

The Place of Information and Communication Technologies in Curriculum Design and Development

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ABSTRACT

With the introduction of more modern instructional practices, the traditional approach to learning and teaching is becoming ever more obsolete. Education practitioners all over the world have been calling for educational institutions, in both developed and developing countries, to improve pedagogical practices as a means of significantly enhancing learner experiences and outcomes in the learning-teaching process. There is evidence that rapid technological changes are taking place in the educational landscape and that the utilisation of Information and Communication Technologies in the instructional process is becoming more and more mandatory. Bearing in mind the afore-mentioned, the objective of this discussion is to underscore the place of Information and Communication Technologies in curriculum design and development. The focus of this discussion and review of literature is on curriculum and what it entails, the importance of curriculum, curriculum design and development, and ICTs and curriculum design and development (which looks at learning theories and ICT-based curricula, integration of ICTs into educational curricula, integration of ICTs into foreign language curricula, and the need for ICT-based curricula). Special consideration is given to ICT-based foreign language curricula because of the increasing importance of language didactics and foreign language education today. Information and Communication Technologies should be considered and integrated into educational curricula because they can revolutionise instructional practices and stimulate pedagogical innovation; foster learner engagement; cater for student learning diversity; promote learner independence and autonomy; increase learner interaction and communication, and support intellectual expressiveness and *creativity of learners, application, and lifelong learning*.

Keywords: *Information and Communication Technology/Technologies (ICT/ICTs); curriculum; curriculum design and development (CDD); learning; teaching; learning and teaching (learning-teaching)*

INTRODUCTION

In the traditional approach to learning and teaching, instructional practices were teacher-directed and teacher-controlled, where the teacher was seen as the 'sage on the stage'. All learning-teaching decisions remained solely in the hands of the teacher. All instruction was carried out via the face to face (F2F) delivery mode. The way in which traditional F2F instruction was conducted did not embrace student learning diversity. Biggs and Tang (2011), on this issue of traditional F2F teaching, contend that such a situation exemplified "what the student is": the teacher's responsibility was to teach and learners were expected to learn what was taught to them, however they could, if they could. Instruction was entirely *teacher-centred* and learners were expected to grasp information transmitted to them. Their preferred learning styles and learning diversity were not considered. The focus was not on tailoring pedagogical practices to meet learners' expectations. Their intellectual, emotional and social development and their personal characteristics (among many others) were not taken into account. *Learners' abilities determined whether or not they were able to "perform" and "attain high scores and grades"*. In essence, "*blame*" was cast on the learner for being bright or not being bright.

The intention of the above scenario is not to suggest that the traditional approach is (wholly) ineffective; in fact, the traditional approach has its own merits. F2F teaching, which is considered to be a traditional instructional mode of delivery, is still a powerful means of instruction (Johnson & Johnson 2005), and it is continually being proven to be effective, since one of the key factors in any process of formation is F2F interaction (Estaire 2005). F2F teaching should not be discarded or disregarded considering that it is the way in which it is carried out that will determine its efficacy or inefficiency. Despite the positive benefits which can be derived from F2F pedagogy, it is important to point out that such an approach, which may engage learners, is gradually becoming more and more out-dated because it does not support the different diversities and styles of learners and learning.

Consequently, education practitioners around the world continue to favour a more modern approach to learning and teaching which is in keeping with the rapid changes taking place in the educational landscape. Enrolments are higher (Burke & Jopson 2005; Guri-Rosenblit, Sebkova & Teichler 2007), and the delivery of high-quality education has now taken centre stage (Ramsden, 2003; Altbach, Reisberg & Rumbley 2009). “Since 2000 there have been dramatic changes in the nature of higher education. It is not just that participation rates are higher than ever ... but that these and other factors have altered the main mission of higher education and modes of delivery” (Biggs & Tang 2011, p. 3). Some of these changes include the demand for value for money; more quality programmes; programmes which are aligned to learners’ needs and interests and to employer guidelines and national development, and learning which is flexible and which can accommodate those students who are working full-time jobs, among many others.

The turning point for these dramatic changes taking place in higher education (HE), from the year 2000, has its origins in the Bologna Process (BP). Initiated in 1999 with the Bologna Declaration, the BP intensified and reiterated the appeal for a critical reform of HE curricula throughout Europe, a principal concentration on the attainment of learner (and learning) outcomes, and the promotion of *creativity, application and lifelong learning* (Council of Europe, 2014). The BP is a collective and collaborative effort among public authorities, universities, teachers and learners, stakeholder associations, employers, quality assurance agencies, international organisations and institutions geared towards European cohesiveness through high-quality HE practices (European Commission, 2016). The effects of the BP in Europe trickled down to other parts of the world. Educational institutions began to embrace the mandate to restructure educational curricula as a means of supporting 21st century didactic practices. Owing to these changing scenes in HE and higher educational practices, it is clear that pedagogical practices must undergo a paradigm shift, and it must break away from teacher-centred approaches (traditional) and embrace *learner-centred approaches* (modern).

In recent decades, modern approaches to didactics have been espoused. With the advent of technology, the use of Information and Communication Technology/Technologies (ICT/ICTs) and technology resources in the educational process has become more widespread. Education practitioners and researchers contend that ICT use can transform pedagogy and the design and development of educational curricula. “One of the strongest arguments for bringing new digital technologies into schools and other educational institutions is that, by doing so, we would trigger pedagogical innovation” (Laurillard, Oliver, Wasson & Hoppe 2009, p. 290). These rapid technological changes which are occurring in the educational arena suggest that educational institutions understand the need to integrate ICTs into their educational curricula to promote optimum learning. This is to say that at the moment of designing and developing curricula, technology and its resources should be incorporated so as to provide a more broad-based learning for learners using a repertoire of learning tools and resources, and to foster *creativity, application, and lifelong learning*. ICTs do occupy an important place in the curriculum design and development (CDD) process, considering that it is through curricula that educational objectives are implemented and appraised.

The emphasis of this discussion and review of literature is centred on curriculum and what it embodies, the importance of curriculum in the learning-teaching process, the design and development of educational curricula, and the centrality of ICTs and curriculum design and development (focussing on learning theories and ICT-based curricula, integration of ICTs into educational curricula, integration of ICTs into foreign language (FL) curricula, and the need for ICT-based curricula). Special emphasis is placed on technology-based language curricula because of the burgeoning field of language learning and teaching and its importance to the phenomena of globalisation and internationalisation. ICTs should be considered and incorporated into educational curricula for many reasons: they can transform didactic practices and activate pedagogical innovation; promote learner engagement; attend to student learning diversity; foster learner independence and autonomy; heighten interaction and communication among learners, and encourage intellectual expressiveness and *creativity of learners, application, and lifelong learning*.

CURRICULUM IS NOT 'SYLLABUS'

In educational institutions, the terms 'syllabus' and 'curriculum' are used frequently, and sometimes interchangeably. These two terms do not mean the same thing and should therefore not be swapped. Immediately below, a distinction is made between the two.

