involving technology-enhanced language learning (TELL) and therefore potentially improve outcomes. They also suggest that the wide range of technological tools now available can accommodate individual learner differences by allowing variation in terms of the content of classes, tasks, learning modes, teaching and learning strategies, assessment strategies, and complexity level. The findings could therefore help teachers to better understand the educational needs of individual learners and the role of technology in meeting these needs.

Keywords
Instructional technologies, individual learner differences, differentiated instruction

1 Introduction

Being aware of and addressing the multiple and complex individual learner differences in the language classroom can be a significant challenge for teachers. As Tomlinson (2017) notes, teachers need to use a variety of approaches in the classroom to provide learners with different ways to learn effectively. In addition to this, with the teaching and learning process becoming increasingly entwined with technology use, teachers, learners and institutions all expect the use of technological aids, both in education in general and in language classes. These expectations necessitate an understanding of the efficacy of technology in the language learning classroom, which in turn requires consideration of the role of technology integration in accommodating individual learners' needs.

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The influence of technology on the psychology of language learners can be seen in terms of positive factors such as motivation and engagement (Abderrahim & Navarro González, 2020), autonomy and responsibility (Huang, 2020), and mindset and willingness to communicate (Chism & Graff, 2020). This paper aims to investigate teachers' awareness of different responses by learners to technology integration and the ways these differences are accommodated. It sheds light on the way technology integration represents an important means of differentiating instruction and effectively addressing individual learner differences.

2 Literature Review

In order to better understand the impact individual learner differences can have on technology choices and that technology can have on individual learners, literature concerned with individual learner differences in language learning, technology in language learning, and the interface between individual learner differences and technology integration is explored.

2.1 Individual learner differences in language learning

A key concept motivating this study concerns individual learner differences. Dörnyei and Ryan (2015, p.2) define these differences as "characteristics or traits in which individuals may be shown to differ from each other … [t]hey concern anything that marks a person as a distinct and unique human being". More recently, Griffiths and Soruç (2021, p.341) suggest a more classroom-focused definition of the concept, describing individual differences as "characteristics which make learners different from each other and which affect the way they behave in the classroom and beyond".

Despite the fact that students have much in common within a class, such as the same teacher, textbook and learning experience, there can still be dramatic differences in the level of success achieved by learners, depending on factors such as differences in motivation and the differing personalities of the learners. As Griffiths and Soruç (2020, p.2) note, "what should be included as an individual difference is far from universally agreed, even among those who are considered experts and who have published in the subject". Skehan (1991) includes foreign language aptitude, motivation, learner strategies, and learner styles in his description of individual learner differences. Later, Dörnyei (2005, 2015) discusses personality, language aptitude, motivation, learning styles and cognitive styles, learning strategies and self-regulation, as well as other learner characteristics such as anxiety, creativity, willingness to communicate, self-esteem, and learner beliefs in relation to individual differences among learners, while Rukanuddin et al (2016) include age, aptitude, intelligence, cognitive style, motivation, attitude, and personality in their description. More recently, Griffiths and Soruç (2020) themselves list age, gender, ethnicity, aptitude, personality, learning style, language learning strategies, autonomy, beliefs, affect, and motivation as factors determining individual learner differences.

It seems clear that individual learner differences play a central role in second language learning. In this respect, Selinker (1972, p.213) believes that "a theory of second language learning that does not provide a central place for individual differences among learners cannot be considered acceptable". For language teachers, a knowledge of learners' individual differences is necessary to help them decide which methods, activities and materials are optimal to maximise their learners' achievements (Kubat, 2018). Along similar lines, Griffiths and Soruç (2020, p.2) state that:

> If they [teachers] become aware of learner differences in their classrooms, they can develop material, change their teaching style, adopt new instructional strategies, and give feedback considering all the learner differences in the classroom.

