MCQs Answers
Short Questions
Long Questions

Technology in Language Teaching

(ENG 529)

Virtual University of Pakistan

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Outline for Technology in Language Teaching

Sr. No.	Topics
1.	**Introduction to Technology** 1. **Why technology** 2. **Benefits of learning technology** ❖ Instant Information ❖ Real communication 3. **A variety of different tools** ❖ Pedagogy Vs Technology
2.	**Technology in Language Learning** 4. **Technology in Language Learning** ❖ Technology in Education 5. **Technology in the Classroom** 6. **Technology Use in Language Education**
3.	**Technology in English Language Classroom** 7. **Technology as an Effective Tool for Language Learning** 8. **Use of Technology & Improvement of Language Teaching & Learner Learning** ❖ The Outcome Dependent on the Language Teacher's Use of Technology 9. **Application of Technology & a Changed English Classroom** ❖ Technology-embedded Classroom Develops Learners' Autonomy ❖ Use of Technology Develops Learners' Higher Order Thinking
4.	**Distance Language Teaching with Technology** 10. **Introduction: Defining the field** 11. **Technologies, tools, and learning environments** ▪ CMC-based environments ▪ Audiographic and videoconferencing environments ▪ Learning management systems ▪ Telecollaboration ▪ Web 2.0 tools 12. **Enquiry into pedagogical issues** ▪ Task design ▪ Assessment of learning ▪ Teacher expertise ❖ Research trajectories and a future agenda

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5.	**The Continuing Evolution of Virtual Worlds for Language Learning** ❖ Introduction **13. What are virtual worlds?** ❖ A brief history of VWs ❖ Overview and categorization of virtual worlds today **14. Categories of VWs** ▪ Age level ▪ Game level (low, mid, or high) ▪ Socialization level (low, mid, or high) ▪ Education focus (low, mid, or high) ▪ Technical requirements (low, mid, or high) **15. The future of VWs**
6.	**Authoring Language-Learning Courseware** **16. What is language courseware?** ❖ Personal computers and authoring tools ❖ Multimedia courseware ❖ Intelligent language tutors **17. Commercial courseware and open educational resources (OER)** **18. Web delivered courseware**
7.	**E-Books** **19. E-Books on the Internet** ❖ Early Internet E-book Projects **20. The World Wide Web and the Expansion of E-books** ❖ Commercial E-books on the Web ❖ Google Books ❖ Authors Bringing in new E-books **21. The Future of E-Books on the Internet**
8.	**Blended Language Learning** **22. Introduction to Blended Learning** **23. Blended learning: Definition** **24. Blended learning: Important considerations** ▪ Theoretical background in blended learning studies ▪ Effectiveness and value of blended learning ▪ Participants in blended instruction: Teachers ▪ Participants in blended instruction: Students
9.	**Designing Curriculums Around Technology** **25. Definition of Integrating Technology**

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	➢ Preparing for the Future ➢ Benefits of Technology in Educational Curriculum ➢ **Outcomes** ▪ More engaged students ▪ Simplified materials ▪ Increased motivation and better-developed collaboration skills ▪ Overall increased student achievement **26. Effective Technology for Successful Curriculum** ▪ Digital Books ▪ Classroom Clickers ▪ Interactive Whiteboards and Tablets E-instruction and Distance Learning
10.	**E-Assessment** Introduction **27. (e-)Assessment for Learning** ▪ Student-involved assessment ▪ Effective feedback ▪ (Self-) assessment skills **28. Assessment for learning issues** **29. Solutions and Recommendations**
11.	**Technologies for Teaching and Learning L2 Reading** **30. L2 Reading Theories** ➢ SLA theories and applications of technology to L2 reading **31. Technologies in use for teaching and learning of L2 reading** ➢ Self-developed and commercial courseware ▪ Self-developed courseware ▪ Commercial courseware ➢ Online activities with individual study tools and portable devices ▪ Dictionaries, glosses, and annotations ▪ Concordancing tools ▪ Reading-level classification tools ▪ Speech synthesis and speech recognition ▪ Mobile devices ➢ CMC technologies (Chat, Moo, email) **32. Challenges** **33. Future Directions**
12.	**Technology and L2 Writing** **34. Technologies for L2 writing** ➢ Web 2.0 applications ➢ Automated writing evaluation ▪ Criterion ▪ Turnitin

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	▪ Writing Pal or W-Pal **35. L2 writing and AWE** ❖ L2 writing and corpus-based technologies **36. Future research and development**
13.	**Technologies for Teaching and Learning L2 Listening** **37. Digital affordances and new listening contexts** **38. Technologies for listening** ▪ Digital Devices and Networks ▪ Content ▪ Controls and Help Options ▪ Operational ▪ Regulatory ▪ Compensatory ❖ Technology, listening, and SLA theory ❖ Technology-mediated listening: Research and practice **39. Current trends and future directions**
14.	**Technologies for Teaching and Learning L2 Speaking** **40. Theoretical frameworks** ▪ Sociocultural theory ▪ The Interactionist Hypothesis ▪ Autonomy and student agency ▪ Cognitive perspectives on speaking proficiency: Accuracy, complexity, and fluency **41. CALL pedagogical frameworks for speaking**: Task-based instruction (TBI) **42. CALL learning environments** ❖ Tutorial CALL and speaking **43. Feedback with tutorial CALL** ▪ Computer-assisted pronunciation training (CAPT) ▪ Asynchronous CALL storytelling ▪ Digital sound tools: Unleashing student creativity ▪ CMC
15.	**Technology-Enhanced SLA Research** **44. Defining SLA and SLA research** ▪ Cognitive approaches to SLA ▪ The interaction approach ▪ Sociocultural theory **45. Defining SLA-relevant research in computer-assisted Language learning (CALL)** ▪ Three SLA-relevant CALL studies ○ Cognitive approach ○ Interactionist approach ○ Sociocultural theory

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Lesson 1

Introduction to Technology

- Definition of Technology
- Why Technology
- Benefits of Learning Technology
- Source of Instant Information
- Real Communication
- A Variety of Different Tools
- Pedagogy Vs Technology

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Definition of Technology

According to Merriam-Webster, technology is defined as:

"The practical application of knowledge especially in a particular area" or "a manner of accomplishing a task especially using technical processes, methods, or knowledge" or "the specialized aspects of a particular field of endeavour."The last definition is especially pertinent to the field of education.

Why Technology?

We now live in a world in which technology permeates every aspect of our lives. Apart from its time- and labour-saving function, technology can also inspire creativity and bring new opportunities to people, connecting them to new ideas and people they otherwise might not have met.

In language teaching and learning, technology can be used for:

- Accessing information, including information about language
- Exposure to the target language
- Entertainment (i.e. reading/listening for pleasure)
- Creating text
- Publishing learner work
- Communicating and interacting with other language users/learners
- Creating community
- Managing and organizing learning (e.g. learning management systems, online vocabulary notebooks, etc.)
- Use of big data to explore any issue
- Explore digital content at the run time from all over the world
- Time-saving (Roberto Busa spent 27 years to accomplish a project, now it can be done in a few minutes.)

Benefits of Learning Technology

Many classroom teachers using technology have anecdotal evidence of their learners being motivated and engaged, and this is often a major reason for using learning technologies. There is also evidence that the use of technological tools empowers learners to transcend the traditional concept of the classroom (Drexler, 2010) and can lead to learners taking greater ownership of their learning (Terrell, 2011), especially through being actively involved together outside the classroom. Real language exposure has been transmitted to learners through technology.

Technology can be a highly engaging and interactive tool, providing a source of real language, both written and spoken, in the classroom, and motivating learners to produce more language than they otherwise might have done. More senses are involved in technology, so learning becomes durable and most penetrating into the slate of the brain.

Source of Instant Information

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The Internet, in particular, has become a social phenomenon that “pervades work, education, interpersonal communication” (Thorne, & Black, 2008), and having internet access in the classroom opens up learning to the real world, beyond the confines of the classroom.

For instance, the web can be an instant provider of information for the teacher, as it has fast become in the world outside the classroom. Rather than telling learners, you will give them the answer to a question later, you can look it up there and then. You can also show the learners how to use reference tools, such as dictionaries, concordancers, a thesaurus and phonemic charts. By helping them help themselves, you are promoting their autonomy, as learners and users. A teacher also has more choice with the Web-more ways to answer vocabulary questions, for example. As well as explaining something or providing a definition or translation, you can look for complete sentences, or show your learners a picture.

The Web is, of course, also a great source of listening. You can find video clips of people speaking countless varieties of English, as well as have access to songs, through sites such as YouTube. Apart from providing a large bank of authentic recordings, the Web allows you to personalize listening tasks and choose a video clip to complement something in the syllabus. The Web can also be used for learners who are particularly interested in a specific topic, or as a stimulus for speaking about a subject.

Real Communication

There has also been a clear shift in the role of the Internet, away from it being a huge resource library towards what has been called Web 2.0, where communication takes the lead, which has led to an increase in internet use. A Web 2.0 site allows users to interact and collaborate as creators of user-generated content in a virtual community.

Your learners can connect to other learners, or users of English, in real-time (synchronously), or at different times (asynchronously), thereby providing opportunities for authentic language practice (i.e. real communication), rather than the practice for practice’s sake that usually takes place in the classroom.

A Variety of Different Tools

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All of this is not just about the internet. The proliferation of hand-held devices, such as mobile phones, digital cameras, tablets, mp3 players and voice recorders, have led to what, for some teachers, is a sometimes bewildering choice of potential activities and resources. Even if mobile phones are banned in your classroom or institution, you can use your own (most mobile phones support this) to record learners (using the voice recorder or video recorder), and if it is a smartphone, there is a rapidly increasing number of applications to be made use of to help you in class.

As the potential of these devices is realized, and more and more learners have access to them, teachers are beginning to experiment with using these tools. The use of mobile devices is expected to lead to language learning becoming more informal and personal (Chinnery, 2006; Kukulska- Hulme, & Shield, 2008), with many more learners studying or spractising with manageable chunks of language wherever they are. This revolution in mobile learning is happening both inside and outside the classroom.

Learners who are addicts of video games, they should be guided to play ESL video games to enhance their linguistic proficiencies. We share some ESL video games for learners:

- Phantasy Quest leaves you on a deserted island
- Sound Factory lets you play a musical factory
- Ketinetto 2
- The Ballard of Ketinetto 7
- Heart Of Tota
- Monster Basement This one is fairly scary,.
- Griswold The Goblin includes audio supported text and a lot of fun..
- The Ballad of Ketinetto
- Dr. Stanley's House 2″
- Inspector Kloo 4

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- Inspector Kloo 5
- The Ballad of Ketinetto 8
- Mild Escape is an “escape the room” game

Pedagogy vs. Technology

This increase in the availability of technology has led to an explosion of interest in its use in the language classroom. Despite the potential for new ways of learning, the trap that teachers can fall into is one of being seduced by the ‘wow factor’ of new technology, with pedagogy being pushed to the sidelines.

Moreover, as language classrooms become more technologized, there is a real danger of teachers developing Everest syndrome (Maddux, cited in Gallo, & Horton, 1994). Named after George Mallory’s reason for wanting to climb Mount Everest, this refers to a situation where teachers can be tempted to use a specific technology just ‘because it’s there.’ Care has to be taken; therefore, to make use of what we have available only when it serves the language aims of the lesson, and to avoid any use of ‘technology for technology’s sake.’

We share with you alist of tools and their academic purposes. Learners should use these tools for beter and advanced level of learning. Now the world is learning smartly, and we must opt latest technology in service of learning.

OVERALL RANKING	CHANGE FROM 2019	TOOL	CATEGORY
1	SAME	YouTube	web resource (videos)
2	UP 8	Zoom	video meeting platform
3	DOWN 1	Google Search	search engine
4	DOWN 1	PowerPoint	office tool / suite

5	UP 6	Microsoft Teams	collaboration platform
6	UP 1	Word	office tool / suite
7	DOWN 1	Google Docs & Drive	office suite | file sharing platform
8	DOWN 3	LinkedIn	social network / community
9	DOWN 5	Twitter	social network / community
10	UP 4	WhatsApp	chat tool
11	DOWN 3	Wikipedia	web resource
12	UP 6	Facebook	social network / community
13	UP 3	Excel	office tool / suite
14	DOWN 5	WordPress	blogging/website platform
15	UP 121	Google Classroom	learning platform / LMS
16	UP 77	Google Meet	video meeting platform
17	DOWN 5	Slack	collaboration platform
18	UP 16	Canva	content dev tool (graphics)
19	SAME	Skype	chat tool
20	UP 8	Trello	collaboration platform
21	DOWN 6	Feedly	news reader & alert tool
22	DOWN 9	LinkedIn Learning	online courses

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23	UP 7	Padlet	collaboration platform
24	DOWN 3	Kahoot	live engagement tool
25	DOWN 8	Dropbox	file sharing platform
26	UP 15	Mentimeter	live engagement tool
27	UP 19	Gmail	email tool
28	UP 20	Instagram	social network / community
29	DOWN 3	Google Forms	forms and survey tool
30	DOWN 10	Articulate	course authoring tool
31	DOWN 9	OneNote	digital notebook
32	UP 13	Google Translate	translation tool
33	UP 5	Outlook	email tool
34	UP 32	Vimeo	web resource (videos)
35	SAME	Google Chrome	web browser
36	UP 14	Moodle	learning platform/LMS
37	UP 40	Google Maps	productivity tool (mapping)
38	UP 34	Flipgrid	video meeting platform
39	UP 8	Prezi	office tool / suite
40	DOWN 16	TED Talks	web resource (videos)

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41	UP 14	OneDrive	file sharing platform
42	SAME	Easygenerator	course authoring tool
43	DOWN 20	Camtasia	content dev tool (screencasts)
44	DOWN 17	Snagit	content dev tool (screen capture)
45	UP 79	Whereby	video meeting platform
46	DOWN 21	Evernote	digital notebook
47	UP 23	Canvas	learning platform/LMS
48	DOWN 17	Pinterest	curation platform
49	UP 43	Screencast-O-matic	content dev tool (screencasts)
50	UP 6	Pocket	curation tool
51	UP 8	hihaho	content dev tool (interactive video)
52	UP 27	Wakelet	curation tool
53	UP 22	Vyond	content dev tool (animation)
54	DOWN 25	Udemy	online courses
55	UP 76	Google Sites	blogging/website platform
56	UP 8	Cisco Webex	video meeting platform
57	DOWN 4	Coursera	online courses
58	DOWN 25	SharePoint	collaboration platform
59	UP 32	Quizlet	games & testing tool

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60	UP 63	DeepL	translation tool
61	UP 10	Kindle	web resource (e-books)
62	UP 115	Quizizz	games & testing tool
63	DOWN 6	H5P	content dev tool (HTML5 content)
64	UP 77	aNewSpring	learning platform/LMS
65	DOWN 26	Google Scholar	web search engine
66	**NEW**	Mural	online whiteboard
67	DOWN 6	Audible	web resource (audio books)
68	DOWN 6	Poll Everywhere	live engagement tool
69	DOWN 15	Apple Podcasts	web resource (podcasts)
70	UP 11	Adobe Connect	video meeting platform
71	**NEW**	Netflix	web resource (documentaries)
72	DOWN 40	Diigo	content curation tool
73	DOWN 37	Yammer	collaboration platform
74	DOWN 9	Degreed	learning platform/LMS
75	**NEW**	Miro	online whiteboard
76	UP 6	Adobe Spark	content development tool (graphics)
77	DOWN 25	Blogger	blogging/website platform

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78	DOWN 38	iSpring	course authoring tool
79	DOWN 1	Grammarly	productivity tool (grammar checker)
80	UP 36	getAbstract	web resource (book summaries)
81	DOWN 7	Apple Keynote	office tool / suite
82	UP 68	Nearpod	lesson authoring tool
83	**NEW**	Spotify	web resource (podcasts & music)
84	**BACK**	MS PowerBI	data analytics & visualisation tool
85	UP 13	Google Workspace (prev G-Suite)	collaboration platform
86	**NEW**	Snip & Sketch	content dev tool (screenshots)
87	DOWN 14	Genially	content dev tool (graphics)
88	UP 31	Socrative	live engagement tool
89	UP 50	Google Alerts	news alert tool
90	DOWN 53	Adobe Captivate	course authoring tool
91	DOWN 33	Duolingo	language learning app
92	UP 34	Totara	learning platform/LMS
93	UP 17	Loom	content dev tool (screen recording)
94	DOWN 51	Tweetdeck	social network (Twitter dashboard)
95	UP 35	Blackboard Learn	learning platform/LMS

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96	DOWN 8	Adobe Acrobat Pro	content development tool (PDFs)
97	DOWN 21	Inoreader	news reader & alert tool
98	UP 27	Firefox	web browser
99	DOWN 16	Google Keep	digital notebook
100	DOWN 56	Adobe Photoshop	content dev tool (photo editing)
101	UP 21	Thinglink	content dev tool (interactive media)
102	UP 11	Jamboard	online whiteboard
103	DOWN 43	Workplace by Facebook	collaboration platform
104	DOWN 18	Adobe Premiere Pro	content dev tool (video)
105	DOWN 4	edX	online courses
106	DOWN 11	Adobe Illustrator	content dev tool (graphics)
107	UP 41	Screencastify	content dev tool (screencasts)
108	DOWN 9	Adobe After Effects	content dev tool (video)
109	**NEW**	Jitsi Meet	video meeting platform
110	UP 19	MS Stream	content dev (video streaming)
111	DOWN 14	Survey Monkey	forms & survey tool
112	DOWN 63	Audacity	content dev tool (audio/podcasts)
113	DOWN 9	Adobe Audition	content dev tool (audio/podcasts)

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114	**NEW**	Coggle	mind mapping tool
115	DOWN 64	Medium	blogging/website platform
116	UP 54	Freemind	mindmapping tool
117	UP 25	Big Blue Button	video meeting platform
118	UP 35	Apple iMovie	content development tool (videos)
119	DOWN 12	Quora	web resource (Q&A site)
120	**NEW**	WebinarGeek	video meeting platform
121	DOWN 58	Mindmeister	mindmapping tool
122	DOWN 16	MS Forms	forms & survey tool
123	DOWN 39	Stack Overflow	social network / community
124	**NEW**	ClickUp	collaboration platform
125	**BACK**	EdPuzzle	lesson authoring tool
126	DOWN 48	Adobe InDesign	content dev tool (interactive PDFs)
127	**BACK**	Blackboard Collaborate	video meeting platform
128	**NEW**	MS Whiteboard	online whiteboard
129	**BACK**	Wooclap	live engagement tool
130	DOWN 28	Plickers	live engagement tool
131	DOWN 23	Google Calendar	productivity tool (calendar)

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132	DOWN 43	Slideshare	web resource (slide sets)
133	DOWN 18	Udacity	online courses
134	UP 9	Mailchimp	email tool (newsletters etc)
135	DOWN 32	FutureLearn	online courses
136	UP 29	Omnigraffle	content dev tool (diagrams)
137	UP 26	DuckDuckGo	search engine
138	**BACK**	Asana	collaboration platform
139	DOWN 4	Lectora	course authoring tool
140	UP 43	Notability	digital notebook
141	DOWN 72	Anders Pink	curation platform
142	DOWN 48	Sway	content dev tool (presentations)
143	**NEW**	Ayoa	mindmapping tool
144	**NEW**	Apple Mail	email tool
145	DOWN 55	Flipboard	curation tool
146	DOWN 79	Powtoon	content dev tool (animation)
147	**NEW**	ilovepdf.com	content dev tool (PDFs)
148	UP 18	Apple Pages	office tool / suite
149	**NEW**	Factile	games & testing tool
150	DOWN 63	Unsplash	content dev tool (image library)

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151	DOWN 55	Biteable	content dev tool (video)
152	DOWN 67	isEazy	course authoring
153	DOWN 15	Blinkist	web resource (book summaries
154	**NEW**	Handbrake	content dev tool (video conversion)
155	**BACK**	Safari	web browser
156	DOWN 7	WeTransfer	file sharing platform
157	DOWN 20	Nuzzel	news alert tool
158	UP 20	Zotero	research tool
159	DOWN 13	Overcast	web resource (podcast player)
160	DOWN 42	Xing	social network / community
161	SAME	gomo Learning	course authoring tool
162	**NEW**	Hot Potatoes	games & testing tool
163	DOWN 6	Podcast Addict	web resources (podcast player)
164	DOWN 6	Highbrow	online courses
165	**NEW**	Google Lens	productivity (image recognition)
166	DOWN 39	Scoopit	curation tool
167	DOWN 67	Piktochart	content dev tool (infographics)
168	DOWN 12	Pluralsight	online course platform

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169	**NEW**	Apple Numbers	office tool / suite
170	DOWN 10	IFTTT	productivity (workflow automation)
171	DOWN 4	MS Edge	web browser
172	DOWN 1	Zapier	productivity (workflow automation)
173	DOWN 1	Bing	search engine
174	DOWN 23	Mind Tools	online course platform
175	DOWN 2	Khan Academy	online course platform
176	**NEW**	Google Arts & Culture	web resource (virtual visits)
177	**NEW**	MS Learn	online courses
178	DOWN 34	Evolve	course authoring tool
179	**NEW**	Gimkit	live engagement tool
180	**NEW**	Telegram	chat tool
181	**NEW**	Brave	web browser
182	DOWN 71	Pixabay	content dev tool (image library)
183	DOWN 55	Axonify	learning platform/LMS
184	UP 9	Google Analytics	web traffic analysis
185	UP 10	LearnDash	WordPress LMS plugin
186	**NEW**	OpenLearn	online courses

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187	**NEW**	Otter.ai	content dev tool (live transcription)
188	**NEW**	Google Currents	collaboration platform
189	**NEW**	MasterClass	online courses
190	**NEW**	MS Publisher	content development tool (DTP)
191	UP 5	Thinkific	learning platform/LMS
192	**NEW**	AskDelphi	learning platform/LMS
193	**NEW**	Drillster	learning platform/LMS
194	DOWN 12	Docebo	learning platform/LMS
195	DOWN 5	Adapt	course authoring tool
196	UP 4	Bluejeans	video meeting platform
197	DOWN 18	edCast	learning platform/LMS
198	DOWN 13	AnswerGarden	live engagement tool
199	**NEW**	Open edX	learning platform/LMS
200	**NEW**	GoBrunch	video meeting platform

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Lesson 2

Technology in Language Learning

- Technology in Language Learning
- Technology in Education
- Technology in the Classroom
- Technology Use in Language Education

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Technology in Language Learning

Technology in language learning has been in constant evolution since its genesis in the 1950s, in part due to attempts to keep up with the ongoing developments in computer technology. The development of technology in language education is also the result of the development of learning theories and pedagogical considerations. These tools are based on some theoretical underpinnings. Many terms and expressions have emerged, and different theoretical perspectives require different approaches to understand and define the concept.

The most widely used variant of technology in language learning is CALL (computer-assisted language learning). This term has been widely used to refer to the areas of technology and both second language teaching and learning despite frequent suggestions to revise the term (Chapelle, 2001). There are, of course, many other similar terms associated with technology use in language learning, for example, TELL (technology-enhanced language learning), WELL (web-enhanced language learning), CELL (computer-enhanced language learning), NBLT (network-based language teaching), and CMC (computer-mediated communication). We also see the use of ICT (information and communications technologies), e-learning and blended learning. In recent years, we have seen the popularity of MALL (Mobile Assisted Language Learning)/ mobile learning (m-learning) which brings 'mobility' into learning (Pegrum, 2014). Consequently, knowledge has become ubiquitous, and its quest should be continued in all activities of life, for instance, a person can listen to audiobooks while driving.