Syllabus

When planning and designing educational curricula, the content to be taught, the *what* of teaching, has to be determined and specified. After the instructional content has been chosen, it then has to be logically organised into teachable and learnable units. This resultant coherent arrangement of content is called a *syllabus*. A syllabus is usually context-specific (Candlin 1984). It delineates the list of course content that is to be worked during the learning-teaching process (Nunan 1993). The major focus of a syllabus is the selection of content and how it should be covered and graded (Rahimpour 2010). Of profound importance is the fact that a syllabus comprises only a small part of the curriculum (Richards 2013).

It is important to point out that the term 'syllabus' means different things in different contexts. In one context, it may refer to a specific course to be taught (for example, Research Methods). In another context, it may refer to the subjects in a specific programme (for example, Maths, English, Spanish, and Social Studies which may form part of the primary or secondary education programme). In yet another setting, it may refer to a course guide for learners (which includes aims and objectives, content, course policies, rules and regulations, required texts, and the like). These views of what a 'syllabus' is may have merit in the respective contexts in which it is used. However, as already highlighted in the paragraph above, *in strictest terms*, a syllabus is an outline or summary of topics that are to be covered in an educational course or programme. It is therefore considered to be *one* component of a curriculum.

Curriculum

Unlike a syllabus (which is only one part of a curriculum), the concept of *curriculum* is much more comprehensive. Curriculum can mean two things: (i) it can refer to the overall learning plan or programme in an educational institution (as in a school or university curriculum), and (ii) it can refer specifically to an individual course or subject (for example, the ED401 course curriculum, or the SPA103 course curriculum). In this discussion on the place of ICTs in CDD, the term curriculum refers to (ii) in all of the cases. While it is equally important to ensure that ICTs are integrated into the general curriculum of an educational institution (as in [i]), this paper is more concerned about the incorporation of technology and its resources into specific course curricula (as in [ii] above).

The term 'curriculum' is derived from the Latin word *currere* which signifies a 'race course'. When thinking of a race course, what comes to mind is movement from Point A to Point B which indicates that effort must be placed into achieving a specific objective. A curriculum can be defined as a 'plan for learning' (Lange 1994) and a 'guide for learning' (Prevedel 2003). In a course curriculum, the instructional process is clearly outlined to reflect the learning-teaching tasks and activities to be carried out from start to finish. Course content (syllabus) is designed and transformed into an instructional plan which enables learners to attain desired learning objectives (Wiggins & McTighe 2006; Sousa 2015). It is concerned with the planning, design and development, and implementation of a learning programme (Tomlinson 2013; Tahirsylaj 2015). In specific terms, when one hears the term 'curriculum', it refers to all those activities within the educational context relating to *why* learners learn, *what* they learn, *how* they learn, and *how well* they learn. Most simply put, it is through a curriculum that pedagogical aims are put into action.

IMPORTANCE OF CURRICULUM

The term 'curriculum' is not new, given that it is through a curriculum that the educational objectives of an institution can achieve concrete expression. A curriculum is exceedingly important to the instructional process because it is a road map of learning. Its primary aim is to articulate the roles of learners and teachers, in the didactic process, in order to ensure that learner achievement is at an optimum level. A curriculum affords teaching staff the opportunity to structure and sequence learning in a coherent manner so that learners can be empowered to succeed in life (Dewey 1916; Vygotsky 1930; Bruner 1960). Thus, the task of a curriculum is to bestow a determined instructional framework to teachers which would allow them to balance the opposing forces of tests, textbooks, and programmes, among others (Squires 2004). Essential to underline is that a management structure of the learning-teaching process is provided through a curriculum, and its non-consideration in pedagogy could lead to chaos in any educational institution. It is therefore fair to assert that a curriculum is fundamental to sound pedagogical practices.

Due to the increasing importance of curriculum and what it means for pedagogy, it has been experiencing constant reforms since the 1950s. This is because it was commonly believed that the traditional curriculum was too *teacher-centred* and *teacher-directed* and that it did not focus sufficiently on the diversity of learners and learning (Marsh & Willis 1999; Barnett & Coate 2005). Since a curriculum is critically essential to sound educational practices, education practitioners and researchers have been calling for the promotion of *learner-centred curricular practices*, asserting that learner-centredness in the learning-teaching process should be paramount (Jones 2007; Livingstone 2014a; Baltork et al., 2015). In other words, a curriculum should place its attention on 'what the learner does' (Shuell 1986). This suggests that learner activity and learner needs and interests should take precedence if a learner-centred curriculum is to be created. Focusing on learners, and on what they do, ensures that they are the *protagonists* of their learning – negotiating meaning and constructing knowledge – and that they can derive significant educational experiences from instruction. Negotiating meaning and constructing knowledge independently and collaboratively, during the execution of learning-teaching activities and tasks, allow for the promotion of *learning that matters* through *creativity*, *application*, and *lifelong learning*: creativity – learners should become innovative, critical thinkers who possess the ability to negotiate meaning and construct knowledge; application – learners should be able to apply learning to real-world issues, situations, and contexts; lifelong learning – learners should be provided with a firm educational foundation that encourages learning throughout their life. These are some of the more critical issues that should be taken into account during the CDD process.

CURRICULUM DESIGN AND DEVELOPMENT

The field of *Curriculum Studies* owes a lot to Tyler (1949) because, in the 1950s, it received a fresh infusion with the publication of his book on CDD. Tyler was arguably the most prominent curriculum theorist. The four questions posed by Tyler embody CDD: (i) what educational aims can be achieved? (ii) what instructional experiences can help to achieve those aims? (iii) how can these didactic experiences be arranged effectively? (iv) how can the achievement of these aims be determined? These four questions underscore the four core components of a curriculum: *objectives, content, method, and evaluation*. This is to say that any curriculum, regardless of the field of knowledge, should attend to these four elements. In outlining these fundamentals, Tyler (1949) stresses that learner involvement and learner outcomes should be the nucleus of CDD.

The model for CDD proposed by Taba (1962), another curriculum theorist and reformer, does not contradict Tyler's model. Even though Taba's model includes some minor variations, it adds credibility to Tyler's model. Like Tyler, Taba was primarily concerned about *learning and learner development*, insisting that learning and development should not be visualised as a 'one-way process' of formulating instructional objectives. For Taba, CDD should be viewed as being multi-faceted. For Stenhouse (1975), a curriculum should be seen as an activity since it involves many actors. This author notes that, at all costs, it should offer a foundation for *designing (specification of content and method), researching (preparation of evaluation tasks and activities) and justifying (formulation of objectives)* a course. For Sharpes (1987), CDD is an action plan. Unlike Tyler and Taba, Sharpes focuses on the teacher's role in CDD, contending that 'what the teacher does' is equally important to 'what the learner does'. Sharpes believes that the teacher is the key person in the CDD process because it is the teacher who is responsible for knowing and understanding a curriculum and finding the best means to communicate it to learners. For Grundy (1987), who also contributed meaningfully to CDD, a curriculum should be designed and developed in such a way that it aids learners to negotiate meaning and construct functioning knowledge. Grundy further argues that *a curriculum should be dynamic, interactive and emancipatory*.

