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Information Communication Technology: Powering Up and Creating a Culture of Innovation for 21st Century Language Education

Abstract. The contemporary language educator must be focused on rich and high quality experiences for 21st century language learners. Education is rapidly evolving in the digital age with direct application in the classroom for teachers of English to speakers of other languages. The way that we teach is changing by necessity and by design, and innovative teaching and methodologies are essential for the success of students. An arsenal of digital tools is literally at our fingertips for all levels of instruction, and educators must tackle the latest technology and digital learning opportunities as quickly as they emerge, to stay current with their students, if nothing else. In the sections to follow, we explore five of the technologies which we believe every educator must understand to remain current, not only with their peers, but with their increasingly technologically savvy students. These five: laptops and tablets; mobile learning devices, i.e. smart phones; rapidly deployed software and "apps"; gaming systems; and

social media, are already being employed in many learning environments. We argue that for the sake of currency, if nothing else, all educators must not just learn, but master all five of these to be effective in the contemporary learning world of the future. We conclude with a section on expertise and online teaching and learning as this has emerged as a significant instructional wave of the future.

Introduction

How do we revitalize the educational experience and prepare multilingual and culturally diverse students for the technology enhanced transcultural workforce of the 21st century global society? There is a shortage of highly qualified graduates from universities. These graduates are crucial in making global contributions, and essential to economic growth, putting university and career accomplishments on equal footing. A collaborative, engaged multicultural perspective at the forefront of best practices focusing on innovative information communication technology (ICT) and shared learning experiences allows students to accelerate progress, and foster success. Adaptation of the curriculum for diverse abilities and learning levels is essential as employers expect a broad range of transferable competencies from students entering the global workforce. These collaborative connections, interwoven with active learning methodologies, ensure optimum learning, motivating students endeavoring to meet the expectations of leaders in business and industry.

As 21st century educators, we are all well aware that education is being redefined and is no longer constrained to the classrooms of our schools (West, 2013). Educational processes can take place across the entire range of our activity spectrum and evolve rapidly. In this digital age, information and communication technologies proliferate around us sparking dynamic, and yet to be explored, opportunities. In the short period since the beginning of this millennium, we have moved from the desktop to the laptop to the phone/tablet and beyond, and classrooms are being designed by creative educators and equipped for innovative models of instruction. Where we were bound by the length of the power

cord and interface cables just a decade ago, we are now freed from those electric/electronic chains witnessing the rise of new battery systems and wireless technologies. In this climate, the tools we use to educate will, of necessity, have to change as well. Gone are the chalk board, and even the erasable white board. In their place, electronic screen technologies will be used to allow materials that embody authenticity to appear instantly on the tablets in front of every student. In their brilliant examination and captivating work, *Generation on a Tightrope: A Portrait of Today's College Student*, Levine and Dean (2012) suggest that students are walking a tightrope attempting to balance digital connectness and personal isolation. Students are requesting greater use of technology and blended instruction combining online and in-person classes. However, employers are concerned that so much time spent on digital activity compromises students' abilities to develop skills focusing on interpersonal collaboration and teamwork.

Innovation, coupled with further miniaturization has yielded a wide array of technological tools which have made educational opportunity available at almost any place or at any time. Teaching strategies for Information Communication Technology (ICT) in the 21st century incorporate:

1. laptops and tablets;
2. mobile learning devices, i.e. smart phones;
3. rapidly deployed software and "apps";
4. gaming systems;
5. social media.

Cross-disciplinary teaching strategies that create a culture of innovation include communication and collaboration to strongly impact learning and build momentum. Data gathering, simplified interfaces, and an emphasis on analytics are essential as we revolutionize the classroom and prioritize learning initiatives and outcomes for students. Disparities in the availability and access of technology for students, as well as varying academic and technical ability levels can result in significant challenges for educators. In fact, it is not unusual for tech-savvy students to have greater expertise than their teachers resulting in a logically inverted shared situation learning between teacher and student. Learning extends among and beyond the school to educational settings allowing online collaboration that is increasing opportunities for continuous learning, in and out of the classroom, supported by educators who showcase expanded

and creative technology. E-learning has become a key focus in classroom-based language learning. Free and open access to materials on the web and via social media continue to drive ICT uses in learning environments, especially those related to language. It is the responsibility of educators to adopt and adapt to the widespread benefits and tools to increase the value of incorporating technology in the education of our students. By encouraging students to power-up and celebrate the numerous opportunities afforded by taking advantage of integrating ICT into innovative language learning, exponential growth can take place and technology goes beyond a tool for use to enhancing and expanding learning.