As practical tasks, learners should explore the following websites. They are replete with all language skills, learning and teaching resources. We found these sites very useful for ESL learners. We share some useful sites for learning the English language:

- British Council Teaching English
- Onestop English
- Zozanga.com
- Manythings.org
- Academia.edu
- Elt-resourceful
- Demand High ELT
- An A-Z of ELT
- 4Teachers.org (to integrate technology
- Abcteach educational offering 5000+ printable
- Breaking News English.com
- Dave's ESL Café
- Education Planet more than 100,000 resources
- Education World educational search engine
- Educator's Reference Desk: ESL Lesson Plans http://www.refdesk.com
- EduHound
- Edutopia
- Eduweb interact with material like video games
- English Firsthand: Teacher Resources

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- ESL Flow
- ESL Kids Stuff
- ESL Through Music
- SongsforTeaching
- Every Picture Tells a Story
- Everything ESL: Classroom Lesson Plans
- Google for Educators
- Interesting Things for ESL Students
- Havefunteaching.com
- Internet Picture Dictionary
- Larry Ferlazzo's Websites of the Day (award-winning website)
- Learn English
- National Capital Language Resource Center

Technology in Education

It would be fair to say, perhaps, that technology has changed our lives in every way, such as shopping, communicating, entertaining, teaching and learning, and even in the way we think. Most, if not all, teachers, educators and policymakers would support the use of technologies in enhancing learning. Computer technologies have for some time now played a significant role in improving education and reforming curricula across countries all over the world (Pelgrum, 2001; Kozma, & Anderson, 2002). Governments, education authorities and schools have all made major investments into providing schools with computer equipment (Pelgrum, 2001; Macaro, Handley, & Walter, 2012).

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Globally, technology integration into education is an important feature of the educational landscape. Countries like the US, Australia, Spain, Italy, Singapore, China, and UAE have taken major steps to equip their educational institutes with technology.

Apart from the policy and investment in technology use in education, it makes sense to use technology in teaching and learning, according to brain research experts (Tileston, 2000). For example, computers can promote visual, verbal, and kinesthetic learning and address different cognitive and psychological processes in learning by using multimodal materials. Later, it leads to multimodal analysis and multimodal learning material.

Technology in the Classroom

Joseph Hardin said, "Technology is affecting education in revolutionary ways, and the momentum toward these changes is irreversible." Technological change is redefining communication by leaps and bounds, but in turn, is also changing how educators need to teach. A significant viewpoint for all teachers is to consider that networking signifies not just an innovative toolset, but a novel environment for learning and teaching. New communication technologies encourage new possibilities and enlist an unlimited database of knowledge for students.

Technology Use in Language Education

Technology has been integrated into second language teaching and learning since the 1960s as a mechanical tutor to train repetitive language drills, the so-called drill-and-practice method. It is only since 2000 that computer technology has been largely used in reading, writing, literacy, and cultural awareness (Chapelle, 2003). With the development of multimedia computing and the Internet, technology is becoming a vital feature of second language classrooms and an important issue confronting second/foreign language teachers and researchers. For example, Chapelle (2003), as an applied linguist, asserts that 'technology-based language teaching and research is not a departure from applied linguistics. It is a continuation- the 21st century version of what applied linguists do'.

There are millions of English learners and the development of technology is embracing these learners. The advantage of the Internet is that it allows language to come to the learner,

rather than a learner having to go to a special place to learn the language. In institutional contexts, such as higher education sectors, secondary schools and primary schools, teachers face a generation who has grown up in an environment in which they are constantly exposed to computer-based technology; therefore, their methods of learning are different from those of previous generations. Determining how to teach the generation which has already integrated technology into their daily life is a challenge to the traditional teaching and learning philosophy. All these points suggest that language learning/teaching is embarking on a new trend, and it has become an urgent issue for teachers, applied linguists and learning theorists to think about how new technologies should be integrated and utilized in language learning.

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Lesson 3

Technology in English Language Classroom

- Technology as an Effective Tool for Language Learning
- Use of Technology & Improvement of Language Teaching & Learner Learning
- The Outcome Dependent on the Language Teacher's Use of Technology
- Application of Technology & a Changed English Classroom
- Technology-embedded Classroom Develops Learners' Autonomy
- Use of Technology Develops Learners' Higher Order Thinking

Technology as an Effective Tool for Language Learning

Technology is an effective tool for learners. Learners must use technology as a significant part of their learning process. Teachers should model the use of technology to support the curriculum so that learnerscan increase the true use of technology in learning their language skills (Costley, 2014; Murphy, DePasquale, & McNamara, 2003). Learners' cooperation can be increased through technology. Cooperation is one of the important tools for learning. Learners cooperatively work together to create tasks and learn from each other through reading their peers' work (Keser, Huseyin, & Ozdamli, 2011).

Use of Technology & Improvement of Language Teaching & Learner Learning

Bennett, Culp, Honey, Tally, and Spielvogel (2000) asserted that the use of computer technology led to the improvement of teachers' teaching and learners' learning in the classes. The use of computer technology helps teachers meet their learners' educational needs. According to Bransford, Brown, and Cocking (2000), the application of computer technology enables teachers and learners to make local and global societies that connect them with the people and expand opportunities for their learning.

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The Outcome's Dependency on the Language Teacher's Use of Technology

They continued that the positive effect of computer technology does not come automatically; it depends on how teachers use it in their language classrooms. According to

Susikaran (2013), basic changes have come in classes beside the teaching methods because the chalk and talk teaching method is not sufficient to effectively teach English. Raihan and Lock (2012) state that with a well-planned classroom setting, learners learn how to learn efficiently. Technology-enhanced teaching environment is more effective than lecture-based class. Teachers should find methods of applying technology as a useful learning instrument for their learners although they have not learnt technology and are not able to use it like a computer expert.

Application of Technology & a Changed English Classroom

The application of technology has considerably changed English teaching methods. It provides so many alternatives as making teaching interesting and more productive in terms of advancement (Patel, 2013). In traditional classrooms, teachers stand in front of learners and give lecture, explanation, and instruction through using blackboard or whiteboard. These methods must be changed concerning the development of technology. The usage of multimedia texts in classroom assists learners in become familiar with vocabulary and language structures. The application of multimedia also makes use of print texts, film, and internet to enhance learners' linguistic knowledge. The use of print, film, and internet gives learners the chance to collect information and offers them different materials for the analysis and interpretation of both language and contexts (Arifah, 2014).

Technology-embedded Classroom Develops Learners' Autonomy

Dawson, Cavanaugh, and Ritzhaupt (2008) and Pourhosein Gilakjani (2014) maintained that using technology can create a learning atmosphere centered around the learner rather than the teacher that in turn creates positive changes. They emphasized that by using computer technology, language class becomes an active place full of meaningful tasks where the learners are responsible for their learning. Drayton, Falk, Stroud, Hobbs, and Hammerman (2010)

argued that using computer technology indicates a true learning experience that enhances learners' responsibilities. Technology encourages learners to learn individually and to acquire responsible behaviors. The independent use of technologies gives learners self-direction.

Use of Technology and Development of Learners' Higher Order Thinking

According to Arifah (2014), the use of the internet increases learners' motivation. The use of film in teaching helps learners to realize the topic with enthusiasm and develop their knowledge. Learners can learn meaningfully when technology is used in the process of learning through using computers and the internet. When learners learn with technology, it assists them in developing their higher order thinking skills. It can be concluded that the true combination of multimedia and teaching methodology is very important to attract learners' attention towards English language learning.

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Lesson 4

Distance Language Teaching with Technology

- Introduction: Defining the field
- Technologies, Tools, and Learning Environments
  - CMC-based Environments
  - Audiographic and Videoconferencing Environments
  - Learning Management Systems
  - Telecollaboration
  - Web 2.0 Tools
- Enquiry into Pedagogical Issues
  - Task Design
  - Assessment of Learning
  - Teacher Expertise
- Research Trajectories and a Future Agenda

Introduction: Defining the field

The form and scale of technology-mediated distance language teaching has expanded markedly over the past two decades, with ongoing innovation providing access to increasingly rich language learning opportunities, for dispersed populations of learners. Language teaching at a distance is now geographically widespread around the world as a well-established means of extending access and opportunities to language learners in both public and private settings. Importantly too there has been a shift in the positioning of distance language programs from being regarded by many as a somewhat marginal enterprise, to being recognized as sites for technological and pedagogical innovation that extend the theory and practices of language teaching. Central to these developments has been an abiding concern to identify the distinctive

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nature and effectiveness of technology-mediated distance language teaching, together with advancing theory, research and practice to inform what a burgeoning domain of activity is.

Defining features of all these forms of distance language teaching are that teachers and learners are physically separated, that "the bulk of the learning takes place in non-co-presence" (Lamy 2013a, 144), and that technology is used to mediate the teaching-learning processes within the presence of an educational organization (distinguishing it from the private study). Distance language teaching has evolved largely in response to developments in technology, from early print-based courses, to educational radio and broadcast television, through to audio and videocassettes, and then to computer technologies, with further possibilities offered by interactive multimedia, Web 2.0 environments, and Second Life. Developments in technology-mediated distance language teaching mark a fundamental shift from early approaches concerned with the production and distribution of learning materials for independent study (including CD-ROMs, video-based courses, and broadcast education for example), to more contemporary approaches concerned with interaction, communication, collaboration and collective activity within virtual learning environments. Technology is no longer solely used for distribution purposes, as in broadcasting, and emphasis is now placed on opportunities for communication using both text and sound, as in the chat, and videoconferencing, meaning that distance language education can focus on communication and learning as a social process.

Importantly, too, the new learning environments offer opportunities for peer support, and for reflection on learning experiences in both private (with teachers) and shared (with peers) conversations online. Thus, emerging paradigms for distance language teaching have made possible different combinations of individual and collaborative language learning environments and called for not only technological innovation but pedagogical innovation. They introduced new expectations of what is required to work successfully in technology-mediated distance language learning environments for both learners and teachers. Earlier research using older technologies such as the telephone (Graham 2000) can acquire new significance with the introduction of accessible tools such as Skype; the value of those earlier studies often lies in the

rich accounts provided of pedagogical challenges, including for example attempts to make conversations more interactive.

Technologies, Tools, and Learning Environments

In distance language teaching while the terms technologies, tools, and learning environments are often used quite loosely, even interchangeably, technology is mostly used as a generic term encompassing, for example, digital technologies and mobile technologies; tools is more specific and is often used to mark a distinction between synchronous and asynchronous tools for example or to refer to specific devices such as the videoconferencing tool NetMeeting. The term learning environment can refer to managed learning environments such as Moodle but more often refers to the complex, local ecology of a course including not only specific tools and content but also constellations of learners, teachers, tasks and interactions, including over time. Blake (2009), in his review of technological applications for second language distance learning, traces advances in the field, concluding that "the profession will need to rethink current best teaching practices and integrate CALL advances fully into the language curriculum including DL options."

To conclude, the most influential technologies, tools, and environments in distance learning have been computer-mediated communication, audiographic and videoconferencing, the use of learning management systems, telecollaboration, and Web 2.0 tools.

- **CMC-based Environments**

  The advent of computer-mediated communication (CMC) opened up entirely new domains in distance language teaching, freeing students from the limitations of pre-determined curricula and materials, and introducing new options for learning through discussion and participation in collaborative environments. Importantly, for the first time distance language learners had the prospect of becoming more active agents in their learning: they could raise questions and participate in more open-ended, collaborative learning opportunities to complement the pre-determined course content. Crucially, isolation was no longer such a barrier, and students were able to connect with their peers,

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and, ideally, develop a sense of affiliation and community. Blake (2005), for example, describes CMC as the essential "glue" that holds students together in distance language learning, arguing that it not only engages them, but allows them to put to use the language they learned during the week, and contributes to maintaining motivation.

White (2003) makes a distinction between static course content and more fluid content which is most easily provided through the use of what are now multiple options for CMC, synchronous and asynchronous, in text, oral, and visual format. Chat, for example, has played a crucial role in providing interactive opportunities in distance language courses: Volle (2005), for example, details synchronous online oral tasks and online oral interviews incorporated into a course for distance learners of Spanish, which was then extended into desktop videoconferencing.

Asynchronous forums were among the earliest forms of CMC used in distance language teaching, with attention to ways in which reflection could be optimally combined with interaction in text‐based conferencing. Subsequently, both asynchronous and synchronous opportunities were used together as in the use of email and chat in an online distance writing course (Raskin 2001), at which point access to the opportunities needed to take account of time zones. A new issue was that of vicarious interaction, that is learners who preferred to read rather than contribute to online interactions. Importantly, this led to new understandings of the importance of social presence online, and the need to integrate computer‐mediated communication into the course curriculum and assessment.

CMC is important in distance language teaching not only as a learning tool but as a gateway to target language communities.

- **Audiographic and Videoconferencing Environments**

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In terms of synchronous conferencing, both audiographic and video conferencing have become crucial components in many distance language courses, providing opportunities for interaction and collaboration, as both the means and the objective of language learning. Videoconferencing, as Guichon (2010) argues, was originally designed for social communication and has been "diverted for pedagogical purposes", a comment that applies equally to the telephone, Skype, blogs and other technologies and tools. In providing face-to-face communication at a distance, videoconferencing has been seen as beneficial for the kinds of interactive opportunities it could provide distance language learners. Importantly too videoconferencing has been recognized as complementing the more established interactive opportunities provided within written online environments (synchronous and asynchronous). Several applications are available (including Adobe Connect, Blackboard Collaborate, Breeze, FlashMeeting, NetMeeting), and they combine different modes such as spoken and written language, and different kinds of access to graphic and visual systems. While early studies identified the benefits of videoconferencing, particularly relating to the affective factors of motivation and confidence, there was an evident need to ensure that task design was well supported by the affordances of the technology.

Both research and practice have focused not only on the affordances and constraints of task-based videoconferencing environments for distance language teaching but also the new demands they placed on language learners and teachers. The challenge for participants has been seen as one of "making meaning in multimodal virtual learning spaces" (Hampel and Hauck 2006), and the complexity of that challenge has been identified as one of developing multimodal literacy, which involves not only becoming familiar with the technology but then learning to "represent meaning in more than one mode at a time, understand each mode and how to use different modes constructively, while remaining aware of. … the affective demands of new media" (Hampel, & de los Arcos, 2013).

Identifying the skills teachers need to work within synchronous distance language teaching environments, has also been a focus of much research (Hampel and Stickler 2005; 138 Cynthia J. White Lamy and Hampel 2007; Wang, Chen, & Levy 2010). Guichon (2009), for

example, identifies the need for specific combinations of socioaffective skills (including to individualize the relationship with students), pedagogical skills that can be deployed in real-time, and multimedia skills. He extends this analysis in a detailed case study of language teachers new to synchronous online teaching, and to videoconferencing in particular. The focus is on language teaching activities, the difficulties experienced by teachers, and the strategies they use to overcome them. A further aim is to identify specifications for a desktop videoconferencing system designed specifically for language teaching. Based on the findings, Guichon refers to "the cognitive limitations met by teachers who had to manage several sub-tasks and deal with several channels almost simultaneously". Key functionalities which would help teachers were identified as relating to planning the online session, communicating more successfully, and keeping track of some of the learner language for later feedback.

- **Learning Management Systems (LMS)**

The expansion of technology‐mediated distance language teaching also required course developers and language teachers to make decisions concerning learning management systems (LMSs), also known as content management systems (CMSs) or virtual learning environments (VLEs). Doughty and Long (2003) were among the first to critique any prospect of the mass commercialization of distance language courses packaged into "ill‐fitting courseware management programs". The concern was that such systems were not created for language learning, with all the attendant limitations that imply. As they evolved, LMSs such as Moodle and Blackboard included a range of communication tools, both asynchronous and synchronous, thus potentially displacing some of the earlier concerns about a lack of opportunities for interaction or engagement with learner needs (Wang, &Chen, 2009). VU LMS is one of the best LMS systems in Pakistan. It synchronizes all academic and administrative activities at one platform.

- **Telecollaboration**

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While technology‐mediated distance language teaching has been concerned with providing opportunities for communication and interaction in the target language, access to those opportunities with native speakers has also remained an enduring ambition. Tudini (2013) argues that interactions which are moderated or mediated by a teacher "are likely to provide only limited preparation for naturalistic conversation outside of the classroom".

Tandem partnerships conducted by email were an early form of asynchronous bilingual exchanges incorporated into distance language courses providing access to authentic interactions with native speakers. Subsequently, telecollaborative exchanges which aim "to bring together language learners in different countries to carry out collaborative projects or undertake intercultural exchanges" (O'Dowd, & Ritter, 2006) were developed within distance language courses using increasingly rich environments (including Web 2.0 platforms such as blogs, wikis, YouTube, and Facebook).

- **Web 2.0 Tools**

More recently, online distance language environments have included, and, in some cases incorporated Web 2.0 tools, such as blogs and wikis. While joint authoring is a key functionality of wikis, the critical dimension of learner support in distance language teaching also needs to be addressed. Organizational aspects are a further challenge related to collaborative work in distance learning, particularly the time it takes for learners to come together and get the work underway.

The functionalities of blogs suggest that they could play an important role in distance language courses: they have an accessible interface and include opportunities to revisit, update, and comment on texts. However, the role of the teacher is critical in ensuring such tools are accepted and embedded within the way the course unfolds, as revealed by Comas-Quinn (2011), in her discussion of an upper-intermediate Spanish distance language course. While only 16% of the distance learners started a blog, for that small community of bloggers committed to

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posting and updating their blogs, it became an important tool for writing practice and a central element of their course. This finding aligns with White's (2003) argument that distance language learners can be seen as course producers, who actively construct their version of the course from the sources available to them, and according to their own learning needs and agendas.

Comas-Quinn (2011) noted that several teachers were reluctant to see "the pedagogic value of blogs and revision exercises that are not properly marked [by the teacher]." Further to this, they expressed resistance to the distributed nature of the learning spaces, arguing that they would prefer to have fewer places to moderate and that such a role could be assigned to an e-moderator as a facilitator of learning opportunities online, separate from the tutor.

The role(s) of teachers in distance language teaching has been an area of enduring debate, and contestation, and the introduction of new technologically mediated spaces tends to draw such debates to the surface once more.

Enquiry into Pedagogical Issues

Technology-mediated distance language learning environments entail quite dramatic shifts in pedagogies developed for more traditional settings, requiring both learners and teachers to rethink their practices. While much emphasis has been placed on technological innovation, pedagogical innovation has tended to lag further behind, though arguably this gap has begun to close as the field matures.

- **Task Design**

In the early forms of distance language teaching, there was a sustained interest in course design and ongoing evaluation of materials. Approaches were informed by principles in the wider distance education literature such as tutorials-in-print and the need to ensure the presence of a "teaching voice" within the course content (Holmberg, Shelley, and White 2005). Course design tended to be a lengthy, detailed process involving trialling of materials during the developmental stage, with ongoing attention to such features as learning goals, assessment, the rate of progress that could be expected, and opportunities for feedback on course work.

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It is important to emphasize that the consequences for flawed design in distance language teaching can be quite significant, impacting on learner motivation and persistence for example, as noted by Lamy (2013): "remote, isolated learners whose learning is impeded or halted by design issues cannot obtain immediate help, nor can the designers intervene swiftly to recast pedagogical orientations that have been explicitly described for the learners in the self-study materials already released to them." While it is now possible to update or revise elements of a course through virtual learning environments, such midstream changes can result in confusion or a negative impact on learner confidence and engagement. As knowledge of broader issues of course design has grown, the emphasis has shifted to task design, which remains an equally high-stakes activity. The prevailing focus has been on task design related to the affordances of particular online tools, the needs and preferences of learners, and the goals of specific learning events. And, as noted earlier, a central concern has been to provide optimal opportunities to develop interactive competence in the target language.

Technology-mediated environments provide the teacher and researcher with a view into the ways in which distance language tasks are interpreted, negotiated, and enacted by students, and by groups of students. This represents a quite dramatic departure from earlier forms of distance language teaching where the teacher was for the most part remote from the individual sites of student learning and had to rely on inferences about students' interpretation of tasks drawn from submitted course work. In technology education, there should be a sustained comparison made between task design and implementation with not only different learners but also different tutors; the aim should be to assist both teachers and course developers in enhancing task design in synchronous online settings.

- **Assessment of Learning**

A prevailing concern has been how to assess the learning gains of distance language students in ways that are appropriate for the learning setting. Currently, we do not have a well-developed philosophy of assessment in distance language teaching, and to date assessing the acquisition of the target language skills by distance language learners has been the focus of enquiry with two broad purposes: to investigate student gains in performance as a means of

establishing the effectiveness of distance language teaching environments and processes (Blake et al. 2008; Volle 2005) and/or as a means of assessing particular skills and providing feedback to learners on their progress. In the first category, early studies focused on assessing and documenting the development of oral skills in online distance environments

An important development in technology ‐ mediated assessment came with the increasing focus on tailoring assessment to match the kinds of interactive and collaborative opportunities integral to contemporary paradigms of distance language teaching. Hopkins (2010) reports on the use of FlashMeeting (which combines synchronous voice and text chat features, together with video, whiteboard, voting, file sharing, and other features) to develop and assess skills in real-time, interactive speaking tasks for English as a foreign language students at the University of Catalonia. The main part of the learning in distance language courses is not directly mediated by a teacher; rather it is the non ‐ co ‐ presence of the teacher into carefully scaffolded, assessed, small group speaking tasks Hopkins (2010).

- **Teacher Expertise**

The knowledge, skills, and expertise required to participate in technology ‐ mediated distance language learning (whether as a teacher, learner, moderator, assessor, course designer), has been explored from several perspectives.

One of the earliest accounts of practices in virtual language classrooms comes from Lamy and Goodfellow (1999a) as they focus on asynchronous conferencing to encourage reflective interaction among distance language learners of French in a project termed Lexica Online. The project aimed to encourage student reflection on their vocabulary learning strategies through group discussions which were moderated by tutors over six weeks. A significant feature of the study is that it analyzes the contributions of tutors and students in terms of message types and tutor styles, both of which are linked to student learning. Of the three text types, only “reflective conversations” (as opposed to monologues and social conversations) were identified as contributing significantly to language learning in that they were interactional “in both information processing ‐ and social ‐ interactional senses”. In terms of optimal tutor styles,

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Lamy and Goodfellow argue the need to attend to both cognitive and social dimensions of student participation and learning. Their work was part of a wider concern as to how to develop learner autonomy within collaborative online distance learning as a critical dimension of learner support.

Hampel (2009) identifies a key challenge in online distance synchronous settings as addressing the tendency for tutors to assume a more directive or teaching-centered approach than is congruent with the espoused benefits of learner-centered language teaching. It is evident that certain features of the setting may lead to this approach including student unfamiliarity with the online tools, technical problems, and the perceived need to direct students to the affordances of the environment. Importantly too Hampel notes that students often find it very difficult to collaborate, having been mostly used to the self-study aspects of distance language learning. Beyond these epistemological shifts in practices of distance language learning and teaching, Hampel identifies the critical importance of design in fostering interaction and collaboration online, referring to Mangenot and Nissen's (2006) framework: "A more learner-centered approach requires the ability on the part of the teacher to provide a setting in which learners can develop the socioaffective, sociocognitive and organizational skills that are prerequisites of collaboration. This can be facilitated by appropriate tasks, moderation and feedback."

These findings underline the importance of affective and organizational dimensions of engagement across all aspects of the role: students for example argued that for their points of contact with tutors were generally high stakes, and that distance language teaching thus requires more attention to interpersonal aspects and relationships, better organization and focus than was often required in other settings, and a degree of sensitivity and empathy towards the learner's individual context. Much research has focused on understanding distance teacher skills in different virtual settings and concerning specific task types (e.g., Comas-Quinn, de los Arcos, & Mardomingo, 2012;Ernest, Heiser, & Murphy, 2013), with a sustained focus on how to encourage interaction and collaboration, to maintain motivation and to ensure student retention and course completion. Important operational practices include setting up online socialization in multimodal learning environments, providing access to support and timely feedback, ensuring congruence between coursework and course assessment, providing spaces where students can

exchange ideas and get support concerning assessment, and generating a feeling of "belonging" to the course and to a learning community.