Other curriculum specialists (Inglis, 1975; Brown, 1995; Graves, 2000), though presenting minor differences in the four major curricular components, have validated the position of Tyler (1949) on the design and development of curriculum. Biggs (1996), who proposed *constructive alignment* (the instructional design method which fosters learner-centredness), characterises these four elements as *aim, course or teaching objectives, and learning objectives (or intended learning outcomes), content, learning-teaching activities (method), and assessment tasks and grading (evaluation)*. Biggs and Tang (2011) have also endorsed the perspectives of curriculum that have been presented by the founding curriculum theorists and reformers. These authors contend that educational curricula must be rightly designed in order to promote teaching for quality learning. These authors outline a number of guidelines which can ensure that curricula are cutting-edge, high-quality, and learner-centred. Livingstone (2014b) conducted a study of a course curriculum document from the University of Guyana to determine whether or not it was effectively designed. The result showed that the course curriculum document was deficient in many areas, and recommendation was made for its redesign. The author makes a call for improved pedagogical practices in HE, especially in the context of the design and development of curricula, in order to boost learning and teaching quality. Baltork et al. (2015) affirm that a curriculum is all planned learning which is executed by an educational institution. These authors assert that the status of curriculum in HE is a crucial issue and should not be taken for granted, given that it is the heart of an educational system, and in view of the fact that it is the most important instrument used to implement educational goals. Whether it is basic, secondary or tertiary education, it is clear that *learning must be planned and guided*. Specifications must be made about *what* is to be achieved, *why* it must be reached, *how* it is going to be accomplished, and *how well* it is going to be attained.

Continuing with this issue of CDD, Delors (1996) provides four learning pillars of a learner-centred curriculum which should not be disregarded: *learning to know*, *learning to do*, *learning to live together and with others*, and *learning to be*. UNESCO, adding another pillar and amending another one, establishes 'Five Pillars of Learning': *learning to learn and to know*, *learning to be*, *learning to live together*, *learning to do*, and *learning to transform oneself and society* (Óladóttir 2013). These five pillars capture the true essence of learning and teaching. By considering these five pillars, a rightly designed curriculum, which promotes *quality education*, can be produced. In doing so, a curriculum can become the catalyst for preparing *creative, lifelong learners* who can *apply learning* in the real world successfully. Bearing this in mind, it can be deduced that a curriculum should be designed and developed to support *creativity, application, and lifelong learning*: learners are able to call on their creative, complex and critical cognitive skills to resolve learning tasks, while developing a full range of other necessary skills that can empower them throughout life. An ICT-based curriculum can achieve these three ideals, especially since these ideals are considered to be important 21st century skills that learners are expected to cultivate and hone.

ICTs AND CURRICULUM DESIGN AND DEVELOPMENT

In the past few decades, the use of ICTs has resulted in greater accessibility to information and materials and improved human interaction and communication, providing unlimited access primarily through the use of communication technologies. ICTs have paved the way for an increased use of the World Wide Web (WWW) which offers endless possibilities for its users. ICTs have opened up many new modes of communication – Instant Messaging, Chat, Video Conferencing, Social Media (Facebook, Twitter) – which make interaction possible, irrespective of an individual's location or time zone. In other words, ICTs have created a global village in which users are provided with the capabilities to communicate regularly. ICTs are also being used in education delivery because they offer a whole new range of online resources, and also because of their potential to transform learning and teaching.

Given the increasing interest in ICTs and its use in teaching contexts over the past two decades, concepts like 'elearning', 'online learning', and 'online education', among many others, have become tantamount to sound educational practices. Lai (2011, p. 1263) reveals that "Education policy makers see digital technology as a transformative tool in teaching and learning". ICTs are seen as a means of helping learners to transition (partially or fully) from the four walls of the traditional F2F classroom to the virtual classroom, allowing them the flexibility to work at their own time and pace. A virtual learning environment caters for interaction and communication, collaboration, and independence and learner autonomy (Gaffar, Singh & Thomas, 2011; Moore, 2012), where learners are empowered to be protagonists of their learning and teachers are relegated to act as facilitators and guides.

Learning Theories and ICT-Based Curricula

The declaration contained in the final sentence of the paragraph above suggests that the identified learning theories - *constructivism*, *transactional distance*, and *connectivism* - strongly support an ICT-based curriculum. With respect to 'constructivism', learners are required to be active participants in the learning process (Ally 2004). Learners are the nucleus or central characters of the learning-teaching process and the role of the teacher becomes a more advisory and facilitative one (Tapscott 1998). Learners have the opportunity to work together to create knowledge in a *knowledge community* where there is mutual interdependence (Vygotsky 1978). With regard to 'transactional distance', learners are expected to work together even though they may not occupy the same geographical space or distance. The transaction is this distance (Moore 1991). It is the relationship among the environment, individuals, and their behaviour patterns in specific situations (Moore 1997). The degree of transactional distance depends on dialogue, structure, and autonomy

of learners (Gokool-Ramdoo 2008). Like constructivism, transactional distance fosters independence and autonomy (Wedemeyer 1981; Keegan 1986) and interaction and communication (Sims 1999; Anderson 2004). With reference to 'connectivism', the emphasis is on the cognitive development of learners. When learners come together in a community of learning, knowledge is then negotiated and constructed when learners discuss, share and think (Downes 2012). A core skill for learners to develop is that of making connections between concepts, ideas, and fields (Siemens 2005).

Based on the above paragraph, it can therefore be surmised that the integration of ICTs in educational curricula is worthwhile, considering that it has many positive benefits for learners. It can promote independence and autonomy of learners, ensuring that they are provided with significant educational experiences. Learners, while still being receptors of knowledge, take on the new role of being creators of knowledge and protagonists of their own learning. The teacher is no longer the 'sage on the stage'; in fact, the teacher's role is downgraded to that of a facilitator and guide. Learners actively engage in the execution of pedagogical tasks and activities. Their active participation in learning-teaching activities increases their motivation because they find value and meaning in what they are doing. Learners interact and communicate and they query so that they can develop their cognitive skills, negotiate meaning, and construct new knowledge. This is achieved when strong communities of learning are created in which both cooperative learning and collaborative learning are utilised as powerful tools for maximising learning. In the learning-teaching process, learners come to realise that exploring various connections within the learning-teaching process allows them to make sense of their reality and acquire meanings of these connections.