Kubat (2018, p.34) suggests ways to help teachers identify individual learner differences, including the use of tests, homework, observation and projects. However, it would of course be challenging for teachers to determine individual learning attributes for each learner and teach each one in a way that suits those attributes all the time, especially in larger classes. Nevertheless, teachers who know about their learners' differences and try to vary their strategies can teach in ways that can potentially satisfy different learners' needs satisfactorily. As Kubat (2018, p.30) comments, "when planning teaching, it is more likely that a plan based on the learning style and speed of the students, rather than the collective instruction, will lead to a more efficient learning environment". In other words, learners who differ in ability and likely level of achievement are likely to benefit from different tasks and assignments, selected appropriately according to their level and other individual characteristics.

A report by the Australian Capital Territory (2016) stresses that some learners need supplementary, intensive and more personalised support in order to engage effectively in the learning process, and so require a curriculum that is designed in accordance with specific intellectual, social and emotional learning needs, thus "[c]urriculum differentiation is critical when designing learning programmes to respond to the individual learning needs of students" (p.9). Similarly, Kubat (2018) suggests flexible delivery of classes to cater for different learners' preferred ways of learning, such as by using different teaching methods, giving learners responsibilities, allowing for different rates of learning and for learners to concentrate on their own interests, and taking advantage of non-standard learning opportunities which engage different senses.

2.2 Technology in language learning

Technology, "digital or electronically based devices, resources or processes that facilitate the teacher and learners' ability to think, perform and succeed" (Mercado, 2017, p.2), can play an important supporting role in the language classroom. Indeed, as part of the ongoing quest to make the teaching process more diverse, effective and engaging, "technology can facilitate the English language learning process by making it more amenable and relevant to twenty-first-century learners, if it is applied wisely" (Mercado, 2017, p.2). Stakeholders in the teaching and learning process therefore need to make appropriate choices concerning which technologies are used, as well as when and how they are used so as to maximise the benefits of technology as an instructional medium. In other words, technology "will only become a powerful enabler and enhancer of the learning experience if the key stakeholders in the educational process use it with enough knowledge, expertise and determination" (Mercado, 2017, p.18).

In recent years, educational planning has placed considerable emphasis on ways technology and technological devices can be beneficial for language learning. In this vein, the US-based National Education Technology Plan (NETP) (2017, p.12) update report lists five ways technology can enhance learning:

- "Technology can enable personalized learning or experiences that are more engaging and relevant". This suggests that it can create opportunities for learners to take responsibility for their learning, including outside the classroom. Technology can, for example, help to facilitate essay writing, sharing knowledge and collaborative work.
- "Technology can help organize learning around real-world challenges and project-based learning - using a wide variety of digital learning devices and resources to show competency with complex concepts and content". This suggests that technology can make learning more engaging through incorporating real-world experiences which in turn can keep the learner at the centre of learning design.
- "Technology can help learning move beyond the classroom and take advantage of learning opportunities available in museums, libraries and other out-of-school settings". The NETP offers an example of an attractive event, namely "the Global Read Aloud", which connects students from all over the world who read, share and discuss thoughts and understandings of the same literature.

- "Technology can help learners pursue passions and personal interest". Consequently, it may encourage learners to explore their own particular areas of interest and to develop research skills, fostering engagement and motivation.
- "Technology access can close the digital divide and make transformative learning opportunities available to all learners". For example, learners with physical impairments can benefit from online courses and have greater opportunities to achieve their goals.

Because of these benefits, there has been an increasing focus on integrating technology into classroom teaching and on making the changes to practice necessary for this to happen. Fullan (2016, p.28) notes that this kind of change in the classroom practices necessitates innovation across three dimensions: the possible use of new or revised materials, the possible use of new teaching approaches and the possible alteration of beliefs. This can be challenging for teachers who, in integrating technology into their classes, need to keep focused on their learners - asking themselves questions such as what their learners need to learn from an activity and what the use of technology brings to the activity. As Hockly (2017, p.22) notes, "there is no point in using technology for its own sake. … [as a teacher, you have to] ensure that your use of technology is meaningful, and that it supports their [students] learning as far as possible". However, although research suggests that teachers have the biggest influence on learning, we cannot neglect the wider role of educational institutions and their "need to support teachers in accessing needed technology and in learning how to use it effectively" (NEPT, 2017, p.28). Indeed, the lack of training for teachers remains one of the main challenges when incorporating technology into teaching.