Research and Review of the Literature

The scope of research and inquiry on this topic is limited. Research is mixed as far as education for ages 5–16, but the big issues that surface are the ability to engage in discourse, and having a higher than average visual learning ability, since much is communicated using graphical methods, illustration graphic interchange formats (GIFs), etc. This would seem on the surface to disadvantage English Language Learner (ELL) students and those who are auditory or kinesthetic learners. As a result, this raises numerous "reach them to teach them" research questions that don't appear to be thoroughly addressed in the literature and research reviewed so far. There is also limited information on the topic of availability or affordability of information technology (IT) systems. While many of the research studies reviewed addressed online learning, they primarily revolved around teaching techniques. There were multiple forms of technology discussed with varying results for applicability in the classroom or in online delivery. Online education has emerged as a popular alternative to face-to-face instruction for those who prefer the flexibility of geographic and time constraints (Crawford-Ferre & Wiest, 2012). However, successful ICT practices for language learning require new methods of course design coupled with instructor interaction and support. Primary concerns given the strong contemporary attention to online instruction and technology in the classroom focus on performance of students and their ability to utilize technology. The key issue that is frequently suggested is that definitive research is lacking, largely because it is virtually impossible to create even quasi-experimental designs, let

alone true experimental ones on on-line instruction at any level. There are too many endogenous and exogenous variables to try to control for. This means that most of the "research" that has been done is simple survey research which is basically descriptive or simply basic comparative in nature. This doesn't please the p-value hungry crowd, but the frustration of the researchers who have tried and gotten nothing to show for their efforts is clearly understandable. Researchers point out that additional investigation should address preparation and support for online instructors as well as "student experiences, motivators for participation, and perception of relative strengths and weaknesses of various aspects of online education" (Crawford-Ferre & Weist, 2012). There is certainly a need for more thorough research in all aspects of ICT and language, but articles reviewed with research bases on post-secondary on-line effectiveness note the significant difficulty in even quasi-experimental designs on the subject matter.

In the sections to follow, we explore five of the technologies which we believe every educator must understand to remain current in face-to-face and online teaching, not only with their peers, but with their increasingly technologically savvy students. These five: laptops and tablets; mobile learning devices, i.e. smart phones; rapidly deployed software and "apps"; gaming systems; and social media, are already being employed in many learning environments. We argue that for the sake of currency, if nothing else, all educators must not just learn, but master all five of these to be effective in the contemporary world of the future.

Laptops and Tablets

Innovative and creative teaching approaches coupled with rapid technological change have impacted the ways in which educators combine computer technology and language learning. Laptops and notebooks have merged as valuable tools to assist English Language Learners (ELL) students in interacting communicatively and purposefully while participating in a variety of learning activities. Discovering ways to merge from the desktop to the laptop then notebook resulted in the best of digital worlds for learners. The capacity and technology combined with mobility results in a digital learning environment that extends beyond the traditional classroom. Lecture capture technologies allow for flipped classroom

environments where students can claim ownership and responsibility for their education independent of traditional classroom time and location constraints. Learning and language skills consistently take place and time zones are no longer a detriment to communication.

Mobile Learning Devices, i.e. Smart Phones

Netbooks, iPads, cell phones, iPods, e-readers and *Personal Digital Assistants* (PDAs) are enabling students by providing the tools they need to take their education into their own hands. These mobile learning devices offer flexibility and facilitate a type of communication that extends beyond the limitations of the traditional classroom. Many of these devices have a tactile, user-friendly interface that students are already comfortable with, and can aid in bridging communication barriers. Students have the potential to integrate course-specific interactive software into their mobile devices that allows them to interact with course material and access cloud-based lecture capture services to search and replay course critical lecture material. These tools allow ELLs to improve their study efficiency, retain more, and target their learning efforts, which ultimately results in better performance. According to Bahrani (2011), mobile assisted language learning meets the learner at their own level of skill and gives the user an opportunity to work individually in an informal setting. Mobile learning devices are now being paired with rapidly deployed software and apps to encourage users to explore content that historically was unavailable due to access or cost constraints.