Conclusion

Technology-mediated distance language teaching is a mature field, yet questions remain about the role of technology and the quality of learning experiences, especially given the diversity of practices that come within the rubric of distance language teaching. While contemporary approaches to distance language teaching are based in social and collaborative virtual contexts, distance language programs around the world still vary considerably in terms of how they are designed, and then in terms of how they are used by instructors and learners, meaning again that the actual experience of distance language learning is highly varied.

While much work remains to be undertaken to shed more light on the processes and best practices of distance language learning and teaching, the research enterprise has been aided enormously by access to archival data from within virtual learning environments. To be of value, access to the situated practices of distance language learners and teachers in particular settings needs to be interpreted against a background of what we have long understood to be major challenges for the field: namely the need for ongoing attention to learner support that adds value to individual learning agendas, attention to the community, and affiliations within that, feedback on an individual and collective activity, and careful consideration of the affective aspects of distance language learning. In introducing new tools or opening up any new learning environments it is critical to consider questions relating to curricular articulation and assessed course components, given the constraints on distance language learners as they seek to adapt to particular learning environments and then learn to derive benefits from working within them.

Lesson 5

The Continuing Evolution of Virtual Worlds for Language Learning

- What are virtual worlds?
- A brief history of VWs
- Overview and categorization of virtual worlds today
- Categories of VWs
  - Age level
  - Game level (low, mid, or high)
  - Socialization level (low, mid, or high)
  - Education focus (low, mid, or high)
  - Technical requirements (low, mid, or high)
- The future of VWs

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What are Virtual Worlds?

While the basic concept of a virtual world has existed for some time, our modern concept of a VW is still a matter of some debate since their continuing evolution has led to refined definitions as well. While some might consider a massively multiplayer online role-play game (MMORPG) like World of Warcraft to be entirely different from a VW like Second Life, others see them as virtual cousins that share many of the same characteristics, with the key difference being that VWs are primarily considered as virtual environments that exist primarily for socializing or what Steinkuehler and Williams (2006) refer to as a "new third spaces" since they may provide virtual "spaces for social interactions and relationships beyond the workplace (or school) and home…"

Characteristics of a Virtual World (VW)

A VW can be defined as having the following characteristics:

• **Online 3D environment:** This may simulate the real world, or it may be wildly creative.

• **Avatars:** Avatars are the in-world representations of real people who control them.

• **Real-time interactivity:** VWs include the possibility of interacting with other avatars in the environment in real-time (synchronous communication), and usually with a range of objects in that VW.

• **24-hour accessibility**

• **Persistence:** When a user logs out of a VW, their avatar, and the actions taken by that avatar, are not deleted.

• **Social space:** Although VWs may vary in look and theme, all VWs are primarily social spaces that exist for the purpose of humans interacting via their avatars.

• **Numbers:** In most VWs there are many players (sometimes in the hundreds of thousands) online in the world at the same time.

• In many—though not all—VWs, users can also control their appearance (e.g., height, facial features, eye colour), gender, clothing, and even their species. In addition, many VWs allow users some control over their environment … (Sadler, 2012, 24–25).

A Brief History of VWs

Works by authors such as Vernor Vinge, William Gibson's Neuromancer in 1984, and Neal Stephenson's Snow Crash from 1992 took the computer technology that was beginning to develop and run with it fictionally. That work, in turn, inspired many of the virtual environments that exist online today.

The history of virtual worlds as they exist on computers and online may be traced back to the creation of the first text-based computer games, beginning with Colossal Cave Adventure

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(CCA) by Will Crowther in 1975–1976. This virtual text-based environment was based on the real-life Mammoth Cave system in Kentucky but included several fantasy-inspired components.

In 1978, Roy Trubshaw created a new game that was patterned on one of the variations of Zork that he called MUD. It first ran on the network of Essex University only, but in 1987 it became available on ARPANET (an ancestor of today's Internet), therefore becoming the first true multi-user online role-play environment. This game, which can still be found on the British Legends website http://www.british-legends.com, included the game elements that made its predecessors popular, but added human-to-human text-based communication and competition in the online environment. This meant that players no longer played solely against a computer, but against (or in support of) each other as well.

The evolution of MUDs led to the creation of MOOs (MUDs, Object-Oriented), with the first created by Stephen White in 1990. While these often looked almost identical to MUDs at first glance—still text-based environments that allowed for multiple users—they also integrated a new feature called object-oriented programming. This allowed for the owner of the MOO, typically called the wizard, to add elements such as a new room or items within a room (again, still text-based) without custom programming a new environment from scratch (a feature that may seem familiar to users of modern VWs like Second Life).

Educators soon discovered that these spaces had the potential for virtual classroom space, and the use of MOOs flourished in that area. Several universities, including the University of Arizona (the Old Pueblo MOO), had MOOs that instructors were able to use for virtual office hours or other educational activities.

While almost all MOOs have disappeared since that time, at the time of this printing the SchMOOze University MOO is still available for use by anyone:

http://schmooze.hunter.cuny.edu/

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Overview and Categorization of Virtual Worlds Today

One of the key questions that is surprisingly difficult to answer is exactly how many virtual worlds exist. One reason for this difficulty lies in the nebulous division between VWs and MMORPGs, as discussed earlier in this chapter.

Determining how many individuals are making use of VWs is also quite difficult. One reason for this difficulty is that VWs that publish user data typically only make available the number of registered accounts.

Categories of VWs

In the early days of VW development, the choices were quite limited, especially for those interested in their use for education. One of the first widely available VWs with a significant education component was Active Worlds (AWs), created in 1995 and still available today. AW included a significant Educational Universe component that, sadly, has largely faded away, as has the popularity of this world. However, there has recently been significant redevelopment in AW that may signal new development in this environment. More recently, as discussed above, the number of VWs has risen dramatically, which means that educators can choose from environments aimed at young children, teens, or adults, with multiple options at each level. Similar options exist for VWs ranging from those almost entirely focused on social interaction to those that blend into the universe of MMORPGs. Most VWs begin with details in five key areas:

• **Age level:** The specific age ranges recommended for the VW based on the information provided by the company. This may be in grade levels or age.

• **Game level (low, mid, or high):** A "pure" social environment would rarely be strongly game-like in nature. A MMORPG like World of Warcraft, on the other hand, may include social elements, but the primary goal of WoW is to gain talents, skills, and tools in order to complete quests.

• **Socialization level (low, mid, or high):** VWs are social spaces, but some are more social than others.

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• **Education focus (low, mid, or high):** Nearly all VWs have potential use for education. The key is in the way that they are used. VWs are a tool for teachers in the same way that PowerPoint can be a tool.

• **Technical requirements (low, mid, or high):** Some VWs are more graphics-intensive than others. Some require more brandwidth, or are more difficult to navigate.

Research on Virtual Worlds

In comparison to other forms of computer-mediated communication (CMC) such as email, message boards, and so on, research into the effect of VWs on language learning and teaching is relatively recent. Except research on Habitat, studies examining VWs have almost entirely been published after 2000.

Given the social nature of VW environments, it is not surprising that one theme shared by several VW studies is their ability to enhance collaboration amongst learners. A second major set of findings regarding VWs and language learning connects to the issue of anxiety. Some of this research found that the use of an avatar (essentially a masked persona for the user) helped learners to "loosen…up a bit…" (Love, Ross, and Wilhelm 2009) while they were able to experiment with new and powerful identities" (Shaffer, Squire, Halverson, & Gee, 2004).

Some researchers also discuss the power of VWs to expose learners to the real world via the virtual environment. While this may seem counterintuitive, it appears that students can become so immersed in the environment that the virtual and the real can become blurred positively.

The Future of VWs

If predictions of future technologies were accurate, contemporary humans would be travelling via personal air cars, with our work being done by groups of robots—made safe, of course, by Isaac Asimov's three laws of robotics as introduced in the short story Runaround in 1942Sadly, this is not the case, but near-future predictions about upcoming advances in VWs may be made with greater accuracy based on products currently under development.

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Over time, VWs have continued to advance, with massive changes in the quality of the graphics, user interfaces, and possibilities for communication.

However, there are many upcoming changes in these environments that will begin to shift them from being VWs to more fully developed artificial reality simulators (ARS). This begins the shift from a 3D environment on a computer screen to "the idea of immersion—using stereoscopy, gaze-tracking, and other technologies to create the illusion of being inside a computer-generated scene." (Rheingold, 1991)

Virtual worlds have grown from their text-based infancy of the 1970s to the 3D immersive environments of today. Educators and students now have a wide array of VWs available to them that can grant instant access to native speakers of a huge variety of languages who are located around the world. As these environments and their associated technologies continue to advance, they promise to change the ways that we understand both human-to-human interaction and what it means to be a student of language.

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Authoring Language-Learning Courseware

- What is language courseware?
- Personal computers and authoring tools
- Multimedia courseware
- Intelligent language tutors
- Commercial courseware and open educational resources (OER)
- Web-delivered courseware

What is Language Courseware?

Language courseware is generally understood to refer to software applications designed for language learning. Here language courseware will be interpreted broadly to include language-learning programs used for individual self-study or integrated into a teacher-led course of study, and running the gamut from simple single-skill activities to comprehensive online courses. With the rise of peer-to-peer interactions and social learning affordances through the internet, the function of the courseware has evolved from the role it played in the early days of computer-assisted language learning (CALL). Rather than being presented as a set of standalone, discrete exercises for enhancing a particular language skill, courseware today is typically integrated into an online learning environment. That is likely to be through a course website, using materials developed in house or provided by a publisher.

Increasingly, structured language-learning materials will be available to students online, whether the course is completely online, delivered in a hybrid/blended format, or taught face-to-face. With the rise of artificial intelligence (AI), have come sophisticated "intelligent language tutors" (ILT) which offer personally customized interactions between learner and computer. Today, language-learning software, including ILTs, is increasingly incorporated into a rich communicative environment delivered over the Web or through mobile apps.

Courseware at the Core of Early CALL

Language courseware goes back to the earliest days of CALL in the 1960s. The early experiments in developing computer-based language-learning software used workstations connected to a mainframe over a phone line. A considerable number of language-learning programs were developed and delivered by way of this setup through the Programmed Logic for Automatic Teaching Operations (PLATO) system at the University of Illinois, which began in 1960.

PLATO programs were created with the TUTOR programming language, specifically designed for education. It was developed so that actual language teachers would be able to create their exercises: "The notion was that instructors would wish to make their own PLATO lessons somewhat in the same way that they produced lecture notes, class handouts, and textbooks; hence, much emphasis was put on making TUTOR easy for the nonprogrammer" (Hart, 1995). PLATO was one of the first systems to be usable by non-experts. This has continued to be an important goal in CALL, to enable real teachers to create their language courseware, tailoring it to the needs of their students and their curriculum. Authoring in TUTOR for PLATO was relatively simple and intuitive, with a very basic instructional format, that came to be used predominantly in language courseware, namely question—response—feedback. PLATO exercises were largely text-based and focused on one particular skill, with assessment through multiple-choice or short answer format questions. The interactions focused on grammar and vocabulary development, although PLATO did have capabilities to display graphics (through a pneumatic tool to access a microfiche) and play audio (on mounted disks). The monitors used were surprisingly sophisticated, as they were touch-sensitive, thereby allowing the creation of exercises such as touching the screen to identify a designated vocabulary item in a picture or playing a concentration-style matching game. Many innovations came out of PLATO, including hierarchical menus, an organized help system, spelling/grammar checkers, and programmed review options (Hart, 1995).

Much of the pioneering work in developing software for language learning was done in the BASIC programming language, provided for free with most early microcomputers. There was a widespread view at the time that serious and effective computer-based language learning needed to be developed by teacher-programmers with a background in both language pedagogy

and computer programming. This was in part driven by the desire to move beyond the kind of drill and practice exercises typically seen in early CALL, as expressed by Underwood in 1984:

"It is ironic that at the same time our profession was discovering communicative methodology, which discouraged piecemeal morphological drill in favour of global practice, the CALL people were busy cutting language up into largely meaningless little pieces."

As it turned out, relatively few language instructors learned to program in BASIC or in other programming languages. For those who are able and willing to do so, the advantage is the full control over the design and functionality of the software created, as well as the ability to update and customize at will. The challenge in using BASIC or any other general programming language is that everything must be programmed by the developer, not just the content and logic, but also screen layout, file organization, and user guidance. In contrast, an authoring language specifically geared towards education, such as TUTOR, provides built-in help for courseware development, so that not everything need to be created from scratch.

One of the early authoring languages dedicated to CALL was Computer-Assisted Language Instruction System (CALIS, 1979), available for MS-DOS (Borchardt 1995). The creation and evolution of this authoring tool is similar to that followed by other systems of this era. CALIS started as a text-only program, with no graphics or multimedia. To create CALIS exercises, instructors used a text editor to create a script, which was run by the student in the CALIS program. Writing the scripts involved using the procedure employed in early word processors for entering formatting instructions, namely inserting words or symbols before and/or after a text string to indicate its programmatic role. This is familiar to anyone having written HTML code for the Web, as it uses the same convention. As is the case with other exercise creation tools, the author types in possible correct answers, entered on a new line starting with the plus sign, with other acceptable responses separated by a vertical bar. Anticipated wrong answers can be entered, by writing a new line starting with the minus sign. Following each line of correct or incorrect answers, the author could provide feedback.

Wildcard symbols and abbreviations can be used to describe particular patterns such as any sequence of text followed by a particular word. Student responses are parsed to check if they match any of the exact text or patterns which the author had included. The software then displays

the preprogrammed feedback to the user. An authoring tool such as CALIS, or similar tools such as Dasher or MacLang, allowed instructors to create their computer-based exercises with only minimal technical expertise (Otto, & Pusack, 2009). This enabled instructors to create learning materials tailored specifically to their needs, that is, using vocabulary, cultural information, or grammar structures that align with textbooks or with other curricular considerations. The fact that the CALIS script is in plain text-enabled easy sharing as well as potential portability to other systems (through a global find and replace). Such considerations are important in decision making about authoring options. Scripting is easier to learn and use than programming code. It is also more readable and portable in that programming code is tied closely to the syntax of the language used and is less easily imported into a new environment. Using a tool such as CALIS eliminates the need to write substantial computer code, but it also limits the functionality to what is enabled by the program creators. While not having to learn general programming is a major time-saver, using such a system could be quite cumbersome in that teachers need to enter correct and anticipated incorrect responses and, optimally, supply customized feedback for each.

The use of authoring languages still requires some coding on the part of the instructor. That is eliminated in template systems, which began to appear in the 1960s. These require the teacher to enter only the content of the item, (i.e., question, correct answer, feedback), not any sequencing or formatting code. The ClozeWrite tool from Fun with Texts, as did other similar programs, allowed free-form text entry, which was evaluated using pattern matching, that is comparing the user's answer to a pre-determined set of correct answers. In a technique used by several authoring systems, students were given feedback on their input through the representation of errors with symbols replacing letters, indicating the locations of errors or misspellings. While this kind of automatic pattern markup can be quite helpful in reducing the time and effort needed to generate feedback, there are several shortcomings to this approach (Pusack, 1983). While the software flags where the error is located in the student's answer, it does not explain the error or provides specific guidance for its correction. It also fails to distinguish trivial from significant errors.

Finally, this approach is good at finding morphological errors but is less useful in identifying other problems such as word order. The Tactical Language and Culture Training System, for example, designed for use by U.S. military personnel, offers a highly interactive

immersion experience that combines cultural information with practical language training (Johnson et al., 2004).

Personal Computers and Authoring Tools

Much of the early work in courseware development of the 1960s and 1970s was designed along similar lines to how drill exercises worked in language labs at the time, with a heavy emphasis on repetitive exercises focused on grammar and vocabulary, inspired by behavioural learning theories. There was also courseware developed for reading, featuring text annotations and comprehension questions. Listening comprehension and pronunciation exercises were limited due to a lack of hardware support. In fact, limitations in the capabilities of the computing environment at the time inhibited the widespread use of language-learning software.

Computer terminals, such as those used in PLATO, were quite expensive and, because they shared processing with other users of the connected mainframe computers, could at times be slow and unresponsive. The advent of personal computers in the 1980s brought about tremendous change in the computing environment and new opportunities for the development and use of language-learning software. Personal computers were relatively inexpensive and could be used without any network or mainframe connection. This changed significantly the development environment, with the prospect of language teachers having their office computers for teaching and research. In this decade teachers began to develop their courseware on PCs through the availability of authoring tools, such as HyperCard (1987).

Authoring tools provide more control than templates over aspects of an exercise such as formatting, feedback, and inclusion of optional items such as help screens. In contrast to authoring languages, authoring tools provide simplified methods for creating exercises with easy-to-use code and procedures for entering questions and feedback. Of course, in the process, they also sacrifice the greater control over presentation and program logic available through the use of an authoring language. Earlier authoring programs written originally for use on mainframe or minicomputers were ported over to the PC environment. From the multitude of computer platforms and operating systems through the 1980s, there was eventually industry consolidation around just two, MS-DOS/Windows from Microsoft and the Apple Macintosh. In the process, some programmers who had developed for other platforms were forced to either abandon their

projects or to re-create their work, which often meant learning a new programming language. This issue remains current, as developers— professional or casual—need to make decisions based on the anticipated longevity of hardware and software.

Just as word processors eventually did away with the necessity of entering formatting codes (special codes around items to designate print formatting), that development was paralleled in authoring tools. CALIS, for example, was ported to Microsoft Windows, becoming WinCALIS, and featuring a script editor, which eliminated the need to learn and write CALIS commands. WinCALIS also supported Unicode, a major factor in allowing courseware to be created for multiple writing systems. Much of the early work in CALL involved efforts to be able to display text written in non-Roman alphabets on computer displays. Another major addition with WinCALIS was the option to incorporate multimedia. The ability to incorporate sound and be able, with some confidence, to enable its playback on student computers, was a major development for language-learning courseware. Audio is important of course for developing listening comprehension, but it can also be used in multiple other ways, such as accompanying readings, audio feedback for computer drills, or pronunciation practice. The growing popularity of the Macintosh during the 1980s, at least in North America, was due in part to its built-in support for multimedia. Also supplied at this time free with every Macintosh computer was a general authoring tool used widely for the creation of language courseware, HyperCard. Authors of HyperCard programs created individual "pages" which could then be combined into "stacks," using a hypertext linking system familiar today from its use on the World Wide Web. It was possible to create HyperCard stacks without any scripting at all, by using icons and pull-down menus to incorporate buttons or other such elements, to add sound and other media, or to create links to other pages or elements on the screen. The text could be entered directly into a text box or copied and pasted from a text file. Advanced users could take advantage of the scripting language built into HyperCard, HyperTalk, to customize layout and functionality and to add more sophisticated interactions. The basic authoring requirements of HyperCard were at a low enough level that technically unsophisticated language teachers were able to create useful courseware. Some instructors who put time and effort into creating extensive HyperCard learning materials were able to make that work available commercially. Moreover, speech to text technology saved the human labour of typing. Now typing voluminous texts have become easier with Speechnotes.co tool which works only with Google chrome.

Written data can be saved in different places. One can access this tool from the link: https://speechnotes.co/

Multimedia Courseware

Most early language-learning software targeted a specific skill area, such as reading comprehension or grammar knowledge. With the ability to incorporate audio and video, new opportunities emerged for multimodal courseware. In the early days of CALL, the ability to create courseware incorporating audio was problematic, let alone using video. However, there were early courseware projects which incorporated video. Some of the first uses were developed at Brigham Young University. Through the development of courseware under the Time-shared Interactive Computer Controlled Information Television (TICCIT) project, which created an extensive set of language courseware, there was interest developed in the use of video for language learning (Hendricks, Bennion, &Larson, 1983).

To allow non-technical instructors to build their own multimedia applications incorporating authentic language materials, several template-based authoring systems for use of video were developed, including IconAuthor, MaxAuthor, and MALTED. One free tool for video annotation is ANVILL, which allows the importation of data from a variety of sources, including phonetics tools, such as the widely used PRAAT. This enables features such as accurate speech transcription. An important component of L2 video is the possibility of including transcriptions as well as L1 or L2 subtitles. Particularly useful is the ability for the viewer to switch at will among the different options.

One of the design choices made for that project was to provide an initial lockstep introduction to the program, which was intended to make sure users were familiar with all the features and functions of the program (Blake, 1999). This is a recurring issue in language courseware design, namely to ensure that users take advantage of the features included for assistance and further exploration, such as help screens, grammar references, dictionaries, or richer feedback options. It seems evident that learners taking the active steps to consult available help mechanisms may lead to deeper processing and therefore more likely language acquisition. That process can also be helpful in building metacognitive awareness in the learners of mechanics and strategies for language learning. Most multimedia projects necessitate a

development team, not a single individual. Needed are not just content experts, but also instructional designers, graphic artists, multimedia specialists, and programmers. The experience, time, and effort involved in such projects make them quite different from earlier projects which often involved work by a single teacher-programmer. In practice, most language-learning projects necessitate funding of some kind, whether that be provided by a grant agency, a university fund, or a commercial entity.

Intelligent Language Tutors

The need for funding applies as well, and perhaps even more, to projects for the development of intelligent language tutors (ILTs), which need the expertise of specialists in computational linguistics and artificial intelligence. ILTs use artificial intelligence to provide a more personal and individualized learning experience. Rather than general feedback or pattern responses, ILTs can provide more tailored feedback, often based not just on what the user has typed, but also drawn from a user profile. That profile may include information on the individual's previous work with the program as well as other data about the user, such as language background, the field of study, or principal area of interest in learning the target language.

Such programs are "intelligent" because they can analyze and evaluate text input by using built-in knowledge about the language to parse, or take apart, the utterance and analyze its form and meaning to determine its appropriateness, comprehensibility, and/or grammatical correctness (Heift, &Schulze, 2007). The program does this based on a language model or "expert system" as well as a language corpus, i.e., a large collection of texts in the target language. Advances in the field of artificial intelligence in recent years have resulted in much more successful natural language processing (NLP). Consumers today often encounter NLP, for example, in automated voice exchanges, where NLP is paired with automatic speech recognition, which has likewise improved tremendously.

The effort and resources required to build an ILT are such that it would be advantageous for these projects to be built cooperatively or to share resources or code. Most programs are built with computer languages commonly used in computational linguistics, namely Lisp and Prolog, along with those used on web servers, Java and Python, but they are normally built from scratch,

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resulting in quite different approaches and code bases. Designing the architecture of the ILT to be modular is a step towards interoperability and flexibility, allowing parts of the system to be turned off or on and to be updated individually. That makes it easier as well to add additional modules in the future. What would increase even more the versatility of ILTs would be the ability for non-programmers to modify the content. The Tutor Assistant is an authoring tool for ILTs which enables that functionality (Toole,Heift, 2002). Flexibility is important as well in providing options to accommodate as wide a range of learners as possible. That could mean providing different pathways for analytical learners who prefer a deductive approach (rules first) and for global learners, who learn better from an inductive method (examples first). When possible, providing different language choices for feedback and other help functions also makes the system more universally usable.

One of the better-known and successful ILTs is E-Tutor for German. Its structure is typical of an ILT in that it incorporates a language knowledge module that parses sentences to provide phrase descriptors and detailed error information, an analysis module, which generates possible responses and updates the student module, which dynamically evolves based on student performance. The nature, amount, and ordering of feedback is one of the most difficult issues that ILT developers face. Language learners will often make more than one error in a sentence so that the system must decide which errors to flag, in which order, and how much feedback to provide for each. Some errors may result from typos, and others may be grammatically incorrect but not critical to comprehensibility. Some systems will provide more detailed feedback to beginners while advanced learners get only a hint at the error.