2.3 Individual learner differences and technology integration

Zarrinabadi and Freiermuth (2020) include in their edited volume a number of studies concerned with technology integration and the psychology of second language learners (cf. Abderrahim and Navarro González (2020); Yang (2020); Huang (2020); Zarrinabadi and Khodarahmi (2020); and Paschalidou (2020)). These studies consider different variables such as motivation, engagement, autonomy, self-concept and attitude in technology-mediated learning settings. They focus on how technology integration might improve the psychological states of second language learners through, for example, facilitating autonomous behaviour and increasing learner responsibility in the learning process. They also consider how technology can engage individual learners and positively affect their motivation in different ways, highlighting the role technology can play in accommodating individual learner differences.

3 Research Methodology

3.1 Research design and research questions

In order to gain an understanding of the importance of individual learner differences in language teaching and learning and the role of instructional technologies in catering for these differences, a qualitative case study approach was adopted to explore a real-world case of teachers using instructional technologies to respond to individual learners' needs. The study aims to present a contextualised picture of technology integration in second language teaching and learning and to acknowledge multiple realities in the way technology can be used to cater for individual learner differences.

The study focuses on teachers' use of instructional technologies to cater for individual learner differences and seeks to investigate the following research questions:

1. To what extent are teachers aware of and responsive to individual learner differences in the language teaching and learning process?
2. How can instructional technologies accommodate these differences?

3.2 Context and participants

The study was conducted within the English language department at a university in north-western Algeria. Three university teachers and three students at the department were involved as participants. Teacher participants (T1, T2, and T3) either hold or are studying towards a Doctorate. They had varied teaching experience and were responsible for different modules with undergraduate programmes relating to two specialties: Literature and Civilization, and Language Studies. Student participants (S1, S2, and S3) belonged to existing groups studying English at this university. The students involved were aged between 19 and 23 years old.

3.3 Data collection

3.3.1 Teachers' interviews

Interviews were used to "explore issues in depth, to see how and why (teachers) frame their ideas [… and] how and why they make connections between ideas, values, opinions, behaviours, etc." (Cohen et al, 2018, p. 506). The interviews took the form of a dialogue between participants, or as Brinkmann and Kvale put it, each one was "an inter-view where knowledge is constructed in the inter-action between the interviewer and interviewee" (2018, p.2). Through the interviews, data was gathered about the teachers' beliefs concerning individual learner differences and the way they use technology to respond to these differences.

In planning, conducting and analysing the interviews, Brinkmann's and Kvale's (2018, p.41) seven-stage process was followed. This began with "thematizing", where the precise aims of the research and rationale for data collection via interviews were confirmed. The second stage, "designing" the interview entailed formulating the interview questions. The next, "interviewing", stage involved conducting the interviews, which lasted between 20 and 40 minutes for each participant and took place in either the teachers' offices or the teachers' room in the department. Following the interviews, the "transcription", "analysis", "verification" and "reporting" stages of the process took place.

3.3.2 Students' diaries

Dörnyei (2007, p.156) notes that diaries "offer the opportunity to investigate social, psychological and physiological processes within everyday situations". As such, they provide an additional means of understanding the way technology use can affect individual learners, capturing the experience as lived by an individual, where different individuals may choose to report their experiences in different ways. As Bailey and Ochsner (1983, p.189) note, the diarist "can report on affective factors, language learning strategies, and his own perceptions - facets of the language learning experience which are normally hidden or inaccessible to an external observer".

In practical terms, guidelines were provided for the student participants on how to write diaries. They were asked to write their feedback and feelings on the technology used in classes, giving as much detail as possible. The diaries therefore provided student participants' thoughts and feedback on, for example, what they enjoyed or did not enjoy, how they felt when using particular technological tools, and their views about technology use both inside and outside the classroom.