Integration of ICTs into Educational Curricula

Since the introduction of ICTs in educational practices and their integration into curricula, there has been a steady improvement in learning (Brown, 2005; Laurillard, 2008; Lai 2010). For example, the use of ICTs increased student interactivity (Persaud & Persaud 2019), and the use of WhatsApp to develop higher order thinking skills in learners (Baguma et al., 2019). Other research conducted has demonstrated the potential of ICTs to revolutionise instructional practices and significantly improve the learning experiences and outcomes of learners. These include increasing peer to peer collaboration using PeerWise [a web-based application used to create and answer multiple choice questions collaboratively] (Singh 2014), and the use of online instructional videos in the acquisition and demonstration of cognitive, affective and psychomotor rehabilitation skills (Cooper & Higgins, 2015), among many others. It is no secret that ICTs and ICT tools and resources are becoming increasingly popular in educational institutions because of the many benefits that can be derived from their use.

The integration of ICTs in teaching contexts is considered to be critical to pedagogical renovation worldwide (Allen & Seaman, 2010; Raturi & Boulton-Lewis, 2014; Cooper & Higgins 2015). In these and other contexts, there have been positive modifications to the educational landscape in such a way that new learning opportunities have been presented to learners and novel learning-teaching resources, which were not possible in a traditional classroom context, are now accessible. Raturi et al. (2011b, p. 18) offers the view that "The role of Information and Communication Technologies (ICT) as well as Computer and Communication Technologies (CCT) and their integration in higher education have transformed the higher education scene". This clearly establishes the point that a number of potential benefits can be obtained, as a result of the incorporation of ICTs into educational curricula, one of which is to significantly enhance learning and teaching.

Laurillard (2012), reiterates that ICTs should not be an after-thought of the CDD process, establishing that technology tools and resources present a myriad of benefits for learners in that they provide, develop and sustain a wide range of skills and competences. Given the incapability of traditional pedagogical methods to sufficiently attend to learner needs and interests, Lam and

Bordia (2008) assert that ICTs should not be excluded from learning and teaching because of its potential to cater for learners' learning diversity. These authors, like so many others (for example, Raturi, Hogan & Thaman [2011a]; Livingstone [2015b]), are convinced that technology should be integrated into the course or programme curriculum because it provides broad-based learning using a repertoire of tools and resources. Sharma (2008) emphasises that if ICTs are adopted in educational environments, positive and lasting effects will be achieved. ICT-based curricula should only be designed and developed (and subsequently implemented) provided that a number of issues have been addressed. This author affirms that policy should be put in place for the espousal of ICTs in learning and teaching. Subsequent to this, training and awareness programmes should be carried out to familiarise learners (learner education) and teachers (teacher education) with learning technologies because teachers' and learners' perceptions of technology and its use are key to its adoption in educational contexts, and especially in curricular practices.

Landry, Payne and Koger (2008) claim that, in many HE institutions, ICTs have been used (and are still being used) as an appendage to maintain traditional didactic practices. This is the reality in many educational institutions where lecture theatres and seminar rooms, for example, are equipped with data projectors and Internet-ready computers to "boost" learning and teaching with some kind of presentational technology. Even though this act suggests that, at least, there is a deliberate attempt to use technologies in education, it is not enough. Rossiter (2007, p. 94) contends that "Such practices are surface uses of digital technologies, with pedagogical practices seldom affected deeply, and there is little shift of focus of control of learning from the teacher to the learner". Lai (2008, p. 216), in support of Rossiter (2007), confirms that "In some educational institutions, ICTs are used primarily to support existing teaching practices, being an 'add-on to the traditional teaching experience', but have not fundamentally transformed it". In this regard, it is critical to highlight that technology in itself cannot do anything for learning and teaching. Rather, it is the way in which technology and technology tools and resources are used that will determine its effectiveness in educational practices. Thus, in order to reap meaningful benefits of ICTs in education, educational institutions, despite the many challenges that they face, must make a decided effort to adopt learning technologies in education and use them correctly.

It is quite a challenge in many countries and in many education systems to implement ICT-based education throughout the educational institution. This could be due to poor Internet connectivity, *administrative and developmental issues* (resources, planning, policy, scheduling, support), and *organisational and leadership issues*. It could also be due to negative reactions of teaching faculty. Some teachers are comfortable with the status quo and they try to repel any initiative that might break that flow. Some teachers may be so stuck in the traditional teaching approach that they may find it extremely difficult to embrace modern pedagogical approaches. At the University of Guyana, for example, the traditional approach to learning and teaching is still very much in vogue, and teaching faculty seems to be comfortable with it (Gaffar et al 2011; Murray 2013). In fact, this University has been using traditional methods for more than 50 years (Murray 2013). Even though there have been attempts to use some form of technology in instruction, and even though Moodle is being used as the preferred learning management system (Livingstone 2015a), the effective integration of technology and its resources into curricula, throughout the university, is still to be observed. Some teachers just use Moodle to send and receive information, or as a mere upload-download tool. No true benefit of technology can be derived in this manner. Some members of the teaching faculty at the University of Guyana have already indicated their readiness for technology-based education (Gaffar et al 2011; Livingstone 2015a), yet implementation is extremely slow (due to many of the reasons outlined at the beginning of this paragraph). Educational institutions, like the University of Guyana, therefore, need to address this critical issue so that they can enjoy the benefits that come from effectively using ICTs.

Integration of ICTs into Foreign Language Curricula

As pointed out in the introduction of this paper, the Bologna Process (BP) has had (and continues to have) a profound impact on HE curricular practices. In 2001, the Common European Framework of Reference for Languages (CEFR) was launched (Council of Europe, 2001). This is an important framework for the learning, teaching and assessment of languages. The CEFR and the Bologna Declaration marked the milestone in European HE development, including in the field of Didactics of Foreign Languages. One of the objectives of the BP was to incorporate European HE within the framework of its different cultures. It had specific consequences for languages. In order to encourage convergence, the diversity of European languages would be celebrated through their study. Foreign Languages (FL) Didactics and curriculum would therefore become a vital tenet of HE institutions. Language learning would be extended to HE learners and staff, calling for institutional language policy development. Additionally, the BP sought to create a rich context of opportunities for language learning in the daily life and practices of European HE (European Commission 2004; Tudor 2005; Terry 2008). It is a well-known fact that the EU encourages freedom of movement among its members. A citizen who possesses good languages skills is better able to benefit from mobility programmes or work opportunities in other member countries. Given the unevenness of language skills in the EU, language learning and teaching (LLT) becomes vital for the sustainability of European integration, especially in HE.

In LLT, the use of computers has resulted in significant changes in how languages are learnt and taught – better learning in a short space of time, lasting learning experiences, and the development of a wide range of communicative competences, among others (Levy 1998; Warschauer 2000; Chappelle 2003). The computer and its many tools are regarded as a new means of shaping the communication process. Since multimedia technology has opened up channels for the introduction of novel and more authentic interactive opportunities between teachers and learners, language teachers, researchers and specialists are conscious of the impact of computer mediated communication and computer-assisted language learning on LLT, because of their capability to produce meaningful learning experiences and to develop the full range of learner competences (Warschauer & Kern 2000; Ferreira & Kotz 2010; Beatty 2013; Wang & Kim 2015).