One approach to user feedback is to have the system places errors into categories and automatically provide feedback on those judged most critical while giving the student the option to see or not feedback on others. Such decisions can be built into the system or be determined by the teacher or by the individual student, by setting defaults in the student module. E-Tutor features an “error priority queue” which ranks errors and is instructor adjustable (Heift, 2004). Another factor for authors to take into consideration in determining user feedback is how much metalinguistic information to provide, that is grammatical or linguistic explanations. Studies have shown that providing such feedback can be more effective than simple flagging of errors (Nagata, 1993) and that learner uptake from feedback is increased if the error is both explained

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and highlighted (Heift, 2004). That is likely to depend on the individual learner so that best practices in this area would seem to point to the importance of flexible feedback, which is at least in part under the user's control.

It is relatively easy to analyze learner input for grammatical and lexical errors. It is more difficult to evaluate and measure other aspects of the user's L2 such as complexity, fluency, and creativity. It is possible to compare an individual learner's input with similar utterances from a learner corpus, comparing sentence length or examining syntactical complexity. One of the other areas that could be examined is the use of collocations or idiomatic expressions, important indicators of lexical sophistication, so crucial for fluency and natural-sounding language output (Tschichold, 2003). An area of importance in second language acquisition is pragmatics, the use of language which is not just grammatically and lexically correct, but also situationally and culturally appropriate. Assessing user input from this perspective is quite difficult, as there are likely to be many different utterances that could be acceptable, and which would likely range from possible but improbable to highly idiomatic (Tschichold, 2003). Providing in the feedback to the user examples of pragmatically appropriate responses—even if the user's utterance is acceptable—may be advisable.

Practical Activity of Corpus:

Corpus must be inculcated in ELT classroom, and learners should be given an autonomous environment for learning and exploring English. Moreover, non-native TEFL teachers have limited linguistic variety. If they lead their students to various authentic corpora, learners can learn best in their respective fields, for instance, journalism students can explore News on the Web corpus and Time Magazine corpus. Mark Davies built the following corpora, and they are free to use by all and sundry. Students are advised to check the following corpora from the given link:

https://www.english-corpora.org/

The links below are for the online interface. But you can also download the corpora for use on your own computer.

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Corpus (online access)	**Download**	**# words**	**Dialect**	**Time period**	**Genre(s)**
iWeb: The Intelligent Web-based Corpus		14 **billion**	6 countries	2017	Web
News on the Web (NOW)		12.9 **billion+**	20 countries	2010-yesterday	Web: News
Global Web-Based English (GloWbE)		1.9 **billion**	20 countries	2012-13	Web (incl blogs)
Wikipedia Corpus		1.9 **billion**	(Various)	2014	Wikipedia
Corpus of Contemporary American English (COCA)		1.0 **billion**	American	1990-2019	Balanced
Coronavirus Corpus		1090 million+	20 countries	Jan 2020-yesterday	Web: News
Corpus of Historical American English (COHA)		475 million	American	1820-2019	Balanced
The TV Corpus		325 million	6 countries	1950-2018	TV shows
The Movie Corpus		200 million	6 countries	1930-2018	Movies
Corpus of American Soap Operas		100 million	American	2001-2012	TV shows
Hansard Corpus		1.6 **billion**	British	1803-2005	Parliament

Early English Books Online		755 million	British	1470s-1690s	(Various)
Corpus of US Supreme Court Opinions		130 million	American	1790s-present	Legal opinions
TIME Magazine Corpus		100 million	American	1923-2006	Magazine
British National Corpus (BNC) *		100 million	British	1980s-1993	Balanced
Strathy Corpus (Canada)		50 million	Canadian	1970s-2000s	Balanced
CORE Corpus		50 million	6 countries	2014	Web
From Google Books n-grams (compare)					
American English		155 billion	American	1500s-2000s	(Various)
British English		34 billion	British	1500s-2000	(Various)

In contrast to the proliferation of multimedia CD-ROMs for language learning, there have been relatively few publicly released ILTs. A good number of projects received preliminary funding to support a proof-of-concept prototype but were not able to fund final development to enable production versions. This is not surprising, given how difficult a task ILTs face, dealing with the complexity of human language and of second language acquisition. ILTs often are designed as research demonstration projects, rather than shareable or commercial products. There are relatively few reviews or studies of ILTs with the exception of those by the developers themselves. Developers of ILT tend to focus, as one would expect, on the functionality and effectiveness of the software, rather than on the user interface design. The user experience can be

quite different from that provided by commercial software. In particular, graphics and multimedia do not display the same high production values.

Commercial Courseware and Open Educational Resources (OER)

In recent years, language-learning software such as **Rosetta Stone** or **Tell Me More** has gained prominence (Nelson 2011). Although such products are sometimes used to provide the primary delivery system for language courses, they are more often used as supplements to classroom instruction or independently by learners in self-instructional contexts. Integrating such commercial software into instructed language learning can be problematic in terms of vocabulary, grammar sequencing, and cultural content. A commercial alternative to standalone software such as Rosetta Stone are the quite widely used electronic workbooks which many publishers are now supplying with basic language textbooks. WWW.duolingo.co is a great source to learn any foreign language. It starts with GTM (Grammar Translation Method), and afterwards, it shifts to the direct method. It is entirely free, and language learning has become a fun with audio visual aids.

Unfortunately, there have been a few studies on the effectiveness of publishers' electronic workbooks. The use of such resources, given the expense and comprehensiveness, is likely to mean that local resources are not developed in support of language instruction. That may not be an issue in some educational settings, but it is possible that curricular requirements or standardized testing may make it imperative to be able to modify materials to meet local needs.

Given the expense, limited access, and inflexibility of much commercial software, one of the recent developments in the creation of language courseware is the rise of shareable teaching and learning materials, often referred to as open educational resources (OER). These can range from quite simple and basic, such as vocabulary grammar drills created with tools such as Quia (a web-based exercise creator) to full-fledged courseware incorporating grammar tutorials, exercises, readings, dialogue, and multimedia.

The well-regarded language courses available from the BBC also are in this category, as are the variety of courseware from the Open Courseware Initiative. There are sites such as Merlot or LORO which act as OER aggregators and feature peer reviews of linked content. While smaller units of OER content, sometimes called "learning objects," can provide useful

learning content for teachers and students, they can sometimes be difficult to integrate into a specific course or curriculum (Friesen 2004). Some learning objects have rich metadata which provide information on provenance, targeted proficiency level/skill, and typical completion time (Meskill, & Anthony, 2007).

Web-Delivered Courseware

Most of what today is produced as OER is available as web-based resources. In fact, today, language courseware is overwhelmingly designed to be delivered over the internet. In the 1990s, most of that development was done in programming environments that were not native to web browsers namely Java and Flash and which necessitated the use of special browser plug-ins to run. Plug-ins are software components added to web browsers that enable special features or functionality. Several ILTs, including E-Tutor, are written in Java and designed to run in the Java plug-in as applets in a web browser. Flash has also been used extensively, for example, for the rich internet applications from the Center for Language Education and Research (CLEAR, Michigan State University). The use of Java and Flash enabled the kind of interactivity and media integration that at that time were not possible in the native web environment using HTML. Plug-ins, however, were not an ideal solution, as they tended to cause performance issues and also could not be fully integrated into web pages. Another early option to move beyond static webpages was server-based interactivity through CGI scripts, or common gateway interface, written in Java or Perl. This method however could be slow, as a new page had to be received from the Web server, and since the entire page was replaced, did not work well for designing interactive courseware. The arrival of JavaScript in the mid-1990s changed dramatically the nature of Web interactivity.

JavaScript (officially ECMAScript) is a scripting language that is incorporated into the source of the webpage, along with HTML and CSS (cascading style sheets). JavaScript is client-side code and is natively supported by Web browsers, which means that it runs efficiently and can be integrated into the Web page structure. What that means in practice is that a script can manipulate objects on the page, for example, showing a checkmark for the correct answer to a question and providing appropriate feedback.

JavaScript syntax and logic will seem familiar to anyone acquainted with earlier scripting languages such as those used in HyperCard or ToolBook. Since JavaScript is embedded into HTML, the source code used for a Web page can be viewed. This makes learning and borrowing much easier than in other development environments. Web browsers incorporate JavaScript debuggers, which enables code errors to be identified and rectified. As both HTML and JavaScript can be created with a basic text editor, this makes the development of interactive web pages more universally feasible than in environments requiring specialized authoring software.

JavaScript has evolved considerably since its origins, to the point at which web applications using JavaScript can be quite complex and sophisticated. One of the JavaScript techniques used frequently is to pull data from a server in the background, then use CSS to update on the fly information on the page, as requested by the user or in response to an action, such as answering a question. This technique, called AJAX for asynchronous JavaScript plus XML, enables the kind of transparent interactivity familiar from authoring tools such as Director. For language-learning software, this allows queries for information housed on a server, such as from a language corpus. That data will most likely be encoded in XML, extensible markup language, a more flexible and generic markup language than HTML. Maintaining program data in a standard, well-structured, open format such as XML is desirable to separate content from formatting. XML offers as well a significant chance to future-proof data, as its structure makes it easy to translate the data into different formats, such as JSON (JavaScript object notation), a lightweight data-exchange format of increasing popularity.

Authoring tools have been created which allow instructors to create exercises which take advantage of the power and flexibility of JavaScript. A tool frequently used by language teachers is Hot Potatoes, which features a wide variety of exercise types. Many language instructors in higher education are likely to be using a web-based course management system, usually called a learning management system (LMS) or virtual learning environment (VLE). These are server-based software tools that are quite useful for course management, including grade recording, assignment distribution and submission, and document archiving. They also provide a consistent and familiar interface to students, as they tend to be used widely across institutions where they have been adopted. As they are generic teaching tools, they do not offer specific language-learning activities. They do include options for creating a variety of exercises, although formats

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and feedback options are limited. Content or exercise creation in most LMS can mean that the content resides in a proprietary system, with limited options for export and reusability.

Moreover, by virtue of the extensive features and functions built into an LMS, the implicit message to instructors may be that this is the total of how the web can be used in teaching and learning, definitely a far cry from the real power and potential of that medium. Most LMS now allow plug-ins or integration of third-party applications, which can supply tools and functions important for language learning such as voice tools. The LMS which is most easily customizable for language learning is Moodle, which also has the advantage of being open source. Many of the external tools and services are increasingly integrated into an LMS through use of an interoperability standard and application program interface (API) called learning tools interoperability (LTI). The LTI-based integration of third-party tools, services, and repositories of learning objects or assessments supplements the built-in functionality of the LMS. This allows as well assessment data from the use of those resources to be sent to the LMS grade book.

The most recent version of the web authoring language, HTML 5, includes features that are important in language-learning applications including native playback for audio and video, enhanced graphics, and robust language support (Godwin-Jones 2014).

The video format allows playback without the need for a plug-in and therefore better integration into the other elements of the page. It also makes it easier, through WebVTT (video text tracks) to include a variety of subtitles and turn them off and on programmatically or at the request of the learner. One of the new elements associated with HTML5 is Canvas, a graphics rendering standard that uses scripting to draw and manipulate images. Form elements on the page (for user input such as text entry fields or radio buttons) can be easily tied to graphic representations using Canvas. Among other additions to HTML5 is a speech input field in forms and advanced text manipulations, such as Ruby annotations, important for some Asian languages. There are other features of HTML5 that make it a good candidate for the development of courseware. The stateless nature of Web pages (i.e., no data kept upon leaving a page) has traditionally been overcome through the use of browser “cookies,” which, however, have limited storage capacity and raise security and privacy issues. The new “Web storage” is more robust and reliable. In terms of interactivity, HTML5 allows any element of the page to be “draggable.”

It also includes support for parsing text with patterns (i.e., “regular expressions”). Since not all features are implemented at the same time in all browsers, it is advisable to use progressive enhancement in designing web apps, that is, assuring basic functionality in all browsers, while enabling more advanced features for supported browsers. This can be done automatically by using available JavaScript libraries.

A JavaScript library, such as the popular jQuery, is a set of pre-written JavaScript which allows for easier development of JavaScript-based applications. These libraries have become very popular with developers, as they make it easier and faster to create rich internet applications.

Using an open standard such as EPUB makes the content usable on a variety of platforms. It also offers some specific features of potential use in language learning. It supports the use of media overlays for creating synchronized audio, which matches up spoken and written texts. This is used heavily in e-books for children, but it clearly could be valuable in second-language learning as well. Media overlays also allow switching from one modality to another, for example, by starting to read at home and then switching to an audio mode in the car. EPUB 3 also offers robust support for non-Latin writing systems, including vertical writing and right to left page progression. Using HTML5 to deliver a web app makes content usable on mobile devices, through the built-in web browsers on smartphones and tablets. Many projects designed for mobile delivery use a proprietary development environment to produce native apps for the targeted platforms. This makes it easier to integrate with the device hardware, but it also means that separate code (using different programming languages) must be written for each platform. Increasingly, authoring tools are taking into consideration mobile users, making the content at last partially usable on phones and tablets. One of the directions holding a good deal of potential for language learning in the mobile space is the development of games. Projects such as Mentira, for example, leverage the capability of mobile devices to enable place-based interactions between students and native speakers. Mentira was created with the game authoring took Augmented Reality and Interactive Storytelling (ARIS), an open-source platform from the University of Wisconsin.

One of the challenges with games and other forms of informal language learning available today is integrating those experiences and the second-language development they

enable into formal learning settings. We seem likely to see in the future more courseware development along the lines of Mentira. The program has a focus on a particular area of linguistic competence of cultural significance—in this case, the use of pragmatics in

A collaborative learning environment is the normal context for the delivery of language courseware. The process of creating and delivering language-learning software has changed significantly since its beginnings in the 1960s. Today, developers are unlikely to be working independently creating discrete language-learning exercises for particular skills. Instead, most developers will be part of a team that includes subject experts, media specialists, and instructional designers. They will be taking advantage, to the extent possible, of pre-built frameworks for creating applications. The delivery system will inevitably be internet-based, using either the open web, a proprietary delivery system such as an LMS, or mobile-friendly apps. Delivery and record-keeping are likely to be cloud-based.

Courseware will continue to be integrated into a social learning environment with rich peer-to-peer collaborative functionality. The majority of language teachers are likely to continue to rely on commercial courseware, developed, and marketed in conjunction with textbooks.

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Lesson 7

E-Books

- E-Books on the Internet
- Early Internet E-book Projects
- The World Wide Web and the Expansion of E-books
- Commercial E-books on the Web
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E-books on the Internet

In modern times, e-books are finally coming of age. A recent Time magazine article highlights growing competition in the e-book reader market. The release of Apple's long-awaited iPad, with accompanying iBookstore and iBooks app, adds even more competition, with over 300,000 devices sold on the first day. Students should also learn technical aspects of the e-books, for example, they should download MobiReader, Winrar because some e-books require these softwares. As a practical task, students must explore the given link to download books from these sources. If users register themselves, they can download 10 books or articles in a day. This site is a reservoir for a bibliophile. Apart from books, it also gives free access to millions of research papers. Please visit this biggest online free library from this link: .https://z-lib.org/

These impressive statistics, the high-profile debate over the Google settlement, and recent popular interest in e-books are signs that they have become part of the public zeitgeist. Long before Amazon began selling books, before Google began scanning texts, and before publishers began to "embrace" e-books, thousands of e-books were available to be read and downloaded for free on the Internet. These e-book libraries were the creation of a relatively small but influential e-book community. This community-developed core philosophies concerning the preservation of digital e-books experimented with digitization processes and learned to cope with accelerating technological change.

Early Internet E-book Projects

The first Internet e-book was created in 1971. The project, aptly dubbed Project Gutenberg, was the brainchild of Michael S. Hart. Hart, then a student at the University of Illinois, founded Gutenberg on the premise of replicator technology. As Hart put it, "Once a book or any other item (including pictures, sounds, and even 3-D items) can be stored in a computer, then any number of copies can and will be available. Everyone in the world, or even not in this world (given satellite transmission), can have a copy of a book that has been entered into a computer" (Hart 1992). Hart accurately predicted the Internet's power as a syndication

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tool. Today the phenomenon is well documented, proven every time a music file is downloaded or a new viral video appears on YouTube. Hart chose the Declaration of Independence as the first document to digitize. Once the document was typed, Hart told his colleagues how to access the file, or sending the 5 kB file to everyone would have crashed the system; six people downloaded the file. Hart had proven his underlying premise. The Gutenberg Library was built slowly. You can browse through this link. https://www.gutenberg.org/ebooks/In August 1989, Project Gutenberg added its tenth book, the King James Bible. In January 1994, Project Gutenberg celebrated its one-hundredth book by publishing the complete works of William Shakespeare. In October 2003, with the addition of the Magna Carta, Gutenberg reached ten thousand volumes.

Today, the Project Gutenberg library contains thirty thousand free books contributed by "tens of thousands" of editors (Lebert 2005). These numbers may seem less when one considers the number of books in the Internet Archive or Google Books. Yet, for nearly four decades, two decades before the World Wide Web, Project Gutenberg has been in the forefront of e-book digitization and collections. Gutenberg first expressed a philosophical basis for Internet e-book collection development policies, in Hart's words "to make information, books and other materials available to the general public in forms a vast majority of the computers, programs and people can easily read, use, quote, and search" (Hart 1992).

Gutenberg's mission is elegantly simple: to "encourage the creation and distribution of e-books"; hence the texts are offered primarily in plain text to make the e-books as widely accessible as possible. Project Gutenberg was the first and, for some time, just about the only Internet e-book library. Eventually, other libraries went online.

Early Internet e-book creators faced substantial technical challenges. E-books had to be typed and progress was slow. Early e-book creators viewed one thousand or five thousand books as significant milestones—and they were. It took over twenty-five years for Project Gutenberg to complete its thousandth book: Dante's Inferno, added in August 1997. Scanner technology—originally developed in 1957—was not widely available, nor were optical character recognition systems, even though Intelligent Machines Research had introduced the first commercial OCR

systems in the 1950s. Eventually, scanners and OCR software would change the role of the early e-book creator from typist to editor/proofreader.

Sharing information on the early Internet was not easy. The Internet, advanced for its time, was still clunky. Download speeds were slow, and basic transfer protocols were in their earliest iterations. TC P/IP (Transmission Control Protocol/Internet Protocol) was developed in 1974, after Hart typed his first e-book. Computer use was not ubiquitous. The first Apple computer, the Apple I, was released in 1977, the first IBM PC in 1981. E-book audiences were small, limited to a handful of academics and scientists.

Early e-book creators faced the twin challenges of building collections and learning how best to use new digital technology. Despite these significant challenges, many of the early collections flourished and survive today.

The World Wide Web and the Expansion of E-books

Many of the technical issues faced by e-books creators were resolved with the advent of the Web, a natural platform for e-books that was far more user friendly than BITNET and previous TCP/IP and FTP platforms. With a viable platform in place and a potential audience of millions, academics, libraries, and enthusiasts jumped into digitization projects and the number of e-book libraries began to increase dramatically. An example of such a site is Renascence Editions, an online repository of works printed in English between the years 1477 and 1799. The site was founded in 1992 by Risa Bear, a staff member of the University of Oregon Libraries (which hosted the site) and an accomplished poetess with a passion for the literature of the period. From 1992 to 2005, Bear and her contributing editors published over 164 e-books on the Web, including works by Shakespeare, Francis Bacon, Mary Wollstonecraft, Edmund Spenser, and Jonathan Swift.

As these libraries grew, people with similar interests began to collaborate and share ideas. E-book communities began to emerge and libraries began to merge. The Luminarium was founded in 1996 by Anniina Jokinen. Initially, Jokinen created the site as a starting point for

students and enthusiasts of English literature. The site grew, adding links to similar sites such as Renascence Editions and eventually hosting content shared by colleagues. In essence, the owners of Internet e-book libraries began to do cooperative collection development, often with great success. The process was so easy as to be almost transparent: hyperlink to the other libraries. In June 1993, Lynn H. Nelson launched CARRIE, the first full-text history library on the Web. In a brief article titled "CARRIE: A Full-Text Online Library," Nelson gives a firsthand account of the site's launch, which he indicates was an immediate success. Within a month the site had approximately three thousand links to historical texts.

Despite its success, CARRI E was soon overtaken by other sites. As Nelson writes, "It was only two months until a new day dawned and colleges and universities throughout the country were scrambling to put up World Wide Web sites, and HNSource and CARRIE lost their uniqueness and were overshadowed by the well-funded and professionally staffed projects that began appearing." Libraries and well-funded projects such as the Library of Congress American Memory project, which grew from a pilot digitization project that ran from 1990 to 1994, were uniquely positioned to develop Internet e-book collections. Aside from their obvious expertise in information management and collection building, they also had the funding and staff necessary to meet the increasing demand for more books, better access models, and more advanced searching tools.

One of the best known of these collections was the University of Virginia Library's Etext Center, founded in 1992. E-book libraries of a similar scale, particularly Internet libraries that offer free e-books, are not common. One that has reached a similar size is the Internet Archive, launched in 1996. The Internet Archive offers "permanent access for researchers, historians, scholars, people with disabilities, and the general public to historical collections that exist in digital format" (www.archive.org). The archive's mission is rooted in the library/archive tradition. It is a visionary effort to create a historical record of a new medium, "to prevent the Internet—a new medium with major historical significance—and other 'born-digital' materials from disappearing into the past." "Born-digital" content included in the archive includes software, audio, video, and e-texts.

As of November 1, 2009, the Internet Archive's Text Collection contained 1,716,115 items. The largest collection, the American Libraries Collection, included 1,139,936 texts. Other collections are Canadian Libraries, 208,867 items; Universal Library, 70,200 items; and Project Gutenberg, 20,377 items. A list of contributors for the American Collection (www.archive.org/details/americana) shows the diverse institutions involved in digitizing books. Contributors include academic and public libraries, the Boston Library Consortium, Lyrasis, and CARLI, the Consortium of Academic and Research Libraries in Illinois. Corporate contributors include Microsoft, Yahoo! and the Sloan Foundation. Microsoft's contribution alone numbers 339,609 books from its defunct Microsoft Book Search.

The Internet Archive includes an open-source e-book reader. The reader is developed and maintained by volunteers. In a refreshing move, the Internet Archive has an open bug reporting system. Readers can report bugs, view a list of known issues, and even see who has been tasked with correcting each issue.

As a result of the combined efforts of all these individuals and institutions, a prodigious number of e-books are available on the Internet. The collections are as diverse as they are numerous. Aficionados of children's books have many sites to choose from: the International Children's Digital Library, Lookybook, Kids' Corner from Wired for Books, Children's Books Online: The Rosetta Project, Children's Literature from the Rare Book Room of the Library of Congress, and a scan of the Original Alice, by Lewis Carroll, in the British Museum's Turning the Pages collection. All these sites are easily found with a search engine.

The Internet also caters to more rarified tastes. Fans of H. P. Lovecraft can read all of his tales of horror at Dagonbytes.com. Readers curious about evolution can browse Darwin's complete works online at the Thackray Medal–winning Darwin Online. Classical music fans might be drawn to the Bavarian State Library's digital library of Felix Mendelssohn's writings. In short, there are many wonderful e-books collections on the Internet waiting to be discovered.

Commercial E-books on the Web

All of these efforts at e-book digitization served as a proof of concept for commercial publishers. Still, it was only after the successful transition from print to electronic journals

proved the viability and profitability of electronic publishing that publishers warmed to the idea of e-books. Even then, publishers faced several practical issues including digital rights management, the risk of e-book sales undercutting print sales, and finding a suitable electronic format and reader. Many of the early efforts to sell e-books were by aggregators who modelled their databases on commercial journal databases and marketed e-books to libraries.

NetLibrary launched the first e-book database for libraries in 1998. Modelled on journal databases, the platform coupled a discovery interface for finding e-books with a reader for viewing the full text of the e-book.NetLibrary's key innovation was allowing readers to search the full text of an entire e-book library at once. Once an e-book was open, readers could take notes electronically, add bookmarks, link to outside resources, and copy and paste the text. Reading from cover to cover was an option, of course, but the emphasis was on research use, similar conceptually to the periodical databases NetLibrary emulated. Within a few years, other e-book aggregators entered the market, including EBL, ebrary, MyiLibrary, and OverDrive. All these platforms offer similar base functionality, but each has its unique features as well.