3.3.3 Students' interviews

Interviews with student participants were used to follow up on what students wrote in their diaries, with questions building upon insights gained through the diaries. Accordingly, the interviews differed slightly for each student participant and provided a platform of them to voice their opinions about instructional technologies in relation to their own learning experiences.

3.4 Data analysis

This study uses thematic analysis to gain insights into participants' ideas, beliefs, knowledge and experiences in relation to technology use. Our approach to generating themes aligns with Holliday's (2016, p. 103) description of the formation of themes where "researchers often know the character of their data regardless of any formal analysis. It is after all largely a product of their own thinking during the process of collecting and recording". Developing themes was, therefore, the result of the connections made during data collection process and during initial analysis of the data, making use of understandings developed and notes made when collecting, recording, and transcribing data and then rearranging them in a structured way.

4 Findings

4.1 Awareness of individual learner differences

The importance of teachers being aware of individual learner differences was highlighted by teacher participants in the study, with several strategies suggested to raise awareness of these differences.

4.1.1 Getting feedback from students

Getting feedback was highlighted as a means of understanding individual learner differences when integrating technology into classes. As T1 noted:

> I can understand if it [technology integration] was successful or not through their interaction and getting their feedback by the end. I ask them what do they think and whether they want me to use it again. (teacher interview)

More specifically, anonymity in giving feedback was highlighted and praised by student participants as means through which honest feedback could be given. In the context of using interactive presentation software to provide feedback, participants commented:

> When I am shy and I don't have enough confidence to give my opinion, the software and my mobile gave me the chance to participate. As if I am under door and this is the chance to say what I want to say. (S1, learner diary)

> All students can share their point of view, and all students including shy students who never talked in the classroom are given the chance to give their opinions because of anonymity. (teacher interview)

Thus, facilitating opportunities for anonymous feedback from students creates the opportunity for teachers to find out more about their learners' needs, attitudes and preferences in learning, and in addition it provides an opportunity for learners' voices to be heard.

4.1.2 Using group dynamics

Teacher participants suggested that developing an understanding of group dynamics could be beneficial in identifying and understanding individual learner differences. As T2 noted:

> Observing students interacting in groups and their behaviour could be an effective determinant of students' differences. We as teachers can easily understand students and identify their needs through their communication, interaction, cooperation, and competition. (teacher interview)

In a similar vein, T3 commented:

> The relationships between students when working together in a group help me identify their differences in character, ability, and achievement and therefore select the appropriate teaching methods and strategies. (teacher interview)

An awareness of group dynamics in the sense of understanding of the characteristics and behaviours of learners working in small groups, seemed to help teachers understand more about individual learner differences and preferences.

4.1.3 Identifying individual learning strategies

Particular learning strategies were chosen deliberately by learners depending on their learning preferences. The different strategies selected by different learners assisted the teachers in revealing individual learner differences and preferences in the classroom. As T2 noted:

> I always pay attention to the motivation and the desire of my students to work with some things rather than others in order to help them challenge themselves, improve, and evolve … (teacher interview)

This highlights the need for teachers to develop an awareness of their learners' preferred learning strategies in order to help them achieve their goals.

4.2 Adaptation to individual learner differences

The need to adapt classroom teaching to accommodate individual learner differences, and in particular the need to ensure that instruction is inclusive of potentially diverse groups of learners, was highlighted. Techniques suggested by participants to make the classroom environment more accommodating of individual learner differences are discussed below.

4.2.1 Instructional adaptation

T2 showed a willingness to adapt the content of her classes based on learners' preferences:

> Most of the group would like to dedicate their session for reading because they come from a literary background and they have already read many books. Though I am not specialist in literature and I don't read literary books, I agreed on that and each session we selected one student to speak about a famous literary book and explain it … (teacher interview)

Teacher participants also suggested offering differentiated input, varying the tasks given, the materials used, the product required or the teaching method used. T3, for example, commented that:

> We should vary our teaching strategies and provide choice to students in order to meet their needs and expectations. We may decide to use technology tools based on our students' desire in certain conditions and we may withdraw such a decision in other circumstances. (T3, teacher interview)

4.2.2 Making use of technology

Appropriate use of technology can offer learners diverse learning opportunities which suit their different learning preferences and enrich the learning experience, as revealed by S2 and S3:

> Using a video, I see things and I can take part of them… I use my eyes and ears to grasp the meaning… Listening to the teacher giving instructions, however, is sometimes boring. (S2, Student interview)

> Seeing a video is not like reading a text…Visuals, animations and scenes do stick in my memory and the day of the exam I can remember them easily. This is a great way to memorize things and keep them in mind for a long time. (S3, student interview)

Adopting new instructional technologies can thus be central to supporting students and addressing their individual needs.