Rapidly Deployed Software and "Apps"

One of the ways that ICT is revolutionizing education for language educators and learners is through continual development of rapidly deployed software and "apps". These applications can be used in the classroom setting to strengthen memory recall, increase retention and improve grades. These programs raise the bar for innovating learning by integrating encyclopedia modules, vocabulary exercises, flash cards, translations, quizzes, illustrations, and gaming applications in simple and potentially cost effective tools that language learners can implement any time, any place. Mosher (2013) tested 20 language learning applications and found

Duolingo (2013), Busuu (2013), and Rosetta Stone TOTALe Companion (2012) to be favored language tools. These are just some examples of the platforms available for educator use to incorporate and supplement course content which can strengthen acquisition of language skills.

Gaming Systems

English Language Learners benefit from educational tools and methodologies that keep pace with the rapidly evolving processes of the 21st century. As ICT impacts language learning by evolving and engaging students in transformational and non-traditional approaches that are fundamentally different from previous approaches, gaming becomes a valuable asset to e-Learning. Gaming and the new media associated with it has greatly expanded approaches for language learning. This form of student-centered learning fosters collaboration and an electronic learning network that is transitioning learners into practitioners and leads to improved preparation and language learning. The task-based learning associated with video games blends education and entertainment and actively engages enthusiastic students with reward and feedback. Simulated real-life environments are purposely designed to improve English language skills. By constructing an experience that incorporates games, learning becomes a process reinforced at each sequential step. The transition from authentic materials to live materials allows cultural learning and significantly expanded content. Sound specialization technologies enable the creation of live curriculum along with the games. Parents are often concerned when students prefer video games over school work, but that no longer needs to be the case. These games can extend and reinforce the learning environment, inspiring language learners with a range of activities and new media. Simulation games and the use of avatars provide students with creative learning by offering imaginary situations and contextualized problems. When educational games are designed to provide learners with meaningful content based on authentic contexts, then students' language skills improve (Baek, 2013).

Social Media

There are numerous opportunities to extend social media and incorporate it as a tool for English language acquisition that is engaging, and provides explanation within pedagogy. Active learning tools are causing teaching methods to change and reading and writing skills are strengthened as long as correct grammar and spelling are used by participants. Students have numerous opportunities to develop their interests and share information as well as cultivate friendships. It is often suggested that the easiest topic to speak or write about is oneself. Therefore developing a homepage characterizing the individual can be a thoughtful and energizing task. Facebook and MySpace allow for creative development of vocabulary while Twitter allows for a more brief exchange of thoughts and opinions. Bringing social media into the classroom adds another dimension to language learning that will engage students in authentic interactions with family and friends and reinforce learning that is connected, flexible and collaborative. These communicative-based teaching and learning experiences let students to derive enjoyment and enthusiasm from learning when participating in social media in their second language, and encourage authentic interactions beyond traditional classroom learning that is connected and flexible. One caveat is that students do not realize that the information published on social media can be used to gather information about an individual by numerous agencies and institutions. If care is not exercised, students may realize that they have provided too much personal information and that, when it comes to divulging information on social media, there is no place to hide. Also, students must be constantly cautioned as to the lack of any systematic verification of the accuracy or validity of social media content. It is essentially "chatter" and must be carefully and thoroughly scrutinized before any academic use.

Gaining Expertise in Online Teaching and Learning

As educators embrace cultural and linguistic diversity around the globe, they seek to provide a quality education for all students and empower them to achieve remarkable accomplishments. ICT and expertise in on-

line teaching and learning continues to be at the forefront of energizing trends in education, and dominates the discourse of academic discussions.

There are a multiplicity of communication tools and learner-centered instructional strategies to support best practices in active and collaborative online teaching and learning. As educators gain an understanding of the detailed processes of student cognition and motivation, they are able to provide the skills and knowledge that students need to accomplish their goals. Seamless communication in the learning environment in partnership with meeting the complex and diverse needs in our fields is essential for success. The way that we teach continues to evolve as we embrace innovative teaching and methodologies.