As aggregators were marketing to libraries, other companies sought to break into the consumer market. The history of these efforts is often a study in mergers and acquisitions as opposed to selling e-books. In 1998, Peanut Press began selling e-books online. Peanut Press was subsequently renamed eReader, then after its purchase by Palm was renamed Palm Press.

In 2008, eReader (which had reverted to its earlier name after Palm spun the company off) was purchased by Fictionwise, an e-book company that had formed in 2000. Soon afterwards, March 5, 2009, Fictionwise was acquired by Barnes and Noble for $15.7 million. Barnes and Noble have parlayed this property and its other e-book holdings into one of the largest e-book stores on the Web, with over 500,000 books available. Individual publishers were a little slower in moving to e-books. The publishers that jumped in most quickly were those successful with e-journals. Notables include Springer and Elsevier, both of which added e-books to their respective proprietary platforms, SpringerLink and Science Direct.

The direct-to-consumer market began to open for publishers with the development of affordable e-book readers. Ultimately, Amazon's Kindle may have the same impact on e-books as Mosaic did on the Internet. The Kindle was not the first reader to market, but it has captured

public attention. Amazon, which offers over 350,000 e-books on its website, recently announced plans to sell the Kindle in over one hundred countries. Other companies are competing for the growing market. Sony recently partnered with Google to make over 500,000 books available online. Barnes and Noble unveiled a new e-book reader, the nook, in October 2009. The nook can store and play MP3 files, and it also allows readers to lend electronic books to friends. Apple introduced the iPad and corresponding iBooks app in April 2010. Asustek, the maker of Asus netbooks, will soon release its Eee Reader, and Samsung is set to release its Papyrus reader, already available in South Korea, in the United States. Major publishers now sell front-list e-books direct to consumers. HarperCollins, Random House, Macmillan, Simon and Schuster, and Penguin all offer e-books and downloadable audiobooks online. Learners should download audiobooks free of cost from the given link: https://www.learnoutloud.com/ . Books have been selected from different genres for instance travel, science, philosophy, business, education, politics, religion etc. Publishers are also adding free e-books to the Internet, often as part of promotional campaigns.

Graphic novel publishers are also getting into the mix. Every week, Marvel Comics offers fifteen free comic books to users who are not ready to subscribe to the Marvel online library, Digital Comics Online. This is a subscription service with over five thousand comics available, including classics like The Amazing Spiderman.

The availability of e-books on both noncommercial and commercial sites coupled with publishers' growing enthusiasm for the direct-to-consumer market is a strong indicator that e-books are reaching maturity on the Internet.

Google Books

Google's plan to make money from e-books is straightforward. First, digitize as many in-print and out-of-print books as possible, thus creating a massive e-book library. Next, when the inevitable lawsuits are filed, negotiate a settlement with industry associations that sanction your business model and establish a revenue-sharing model that heels your biggest threats. Finally,

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make gobs of money with your e-book storefront, print-on-demand services, e-book subscriptions to libraries, and advertising revenue. The more complex issue is whether Google's strategy is a good or a bad thing for anyone other than Google employees and the company's shareholders. In creating Google Books, Google has done an excellent job of building partnerships. Initially, Google partnered with publishers. Among the first to join in were Cambridge University Press, the University of Chicago Press, McGraw-Hill, Oxford University Press, Penguin, Springer, and Taylor and Francis. In December 2004, Google partnered with prominent libraries in launching the Google Print Library Project, subsequently renamed Google Books. Google sought to work with prominent libraries such as Harvard, the University of Michigan, the New York Public Library, Oxford, and Stanford. Eventually, other libraries joined in the effort, including the University of California, University Complutense of Madrid, and the University of Virginia.

It was the Google Books project—specifically the scanning of the libraries' books—that provoked a lawsuit by the American Publishers Association and the Authors Guild. At the heart of the lawsuit was the assertion that Google had violated copyright law by digitizing dozens of works without the copyright holders' permission. The lawsuit played itself out in a series of increasingly self-serving and tedious pronouncements by both Google and the APA.

In October 2008 they announced a settlement, detailing the key terms in a lengthy (some might say tedious) legal document. Google got the right to scan and display books. For books in copyright, rights holders have to opt in to have their material included; for out-of-print materials,

rights holders have to opt-out. Google retains 37% of the profits from sales of the texts; the remaining 63% is divided between the publishers and the authors.

The settlement also calls for the creation of a Book Rights Registry. The registry, a nonprofit institution, is to track sales and hold money in escrow for copyright holders until the funds are claimed.

One might be justified in thinking that perhaps the Google uproar is overdone. The Google Books project will make more books available to readers than ever before. Those books

will be easier to find and relatively inexpensive. There is also a built-in safety valve of sorts, for if the experience of the music industry has proven anything, it is that today's tech-savvy consumers will find alternatives to commercial sites if the price is too high or if the information is too restricted.

E-books and Authors

The e-book is still in the early stage of development as a medium. Now that e-book technology is reaching a level of advancement where it does not distract from the text, many writers are no longer content with simply replicating the print. Blogs are alive with discussions about multimedia e-books.Writers are experimenting with embedding video, audio, and animation in their work. More engaged authors have already begun to influence the form and the market.

In 2000, Stephen King released his novella **Riding the Bullet** exclusively as an e-book on the Internet. Scribner's servers were so busy that many people were unable to download the work. King had demonstrated that authors (well-known authors at least) could effectively use the Internet to publish their writing. On October 21, 2009, Scribner announced a $35 list price for the e-book edition of **Under the Dome**, Stephen King's latest epic. Evidently, King and Scribner are hoping to prove the point once more at a significantly higher price point.

King's **Riding the Bullet** was a conventional e-book (in terms of its technology, not the text) that was marketed unconventionally. As King was releasing his novella, other authors were working with the medium in less conventional ways. In 1999 the Kennedy Center and RealNetworks launched Storytime Online, a project aimed at using the Internet "to make the unique power and magic of children's books more accessible."

Each story featured audio of the authors reading their works combined with visual and textual accompaniment. Stories included Judith Viorst's Alexander and the Terrible, Horrible, No Good, Very Bad Day; Debbie Allen's Brothers of the Knight; and the poem Harlem by Walter Dean Myers. In merging audio, video, and text, the program demonstrated the e-book's potential as a multimedia medium.

The Screen Actors Guild took a similar approach with Storyline Online, which featured members of the Guild reading children's books, with accompanying text and video. Stories on the site include To Be a Drum, by Evelyn Coleman, read by James Earl Jones; My Rotten Redheaded Older Brother, by Patricia Polacco, read by Melissa Gilbert; The Polar Express, by Chris Van Allsburg, read by Lou Diamond Phillips; and Enemy Pie, by Derek Munson, read by Camryn Manheim. Sadly, at the time of this writing, a note had been posted on the site indicating that funding for the project had run out.

The concept of creating Internet e-books by merging text with Internet technology was taken to another level by writers participating in the Penguin Books project **We Tell Stories**. We Tell Stories features six different stories from six different authors told over a series of six weeks. Each story incorporates the Internet in the storytelling uniquely. For instance, Charles Cummings's **21 Steps** uses Google Maps to track the movements of the characters. Each chapter is accompanied by a map of the city of London indicating where the characters are standing. Toby Litt's Slice uses a weblog to tell its story. Litt encourages readers to e-mail the characters, and the characters send text messages through Twitter. Nicci French wrote her story **Your Place and Mine** live on the Internet while readers followed along.

Other Internet e-book projects have more of a retro feel. USAToday .com's Open Book series features original works of fiction published in weekly instalments, similar to serialized stories published in popular magazines. Although Open Book does not use the Internet as innovatively as We Tell Stories, it takes advantage of the Internet's strength as a syndication tool.

As writers continue to explore the medium, they will necessarily stake out a position in the ongoing debate about a standard file format for e-books. Indeed, they could conspire to render the notion of a single standard obsolete by working across formats as artists might work in a combination of inks, pastels, watercolours, and oils.

A significant change is not likely in the immediate future. Text will remain the most critical element in an e-book, as is appropriate. Moreover, the adoption of the EPUB standard, which supports multimedia functionality, will accommodate most writers' needs. Authors will be able to incorporate video or even soundtracks in their works. Authors/publishers will be able to

create so-called deluxe editions of books, just as movie studios have released director's cuts of movies and recording companies have included bonus tracks and video on CD reissues. Soon readers will be able to hear Dan Brown explaining obscure references in **The Lost Symbol** or J. K. Rowling's feelings on how sections of the Harry Potter books were adapted for the screen. Successive editions of books will be just as, if not more, desirable than the first edition. Readers will experience books in a very different way than they previously have.

E-books and Their Future on the Internet

The thirty-year history of the e-book on the Internet began with slow and steady development and then launched into accelerated progress. Early efforts focused on putting public domain, rare, and unique content online, in Michael Hart's words, "to make the full record of humanity as intellectually accessible as possible to every human being, regardless of linguistic or cultural background." As the commercial implications of Internet e-books became clear, aggregators and publishers joined in, focusing on the Internet as a market for frontlist titles. Authors became involved too, wrestling with the commercial implications of e-books while exploring them as a new medium. The interests of all those involved are largely complementary.

For instance, digital projects tend to focus on books that are out of copyright, and publishers are concerned about their catalogue. All want to promote e-books, even Google Books, which has caused the most legal commotion and disharmony to date.

Academics and enthusiasts will continue to create websites with free downloadable e-books. Authors will use the Internet as they explore e-books in their literary work. Consumers will make purchasing decisions based on costs (monetary and otherwise). If the costs are too high, independent-minded consumers will find ways to "liberate" e-books by harvesting and sharing the content.

Today more books are available for readers than ever before; they are also easier to access and less likely to go out of print. E-books are searchable, interactive, and less expensive (millions are free). Writers are exploring the e-book medium and are using it in novel ways. The future of the e-book, and the e-book on the Internet, has never looked brighter.

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Lesson 8

Blended Language Learning

- Introduction

- Blended learning: Definition
- Why adopt blended learning?
- Benefits of Blended Learning
- Five Important Considerations Before Adopting a Blended Approach
- Conclusion

Introduction

In the field of second language learning as well as general education, blended and hybrid learning is receiving a lot of attention. Researchers investigating blended learning tend to agree that "blended learning is a transformational force in education." According to Watson (2008), blended learning is "likely to emerge as the predominant model of the future and to become far more common than either [online or face - to - face instruction] alone"

Blended learning as an approach is not new. Indeed, the practice of combining different learning approaches and strategies is not new at all. Distance learning courses have long combined blended learning through a mix of self-access content-print/video/TV/radio-and face-to-face/telephone support.

'Traditional' courses have always combined a variety of delivery modes that combine content such as lectures, seminars, tutorials, workshops and group work to give learners a range of learning opportunities. And of course, 'good teachers will always use more than one method or approach in their teaching, and good learners will always combine different strategies in their learning.'

So we could say that the term 'blended learning' refers to every time teachers mix different media (e.g. print, audio, and video) with classroom interaction, maximizing authentic input to support learners' output and skills development. As such, blended learning has more or less always existed, although the term itself is a mere 15 years old at most, and is now understood to mean a rich, supportive learner-centred learning environment where the 'right blend' is synonymous with effective learning (and teaching).

What is new is that today, the technology combines all the different media within one environment: online. The online space facilitates learner-learner interaction, encourages incidental and exploratory learning and allows learners and teachers to stay connected outside the classroom, if they so wish. Learners can benefit from the fact that space and distance do not matter anymore. Teachers and educationalists are now understanding more and more that, with the 'right blend', teachers can offer a much richer, supportive learning environment, learning opportunities increase, learning becomes more effective and the learning process becomes more enjoyable.

Blended Learning: Definition

There are many definitions for blended learning, but they all have the following in common: they refer to two different learning environments — face-to-face (synchronous) and online (asynchronous); and they refer to combining those two learning environments in a complementary way to deliver a program of study so that learners can be supported both within the classroom environment and outside of it.

More specifically, Picciano (2009) describes blended classes as those where face - to - face and online activities are integrated in a planned, pedagogically valuable manner and where online activities replace a portion of face - to - face time. Both definitions include two main ingredients: online and face - to - face instructional modes.

In addition, some definitions include the amount of instruction in each mode. For example, the website Blended Learning Toolkit 2014 quotes the definition from the Online Learning Consortium (formerly the Sloan Consortium) which "defines blended learning as a course where 30 percent to 70 percent of the instruction is delivered online." From the range of definitions currently in use, Picciano aptly concludes, 'There is no generally accepted definition of blended learning' (2014).

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We could go further and say, 'It's in the blend!' That is, the key to a successful blended learning approach is to use the strengths of each medium appropriately, combining the two different learning environments in an integrated way so that each medium complements one another: the classroom environment being used for what it does best, such as introducing new topics, explaining important language points or for meaningful communicative activities, and the online environment being used for what it does best, such as preparing for the next topic (by watching a video/reading a text, etc.), and/or practising and consolidating what has been learnt in class or for extra practice. Both modes of delivery put the learner at the centre of the learning process.

Thus, the term 'blended' is used to mean combining different learning environments in an integrated way and appropriately and the stress is very much on 'learning' (not teaching) — either learning in the classroom with the teacher's help and support or learning online more independently or with peer support. As Marsh (2012) remarks, ‘Today blended learning can refer to any combination of different methods of learning, different learning environments, different learning styles. In short, the effective implementation of blended learning is essentially all about making the most of the learning opportunities and tools available to achieve the "optimal" learning environment.’

Why Adopt Blended Learning?

It is undeniable that the linguistic theories on language teaching and learning of the last 50 years, and their application in the classroom have influenced teachers worldwide. Most English language programs have communicative competence as one of their main objectives. Learners worldwide need English to communicate. Teachers worldwide are using (more or less successfully) the Communicative Approach to teach English. However, time in the classroom for

listening to learners, supporting them and helping them become communicatively competent is limited. Therefore, incorporating online mediums of education into traditional education makes learning more time effective.

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Benefits of Blended Learning

Teaching cannot be defined separately from learning. 'It is guiding and facilitating learning, enabling the learner to learn' (Brown, 2000). The role of a teacher is therefore multidimensional: it is to facilitate learning, to support learners through their learning journey, to know when to intervene (with suggestions, explanations, encouragements), and when to stand aside and observe. Today's learners are often said to breathe technology and this must be used to the full by the teacher because learning happens everywhere, not just in the classroom. This is particularly true in this digital age of ours (Dudeney, & Hockly, 2016).

Online learning provides learners with the ability to be both together and apart, and to be connected to a community of learners anytime and anywhere, without being bound by time, place or situation (Garrison and Kanuka, 2004). However, it should be noted that the online environment must be learner-driven and not technology-driven (Salaberry, 2001). Technologies, mobile or otherwise, can be instrumental in language learning. They are very powerful tools for the transmission and distribution of linguistic information (input) or, in other words, aids to communication rather than a means of instruction (Chinnery, 2006). An appropriate online environment must be conceived and developed to provide support to those learning online and thus must focus on learners' needs and use technology appropriately to support these needs (Colpaert, 2004).

When the online environment within a blended approach is used appropriately, it empowers learners, provides them with rich interactive input, gives them just-in-time support, helps them become independent learners and encourages learner discovery. When the classroom environment within a blended approach is used appropriately, it is an effective way for teachers to fulfil their multidimensional role. It gives teachers the possibility of giving more individual attention to learners, it maximizes social interaction in the classroom, and it facilitates teacher–learner communication outside the classroom. Research suggests that when online and face-to-face elements are combined, learners often place a greater value or emphasis on the face-to-face aspects of the experience (Graham, 2004). But teacher–learner communication does not stop

when learners leave the classroom; it continues outside the classroom environment. And with the right blend, the classroom time can be used to maximum effect.

Five Important Considerations Before Adopting a Blended Approach

1. Teacher Training

The first consideration is that teacher training is required. This will help with choosing an appropriate blend. When the classroom and online environment are used appropriately and effectively in a blended approach, this puts the learner at the centre of the learning process. Teachers must be trained to develop programs of study that take into account both the strong and weak points of each environment. This means that teachers must learn that every single input does not necessarily happen in the classroom. Teachers should also be aware that:

- People learn better when they can choose their path of study, as this is a great motivator.
- Listening is a key part of teaching and that listening happens best in the classroom environment.
- Taking more and more of a back seat in the classroom environment is a testament not only to their learners taking charge of their learning but also to the fact that they, the teachers, have developed a blend that is appropriate to the learners and which is helping them become effective communicators.
- Preparation time is front-loaded: most preparation is needed when leading up to the course, together with supporting learners at the beginning of the course.
- A blended approach represents a significant departure from a traditional approach. It represents a fundamental reconceptualization and reorganization of the teaching and learning dynamic. In this respect, no two blended learning designs are identical (Graham, 2004).

2. Choosing an Appropriate Blend

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The success of any blended learning course is largely in the blend. People tend to ask how much of the course should be online and how much of the course should be in the classroom. This is a fair question. But only teachers can answer such a question, as the answer lies in the needs and wishes of learners, the type of assessment requested by the institution and the institution's constraints, whether they be time allocation for a course, availability of human resources, physical/geographical conditions, etc.

A golden rule in developing any blended course-and indeed, learning courses in general-is to always start with the end in mind, i.e. the aims and objectives of the course, taking into account the institution's constraints. When devising a blended course, an important question that we must ask ourselves as teachers is how much time should be spent ideally in the classroom. Then it follows how much time will be spent online. Class contact time is usually dictated by the institution and is not therefore a moveable feast. However, online contact time can be as much or as little as necessary and is to a large extent decided by learners themselves. The particular blend will be dictated by looking at the language proficiency of our learners together with the language content and skills they must develop during their course. In other words, this will dictate what is best done online and should be done online, as well as what is best done in the classroom and should be done in the classroom, and therefore the number of hours to be spent in the respective environments.

Our priorities as teachers must always be to focus on the 'output' (learners' production of the second language). But for 'output' to happen, learners usually need 'input' (watching videos, listening to the audio, reading texts, being familiarized with authentic language, explanation of key language and concepts, etc.). We know that the 'output' (to a large extent, spoken output) is what all learners need and want. We also know that the (spoken) output usually happens within the social environment of the classroom. So teachers must maximize the time given to output in the classroom

environment without minimizing the time given to input (such as grammar explanation or clarification, pronunciation practice, etc.) in the classroom because teachers know that the

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better the input, the better the output. The beauty of any blended learning course is that the blend can be developed, adapted, changed, tweaked or refined at will, or whenever the paramount needs of the learners demand it. Choosing the right blend is a key part of the teacher's role.

Teachers must use the flexibility that blended learning grants them to design the course that best fits learners' needs and wishes whilst taking into account assessment requirements and institutional constraints.

3. Costs

The costs involved in blended learning must be considered as they might not be negligible, especially at the beginning of the process. Cost-effectiveness is a third major goal for blended learning systems. It is undeniable that these provide an opportunity for reaching a large, globally dispersed audience in a short period with consistent, semi-personal content delivery. Some researches have been undertaken in the corporate sector that shows that blended learning which is used effectively provides a large return on investment (Garrison & Kanuka, 2004). However, containing costs requires a fundamental shift in thinking. Rather than focus on how to provide more effective and efficient teaching, we must focus on how to produce more effective and efficient student learning. Once learning becomes the central focus, the important question is how best to use all available resources — teacher time and technology — to achieve certain learning objectives. Using all available resources most efficiently leads to reduced cost and improvement in student learning (Twigg, 2006).

4. Attrition and Motivation

An important element to consider when adopting a blended approach is student attrition and retention. Many students, when they are first introduced to e-learning, tend

to say that they are not 'being taught' and feel that not only have they been wasting their time but that teachers are not doing their job. There are two critical elements at play here:

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academic factors such as difficulty and/or relevance with course material and non-academic factors such as time pressure (Picciano, 2006). Concerning non-academic factors, blended learning (especially the online element) can address two of them: time pressure (in relation to when to learn) and space (where to learn). As for the academic factors, experience has shown that well-designed blended courses enhance student learning and increase student retention (Amaral, & Shank, 2010). Furthermore, any blended course requires self-discipline and motivation on the part of the learners.

However, one factor encouraging motivation in blended learning is reliance on discovery learning and self-directed learning, the type of skill base that is often lacking among such students (Huang & Zhou, 2003). It exists everywhere and is most prominent amongst students used to being taught, to receive instructions, to learning for exams. Another important factor regarding motivation is a cultural shift from teaching to learning, from being taught to learning on one's own with guidance (Prensky, 2007), which needs to take place when a blended course is adopted. This changing paradigm means that not only must the course aims and learning objectives be made transparent and meaningful to students, but also that students themselves must take more responsibility for their learning. Being more in control of one's learning is a great motivational driver. And finally in terms of motivational drivers, one should perhaps also look at local and cultural adaptation. One of the strengths of e-learning is the ability to rapidly distribute uniform learning materials. Yet there is often a need to customize the materials for a local audience to make them culturally relevant and locally meaningful, thus increasing motivation. By striking a balance between global and local interests and using face-to-face classroom interaction, teachers can play an important role in helping to make globally distributed materials locally and culturally relevant and meaningful (Jagannathan, 2004).

5. Peer Support

Peer support is an integral part of a blended approach, as teachers cannot be on hand to help learners all the time. Peer support is relevant in any learning environment,

but it is even more relevant in a blended approach because blended learning facilitates peer support. It is easier to ask one's peers a question online than in the classroom, whether for lack of time or fear of appearing stupid. Peer support fills gaps in other students' knowledge or understanding. It also encourages the sharing of ideas about how to learn. Helping and supporting peers (for example, those who missed sessions or were having difficulty understanding key concepts etc.) is a great motivator (Hughes, 2007). Another benefit of peer support is that students who answer their peers' questions develop not only their communication skills by using the language appropriately to explain key concepts, but also their social skills by using that language effectively. And finally, thanks to peer support, teachers find that they are not overwhelmed by individual requests for help and that when these do arise, they have the time to respond promptly.

Conclusion

Blended learning is an approach that takes into account different learning styles and combines different learning environments in a flexible, integrated and complementary way in order to help, support and enhance learners' diverse needs and provide a successful, efficient and enjoyable learning experience. Mixing different media, different modes of delivery and different instructional strategies is not a new approach, but the capabilities of today's technology can make a blended approach both easier and more meaningful for learners. Blended learning puts learners at the centre of the learning process, encouraging them to be more independent, and also helps teachers in their vital role of supporting learning.

Blended learning — if appropriately conceived, developed and delivered — can support any number of learners, anywhere and anytime; it can help managers use human and other resources in the most efficient way possible to give learners the best learning experience possible. It is satisfying to know that there is a growing body of evidence to support the view that blended learning can result in a better student learning experience, an improvement in learning outcomes, and greater student motivation, confidence and satisfaction, leading to learners becoming more independent learners and enjoying learning the language.

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Lesson 9

Designing Curriculum Around Technology

- Integrating Technology
- Curriculum Design
- Role of the Teacher
- Preparing for the Future
- Benefits of Using Technology in the Classroom
- Outcomes

- Digital Books
- Classroom Clickers
- Interactive Whiteboards and Tablets

Integrating Technology

The integration of technology should serve to guide, expand, and enhance learning objectives. It is understood that teachers and students do need to spend time learning the basics of using a computer. This is necessary to move to effectively integrating technology. Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance learning in a content area or multidisciplinary setting. Technology enables students to learn in ways not previously possible. Effective integration of technology is achieved when students can select technology tools to help them obtain information promptly, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions as accessible as all other classroom tools.

Curriculum Design

Curriculum design is a term used to describe the purposeful, deliberate, and systematic organization of curriculum within a class or course. In other words, it is a way for teachers to plan instruction. When teachers design a curriculum, they identify what will be done, who will do it, and what schedule to follow.

It is generally understood as a high-level process defining the learning to take place within a specific program of study, leading to a specific unit(s) of credit or qualification.