4.3 Catering for individual learner differences through technology integration

Technology integration can play a fundamental role in how classes are delivered and therefore in addressing individual learners needs.

4.3.1 Varying the content of classes

Different teacher participants referred to different ways technology can help them to vary the content they present, the way they present it, and have an impact on what learners learn:

> Technology and internet represent a great platform which provides accessibility to a wide range of content areas. In addition to this, it facilitates access to different written, visual and auditory input. (T1, teacher interview)

> Using Internet, I can easily diversify what I am teaching and what my students are learning. We do not need to stick to one area; students can make research, presentations and projects in different domains of knowledge. (T3, teacher interview)

Another indication of the fact that technology offers access to different content was addressed by S2, who appreciated the variation of content, method and the setting of learning:

> Technology is giving me a certain degree of freedom, variation and more space. It is up to me to choose what to learn, how to learn and when to learn. (learner diary)

4.3.2 Varying the teaching strategies

Technology helps teachers use different teaching methods which allow them to engage and motivate their learners in different ways in the classroom. T1 gave an example of the flipped learning strategy and the way it addressed particular individual learners' needs:

> Flipped learning is really helpful for students who need time and repetition again and again to absorb information. They have enough time before coming to class to read or see the content of the lecture. Then, when we come to the classroom, I explain again and remind them of the lesson and they have time to ask for more clarifications. (teacher interview)

Similarly, T3 considered the way technology integration involved the listening skill as a strategy when teaching a module called "Oral Expression":

> Teaching Oral Expression module has changed nowadays. Before the module was all about speaking, now technology is allowing us to include listening as well. (teacher interview)

The diversity of technology use and resources was also highlighted by S1 who reported being able to understand language more easily and a feeling of freedom and enjoyment when learning:

> The variation in technology use and its resources makes me enjoy its use, understand easily and learn more independently. (student interview)

4.3.3 Allowing different learning modes

By integrating appropriate technology in the teaching and learning process, teachers are enabling different ways of learning and learners with increased and diverse opportunities to enrich the learning experience.

S3 appreciated that the use of instructional technologies within her university encouraged a learner-centred approach and gave more responsibility to the learner:

> I like the university's system because everything is based on the student and we are using educational technologies which encourage student-centred education in the classroom (student interview)

She also referred to a flipped learning experience used by one of her teachers which helped her learning by allowing her to be more self-reliant and engaged, so facilitating information retention:

> One of our teachers used to send us lectures in a form of a video. We watch it at home and when we come to class she just summarizes the content of the video. Such a method was advantageous: I felt like I am relying on myself and when I extracted the rules from a video I couldn't forget them later on (learner diary)

In a similar vein, S2 showed gratitude towards the use of technology as it allowed her to listen to audiobooks during her work time and benefit from an independent learning experience:

> I am someone who studies at university and works at the same time. I love literature and I enjoy reading books but I have no time for that. So, while I am doing my job I wear my earphones and listen to audiobooks. That's an effortless hobby that makes me feel happy and knowledgeable at the same time. (student interview)

S1 and his classmates seemed to benefit from the use of social media within their learning experience. He recognised the role this had in helping to facilitate collaborative learning, partly through creating a more informal environment, commenting that:

> We created a group on Facebook and it is really helpful. We share lectures, homework, and assignment deadlines. We ask questions about lectures or points that we couldn't understand or we missed in the classroom. We share experiences and we reflect on each other's' work. (learner diary)