Challenging students to become high-performing learners in an online or face-to-face classroom environment, and incorporating the myriad technological experiences into our curriculum builds credibility and engages students in the educational process. We have the opportunity to revolutionize the classroom and prioritize learning initiatives and outcomes for students. As they are allowed to make choices and explore the tools of educational technology that target their learning styles, students will reach higher levels of understanding. By assuming a significant role in their own educational process, students will become innovative problem solvers. Of course, user interface and experience is crucial and ICT is only successful when the technology is accessible and works. It is not our intention for students to become problem solvers because they are troubleshooting the technology and solving technical problems instead of the problems that we design as part of the collaborative curriculum.

Critical issues and practices for language learners and educators need to include strategies for aligning online and face-to-face course content and technology as we seek to transform education with a vision to the future developing educational tools and methodologies that keep pace with the rapidly evolving processes of the 21st century. Current approaches in course design, methods and lesson components should be tailored to the learning preferences of students with diverse talents. Content area, particularly Science, Technology, Engineering and Mathematics (STEM) fields, must also be addressed as cross disciplinary and interdisciplinary learning is important for all students.

The incorporation of ICT in education at every level is tantamount to success as education is transformed for 21st century learners, with high expectations for interactive instructional technologies in an evolving campus with a passion for technology. In order to strengthen cognitive presence, it is crucial to combine content, knowledge and technology to create a balance in developing the learning environment.

Diverse characteristics of ICT learners and cultural differences impact learning in numerous ways. Student learning styles vary tremendously, not only within countries, but among students, age levels, and educational settings. The course and pace that self-directed learning takes changes constantly based upon intrinsic and extrinsic motivation. ICT is the key to providing best practices for educational experiences of the future. No longer is learning restricted to the classroom or library, and educators must strive for a balance between paper and digital--rethinking emerging practices.

It is crucial to leverage exemplary strategies, keeping students on task and capturing and sharing cutting edge experiences that lead to quality courses and student success. Massive Open Online Courses (MOOCs), are another strategy for offering online education that reaches far beyond the classroom. Their use appeared to have potential when they were first introduced in or around 2008. Their use has rapidly waned, however for multiple reasons.

As far as MOOCs go the issues can be summarized using a ..."tion" list:
Creation
Proliferation
Registration
Utilization
Completion
Evaluation
Accreditation
Articulation

Every one of these elements constitutes a label for several incorporated sub-factors. In some cases MOOCs ended up being too complex to handle on any but a free use for no credit basis in most of the post secondary arena.

An essential conclusion is that at first blush there is not a lot of difference in outcomes between on-line and traditional classroom course

presentation. There appears to be a lot of "sniffing around the edges", but no one has a good handle on how to probe the subject in any depth. It is interesting to note the lack of any major research efforts around MOOCs. The whole subject may have collapsed in on itself. Research articles indicate that there is little difference in outcomes between on-line and traditional courses at post secondary level, and the material on MOOCs imply that the wave has crested and is subsiding fast (Nguyen, 2015).

Conclusion

There are yet to be explored opportunities. One key aspect is shared across the globe and throughout our disciplines and specialized interests within ICT. That is our overarching goal of providing the best education possible for our students, challenging them to high ideals and continuing our passion for educational excellence. Educators find purpose in collaborating once more as we explore transglobal innovative educational methodologies.

As we have discussed, laptops and tablets, mobile learning devices, i.e. smart phones, rapidly deployed software and "apps", gaming systems, and social media are all well-established tools in the lives of those we teach. They are becoming an integrated part of global culture in this new millennium. As educators, we have an obligation to be aware of and facile with the tools already in the hands of our students. That is the primary challenge before us. For some this challenge will be easy, but for some, not so. But accept the challenge, we must. And, we must also not be content to rest on our laurels, having mastered these five. New and increasingly intriguing technologies are emerging every day. When one can find descriptions of such items as Sifteo cubes which are touch screen enabled, wireless capable, computer powered blocks (like the wooden alphabet and number blocks of old) in a widely distributed weekend magazine supplement to a local American newspaper (USA Weekend, 2013), the challenge ahead is obvious. The race ahead is not a short sprint, but a marathon that we will all have to run.

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