Teachers design each curriculum with a specific educational purpose in mind. The ultimate goal is to improve student learning, but there are other reasons to employ curriculum design as well. For example, designing a curriculum for middle school students with both elementary and high school curricula in mind helps to make sure that learning goals are aligned and complement each other from one stage to the next. If a middle school curriculum is designed without taking prior knowledge from elementary school or future learning in high school into account it can create real problems for the students.

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Role of the Teacher

Teaching English in the digital era is challenging as we deal with the technology development. In dealing with Y and Z generations who are digital natives, teachers are expected to be more technologically savvy as the incorporation of technology in the teaching and learning process is a prerequisite for supporting the digital natives.

It is obvious that if we expect teachers to integrate technology into the curriculum there needs to be a degree of familiarity with the computer. The question is how familiar? How much does a teacher need to know about computers to effectively integrate them into the curriculum? Teachers don't need to know how a computer works but rather how to use and apply a computer in the classroom. A simple analogy can be used when comparing a computer user to a person that operates a vehicle. In order to operate a vehicle, a driver does not need to understand how the engine of the vehicle works, how to repair the vehicle, or even know how to buy a vehicle. It is expected that the driver will know how to operate the vehicle on the road understanding road signs and expectations of drivers on the road. As the driver gains more experience driving, their confidence level increases as well as their skill on the road. When operating a computer, a basic level of knowledge is necessary to be successful. The user does not need to know how the computer works, how to repair the computer, or even know how to buy a computer. Over time

the user will become more experienced and confident with using a computer. Teachers should strive for two goals when integrating technology. The first goal is to become a computer-using teacher. It may be the producing materials to use in the classroom such as handouts, banners or newsletters. It may be using the computer to manage the students' marks or using a software program to strengthen a particular skill. The second goal is to make the computer a teaching partner rather than an object of study. "The instructional goals of computer-using teachers are in art, science, math, language arts, social studies, or other disciplines, not in computers." (Geisert, & Futrell, 1995).Teachers must have a clear understanding of what technology can and can't do in the classroom.

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Computers can help teachers and students find old information and new information from thousands of sites on the Internet that are updated daily. Computers enable students to view live, synchronous events happening almost anywhere in the world or from space (e.g. the current weather as seen from a satellite). Computers can be used to manipulate data so that students can grasp quickly how a change in one variable in a system affects other variables. Computers enable students to assemble and create new information. Computers enable students to have text, audio, and graphic information that they might not have access to in some less densely populated areas. Computers allow students to communicate with just about anyone, anywhere, and anytime. (Valmont and Wepner, 2000)

On the other side of the coin, computers cannot replace teachers. Valmont and Wepner quote in 2000:

"Contrary to the wisdom of the most fanatical technologists, computers do not think, initiate, or react the way teachers do. Although some people believe that information equals education, teachers know that understanding is not automatic with the acquisition or memorization of facts. Knowing how to apply information, how to use ideas in new ways, how to evaluate information, and how to extrapolate or go beyond basic information are important aspects of learning."

Teachers understand when the teachable moment is at hand and guide students' academic growth. The teacher facilitates learning and helps students transfer ideas to new learning

situations. Integrating technology isn't about using complex technology programs but rather simplifying technology choices and focusing on how technology connects to learning.

Preparing for the Future

Integrating technology into the curriculum is necessary to stay updated and take benefit of the latest technological advances happening around the globe. We must prepare our teachers and students for the digital future and one part of that means equipping them with technology. In

today's world and the future era, online education as well as the capability of using computers, laptops, tablets and the like are a must.

These 21st-century skills are essential to be successful in this day and age. Jobs that may not have had a digital component in the past may have one now. Education isn't just about memorizing facts and vocabulary words; it's about solving complex problems and collaborating with others in the workforce. Ed-tech in the classroom prepares students for their future and sets them up for this increasing digital economy.

Therefore, regardless of the field of education one belongs to, technology integration is a must for future preparation. The teachers and students who will be unable to do so will lag behind and would either be replaced by machines or forced to stay back.

Benefits of Using Technology in the Classroom

Improves Engagement

When technology is integrated into lessons, students are expected to be more interested in the subjects they are studying. Technology provides different opportunities to make learning more fun and enjoyable in terms of teaching the same things in new ways. For instance, delivering teaching through gamification, taking students on virtual field trips, and using other online learning resources. What is more, technology can encourage more active participation in the learning process which can be hard to achieve through a traditional lecture environment.

Improves Knowledge Retention

Students who are engaged and interested in things they are studying are expected to have better knowledge retention. As mentioned before, technology can help to encourage active participation in the classroom which also is a very important factor for increased knowledge retention. Different forms of technology can be used to experiment with and decide what works best for students in terms of retaining their knowledge.

Encourages Individual Learning

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No one learns the same way because of different learning styles and different abilities. Technology provides great opportunities for making learning more effective for everyone with different needs. For example, students can learn at their speed, review difficult concepts or skip ahead if they need to. What is more, technology can provide more opportunities for struggling or disabled students. Access to the Internet gives students access to a broad range of resources to conduct research in different ways, which in turn can increase the engagement.

Encourages Collaboration

Students can practice collaboration skills by getting involved in different online activities. For example, working on different projects by collaborating with others on forums or by sharing documents in their virtual learning environments. Technology can encourage collaboration with students in the same classroom, same school, and even with other classrooms around the world.

Students Can Learn Useful Life Skills

By using technology in the classroom, both teachers and students can develop skills essential for the 21st century. Students can gain the skills they will need to be successful in the future. Modern learning is about collaborating with others, solving complex problems, critical thinking, developing different forms of communication and leadership skills, and improving motivation and productivity. What is more, technology can help develop many practical skills, including creating presentations, learning to differentiate reliable from unreliable sources on the

Internet, maintaining proper online etiquette, and writing emails. These are very important skills that can be developed in the classroom.

Benefits for Teachers

With countless online resources, technology can help improve teaching. Teachers can use different apps or trusted online resources to enhance the traditional ways of teaching and to keep students more engaged. Virtual lesson plans, grading software and online assessments can help teachers save a lot time. This valuable time can be used for working with students who are

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struggling. What is more, having virtual learning environments in schools enhances collaboration and knowledge sharing between teachers.

Teachers can use lesson plans for their classrooms from these authentic websites.

- PBSlearningmedia.org 3,000 free lesson plans
- Unesco.org.pk lesson plans
- http://www.eslkidstuff.com
- Lesson plans etc http://www.edhelper.com/

- Time Magazine for Kids: Classroom Resources
- Esltower
- Esl galaxy
- Eslkidslab
- Esldepot
- Eslgold

Effective Technology for Successful Curriculum

- Digital Books
- Classroom Clickers
- Interactive Whiteboards and Tablets

Digital Books

Digital books or e-books are an effective technological tool for curriculum. Anything that makes life easier for people is attractive. E-Books are portable and convenient. With a supported eBook device, anyone can have a library at their fingertips. Carrying around one's favourite books on iPad, eReader, smartphone, or table is a lot easier than lugging around a thousand paperback books.

Classroom Clickers

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Current research describes the benefits of active learning approaches. Clickers, or student response systems, are a technology used to promote active learning. They take the guesswork out of teaching. A mix of software and hardware, clicker technology enables the teacher to collect and evaluate student answers to questions during class. It helps the teachers gauge student learning as it is happening and enables them to alter the lecture or classroom activities on the spot with clicker technology.

The risk of getting an answer wrong can lead many students to shy away from participating. But, with classroom clickers, young and mature learners are empowered to answer questions anonymously. Most research on the benefits of using clickers in the classroom has shown that students become engaged and enjoy using them.

Interactive Whiteboards and Tablets

Interactive whiteboards have brought significant improvements in the education sector by simplifying the learning processes. An interactive whiteboard (IWB) also commonly known as an Interactive board or Smart whiteboard is a large interactive display in the form of a whiteboard. It can either be a standalone touchscreen computer used independently to perform tasks and operations, or a connectable apparatus used as a touchpad to control computers from a projector.

Interactive whiteboards allow educators to take standard lessons and turn them into interactive activities. Students have a lot of fun while they learn. Interactive whiteboards allow students to interact with the learning material. They become a part of the lesson and can even teach each other. Their understanding of the subject is seen through touching, drawing, or writing on the board. Educational games can be played by entire classrooms. They also provide immediate feedback, so students and teachers can easily assess the student progress. Interactive whiteboards are clean and require very low maintenance. No chalk or markers or other writing utensils needed. Data is modified using a specialized pen for highlighting, drawing, and writing. Therefore there is no mess. No cleanup. It's just that easy.

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Various media types can be displayed on an interactive whiteboard. Whether photos, graphs, maps, illustrations, or videos, teachers have an abundance of options. They can create creative lessons to inspire their students. Students are more attentive in the classroom; their comprehension improves; test scores rise, and literacy increases. Students learn better and remember it. When students are engaged more in the classroom, learning always increases.

Outcomes

Integrating technology into the curriculum has the following outcomes:

- More engaged students
- Simplified materials
- Increased motivation and better-developed collaboration skills
- Overall increased student achievement due to increased involvement and learning at their own pace

Conclusion

Therefore, to sum up, we can say that integrating technology into the curriculum not only prepares teachers and students for a digital future, but it makes the process of learning much more collaborative, easier, and fun.

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Lesson 10

E-Assessment

- Definition of E-Assessment
- Introduction
- Different Forms of E-assessment
- Approaches for Providing Feedback in E-assessment

- Reasons for Using E-Assessment

Definition of E-Assessment

Electronic assessment, also known as e-assessment, online assessment, computer-assisted/mediated assessment and computer-based assessment, is the use of information technology in various forms of assessment such as educational assessment, health assessment, psychiatric assessment, and psychological assessment. This may utilize an online computer connected to a network. This definition embraces a wide range of student activities ranging from the use of a word processor to on-screen testing.

Introduction

E-assessment is becoming more widely used by exam awarding bodies, particularly those with multiple or international study centres and those that offer remote study courses.

Specific types of e-assessment include multiple-choice, online/electronic submission, to a peer-assessment exercise in which students are required to assess each other's work. Different types of online assessments contain elements of one or more of the following components, depending on the assessment's purpose: formative, diagnostic, or summative. Instant and detailed feedback may (or may not) be enabled.

In education assessment, large-scale examining bodies find the journey from traditional paper-based exam assessment to fully electronic assessment a long one. Practical considerations

such as having the necessary IT hardware to enable large numbers of student to sit an electronic examination at the same time, as well as the need to ensure a stringent level of security is among the concerns that need to resolve to accomplish this transition.

E-marking is one way that many exam assessments and awarding bodies, such as Cambridge International Examinations, are utilizing innovations in technology to expedite the marking of examinations. In some cases, e-marking can be combined with electronic

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examinations, whilst in other cases, students will still handwrite their exams with papers scanned in securely and uploaded into an e-marking system.

Different Forms of E-assessment

Some of the most widely-used forms of e-assessment are:

a. online tests, quizzes, and exams
b. e-submission and e-marking
c. self- and peer-assessment
d. student response systems

a. Tests, quizzes, and exams taken on a computer screen under the supervision of an invigilator are known as **online tests, quizzes, and exams**. The tests and exam questions are already created by the instructors and uploaded online at the university/college's website or canvas.

b. e-submission is the process by which a student submits work online for storage and retrieval by academic, administrative or other staff for marking, feedback, or review. This can also include originality checking to help identify plagiarism using Turnitin.

e-marking is the process by which staff provide marks and feedback to students online, which can include online annotations e.g. using Blackboard inline grading, annotated files e.g. using comments in Microsoft Word, audio, video, or the use of online forms.

c. Self-assessment means the process of having the learners critically reflect upon, record the progress of and perhaps suggest grades for, their learning.

The term **peer-assessment** refers to the process of having the learners critically reflect upon, and perhaps suggest grades for, the learning of their peers.

Reasons for Using Self- and Peer-assessment

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Self-assessment

- Encourage reflection
- Help lecturers focus their feedback (e.g. not telling students what they are already aware of)
- An important skill in itself – helping students become more autonomous learners

Peer assessment

- Students practice softer skills e.g. constructive criticism
- Help students learn from each other and place their work
- Students naturally compare themselves with their peers
- Encourage engagement with marking criteria
- Promote deep learning e.g. evaluation
- More efficient & timely feedback for large groups

d. A **student response system (SRS)** is a technology used in face-to-face teaching scenarios to facilitate interactivity, enhance feedback processes on multiple levels, and collect data from students. **TurningPoint** is a leading commercial student response system. It is quick and easy for novice users to introduce basic practices into their teaching, and there is an excellent range of advanced features for those wishing to do more.

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Approaches for Providing Feedback in E-assessment

Following are some approaches for providing feedback in online assessment:

- Provide digital feedback files e.g. standard feedback forms in Word format.
- Annotate work, for example using comments in Word or Adobe Reader. Upload annotated assignments back into Blackboard.
- Fill in an online feedback form (rubric), available in both Blackboard and Turnitin.

- Create audio or video/screencast feedback, and make this available to students via Blackboard.
- Annotate work directly in Blackboard or Turnitin.

Reasons for Using E-Assessment

E-Assessment covers a wide range of activities so can have a wide range of benefits. The advantages of e-assessment can include:

- Immediate feedback, tailored to help students improve their knowledge and performance
- Access for students in different geographical locations and at different times
- Sophisticated reporting, allowing you to refine the exercise or identify areas in which more instruction is needed
- Students undertake online tests many times to assess and re-assess their knowledge

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Lesson 11

Technologies for Teaching and Learning L2 Reading

- Introduction
- L2 Reading theories

- SLA theories and applications of technology to L2 reading
- Technologies in use for teaching and learning of L2 reading
- Self-developed and commercial courseware
- CMC technologies (Chat, Moo, email)
- Challenges
- Future directions

Introduction

With widespread access to reading resources and various forms of reading, the concept of reading nowadays may be different from what it once was. Online reading allows readers to interact in compelling ways with text and with others, but readers are at the same time being exposed to the danger of distractions or are overloaded by the volume of materials (Godwin-Jones 2010). This can be especially true for L2 learners reading in a language that they are not proficient in because they need support to overcome linguistic and processing practice limitations (Cobb, in press; Grabe 2014).

Simultaneously, many Web 2.0 tools and technologies are being designed and used for all levels of L2 learners to build certain skills for effective L2 reading. L2 educators play vital roles in helping students acquire the skills necessary to take advantage of new technological tools so they can actively participate in global communities (Gonglewski and Dubravac 2006). The objectives of this chapter are:

(1) To inform L2 teachers, researchers, and software designers of the theoretical grounding of applying technological innovations to the teaching of L2 reading

(2) To introduce the variety of technology applications to foster successful L2 reading

(3) To discuss the pitfalls and challenges of reading in the technology age

(4) To provide thoughts on future directions for applying technology to L2 reading development and the possibilities of cultivating ubiquitous, learner-centred, autonomous learning.

L2 Reading Theories

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Reading theories for both L1 and L2 have attempted to explain reading processes from three perspectives: structural, cognitive, and metacognitive. Structural perspectives are also referred to by researchers as the "bottom-up" (Chun and Plass 1997; Nunan 1991) or the "outside-in" (McCarthy 1999) views. They focus on the printed form of a text and postulate that meaning exists in the text and readers are passive recipients of the information.

According to this view, reading is primarily a matter of decoding a series of written symbols into their aural equivalents in the quest to make sense of the text. For successful decoding, readers need to acquire a set of hierarchically ordered sub-skills that sequentially help improve comprehension ability (LaBerge and Samuels 1985). This view, however, has been criticized as being inadequate due to overemphasis on the formal features of the language, mainly words and structure, and downplaying the significance of contextual comprehension factors.

The cognitive view brings the role of background knowledge into play and highlights the interactive nature of reading and the constructive aspects of comprehension. It is also referred to as the "top-down" model and was introduced to counteract the over-reliance on linguistic forms in the structural perspective of reading (Chun and Plass 1997; Nunan, 1991). From the cognitive view, reading is regarded as a psycholinguistic guessing game, a process in which readers sample the text, make hypotheses, confirm or reject them, make new hypotheses, and so forth (Goodman, 1967). Background knowledge and schema development are seen as crucial in cognitive inferencing through contextual cues and hypothesis testing (Smith 2004). Without complete background knowledge or appropriate schemata, readers encounter difficulties processing and

understanding the text because such knowledge is needed to interpret sensory data, retrieve information from memory, organize reading goals and sub-goals, allocate resources, and guide the flow of the processing system.

Contemporary models of metacognitive reading were proposed due to the tenuous affirmation of the roles for structural and cognitive language processing in reading development (Askildson, 2011; Carrell, & Grabe, 2002). Although the structural view over-relied on language

forms, a reader must know them to comprehend the text. The influence of background knowledge on reading comprehension also cannot be denied (Block 1992). Supporters of the metacognitive view regard reading as a process of active meaning construction during which readers make use of both linguistic information from the external printed text (Langer et al. 1990) as well as their internal background knowledge (Brantmeier 2003). In addition, skilful readers often use a set of flexible, adaptable metacognitive strategies to make sense of a text and monitor their ongoing understanding of the text (Dole, 2002). Metacognition involves being aware of what one is doing while reading (Block 1992). Strategic readers are capable of reflecting on their level of understanding and know what to do when reading difficulties occur. By using metacognitive strategies, readers are better at activating background knowledge, identifying and planning reading tasks, and monitoring their reading (Boulware-Gooden et al., 2007).

SLA Theories and Applications of Technology to L2 Reading

When reading is seen as a means for second language acquisition and technology is added, the L2 reading process becomes even more complex to conceptualize. Digital environments add visual and auditory features to a text and require the reader to integrate the information afforded by these modes into the processes of comprehension. Furthermore, with the interactivity provided by Web technologies, reading is supplemented by a social dimension of instantaneous connectedness not just with text but also with other people for exchanges and co-construction of understanding. To create and evaluate technology for language learning, computer-assisted language learning (CALL) developers and researchers have looked to second language acquisition (SLA) theories for support and guiding principles. Similar to reading theories, SLA theories have also gone through stages of transition. Although SLA approaches of the different stages provide distinct implications for CALL, cognitive, linguistic and psycholinguistic approaches have been most commonly adopted for the study of applications of technology to L2 reading (Chapelle, 2009; Chun, 2011a). More recently, as the Internet provides far-reaching and instantaneous interactivity, researchers and educators increasingly rely on sociocultural approaches.

The focus of cognitive theory on noticing, working memory, automatization of word recognition, and activating prior knowledge has provided theoretical bases for many studies examining how online or multimedia reading scaffolds, such as dictionaries, glosses, and annotation affect vocabulary learning and reading comprehension. For example, Schmidt's (1990) "noticing hypothesis" which maintains that attention is critical in the acquisition process of an L2 has provided the theoretical framework for exploring the effects of different types of multimedia glosses on text comprehension and vocabulary learning of computerized text (Hegelheime,Chapelle, 2000). Based on the noticing hypothesis, efforts have been made to compare reader performance in computerized and traditional paper-pencil glosses on vocabulary development, certain linguistic features, and comprehension (Bowles, 2004).

Mayer's (2005) cognitive theory of multimedia learning (CTML) has also been applied to L2 reading studies and to developing multimedia text for L2 reading. Based on three general cognitive science principles (i.e., the dual-channel assumption, the limited capacity assumption, and the active processing assumption), CTML postulates that meaningful learning occurs when students select suitable words and pictures, organize them into coherent pictorial and verbal models, and integrate them with each other and appropriate prior knowledge.

When information presented is similar to the learner's cognitive processes, the learner would have better information retention by storing it in long-term memory. An example of applying CTML to the design of multimedia materials for L2 reading is the study by Alkhasawneh et al. (2012), in which the researchers developed a multimedia text to increase students' abilities to comprehend the reading. In another study, Garrett-Rucks, Howles, and Lake (2015) examined the combined use of audiovisual features by 70 French language learners for the reading comprehension of L2 hypermedia text.

Metacognitive approaches also provide theoretical frameworks for understanding how new technologies might be changing L2 reading behaviours (Leu, 2002). Research has compared reading strategies used in text-based contexts and online environments (Genc, 2011), the strategies used by EFL learners (Omar, 2014), as well as by L1 and L2 learners during online reading (Taki, 2015). Studies are also exploring strategies and decision-making processes used as

L2 learners engage in online reading (Park, Yang, &Hsieh, 2014). As mobile devices become increasingly accessible, strategies used in mobile contexts are not left unexplored. Auer (2015) looks into the strategies employed by readers when using the functions afforded by tablets to support reading comprehension. The study by Fu et al. (2014) focused on the effects of reading strategy via e-book reading.

More recently sociocultural theories that posit mediation of understanding through cultural tools have been adopted by researchers to study technologies and L2 development. Different from the cognitive approaches that theorize language learning as process of acquiring grammatical forms in a specific predetermined order, sociocultural theories maintain that learning occurs in a sociocultural milieu in which learners are active constructors (Lantolf 2010; Rémi and Lawrence 2012). From the sociocultural point of view, reading is not a series of individualistic skills to be mastered. Rather, it is a social skill requiring active participation and interaction of learners involved. Implications of sociocultural perspectives for investigating technology use for L2 reading have not been sufficiently explored (Chun, 2011a). However, the use of Web technology for social-networking-based learning has led to an increased interest among researchers and CALL material developers to draw on these perspectives as the theoretical framework for their work. Studies have been conducted to understand how sociocultural backgrounds influence L2 learners' use of web-based tools for vocabulary learning, collaborative reading, reading comprehension, and so on (Gao, 2013; Juffs, & Friedline, 2014; Parisa, Mansoor, & Saeed, 2014).

A review of the theoretical bases of technological applications to L2 reading demonstrates that SLA perspectives have provided theory-based development and evaluation of both commercial and academic CALL materials for language teaching and learning, including

L2 reading. In the areas of vocabulary learning, reading comprehension, reading strategies, activation of background knowledge, motivation, and collaborative reading, they have fulfilled what Chapelle (2009) describes as the "pragmatic goal of marshalling professional knowledge in a manner that is useful for creating learning opportunities and demonstrating successful

learning." In turn, technologies are contributing to creating innovative approaches to teaching and learning as well as a means for developing materials for L2 reading.

Technologies in Use for Teaching and Learning of L2 Reading

The range and quantity of applications of new technologies for reading have grown rapidly. Selecting the appropriate one from an ever-expanding pool can be an overwhelming task for teachers. The processes of making decisions about which technology to use to teach targeted language skills and for specific pedagogical objectives can also be complicated.

In this section, the technologies most relevant to L2 reading are described. They include:

(1) self-developed course and commercial courseware

(2) online activities with individual tools and mobile devices

(3) CMC

(1) Self‐developed and Commercial Courseware

- **Self-developed Courseware**

Self-developed courseware is usually designed by collaborative teams to create language learning tools to suit a specific group of learners. It may involve several stages, components, or systems that are available online. Different modes of vocabulary annotation and multimedia glosses are often built-in to help learners increase vocabulary size and improve comprehension of text. The utilization of intelligent tutoring systems (ITSs) to provide immediate, customized instruction or feedback to learners is also increasing.

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A fair amount of self-developed courseware for teaching L2 reading has been used and its effectiveness has been documented. Studies have explored users' preferences for different types of annotations. Growing incorporation of intelligent tutoring systems (ITS) into self-developed courseware has been due to technological breakthroughs from the fields of computational

linguistics, information retrieval, cognitive science, artificial intelligence, and discourse processing. ITSs are designed to simulate a human tutor's behaviour and guidance. A well-designed ITS system provides users with convenient access to individualized practice, models good problem-solving approaches, and helps learners based on their learning rates and specific needs. Salomon, Globerson, and Guterman (1989) studied the effectiveness of their computerized reading tool, Reading Partner, and found students improved in metacognitive reconstruction, reading comprehension, and the quality of written essays. The technologies for creating an ITS have improved a great deal since then. A research team at Pennsylvania State University has developed a web-based ITS for improving learners' reading comprehension by presenting and training them to use the structure strategy to read (Wijekumar and Meyer, 2006). READ, developed by researchers at Carnegie Mellon University, provides reader specific lexical practice for reading comprehension (Brown, & Eskenazi, 2004). Some systems have been created specifically with L2 learners in mind. For example, in Taiwan,Tsai (2011) created multimedia courseware for EFL learners to improve English language proficiency through readings on world heritage sites.