Language teachers have also realised the need to integrate digital tools in language education because of their favourability to language learning (Kenning 2007; Gedera & Pahala 2011; Zhang 2012; Kaya 2013). One of the main reasons for this burgeoning appreciation of educational technologies in FL curricular practices is because of the fact that it allows language learners to engage with authentic language samples on the WWW, consequently exposing them to different, authentic varieties of language use from real socio-cultural Internet contexts (Kern, Ware & Warschauer 2004). Studies conducted, which incorporate the use of ICTs and other learning technologies, highlight the use of audiovisual translation to teach Spanish (Lerma Sanchis 2013), and the use of software applications to develop learners' oral and written skills in English as a FL (Guerra 2012; Martins 2012; Orega 2014). Such fresh opportunities for rich and authentic language input (Krashen 1985), and for noticing and negotiation of meaning (Ellis 2003), are indicative of how language learning takes place, and should be considered during the CDD process.

The use of ICTs in language curriculum development practices has significant implications for the nature and purpose of educational institutions. The knowledge and skills gained through ICT use allows for learning throughout learners' lifetime, which speaks to the issue of *lifelong learning*. ICTs are considered to be very powerful tools for pedagogical change and reform. The benefits of ICTs should be strategically harnessed to improve educational efficiency and effectiveness because it enables information access. Most importantly, the language learning process could be structured differently (F2F, blended, fully online, web-enhanced). One or more of these instructional delivery modes could be selected as a means of providing learners with different options, taking into consideration learners' learning styles and preferences for instructional delivery mode, and as a

means of ensuring that learners are comfortable and sufficiently motivated in their learning environment. It is no secret that not all learners can function well in all of these learning environments. Some learners may prefer full F2F learning experiences, while others may prefer a blended mode, and the like. Raturi et al (2011b) carried out a study to determine learner preference for instructional delivery mode. Blended mode was the preferred choice of instruction delivery. In order to ascertain which delivery mode of instruction learners prefer, it may be best to conduct a quick survey to find out which is the generally accepted mode of education delivery.

Consequently, ICTs should be viewed as an integral part of FL curricular practices because it paves the way for effective LLT (Morales & Ferreira 2008; Livingstone 2015b; Guillén 2015). This affirmation is evident in the educational practices of Walden University in the United States of America, the Open University in England, the National Distance Education University in Spain (*Universidad Nacional de Educación a Distancia* in Spanish), and the Open University in Portugal (*Universidade Aberta* in Portuguese), among many others. These are all distance learning universities which offer courses and programmes primarily in a virtual/online environment propelled by ICTs and other specific learning technologies. A survey of the webpages of each of these institutions can confirm that student enrolments are steadily increasing. This increase in student registration could be based on many factors such as marketing, increased awareness of learning options, more quality programmes, and improved curricula design, among others. It is not unfair to suggest that the use of ICTs in pedagogical practices has encouraged greater student participation. One of the main reasons for this is that with ICTs, learners have the benefit of being able to work at their own pace and time. Another reason for this increased student numbers is because learners are experiencing the benefits of ICTs in educational practices, especially considering the fact that the world of work demands the use of ICTs. This underscores the fact that given this age of technology, institutions of learning should seek to provide many learning options to learners in the learning-teaching process, one of which should be ICT-based education.

Concerning ICT-based education, Livingstone (2017) conducted a study which investigated the design and development of FL curricula in Portuguese HE institutions. To achieve this purpose, 73 English and Spanish language curriculum documents from four Portuguese universities were analysed to determine the quality of CDD. With specific reference to the incorporation of ICTs into language curricula, the results showed that some language curricula considered the use of different kinds of technology resources, while some did not consider any technology resource. The recommendation was made for ICT resources to be integrated into didactic practices (and be clearly outlined in the designed and developed curricula) in order to develop learners' competences through cooperation, collaboration and communities of learning. This is an important study that was conducted because it was the first of its kind to have been carried out in Portugal. This study has implications for educational institutions which are engaged in the (language) curricula design and development process, and for those which are yet to do so.

The Need for ICT-Based Curricula

The need for ICT-based curricula in these modern times is justified. No one can deny that learners are being prepared for a world in which technology is the catalyst for innovation, but they are being prepared by educational institutions which are not positioned to embrace leadership, administrative, operational and pedagogical changes. Educational technologies, used correctly and effectively, could ensure that the instructional process is adapted to a world which is quickly adjusting to technology. The fact is that technology-based education is pervading educational institutions because of its pedagogical benefits and its enormous potential to produce significant learning experiences. Facing this situation, education stakeholders should therefore seek to address current assumptions about learning and teaching. Education administrators should see themselves challenged to such an extent that they do everything in their power to ascertain

learners' increasing demands for high-quality learning. Due to existing evidence that ICTs have had (and continue to have) positive influences on educational practices worldwide, the inescapable truth is that ICTs will be the key technological innovation for educational institutions in this millennium and beyond.

CONCLUDING REMARKS

Technological changes in the educational landscape have been occurring at a fast rate and this suggests that educational institutions should integrate ICTs into instructional curricula in order for learning to be optimum. This means that when it comes to designing and developing curricula, technology resources should be included so as to provide opportunities for learners to develop their creative, critical and complex cognitive skills. The discussion has focused on curriculum and what it is, the importance of curriculum, curriculum design and development, and ICTs and curriculum design and development, with a special focus on ICT-based foreign language curricula. The literature reviewed and discussed has underlined that, now more than ever, there is a great need for technology-enhanced learning and teaching in all educational institutions.

There is no room for doubt that ICT applications provide learners with a plethora of tools and resources which are instrumental in their becoming active learners as they seek to produce content for a worldwide audience. The fact cannot be overlooked that the very nature of ICTs fosters collaboration, cooperation, active participation and engagement, sustained interaction and interactivity, as well as user-generated content which are critical to effective learning. The adoption of ICTs and ICT resources requires a commitment from education administrators to become agents of change. The concepts of *effective educational leadership* and, more specifically, *effective pedagogic/instructional leadership* come into play because educational institutions can only be as efficient as their academic staff. For ICTs to be integrated into learning and teaching, teaching staff must rethink their didactic and curricular practices. They must engage in *reflective practice*. Education must adapt and renew itself so that it becomes compatible with the globalised world. By incorporating ICTs into the learning-teaching process, learners and teachers would be able to have meaningful pedagogical experiences. In the case of language learning, for example, it is fair to submit that when authentic information and materials are provided by the Internet, learners would have a better understanding of the country and people whose language they are studying.