4.3.4 Taking multiple approaches to formative assessment

Technology-mediated instruction can allow a variety of formative assessment tools to be offered, which can help teachers evaluate their learners more quickly and easily. In this study, different approaches to formative assessment helped teacher participants determine their learners preferred ways of learning, strengths, weaknesses, interests and needs more effectively. As T2 suggested:

> We have access to a variety of technology-based assessment tools. Interactive presentation software, for example, allows us to embed questions into the lesson or check the students' understanding by the end of the class. Digital journals also help students to reflect on the

content delivered in the classroom and discuss what they understood and what they did not and define their strengths and needs. (teacher interview)

4.3.5 Differing complexity levels

The use of technology also allows teachers to manage learners with different levels and abilities. It helps them to assess the learners' abilities and tailor instruction according to these abilities. As T1 commented:

Instructional technologies help me diversify complexity levels according to the students' different abilities which necessitate different tasks and teaching practices. Using technology, I can give assignments to students and add additional instructions on an individual basis according to their abilities. (teacher interview)

Using instructional technologies therefore provides teachers with opportunities to adjust the learning experience according to the learners' abilities.

5 Discussion

The findings above have highlighted a number of issues in relation to individual learner differences, as discussed below.

5.1 Awareness of individual learner differences

The study has provided a reminder of the need for teachers to focus on language learners as individuals who approach the learning process in their own unique ways. These individual learner differences can be an important determinant of how learning happens and thus impact significantly on learning outcomes. Teachers therefore need to develop an awareness of individual learners' needs in order to meet these needs and so improve learning outcomes.

The study suggests various strategies and teaching practices that could assist teachers in raising their awareness of individual learner differences and learning preferences including:

Getting anonymous feedback from learners on the classes and materials used: this would provide honest feedback about what the learners find useful in terms of teaching practices and materials, giving learners more of a voice in the learning process. It would also facilitate opportunities for reflective practice among teachers and for building a collaborative learning culture within the classroom. The anonymous aspect is important since, as Shaheen et al (2021) notes, it reduces learners' apprehension about giving honest feedback and therefore allows teachers to uncover the learners' genuine needs, preferences and problems, and to maximise the chances of engaging the learners.

Developing an awareness of group dynamics: as Dörnyei and Murphey (2003) note, positive group dynamics can create a positive atmosphere in the classroom. When learners are cooperating and working towards a common goal, they need, for example, to communicate with each other, challenge each other, assign roles and showcase their individual abilities. This could in turn provide an opportunity for the teacher to observe and recognise individual learner differences.

Identifying individual learning strategies: different learners use different means of achieving their learning goals. By identifying the techniques and strategies learners use, either through observation, discussion or asking directly, teachers will be better placed to recommend learning goals appropriate to each individual learner.

5.2 Adaptation to individual learner differences

As outlined above, being aware of individual learner differences in language learning classrooms is of great importance in improving learning outcomes. However, teachers also need to respond to these differences in order to move towards a more optimal learning environment. This study suggests several ways to make instruction more accommodating of individual learner differences, in particular:

Instructional adaptation: teachers may vary the content of their classes, their approach to teaching, the product through which learners' knowledge is demonstrated and the learning environment. They may also provide choice and flexible-paced learning in order to allow learners to study in ways that maximise their engagement. As Parsons and Vaughn (2016, p.14) note, teachers focusing on individual learners needs in this way "are able to balance instructional mandates, beliefs of instruction, and their students' interests, cultures, and instructional needs into the classroom".

Making use of technology: the introduction of interactive tools and digital resources may in turn help to engage learners, for whom technology is already a central part of their everyday lives. Digital resources also offer diverse and innovative approaches to teaching and learning such as through the use of flipped learning, which suit different learning preferences and enrich the learning experience, but which were not available as part of the teacher's repertoire in the past. More broadly, as Motteram (2013, p.77) notes, one reason teachers give for 'harnessing technology for adult learners' is that it allows them "to fill some particular needs gap (…) and provides for individualised and differentiated tasks".