- **Commercial Courseware**

Commercial courseware is ready-made, licensed, and sold by companies. It usually consists of a combination of lessons, activities, tests, and other relevant materials. One popular commercial courseware that was studied for its effectiveness for L2 learning of listening and reading is Longman English Online. While some educators can develop their courseware to meet the specific needs of their students, most of them have neither the time nor the technical support. The market for commercial language learning courseware is vast and expanding. More studies on evaluating commercial courseware would help teachers to choose those most appropriate so the institutional investment is not wasted.

(2) Online Activities with Individual Study Tools and Portable Devices

In Stockwell's (2007) view, online activities are different from "courseware," in that the former refers to smaller‐scale independent activities that are not part of a larger package. Many of these activities incorporate digital scaffolding tools, such as dictionaries, annotations, glosses,

concordances, reading ‐ level classification tools, speech synthesis/recognition technology, and mobile devices.

- **Dictionaries, Glosses, and Annotations**

The increasing availability of electronic corpora and online technology has facilitated the creation of tools that aim to support L2 reading by accelerating and automatizing word recognition.

Today one can easily access millions of word definitions, spellings, audio pronunciations, example sentences, and word origins free from publishers like Cambridge, Oxford, Macmillan, and Dictonary.com who have teams of experienced lexicographers to compile and continuously update the content of their dictionaries. There are also dictionaries created by individual enthusiasts, such as WordReference.com. Free web ‐ based document annotation tools are also available, for example, Annotate.com allows users to add notes and tags to their text and images. Similar Web annotation tools that allow users to modify data from a Web resource without modifying the original Web page include Diigo, Bounce, Corcodoc, Markup.i0, and so on.

A great majority of studies dealing with technology or CALL for L2 reading have focused on teaching and learning L2 vocabulary. This is no surprise since knowing vocabulary is key to learning to read and comprehend just as exposure to texts containing key vocabulary is necessary for learning vocabulary. The use of electronic dictionaries, text ‐ based glosses, as well as annotations and multimedia glosses has been extensively researched since they appeared in the late 1990s (Chun, 2011).

In recent years, as NLP tools and resources have become more versatile, vocabulary learning tools are increasingly adaptive to learner control and needs. The SmartReader designed by Oflazer, Kemal, and Mitamura (2013) allows users to either choose a text from the system's library or upload a document of their own to create intelligent e ‐ books. The vocabulary learning tool MyVLS ‐ Reader was specifically designed by Hsu and Ou Yang (2013) for

university students majoring in science and technology and also provides multiple learning choices for its users.

- **Concordancing Tools**

A concordancer is a corpus analysis tool that extracts instances of a given word from a corpus, database, or the Internet and then presents to the user a list of the occurrences of the word, part of the word, or combinations of words, together with their contexts, from a corpus of texts. The development of corpus analysis software and computer networking makes it easier for learners to access free online concordances. Tom Cobb's (2015) LEXTUTOR and William Fletcher's (2015) Phrases in English are two sophisticated websites with concordancing tools freely available to users.

- **Reading-level Classification Tools**

Though based on the same belief that vocabulary knowledge is the foundation to reading comprehension, reading - level classification tools work from a different angle. They take the approach of modifying texts so readers understand them better. Supporters of text simplification

uphold that linguistic modifications increase text comprehensibility and subsequently facilitate readers' abilities to interact with and comprehend a text (Allen, & Widdowson, 1979; Goodman, & Freeman, 1993; Long and Ross, 1993).

- **Speech Synthesis and Speech Recognition**

Text - to - Speech (TTS) is the process of synthesizing natural-sounding speech from text via computer programs. Speech synthesis technology has been around since the 1960s and the tools applying the technology are now quite accessible. Many of them are freely available (e.g., Speak Selection, Screen Reader, Natural Reader) but some are commercial (e.g., Text Reader, Voice Dream Reader). Google Chrome also provides free TTS tools to support teaching and learning of reading (e.g., Select and Speak, SpeakIt!, Reading & Write for Google). Some

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TTS applications are created specifically for L2 learning. Voki, created by Oddcast, allows users to create their talking avatar, speaking different accents. They can even be emailed, embedded on websites, or shared on social media. Teachers can use its classroom management system to assign students classwork. TTS tools have been applied to assist struggling readers in L1 (Schmitt et al., 2011). They also receive attention from researchers for their potential to enhance L2 reading.

Speech recognition (SR), in essence, is the process of allowing computer software to interpret the meaning of a speaker's utterances. SR also has been increasingly incorporated in L2 learning. There are any providers of commercially available CALL systems that use technology, including Rosetta Stone Tell Me More), Pearson (MyLab), Scientific Learning (Soliloquy Reading Assistant), eLanguage (Learn to peak), Carnegie Speech (NativeAccent), L Labs (MyET), Livemocha, English Central, Duolingo, Babbel, Aleo, and Berlitz. Studies have examined some SR software (e.g., IBM Reading Companion and Watch ‐ me! ‐ Read, Carnegie Mellon's Project LISTEN, Colorado Literacy Tutor, University of Birmingham TAR Project), and findings suggest that their uses bring not only motivation and encouragement but also prove reading ability in children (Mostow et al. 2008). Reading Companion has been applied to help children in Taiwan improve reading in EFL (Liaw 2013). Meihami and Varmaghani (2013)

reported how Tell Me More Software was used to help students improve EFL reading comprehension.

- **Mobile Devices**

Mobile devices have many advantages as learning tools, which include learning written language. They are portable and provide access to an ever ‐ expanding amount of information and resources, which can be shared through apps and/or social networking sites. The three-year observation made by Stockwell (2010) of EFL students in Japan suggests an increase in the use of mobile phones over time for vocabulary learning. In the study by Motallebzadeh and Ganjali (2011) vocabulary was taught by sending short messages (SMS)via mobile phones and positive

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results were found. Gheytasi, Azizifara, and Gowhary (2015) conducted a similar study and found students receiving instructions via mobile phones achieved higher reading comprehension scores than the other group who were taught using a conventional approach. Alemi and Lari (2012) compared the effects of using SMS and dictionaries for vocabulary learning and found SMS more effective and welcomed by the participants. Kim's study (2014) showed that students who discussed reading topics through their mobile devices outside of class significantly outperformed the other group who did not in reading comprehension.

Learners should use the following apps for learning and teaching purposes. They are countless, but we just introduce a few apps. Another dimension is that, our youth has become technology addicts, so they are in dire need to use MALL (Mobile Assisted Language Learning) to learn ESL skills.

- **aptoide (app store) blackmart (app store)**
- free Google Apps for Education
- **Grammar Up**
- **Grammaropolis**
- **English LaunchPad (whiteboard etc)**
- **Socrative (assessment)**

- **Learn English The Fun Way**
- **SpeakingPal** **SpeakingPal English Tutor**
- **iFPoems** **Busuu** **(vocabulary 3000)**
- **Wordflex Touch Dictionary**
- **Dynamic English Lesson 3 – Idioms**

iBooks) My Story **Writing Prompts**

- **Listen and Speak**
- **Cartoon- Free English**
- **EnglishPodcast for Learners**
- **Fluent English**
- Supiki English Conversation Speaking Practice app

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- **Learn English Elementary (by British Council)**
- **Language Verb Trainer**
- **LangLearner English Idioms**
- Sentence Builder
- **50 Languages**

(3) CMC Technologies (Chat, Moo, email)

Reading instruction is increasingly informed by sociocultural and learner-centred constructive perspectives, with one consequence that cooperative reading and co-construction of meaning from the text are now making their way into L2 learning. Furthermore, in today's information age, CMC technologies, ranging from email, free browser extension tools, to innovative systems designed by researchers can be accessed to facilitate cooperative reading among learners of different cultural and linguistic backgrounds. Shang (2005) developed an electronic-based peer collaborative environment to explore students' attitudes toward email applications in reading classes. Lan (2013) designed a co-sharing-based strategy learning system for L2 vocabulary learning known as "Mywordtools." Lan, Sung, and Chang (2007) developed a mobile-device supported peer-assisted learning (MPAL) system for collaborative EFL reading activities and found the system improved elementary school EFL learners' collaboration and reading skills.

eComma, an open-source Web application for textual annotation developed by the Center for Open Education Resources and Language Learning, was developed to turn reading into a group activity during which learners help each other understand a text (Blyth, 2013).

Challenges

Reading in the technological age is making a tremendous impact on how we see and interact with the world. For L2 learners, the abundant access to authentic information resources and technological tools to facilitate learning L2 reading are creating unprecedented opportunities for potential success. Nonetheless, the affordance of interactivity also leads to distracted minds, information overload, and fragmentation (Cobb, in press; Godwin-Jones 2010). Students

nowadays constantly engage in reading and interacting often by using short, de-contextualized informal language that may distract them from focused thinking. One important challenge today for educators is then to find creative and effective ways to lead distracted readers back to productive language learning.

Another challenge faced by educators is keeping up with the ever-evolving technologies and selecting the most appropriate ones to design instruction with sound principles of reading. Technologies can support successful L2 reading; at the same time, they are increasingly complex and hard to follow. Often, factors for using technologies in the classroom are social and economically driven instead of pedagogically-oriented. Instructors frequently adapt tools on an ad hoc basis. New technologies emerge more rapidly than educators can connect them with theoretical or pedagogical grounding. The needs of this rapidly evolving environment do not fit well with predefined curricula, annualized budgets, and programmed institutional investments. Resources would need to be as reactive and the teaching environment then prioritized, and this is contingent on L2 teaching conditions which vary widely.

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Traditionally, teachers are educated about the nature of reading and are ready to teach based on their education. However, as reading and required strategies change due to new technologies, many teachers find their knowledge obsolete and inapplicable to meet the needs of their students. Teacher education thus also faces challenges of cultivating teachers' abilities to continuously learn the changing technologies and develop new visions for literacy.

Future Directions

It is foreseeable that technology developers and educational researchers will continue to build products and learning environments for a wide range of student abilities and preferences. They can indeed be useful for the teaching and learning of L2 reading but should not be used simply because they are available (Chun, 2007). Sound support of reading and SLA theories, as

well as pedagogical considerations are essential. It is also important to envision how the notions of reading, writing, and literacy are changing in the global context. Reading in the digital age is not just about decoding text; it is also critically evaluating and co-constructing on the globally-connected information super highway. Goodwin-Jones (2010) points out that as we use available tools, we in turn are shaped by them. Therefore, by choosing the tools, we also select how and what we are becoming. In this context, L2 reading may be shaped by three trends in technology of learning.

First, ubiquitous learning may be possible because reading materials are widely available via mobile devices, which offer portability and instant forms of communication on the go. In mobile learning, computers are not limited by being embedded in the learner's surroundings. In a ubiquitous learning environment, the learning is supported by embedded and invisible computers as well as networks in everyday life. While learners are moving with mobile devices, the system dynamically supports learning by communicating with embedded computers in the environment and mapping real objects and the information into a virtual world. Ubiquitous learning systems have been developed for L2 vocabulary learning and reading comprehension, and their future is encouraging as the technologies are fast-evolving to provide greater adaptability for diverse L2 reading needs in real-life contexts.

Second, adaptive learning and personalization may continue to be developed for learning L2 reading. As mentioned earlier, continuous efforts have been made on building flexible and adaptable scaffolding tools to address diverse learner needs. Learner-centeredness will continue to be the force leading the design and selection of technological tools. More learner preferred features will be incorporated for students who need them, invisible to those who do not, and adjustable and removable to accommodate the learner's reading progress. As for learner preferences and needs, in addition to teachers' professional judgement, Big Data technology can be applied to turn information overload into useful knowledge for designing learner-fit L2 reading materials and learning systems. Additionally, alternative formats, such as visual-syntactic text formatting (VSTF) which replaces the block-shaped text of the standard format with a cascading pattern, have been suggested by researchers to help readers identify the

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grammatical structure and increase reading comprehension (Yu, &Miller, 2010; Warschauer, Park, &Walker, 2011).

Third, these technologies may continue to work toward autonomous learning. The ultimate goal of scaffolding and learner-centred technologies is to automate the identification of appropriate learning tools for students. Researchers have taken up social-interactive approaches to foster learner autonomy with technology, including incorporating learner choices, learner productions, and project-based tasks (Collentine, 2011). Researchers emphasize raising learner metalinguistic awareness and motivation for L2 learning by using technological innovations, but psychological differences in how language learners conceptualize and relate to particular technologies also need to be taken into account. The range of new technologies being applied to the evolving process of reading indicates that this is an area of continuous innovation.

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Lesson 12

Technology and L2 Writing

- Technologies for L2 writing
- Web 2.0 applications
- Automated writing evaluation
    - Criterion
    - Turnitin
    - Writing Pal or W-Pal

- L2 writing and AWE

- L2 writing and corpus-based technologies
- Future research and development

Introduction

New information and communication technologies are altering writing practices in important ways. As Relles and Tierney (2013) put it, "the integration of communication Technologies with academic culture suggests that the writing habits of tomorrow's students will be navigational across myriad discourse situations that do and will yet exist".

Students in lower grades, for example, while still working on writing sentences, may be Routinely asked to go beyond traditional writing tasks to put together PowerPoint slides, collages, or contribute text to blogs. High school students, while drafting persuasive essays, may be tasked with writing Facebook or Twitter posts. College students continue to write lab reports but also need to construct multimodal compositions that include both text and visuals. Successful business people must be able to write communications to be disseminated through a variety of social media.

In this context, all teachers, schools, and colleges are challenged to respond to the changing nature of writing (Herrington, &Moran, 2009). Fortunately, the same wave of technologies affecting writing practices provides a wealth of tools for the teaching of second or foreign language writing. Such tools have been adopted by business and education to improve the teaching and learning of writing. In this chapter, we describe technologies developed to aid in the writing process, which are also used for teaching. Following the description, we provide critical analysis of the empirical research on the effectiveness of software and web‐based technologies in teaching L2 writing. We conclude the chapter with a look at future research and development of technologies and pedagogies for L2 writing.

Technologies for L2 Writing

The wide variety of technologies for L2 writing can be divided into three general categories.

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The most general purpose of the three is the Web 2.0 application, which allows for authorship of multiple users who contribute content to a common repository online. The second category is automated writing evaluation systems developed specifically for analysis and feedback to writers during the writing process. The third category is the corpus‐based tools, which serve as a reference to writers as they strategically examine the language used in collections of existing electronic texts. Many software tools exemplify each of these categories, but we have chosen a few to illustrate the affordances offered writers by tools of each of the three types.

- **Web 2.0 Applications**

Web 2.0 tools include a variety of social media sites, such as Facebook and Twitter, as well as blogs. For L2 learners, these sites provide unprecedented opportunities to experiment with their language in settings where their language appears before and communicates with real audiences rather than being confined to communication for practice within the language classroom. The use of language for communication, rather than for practice alone, is a core goal of most language instruction. Beyond opportunities for communication, Web 2.0 applications like Google Docs provide the tools for collaborative writing.

Lang‐8 (http://lang‐8.com/) is a good example of a social networking site designed to encourage L2 communication by creating a community where language learners are matched with native speakers of target languages. Each member can contribute to the virtual language learning community by writing posts in the language they are learning and giving feedback or making corrections to other members' written posts in his or her native or stronger language.

With a few buttons for editing, such as colour changing and crossing out, users can easily correct or edit others' posts on Lang‐8. Lang‐8 rewards active users with "L" points, which help make their posts more visible to proficient users, thus increasing the probability that they will receive feedback or corrections. In other words, the more a member of the community contributes to the process of language correction, the more his or her writing or posts are corrected. In addition to written corrections, Lang‐8 has integrated Skype, an online tool allowing for international, live video communication. Lang‐8 allows learners to practice

writing on their own. Language instructors can also create groups on Lang‐8 and design collaborative writing activities for their students and others in the larger community.

Google Docs, another important example, is a free online word processor within Google Drive, an office suite developed by Google Inc. Users need a Google account to create, edit, and share Google Docs files. Google Docs features a full‐fledged word processor with an easy‐to‐use text‐editing interface. Compared to traditional word processing software, Google Docs is unique in its capability for real‐time collaboration, including editing, commenting, and chatting by and among multiple users on a shared file. Additionally, the composing and revision history on Google Docs is automatically saved and a record of the entire composing process is available for review. A completed piece of writing can be published online or downloaded in different file formats, including Microsoft Word, pdf, plain text, html page, and so on. As a collaborative writing platform, Google Docs has gained popularity in language teaching classrooms at all levels.

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- **Automated Writing Evaluation**

Automated writing evaluation (AWE) systems have been developed to assist both native speakers and L2 learners to write more accurately by providing them with automated corrective feedback. AWE systems utilize sophisticated natural language processing (NLP) techniques and machine learning to create tools that are more powerful than traditional spelling and grammar checkers. NLP technologies have become sufficiently widespread that a number of these systems have been developed, although because of the substantial resources required to develop them, they are typically not freely available on the Internet. Criterion, Turnitin, and Writing Pal are among the widely used AWE systems.

Criterion (http://www.ets.org/criterion/) is a webbased commercial writing evaluation and feedback tool developed by Educational Testing Service (ETS, 2015). Criterion targets the writing instruction both in K‐12 programs and higher education and provides a holistic score

and feedback based on level‐specific models considering both the age and proficiency levels of the learners. Building on e-rater, an automated scoring engine, Criterion is capable of providing holistic scores (1–4 or 1–6 points) to the essays written to its prompts. In addition, detailed diagnostic trait feedback, in a mixture of both direct and indirect feedback formats, is available in five categories: grammar, usage, mechanics, style, and organization, and development. Besides, the holistic score and individualized feedback, it provides resources such as an essay planning tool and the Writer's Handbook at different levels for students to understand and evaluate the feedback provided. The handbook is available in different languages for ESL learners speaking Chinese, Spanish, Korean, and Japanese. Teachers can assign writing tasks from the built‐in pool of writing prompts or create their essay topic.

Moreover, it allows for teacher and peer feedback. This web‐based tool can be used at different stages of writing instruction for various purposes. Language instructors can use it in class for essay planning or a peer‐feedback activity, or out‐of‐class for students to submit and revise based on the feedback.

Turnitin (http://turnitin.com/) was initially launched as an online plagiarism prevention service by iParadigms, LLC, in 1997. Recently, through partnering with or acquiring other companies, iParadigms added more functions to Turnitin and transformed it from an originality‐checking tool to a comprehensive platform of online automated grading and peer review (Turnitin, 2015). For example, Turnitin has integrated e-rater, the automated scoring engine developed by ETS as well as LightSide Labs' LightSide Revision Assistant to enhance its grammar checking and assessment function. In addition, Turnitin facilitates teacher feedback by providing frequently used comments and rubrics as well as a voice commenting tool. Turnitin can be integrated with mainstream learning management systems (LMS), such as Blackboard Learn, Moodle, Canvas, and so on. Turnitin targets customers in the field of education, including educators and students in middle and high schools, colleges and universities. Turnitin also provides online tutorials and training to teachers, students, and school administrators. Currently, Turnitin has found its place in several institutions as a plagiarism detection tool and several empirical studies have been conducted to investigate its utility and user perceptions (Rolfe, 2011;

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Stapleton, 2012). Turnitin's recent expansion of grading and peer-reviewing functions invite empirical investigations into its effects on writing pedagogy as well.

Writing Pal or W-Pal is an automated intelligent tutoring system (ITS) developed by the Science of Learning and Educational Technology (SoLET) Lab at Arizona State University.W-Pal's intended users are native English - speaking students in high schools. However, English language learners in high school and college freshmen have also been included in some empirical studies of W-Pal in the United States. Unlike other AWE tools, W-Pal is designed as a writing strategy instruction tool based on four principles for teaching writing, namely, strategy instruction, modularity, extended practice, and formative feedback (Roscoe and McNamara 2013). Accordingly, W-Pal provides eight animated learning modules covering the typical writing process, including writing strategies used in the pre - writing phase, drafting phase, and revision phase. The learning modules are coupled with two types of interactive practices to improve student engagement and learning motivation: game - based practices as well as essay - based practices. Student essays produced on W - Pal can be scored automatically with automated formative feedback, using Coh - Metrix –a system developed for computing cohesion in the written and spoken texts by the Institute for Intelligent Systems at the University of Memphis– and other text analysis tools.

- **Corpus - Based Tools**

Like AWE systems, a number of corpus - based tools have been developed as resources for L2 writers to gain access to examples of authentic language use in collections of electronic texts. Corpus - based pedagogies, data - driven learning, are based on the idea that students need to have access to examples of language (i.e., data) as they write, and that such examples need to meet specific writing needs at the time of writing. Corpus tools, therefore, consist of corpora of texts as well as the software tools required for searching and displaying the examples. The Corpus of Contemporary American English (henceforth COCA, Davies 2008) serves as a good example of a widely used corpus.

COCA (http://corpus.byu.edu/coca/) is a freely available online corpus of English, Created by Mark Davies at Brigham Young University. The corpus has over 450 million words of text that covers spoken, fiction, popular magazines, newspapers, and academic text genres. Users can search for exact words and phrases, parts of speech, and collocations through the COCA interface. In addition, users can take advantage of semantically‐based queries to Differentiate usages of synonyms (e.g., little vs. small) or related words (e.g., men vs. women). The COCA interface "Word and phrase" (http://www.wordandphrase.info/) permit users to interact with the tool differently. For example, users can submit a whole text for analysis and see a detailed frequency report on the words that they produced. Learners can also compare their use of phrases to the phrases in the corpus. The words and phrases can be limited to academic texts so that users can analyze an academic text as well as search for academic word lists and collocations. COCA can be used for different purposes in second language writing instruction. For example, language instructors can use it to expose learners to the authentic use of language and thus the form and functions of different language uses, which in turn might encourage learners to implement these features in their writing.

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Empirical Research on L2 Writing Technologies

Empirical investigations into the usefulness of writing technologies for L2 writing have been described for each of the three categories of writing tools introduced above. Research encompasses a range of methodologies to address questions about learners' writing strategies, their language use, their writing practices, attitudes, and writing outcomes.

- **L2 Writing with Web 2.0 Applications**

Social networking sites (SNS) and wiki‐type tools as representative Web 2.0 platforms have allowed the researchers to investigate L2 writers' engagement in meaningful social interaction as well as collaborative writing (Lee 2010). Recent research has shown that collaborative writing on web‐based word processing tools, such as Google Docs, benefit learners' writing development through peer editing and meaning‐related revising. The study

found that the L2 writers focused more on meaning than form and the grammatical changes they made collaboratively were mainly accurate, which in general contributed positively to the quality of their writing.

Educational uses of social media websites, such as Facebook and Twitter, have begun to be investigated by researchers. For example, in a research about an English writing class for students majoring in English peer assessment was included on the Facebook page designed for English writing. It was found out that the students made significant improvement in English writing in terms of content, organization, structure, vocabulary and spelling, and genre awareness. The use of Facebook as a platform for peer assessment was positively perceived by the students as Facebook‐based activities promoted collaborative learning and enhanced students' interest and motivation. However, the educational value of Facebook has not yet been fully explored and the assumption that using Facebook could meet the expectations of younger generations of learners, known as digital natives, is not well supported by empirical studies.

It was also found out in research that the digital natives or millennial learners did not necessarily have enthusiasm for educational technology and some of them were not willing to use Facebook for formal learning because it seemed to them in conflict with the purpose of Facebook.