Modern technology offers many opportunities to enhance and sustain educational practices. Since ICT-based learning and teaching seems to be the catalyst to foster revolutionary didactic practices, universities all over the world, in both developed and developing countries, have adopted this alternative and stimulating mode of education delivery. The principal objective of such a move is to improve pedagogical practices in their institutions of learning, accommodate the different learning styles of learners, and to bridge the geographical gap, allowing education to be (come) accessible to all. For technology-based education to be embraced, implemented, institutionalised and sustained, all relevant education stakeholders must work together, engage in active, participatory discussions relating to pedagogy, and make all educational decisions collaboratively. In this way, true instructional transformation can be engendered.

In the curriculum design and development process, ICTs do occupy a significant place because the benefits are endless. ICTs are seen as a means of helping learners to transition (partially or fully) from the four walls of the traditional face to face classroom to the virtual classroom. ICTs can transform didactic practices and trigger pedagogical innovation; provide flexibility to learners; encourage learner engagement; cater for learners' learning diversity; foster independence and autonomy of learners in the learning process (where learners are protagonists of their learning and teachers are facilitators and guides); increase interaction, communication and collaboration among learners, and stimulate intellectual expressiveness and learner creativity, among many others

benefits. ICT-based curricula should therefore enable learners to create knowledge, apply it, and use it throughout their life. In essence, it is just to affirm that integrating ICTs into educational curricula can promote *creativity, application, and lifelong learning*.

REFERENCES

- Allen, IE & Seaman, J 2010. *Learning on demand online education in the United States 2009*, Sloan Consortium, Massachusetts.
- Ally, M 2004, "Foundations of Educational Theory for Online Learning", *Theory and Practice of Online Learning*, eds T. Anderson and F. Elloumi, Athabasca University Press, Athabasca, pp. 3-31.
- Altbach, PG, Reisberg, L & Rumbley, LE 2009, "Trends in Global Higher Education: Tracking an Academic Revolution, *Report on UNESCO 2009 World Conference on Higher Education*, UNESCO, Paris, pp. i-xviii.
- Anderson, T 2004, "Towards a Theory of Online Learning", *Theory and Practice of Online Learning*, eds T. Anderson and F. Elloumi, Athabasca University Press, Athabasca, pp. 33-60.
- Baltork, MA, Nasresfahani, A, Mohammadi, M & Omran, ES 2015, "Application of Constructivist Curricula in Higher Education in Iran", *Merit Research Journal of Education and Review*, vol. 3, no. 3, pp. 145-150.
- Barnett, R & Coate, K 2005, *Engaging the Curriculum in Higher Education*, Open University Press, Maidenhead.
- Beatty, K 2013, *Teaching and Researching: Computer-Assisted Language Learning*, Routledge, London/New York.
- Biggs, J & Tang, C (eds) 2011, *Teaching for Quality Learning at University*, 4th ed., McGraw – Hill/Open University Press/Society for Research into Higher Education, Maidenhead.
- Biggs, J 1996, "Enhancing Teaching through Constructive Alignment", *Higher Education*, vol. 32, pp. 1-18.
- Brown, JD 1995, *The Elements of Language Curriculum: A Systematic Approach to Program Development*, Heinle & Heinle, Boston, MA.
- Brown, M 2005, "Learning Spaces Design", in *Educating the Net Generation*, eds J. Oblinger & D. Oblinger, EDUCAUSE, Boulder, CO., pp. 12.1 – 12.22.
- Baguma, R, Bagarukayo, E, Namubiru, P, Brown, C & Mayisela, T. 2019. "Using WhatsApp in Teaching to Develop Higher Order Thinking Skills – a Literature Review Using the Activity Theory Lens", *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, vol. 15, no. 2, pp. 98-116.
- Bruner, J 1960, *The Process of Education*, Harvard University Press, Cambridge, MA.

- Burke, K & Jopson, D 2005, *Dark plagiarism cloud hangs over lucrative overseas programs*. Available from <<http://www.smh.com.au/news/National/Dark-plagiarism-cloud-hangsover-lucrative-overseas-programs/2005/05/09/1115584909943.html>> [October 23 2019].
- Candlin, CN 1984, "Syllabus Design as a Critical Process", *English Language Teaching Documents 118*, ergamon & The British Council, London, pp. 29-46.
- Chapelle, C 2003, *English language learning and technology*, John Benjamins B.V., Philadelphia, PA.
- Cooper, D & Higgins, S 2015, "The effectiveness of online instructional videos in the acquisition and demonstration of cognitive, affective and psychomotor rehabilitation skills", *British Journal of Educational Technology*, vol. 46, no. 4, pp. 768-779.
- Council of Europe 2014, *The Bologna Process*. Available from <https://www.coe.int/t/dg4/highereducation/EHEA2010/BolognaPedestrians_en.asp> [October 23 2019].
- Council of Europe 2001, *Common European Framework of Reference for Languages: Learning, Teaching, Assessment*, Language Policy Division, Strasbourg, France.
- Delors, J 1996, *Learning: The Treasure Within. Report to UNESCO of the International Commission on Education for the Twenty-first Century*, UNESCO, Paris.
- Dewey, J 1916, *Democracy and Education: An Introduction to the Philosophy of Education*, MacMillan Publishers, New York.
- Downes, S 2012, *Connectivism and Connective Knowledge, Essays on meaning and learning networks*. Available from: <https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/Connective_Knowledge-19May2012.pdf> [October 23 2019]
- Ellis, R 2003, *Task-Based Language Learning and Teaching*, Oxford University Press, Oxford.
- Estaire, S 2005, *La enseñanza de lenguas mediante tareas: principios y planificación de unidades didácticas*, MEELE, Universidad Antonio de Nebrija, Madrid.
- European Commission 2016, *The Bologna Process and the European Higher Education Area*. Available from <http://ec.europa.eu/education/policy/higher-education/bologna-process_en.htm> [October 23 2019].
- European Commission 2004, *Promoting Language Learning and Linguistic Diversity: An Action Plan 2004-2006*, European Communities, Luxembourg.
- Ferreira, A & Kotz, G 2010, "ELE-Tutor Inteligente: Un analizador computacional para el tratamiento de errores gramaticales en Español como Lengua Extranjera", *Revista Signos*, vol. 43, no. 73, pp. 211-236.
- Gaffar, K, Singh, L & Thomas, T 2011, "Are We Ready for Web 2.0? Evidence from a Caribbean University", *Caribbean Teaching Scholar*, vol. 1, no. 2, pp.129-146.