5.3 Catering for individual learner differences through technology integration

This study highlights a number of ways in which planned and purposeful technology integration into language learning can help to enable differentiated instruction according to individual learners' needs.

The use of instructional technologies in language learning can, for example, assist teachers in varying the content of classes, teaching strategies, the learning mode (e.g., student-centred learning, collaborative learning, or autonomous learning), the approach to assessment, particularly formative assessment, and the complexity levels within the class and the materials.

The aforementioned strategies are echoed in the characteristics of differentiated instruction highlighted by Tomlinson (2017) as means of helping teachers deal with the diversity of individual learners' needs. These characteristics include being "proactive" in the sense that the teacher keeps in mind that learners learn differently, anticipates what might happen in the classroom, and "proactively plans lessons that provide a variety of ways to 'get at' and express learning" (p.5). Through the use of technology, teachers can provide diverse learning opportunities for learners through multi-modal (e.g., written, visual and auditory) input, which can in addition increase learner engagement.

Tomlinson also notes that "differentiated instruction is more qualitative than quantitative" (2017, p.6). A quantitative approach to differentiation looks inefficient since one assignment can be too demanding for a struggling learner and more than one task can be regarded as a punishment by advanced learners. For this reason, teachers are encouraged to alter "the nature of the assignment to accommodate individual learners' needs". In addition, she suggests that "differentiated instruction is rooted in assessment", seeing a formative approach to assessment as necessary to determine how learning is taking place and to assess "the students' developing readiness levels, interests, and approaches to learning and then design learning experiences based on the latest, best understanding of students' needs" (p.7).

Another characteristic of differentiated instruction is the fact that it takes "multiple approaches to content, process, and product" (Tomlinson, 2017, p.7). By varying these elements, teachers are visualising differentiation in practical ways that can encourage diversify what learners learn (the input), how they learn (the process), and how they demonstrate what they learn (the output). By implementing a

technology-based learning approach, teachers have the potential to allow their learners to access and use a wider range of different content areas and procedures. Technology integration can also, as discussed earlier, support the use of different modes of learning such as autonomous learning, collaborative learning, and flipped learning. Digital tools afford a greater variety of ways to demonstrate different aspects of their learning, such as their verbal ability (via the creation of audio files, presenting, debating or discussing online through audio- or video-conferencing), their written ability (via research papers, essays, or writing practice on a class social network), or their visual ability (via posters, illustrations, images or videos.).

Tomlinson (2017) also emphasises the need for a learner-centred approach to facilitate differentiation in instruction. She sees differentiated instruction as a responsive instruction, giving every learner some degree of control in what and how to learn, noting that "teachers who differentiate instruction in academically diverse classrooms seek to provide appropriately challenging learning experiences for all their students" (p.8, our italics). Further, as Samaranayake (2020) observes, technology can help create and support a learner-centred environment since it engages learners in critical thinking, problem solving, collaboration and self-directed learning. This is also likely to increase learner motivation and responsibility in the learning process.

All of this said, this is not to minimise ongoing constraints on technology integration, with recent studies continuing to point to long-established barriers such as "teachers' unwillingness to use modern teaching strategies" and "the lack of modern classroom equipment" (Al-shaboul et al, 2021).

6 Conclusion

This study has explored the extent to which teachers are aware of and responsive to individual learner differences and the way instructional technologies can accommodate these differences. It suggests a number of ways to help teachers understand individual learner differences and adapt their teaching to create a learning environment inclusive of diverse learners. It also highlights the role of technology integration in addressing individual learners' needs.

The results of this study have several implications for accommodating individual learner differences through appropriate use of technology. Firstly, it highlights the potential for different approaches to learning to cater for different learners' needs, such as the use of online learning, which allows learners to study at their own pace, carry out additional research, manage their own time and gain familiarity with different technologies. Secondly, underpinning the potential for technology use to enhance the teaching process in a general sense, and its potential for helping to accommodate individual learner differences in particular, is a need for teacher training programmes to include a sustained focus on the use of technology in language teaching, as this is increasing becoming a key requirement in almost any teaching context.

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