- Gedera, D & Pahala, S 2011, "Integration of weblogs in developing language skills of ESL Learners", *International Journal of Technology in Teaching and Learning*, vol. 7, no. 2, pp. 124-135.
- Gokool-Ramdoos, S. 2008, "Beyond the Theoretical Impasse: Extending the applications of Transactional Distance Theory", *International Review of Research in Open and Distributed Learning*, vol. 9, no. 3. Available from <http://www.irrodl.org/index.php/irrodl/article/view/541/1148> [October 23 2019].
- Graves, K. 2000, *Designing Language Courses - A Guide for Teachers*, Heinle & Heinle, Boston, MA.
- Grundy, S 1987, *Curriculum: Product or Praxis?* Falmer Press, Sussex.
- Guerra, L 2012, "English Language Learning through Networked Written Communication", *IV CercleS Seminar*. April 26-28. U.Minho, Braga, Portugal. Available from <<http://dspace.uevora.pt/rdpc/handle/10174/8232>> [October 23 2019].
- Guillén, G 2015, "Awareness and Corrective Feedback in Social CALL, Tandems and E-Tandems", *International Association for Language Learning Technology (IALLT) Journal*, vol. 44. No. 2, pp. 1-42.
- Guri-Rosenblit, S, Sebkova, H & Teichler, U 2007, "Massification and diversity of higher education systems: Interplay of complex dimensions", *Higher Education Policy*, vol. 20, no. 4, pp. 373-389.
- Inglis, F 1975, "Ideology and the Curriculum: The Value Assumptions of System Builders", *Curriculum Design*, eds M. Golby, J. Greenwald & R. West, Croom Helm, London, pp. 40-47.
- Johnson, DW & Johnson, RT 2005, "Cooperative Learning, Values, and Culturally Plural Classrooms", *Classroom Issues: Practice, Pedagogy and Curriculum*, eds M. Leicester, C. Modgil and S. Modgill, Routledge Falmer, London/New York, pp. 18-36.
- Jones, L 2007, *The Student-Centered Classroom*, Cambridge University Press, New York.
- Kaya, T 2013, "New methods of mobile assisted language learning", *Gakush in Joshidaigaku Kiy* , vol.15, pp. 19-29.
- Keegan, D 1986, *The foundations of distance education*, Croom Helm, London.
- Kenning, MM 2007, *ICT and Language Learning. From Print to the Mobile Phone*, Palgrave Macmillan, New York.
- Kern, R, Ware, P & Warschauer, M 2004, "Crossing frontiers: New directions in online pedagogy and research", *Annual Review of Applied Linguistics*, vol. 24, no. (1), pp. 243-260.
- Krashen, SD 1985, *The Input Hypothesis: Issues and Implications*, Longman, New York.
- Lai, KW 2011, "Digital technology and the culture of teaching and learning in higher education", *Australasian Journal of Educational Technology*, vol. 27, no. 8, pp. 1263-1275.

- Lai, KW 2010, "School readiness for using ICT adapted to student needs", *Proceedings of Society for Information Technology & Teacher Education International Conference*, eds D. Gibson and B. Dodge, Association for the Advancement of Computing in Education (AACE), Virginia, pp. 1487-1490.
- Lai, KW 2008, "ICT supporting the learning process: The premise, reality, and promise", *International handbook of information technology in primary and secondary education*, eds J. Voogt & G. Knezek, Springer, Berlin, pp. 215-230.
- Lam, P & Bordia, S 2008, "Factors affecting student choice of eLearning over traditional learning: Student and teacher perspectives", *International Journal of Learning*, vol.14, no. 12, pp. 131-39.
- Landry, BJ, Payne, D & Koger, MS 2008, "From 'chalk and talk' to online offerings: keeping pace with technology in education", *International Journal of Management Education*, vol. 2, no. 3, pp. 300-317.
- Lange, DL 1994, "The Curricular Crisis in Foreign Language Learning", *Association of Department of Foreign Languages Bulletin*, vol. 25, no. 2, pp. 12-16.
- Laurillard, D 2012, *Teaching as a Design Science: Building Pedagogical Patterns for Learning and Technology*, Routledge, New York.
- Laurillard, D 2008, "The teacher as action researcher: Using technology to capture pedagogic form", *Studies in Higher Education*, vol. 33, no. 2. pp. 139–154.
- Laurillard, D, Oliver, M, Wasson, B & Hoppe, U 2009, "Implementing Technology-Enhanced Learning", *Technology-Enhanced Learning: Principles and Products*, eds N. Balacheff, S. Ludvigsen, T. de Jong, A. Lazonder and S. Barnes, Springer Science+Business Media B. V., Dordrecht, pp. 289-306.
- Lerma Sanchis, MD 2013, "Traducción audiovisual y aprendizaje de lenguas extranjeras: algunas consideraciones sobre la enseñanza del español en Portugal", *Actas del V Congreso sobre la enseñanza del español en Portugal*, dir A. M. Sainz García, Consejería de Educación, Lisboa, pp. 84-89.
- Levy, M 1998, "Two concepts of learning and their implications for CALL at the tertiary Level", *ReCALL Journal*, vol.10, no. 1, pp. 86–94.
- Livingstone, KA 2017, *Investigating Foreign Language Curriculum Design and Development in Portuguese Higher Education Institutions*, Unpublished PhD Thesis, University of Porto, Porto.
- Livingstone, KA 2015b, "The Impact of Web 2.0 in Education and its Potential for Language Learning and Teaching", *LENGCOM. Revista internacional científica y divulgativa de lenguaje y comunicación*, vol. 6.3, pp. 1-27.
- Livingstone, K.A. 2015a, "Teaching faculty's perception about implementing elearning practices at the University of Guyana", *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, vol. 11, no. 2, pp. 85-103.

- Livingstone, K. 2014b, "Improving Curriculum Design and Development. A Case Study from the University of Guyana", *Blue Ocean Research Journals-Journal of Business Management & Social Sciences Research*, vol. 3, no.5, pp. 1-17.
- Livingstone, KA 2014a, "Constructive Alignment and the Curriculum: A Call for Improved Pedagogical Practices in Higher Education", *Blue Ocean Research Journals-Journal of Business Management & Social Sciences Research*, vol. 3, no. 12, pp. 19-34.
- Marsh, C & Willis, G 1999, *Curriculum-Alternative Approaches, Ongoing Issues*, Merrill, Englewood Cliffs, N. J.
- Martins, M 2012, *Web 2.0 e a Competência Comunicativa em Língua Inglesa*, Tese de Doutoramento não publicada. Universidade de Aveiro, Aveiro.
- Moore, A 2012, *Information and Communication Technologies (ICT) Professional Development Strategy for Teachers in Guyana: A Case Study*. Available from <http://oasis.col.org/bitstream/handle/11599/279/Guyanacastudy_web_96.pdf?sequence=1&isAllowed=y> [October 23 2019]
- Moore, M 1997, "Theory of transactional distance", *Theoretical Principles of Distance Education*, ed D. Keegan, Routledge, New York, pp. 22-38.
- Moore, M 1991, "Distance Education Theory", *The American Journal of Distance Education*, vol. 5, no. 3, pp. 1-6.
- Morales, S & Ferreira, A 2008, "La efectividad de un modelo de aprendizaje combinado para la enseñanza de inglés como lengua extranjera: estudio empírico", *Revista de Lingüística Teórica y Aplicada*, vol. 46, no. 2, pp. 95-118.
- Murray, J 2013, "E Business and the University of Guyana", *International Journal of Business and Commerce*, vol. 2, no. 11, pp. 33-45.
- Nunan, D 1993, *Syllabus Design*, Oxford University Press, Oxford.
- Óladóttir, H 2013, *UNESCO Education for Sustainable Development 2005-2014*, Available from <http://menntuntilsjalfbaerni.weebly.com/uploads/6/2/6/2/6262718/unesco_5_pillars_for_esd.pdf> [October 23 2019]
- Orega, M 2014, *Compreensão do Texto Escrito em Inglês Língua Estrangeira. Estudo de Caso sobre o Uso de um Hipermedia de Flexibilidade Cognitiva*, Tese de Doutoramento não publicada, Universidade de Aveiro, Aveiro.
- Persaud, V & Persaud, R 2019, "Increasing Student Interactivity using a Think-Pair-Share model with a Web-based Student Response System in a Large Lecture Class in Guyana", *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, vol. 15, no. 2, pp. 117-131.
- Prevedel, A 2003, "Values and Beliefs: The World View Behind Curriculum", *NCSALL Annual Review*, vol. 3, pp. 8-13.
- Rahimpour, M 2010, "Current Trends on Syllabus Design in Foreign Language Instruction", *Procedia –Social and Behavioral Sciences*, vol. 2, pp. 1660-1664.

- Ramsden, P 2003, *Learning to teach in higher education*, 2nd edn, Routledge Falmer, London.
- Raturi, S & Boulton-Lewis, G 2014, "Shaping lecturers' beliefs about teaching and learning in higher education in the Pacific", *Issues in Educational Research*, vol. 24, no. 1, 67-84.
- Raturi, S, Hogan, R & Thaman, KH 2011b, "Learners' Preference for Instructional Delivery Mode: A Case Study from the University of South Pacific (USP)", *International Journal of Instructional Technology and Distance Learning (IJITDL)*, vol. 8, no. 6, pp. 17-30.
- Raturi, S, Hogan, R & Thaman, KH 2011a, "Learners' access to tools and experience with technology at the University of the South Pacific: Readiness for elearning", *Australasian Journal of Educational Technology (AJET)*, vol. 27, no. 3, pp. 411-427.
- Richards, JC 2013, "Curriculum Approaches in Language Teaching: Forward, Central, and Backward Design", *RELC Journal*, vol. 44, no. 1, pp. 5-33.
- Rossiter, D 2007, "Whither e-learning? Conceptions of change and innovation in higher education", *Journal of Organisational Transformation and Social Change*, vol. 4, no. 1, pp. 93-107.
- Sharma, AN 2008, "ICT in Teacher Education: The USP Experience", *Pacific Education: Issues and Perspectives*, eds J. Dorovolomo, C.F. Koya, H.P. Phan, U. Nabobo-Baba & J. Veramu, University of the South Pacific, Suva, pp. 165-179.
- Sharpes, DK 1987, *Education and the US Government*, Palgrave MacMillan, New York.
- Shuell, TJ 1986, "Cognitive Conceptions of Learning", *Review of Educational Research*, vol. 56, pp. 411-436.
- Siemens, G 2005, *Connectivism: A Learning Theory for the Digital Age*. Available from <http://www.itdl.org/journal/jan_05/article01.htm> [October 23 2019].
- Sims, R 1999, "Interactivity on stage: Strategies for learner-designer communication", *Australian Journal of Educational Technology*, vol. 15, no. 3, pp. 257-272.
- Singh, L 2014, "Technology enhanced peer learning with PeerWise: Experiences and perceptions from a developing country", *Caribbean Teaching Scholar* vol. 4, no. 1, pp. 5-22.
- Sousa, JM 2015, "Curriculum and Didactics: A Matter of Power. The Case of the University of Madeira", *European Conference on Curriculum Studies: Policies, Practices and Perspectives*, orgs C. Leite, A. Mouraz & P. Fernandes, Porto: CRIE, FPCE, U.Porto, pp. 450-465.
- Squires, D 2004, *Aligning and Balancing the Standards-Based Curriculum*, SAGE Publications, California.
- Stenhouse, L 1975. *An Introduction to Curriculum Research and Development*, Heineman, London.
- Taba, H 1962, *Curriculum Development: Theory and Practice*, Harcourt Brace and World, New York.
- Tahirsylaj, A 2015, "Curriculum and Didaktik in 21st Century: Still Divergent or Converging?" *European Conference on Curriculum Studies: Policies, Practices and Perspectives*, orgs C. Leite, A.Mouraz & P. Fernandes, Porto: CRIE, FPCE, U.Porto, pp. 53-71.

- Tapscott, D 1998, *Growing up Digital: The Rise of the Net Generation*, McGraw-Hill, New York.
- Terry, LS 2008, "The Bologna Process and Its Impact in Europe: It's So Much More than Degree Changes", *Vanderbilt Journal of Transnational Law*, vol. 41, no. 107, pp. 107-228.
- Tomlinson, B (ed) 2013, *Developing Materials for Language Teaching*, 2nd edn, Bloomsbury, London.
- Tudor, I 2005, *The Challenge of the Bologna Process for Higher Education Language Teaching in Europe*. Available from <userpage.fu-berlin.de/~enlu/downloads/Bologna_ENLU_OK.rtf> [October 23 2019].
- Tyler, RW 1949, *Basic Principles of Curriculum and Instruction*, University of Chicago Press, Chicago.
- Vygotsky, L 1978, "Interactions between learning and development", *Mind in Society*, Harvard University Press, Cambridge, MA., pp. 79-91.
- Vygostky, L 1930, "The Socialist Alteration of Man", *The Vygostky Reader*, 1998, eds R. Van Der Veer & J. Valsiner, Blackwell Publishing, Oxford, pp. 175-184.
- Wang, S & Kim, D 2015, "Incorporating Facebook in an Intermediate-level Chinese Language Course: A Case Study", *International Association for Language Learning Technology (IALLT) Journal*, vol. 44, no. 1, pp. 38-78.
- Warschauer, M & Kern, R 2000, *Network-based language teaching: concepts and practice*, Cambridge University Press, Cambridge.
- Warschauer, M 2000, "The death of cyberspace and the rebirth of CALL", *English Teachers' Journal*, vol. 53, pp. 61-67.
- Wedemeyer, CA 1981, *Learning at the Back Door: Reflections on Non-Traditional Learning in the Lifespan*, University of Wisconsin Press, Madison, WI.
- Wiggins, G & McTighe, J 2006, *Understanding by Design: A Framework for Effecting Curricular Development and Assessment*, ASCD, Alexandria, VA.
- Zhang, F (ed) 2012, *Computer-Enhanced and Mobile-Assisted Language Learning. Emerging Issues and Trends*, IGI Global, Hershey, PA.