- **L2 Writing and AWE**

In the past decade, research has examined the use of AWE tools for helping learners with their writing, that in some cases these promising tools can be challenging to implement with the intended effects. Some researchers also noted from their critical analysis of the research on the effects of AWE feedback on the quality of writing that "there is little clarity about whether AWE is associated with more general improvements in writing proficiency. One problem that they noted with the research is the lack of clarity as to whether or not the feedback provided by AWE tools in the English class helps with writing students do in their content courses because "AWE programs generally offer only a limited number of genres, such as persuasive, narrative and informative genres.

Another issue identified in research on AWE is that the automated corrective feedback in the AWE systems needs to be implemented because of the target audience and learning context.

It was also found that AWE feedback can be more effective when it is combined with teachers' feedback. There are numerous possible ways of integrating AWE with teacher feedback.

To illustrate, students can use AWE to help them improve the quality of initial drafts before submitting them to the teacher for feedback or teachers can use AWE as a diagnostic tool to identify the problems that students have with their writing and provide feedback based on the automated analysis.

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- **L2 Writing and Corpus - Based Technologies**

Empirical studies of corpus use for data - driven learning have yielded positive findings. Investigation of English language learners' interaction with corpus - based materials through micro - level analysis of learners' behaviours has revealed positive learning outcomes associated with intensive interactions with corpus tools.

With a focus on the use of a corpus as a source to inform students' revision in a short essay - writing assignment, a study was conducted and the findings indicated that interacting with the corpus tool helped students correct grammatical errors. However, the accuracy of correction was significantly different among three types of errors, namely omission, misleadinginformation, and addition, which highlights the need for research to have a closer look at the learner - corpus interaction for different purposes.

Besides the use of corpus tools for lexico‐grammatical learning, there are relatively fewer studies on the use of a corpus for discourse-level learning and writing, especially for academic writing.

Future Research and Development

Findings from empirical research on L2 writing technologies are promising. The availability of a wide range of technologies has the potential to facilitate the L2 writing, teaching, and learning process. At the same time, it also challenges L2 writing practitioners and researchers to investigate the best techniques and strategies to utilize these technologies to best answer the specific needs of their learning contexts. More emerging technologies are yet to be incorporated into L2 writing activities, L2 writing pedagogy, and L2 writing research.

Learning analytics is defined as the educational instruments designed to collect, measure, and analyze students' learning data with the goal of better understanding learning processes and predicting learning outcomes in educational contexts. In many fields of study, efforts are being invested in analytic approaches to learn from large datasets. In education, such data mining research may inform approaches to L2 writing data collection and analysis.

Writing‐based learning analytics, such as Mi‐Writer developed at Athabasca University, Canada, is one of the learning analytics designed to capture data throughout a writing process, including planning, composing, reviewing, editing, and feedback‐giving. For example, students' writing behaviour and interaction with peers and teachers can be recorded in real‐time. Mi‐Writer is also capable of generating writing‐related metrics for both L2 writers and L2 writing instructors. Such data collection mechanisms open the possibility of facilitating automated real‐time feedback that is tailored to individual learners.

Learning analytics can be treated as a comprehensive technology that will also benefit from integrating other techniques such as keystroke logging and eye‐tracking technologies. New unobtrusive data gathering techniques such as keystroke logging and economically more

feasible techniques involving eye tracking can help practitioners and researchers better understand students' writing behaviour, multimodal composition processes, as well as strategies employed for resource use and self‐regulation.

Conclusion

This chapter reviewed the three major categories of technologies, namely Web 2.0 applications,
AWE, and corpus‐based tools. These new technologies are shaping how L2 writing is spractised and taught. Therefore, language teachers should be open to the development of new technologies that have the potential to assist L2 writing.

Openness in this domain means that L2 writing teachers are expected to experience these technologies themselves and then to make a critical evaluations of the technologies for their utility in L2 writing contexts. In using these technologies, language teachers should not underestimate the importance of learner training. Even when using technologies that L2 learners are already familiar with, teachers need to teach the desired practices through carefully designed learner training. Likewise, some researchers remind us of a potential mismatch between learners' "natural" use of technology and suggested "ideal" use of technology for learning.

Consequently, learner training is even more critical with the technologies designed especially for writing pedagogy, such as corpus‐based tools and AWE tools. While independent access remains possible, the relative success of many of these tools will continue to rely on classroom teachers as teachers play a pivotal role in technology‐enhanced classrooms.

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Lesson 13

Technologies for Teaching and Learning L2 Listening

- Digital affordances and new listening contexts
- Technologies for listening
  - Digital Devices and Networks
  - Content
  - Controls and Help Options
  - Operational
  - Regulatory
  - Compensatory
- Technology, listening, and SLA theory

- Technology-mediated listening: Research and practice
- Current trends and future directions

Digital Affordances and New Listening Contexts

In recent years, it has become increasingly common to speak about technology tools and applications in terms of their affordances. According to Norman (1988), affordances are the perceived possibilities that a user has for such tools and applications. The term is used here in a broad sense where that "perception" is not necessarily universal but rather mediated through theory and practice toward the goals and objectives of second language learning. In this context, referring to the online language learning environment, Lyceum defines affordances as possibilities as well as limitations" having "an impact on its [Lyceum's] use". For example, the affordance of a button for turning on and off captioning in videos may differ depending on whether a teacher or learner perceives it as (1) a shortcut to comprehension that can privilege reading over listening, (2) enrichment of the audio channel to support noticing (Schmidt 1993) during dual coding (Plass and Jones' (2005) multimedia model described below), or (3) a means

to identify and capture new vocabulary items (Danan 2004) in combination with the additional function of pausing.

Technologies for Listening

The preceding categories broadly represent the potential characteristics of digital devices and networks for mediating listening both for aiding comprehension and for facilitating language learning (with an emphasis on potential). This section reviews a range of relevant technologies, describing them and discussing in general terms what their value to listening and language learning might be, singly or in combination. One major area, help options, is discussed through a framework developed by Cardenas‐Claros and Gruba (2013).

Digital Devices and Networks

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Listening is currently supported by a range of digital devices. Desktop and laptop computers remain widely used, but these have been supplemented by tablets and smartphones (which in reality are just small mobile computers). In addition to these general‐purpose devices, there are more narrowly dedicated ones such as DVD players, mp3 players, feature phones (the "traditional" mobile phone with some additions like an mp3 player but without the smartphone's web connectivity), and streaming media players like Apple TV and Google Chromecast that work with a digital TV or monitor. All can have a role in connecting language learners to listening experiences. The networks that connect these devices to servers and other devices are also critical as it is increasingly less common to load programs and content from a physical disk, CD, or DVD. Networks—wired, wireless, and mobile (e.g., 3G, 4G, and LTE)—can be used to download material for listening or to stream it. Increased bandwidth in both developed and developing countries are putting Internet audio and video readily into the hands of hundreds of millions of subscribers. By the end of 2014, the global average connection speed was 4.5 Mbps (megabits per second). According to the U.S. Federal Communications Commission (FCC), 4 Mbps is sufficient for streaming HD video. Although mobile data connections are typically slower, ranging from 16 Mbps average in the United Kingdom to 1 Mbps in New Caledonia, even that 1 Mbps rate can support basic video at 640 Kbps. The primary issue for many remains the cost rather than the base technology; however, the cost continues to drop and many mobile

users can rely on free or inexpensive Wi‐Fi rather than mobile data plans, especially for listening with video.

Content

Content here refers to audio or video recorded spoken language texts of all types, from dialogues and short clips to academic lectures and movies. Content designed for and dedicated to enhancing listening skills is readily available online, especially for English language learners (e.g., http://www.esl‐lab.com, http://www.elllo.com). Many multiskill programs have a substantial listening component, and online listening files accompany several foreign language

textbooks. However, the most significant change for listening is that access to native speaker content has exploded in the last decade or so. In the space of those few years, language teachers and learners have gone from relying on limited personal and institutional physical collections of audio and video recordings to tapping into the enormous and continually expanding archives of free, authentic material available on institutional and commercial media websites and through YouTube (launched in 2005) and other streaming services. The problem for many teachers and independent learners now is not locating material but sorting the bountiful options for content that is likely to be effective for supporting the development of listening skills and target language proficiency. As noted below, one direction for addressing this issue is an expansion of authentic content curation by language learning experts.

Controls and Help Options

There are several ways that technology can improve the listening experience for language learners so that comprehension, processing, and acquisition are potentially supported. Cardenas‐Claros and Gruba (2013) have captured these in a relatively comprehensive framework, called CoDe, for conceptualizing (Co) and designing (De) help options to support second language listening. Although their focus is on help options for listening resources and environments dedicated to second language teaching and learning, elements of the framework are also relevant for supporting learner use of authentic audio and video content not targeted at that objective.

Drawing on the work of Chapelle (2003) among others, they divide help options into four categories: operational, regulatory, compensatory, and explanatory.

Operational help fits into the category of technical support and training. These include user manuals, help menus, training modules, and introductory‐level tutorials aimed at making learners aware of how to use the hardware and software, how the program functions, what help options are available and how to invoke them, and potential frustrations.

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Regulatory help options are those that aim to prepare the learner for a particular task and understand and reflect on that task after its completion. In the former category, they place listening tips, directions for specific strategy use and development, and guidance on which of the available help options to use for that task. For post‐listening guidance, they list explanatory feedback; another example would be directions to reflect or comment on "lessons learned" in line with metacognitive approaches aimed at promoting autonomy.

The provision of compensatory help options taps into the affordances of digital technologies to provide modified input or to make input more salient in ways that can support both comprehension and subsequent acquisition. For modified input, Cardenas‐Claros and Gruba note various combinations linking text (subtitles and transcripts) to audio and video, audio to still images, and L1 to L2 transcripts. For increased saliency, they identify the various audio control buttons (volume, rewind, pause), the media controller bar or slider, and for some media players, the variable speed control for slowed playback of audio and video.

Their final category of explanatory help options similarly includes operations targeted at making input more salient through visible links to explanatory hints or links to definitions and glosses from subtitles or transcripts. Explanatory help can also appear in the form of input elaboration, namely, the content found in cultural notes, grammar explanations, electronic dictionaries, and tools such as concordancing programs.

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This framework is useful not only for developers. Looking beyond dedicated language learning software with a listening component, language teachers can exploit some of these concepts to help their students have a more productive learning experience with authentic materials. For compensatory help, they can identify specific media players (e.g., the VLC player—see http://www.videolan.org) with a rich set of options as well as sources of appropriate online audio or video materials that include captions and/or transcripts. They can offer some regulatory support themselves by suggesting effective procedures for using these materials and media tools. For explanatory help, teachers can also evaluate and recommend electronic

dictionaries and sources of grammatical and cultural explanations, as well as train students in their use. Such recommendations have been prompted in some cases by connections made between technology, listening, and theories and models of second language acquisition.

Technology, Listening, and SLA Theory

Many research studies on listening and related topics, such as vocabulary acquisition in audio and video contexts, draw on an SLA theory for their framing. However, these theories are often simply borrowed without taking into account the impact of the mediating role of technology on the listening or learning process at the theoretical level. There have been few overt attempts similar to those by Cardenas‐Claros and Gruba to bring technology and SLA theory explicitly together in a way that is relevant for listening. In this section, we review three of them: Chapelle's (2003) interpretation of SLA theory and technology, Plass and Jones' (2005) multimedia learning model, and Vandergrift and Goh's (2012) application of their metacognitive model of listening to technological environments.

Chapelle (2003) links technology to SLA theories by showing how several theories can be adapted to explore the role of the computer as a stand‐in for a human interlocutor. Although she touches on sociocultural approaches as well as the depth of processing theory, she draws most heavily on the interactionist perspective in this work. While not specific to listening, much of her proposal is relevant here.

Using concepts from the interaction hypothesis, Chapelle describes ways in which the computer can aid the learner by making input more comprehensible. As she explains, "The concern for developing good CALL tasks is how to design materials that can direct learners' attention to particular linguistic forms within the input".

We have suggested various websites to incorporate readymade material for ESL learners. Now we recommend some tools to design pedagogical material.

- **1. Exam time mind maps/ https://www.spiderscribe.net/:**

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- **2. examtime Quizzes:**
- **3. eltpics photos to teach**

- **4. Author Stream slides**

- **5. Present.Me A video presenting platform:**

You simply upload a Power Point presentation and add video or audio to accompany your presentation slides.

6. Blabberize Animates any image with a moving mouth and audio.

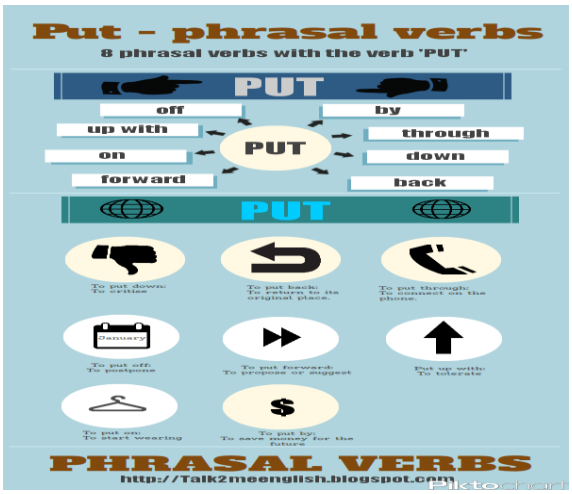
- **7. wordle.net, wordclouds.com Creates beautiful word clouds.**
- **8. Infogram Creates interactive infographics**

When you move the mouse over each word, an information box opens with a synonym or explanation. You can also add photos and videos.

9. Animoto Creates videos

with photos, music and text.

10. Piktochart Creates quick and impressive infographics



- 11. StudyBlue- an online tool for making flashcards with video and audio
- 12. Pixton- an online comic maker to add sound, upload pictures and images.
- 13. Storybird- is a collaborative storytelling tool. Students can create short art inspired stories

- 14. Prezi- a cloud-based presentation software that can zoom in and out.

Thus, one important function of the computer for listening within this theoretical perspective is to provide enhanced input through increasing salience, input modification, or input simplification or elaboration. As we will see below, this provision can also be relevant for training learners to be autonomous so that they will direct their attention to these enhancements and use them appropriately when listening to authentic materials.

For salience, targeted language forms in text support for listening material (e.g., transcripts or captions) can be underlined, boldfaced, or coloured differently, or a word or phrase could be stressed. In fact, following Cardenas‐Claros and Gruba (2013) the presence of text in any form (captions or transcripts) can serve to make recorded input more salient (assuming learners have sufficient reading proficiency in the target language script; by providing full versions of reduced forms and making word boundaries obvious. Audio material may also be repeated to increase saliency, and specific task elements can direct learners to such repetitions. Besides discussing strategies for increasing salience, Chapelle covers a range of options for input modification to make that input more understandable. Still images accompanying an audio clip or a video where the visual information supports the meaning of the spoken language is one form of modification, although it is worth noting that the visual dimension can interfere with rather than support comprehension if it is not congruent with the audio content. Text supports in the form of either translations or target language definitions of words or phrases can also provide another form of input enhancement relevant to listening comprehension.

Finally, input enhancement in computer‐mediated listening can occur through a programmed feature providing simplification or elaboration. Plass and Jones (2005) build on concepts from Chapelle's (1998) version of the interactionist perspective and combine them with Mayer's cognitive theory of multimedia (Mayer, 2001) to synthesize an integrated model of multimedia language learning applicable to both listening and reading. Mayer's theory links verbal and pictorial input through parallel processing, or dual coding, reinforcing one another when conditions are right. A set of empirically supported principles in the theory describes those conditions.

For example, Mayer's Contiguity Principle states that complementary text and pictorial material that are close to one another are processed better than when they are further apart. This would imply that presenting a video with captions on the screen should yield better comprehension than presenting a video with a transcript in a window to the side. Plass and Jones propose that this dual coding can strengthen each stage in Chapelle's model of the second language acquisition process: apperception (including noticing aspects of the input), comprehension, intake, and finally integration into the learner's linguistic system.

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They use their model to interpret the multimedia research existing up to that time and offer three principles for using multimedia in support of language learning:

• Multimedia Principle: "Students acquire language better from input enhanced by text and pictures than by text alone."
• Individual Differences Principle: "Students acquire language better when they have the choice of visual versus verbal annotations…"
• Advance Organizer Principle: Advance organizers in reading and listening activities aid language acquisition and those "presented in visual and verbal modes are more effective than those presented only in the verbal mode."

Teachers and learners operating in multimedia environments can similarly invoke these principles, regardless of whether those environments and the content for them have been specifically designed for language learning. In addition to the three principles, Plass and Jones offer three recommendations, weaker claims that they distinguish from principles because the empirical support for them is more limited. These include allowing learner control over the order, pace, and choice of materials, opportunities for producing comprehensible output, and vocabulary testing in the same mode as the annotations that are provided.

Vandergrift and Goh (2012) build their theoretical second language listening model oncomprehension, using as its foundation Levelt's cognitive comprehension and productionmodel. The authors identify several cognitive and affective factors that affect listeningsuccess (e.g., vocabulary size and motivation). However, the defining feature of the model isits emphasis on metacognition, along with their claim that metacognitive instruction canhelp learners become more effective and efficient especially in listening tasks and activities conducted outside of class. This instruction begins with a knowledge foundation for thelearner:

• Personal knowledge (beliefs about listening and identification of individual listening problems)
• task knowledge (listening processes, different listening skills based on objectives, factors affecting performance, etc.)

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• strategy knowledge (understanding of the roles of cognitive, metacognitive and affective strategies as well as identification of appropriate types for particular tasks and problems)

That foundation is then integrated into the metacognitive processes of planning, monitoring, and evaluation for learners. In each of these areas, Vandergrift and Goh address not just listening comprehension goals but also procedures for overall listening development.

The authors devote a full chapter to listening in multimedia environments, reviewing research in areas such as the use of visual media, support options, and captions. Although they acknowledge the potential of these, they emphasize that the evidence for incorporating them is mixed and provide a set of useful guidelines to teachers to harness them appropriately.

Technology‐Mediated Listening: Research and Practice

This section begins with an overview of research in four areas relevant to technology and listening that have been studied over the past 20 years or so, much of which overlaps with Cardenas‐Claro and Gruba's (2013) typology of help options: **(1)** use of captions and transcripts,
(2) multimedia, **(3)** electronic glossaries and dictionaries, **(4)** play speed control for slowing the speech rate. It then discusses some examples of techniques and strategies in practice as well as exploring the role of learner autonomy.

Captions and Transcripts

The use of both L1 and L2 captions for enhancing listening comprehension and ensuing vocabulary development has been studied since the days of VHS video players (note that here captions and subtitles are not distinguished. Although the results of some of that early research were mixed, several more recent studies support the notion that captions are a valuable comprehension tool, especially for listening‐based vocabulary development. Among the first studies using random access technology (a videodisc) was Borras and Lafayette (1994). They

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found that for their subjects (fifth‐semester college French students) the presence of captions under learner control led not only to better comprehension than that of a control group without captions but also a better subsequent performance on a related speaking task.

Winke, Gass, and Sydorenko (2010) noted that the use of captions involves a combination of factors including what learners are attending to when they read captions as well as how they process them. In addition to confirming prior research showing that captioned videos were better than non‐captioned for both comprehension and for recognizing new vocabulary, they suggested that processing differences are likely to be influenced by the learner's familiarity with the writing system. Native English learners of Spanish and Russian in their study were most successful having captions on the first of two listenings while learners of Chinese and

Arabic, whose orthography is more distant from that of English, did better on the second listening after context was established. Although they found no significant difference in benefits for second vs. fourth-year students (in Spanish at least), other studies suggest caption use can indeed be influenced by language level. For instance, Leveridge and Yang (2013) tested learner reliance on captions with high school EFL students in Taiwan. They found that there was a considerable individual difference but that overall, lower level learners were much more reliant on captions than their higher-level counterparts. There have been other issues related to captions that have been studied as well. Though most research has focused on target language captioning, some researchers have looked at differential effects of L1 vs. L2 captions.

While some scholars such as Danan (2004) focus on the positive affordances of captions, Vandergrift and Goh (2012) among others acknowledge the value of captions for vocabulary development and overall comprehension, but caution that it is not possible in most cases to distinguish whether they enhance listening comprehension or simply replace it with comprehension by reading. A study that supports their position is Sydorenko (2010), who found that learners are given captioned audio and video scored higher on written word recognition of presented vocabulary while those presented the same material without captions scored higher on aural recognition.

It is worth noting that Vandergrift and Goh's concerns are based on the assumption that language learners are not able to use captions in normal, real - time face - to - face encounters. Yet it could be argued that for many language learners, the great majority of their listening now and in the future will be one - way—listening to recorded media—rather than interactive, and that the online audio and video material they encounter will often be accompanied by captions. Thus, an environment of captioned listening may increasingly be considered as "authentic" as a traditional face - to - face one. Computer - mediated listening is simply a more complicated and varied phenomenon than is commonly acknowledged.

A less studied but related area of text support is the use of transcripts. The issues involving the impact of reading on the listening process discussed above are relevant here as well,

coupled with the additional problem of transcripts and video not being as contiguous as captions and video (Mayer, 2001). Although transcripts can aid in identifying word boundaries and new vocabulary, Grgurović and Hegelheimer (2007) found that the literature on the value for comprehension was mixed, with various studies showing an advantage, a disadvantage, and no effect. In testing learner preference of captions versus transcripts for support in video listening with a system that provided the two options under student control, they first found that learners used both less than expected. However, there was a clear preference for captions. They nevertheless concluded that it would be helpful to provide both if possible, along with training in their use, because a small group of students still showed a preference for transcripts.

Multimedia: Turning now from text support to multimedia in general, the area is a diverse one due to the options involved in selecting which media to combine, how to combine them, and who controls the result. For listening purposes, video is already multimedia when compared to audio (Yang, 2014), and video or audio plus captions or transcripts are multimedia compared to written text alone. Captioned video as discussed above is an example of multimedia, as is video presented with a transcript available on the same screen.

Multimedia materials can provide for a richer and deeper processing of the material. For example, Jones and Plass (2002) found that students listening to aural texts in French that included written and pictorial annotations scored higher on recall protocol comprehension tests than those who listened to the aural text alone. However, much of the research for multimedia language learning has focused on vocabulary acquisition, possibly because vocabulary knowledge is easier to test for. Jones and Plass also found that learners with written and pictorial annotations performed better on a subsequent test of new vocabulary from the listening material. Al‐Seghayer (2001) concluded that words glossed with text and video were more readily recalled than those with text plus a static picture. In a review of multimedia research for listening, Jones (2006) noted examples of listening studies showing (1) a stronger effect for visual annotations alone for high relative to low verbal ability students, (2) a text recall advantage for students working collaboratively with multimedia annotations in pairs rather than independently, (3) student attitudes toward multimedia improving with familiarity, and (4) value in providing

ongoing comprehension feedback during multimedia listening tasks. Although the research is generally positive regarding multimedia as an aid to richer processing during listening activities, the number of studies is limited. In recent years, the term multimedia in CALL research seems largely to refer to just captioned video (Leveridge and Yang 2013; Li 2014) or even video as opposed to audio (Yang 2014).

Electronic glossaries and dictionaries: Cardenas‐Claros and Gruba (2013) categorize both electronic glossaries and electronic dictionaries as explanatory help options. Functionally, though, they can be quite different. Glossed words and phrases typically provide an in-context explanation of their meaning, requiring intervention by materials writers at the development stage. In contrast, electronic dictionaries are independent of the text in which the links to their entries occur, so learners must interpret the results relative to the context in which an item occurs. Besides dictionary definitions, some electronic dictionaries will automatically link to Wikipedia entries (e.g., http://wordweb.info) to allow for elaboration.

The previous research on mixing pictorial and written annotations of items in an audio text is relevant here, but there is little else covering electronic dictionaries and listening. Jin and Deifell (2013) report results of a survey study where of 211respondents to a question regarding the use of online dictionaries, only 21.3% employed them for listening in the target language as opposed to 73.9% for reading. As noted in Levy and Steel (2015), usability is one of the primary issues for electronic dictionaries in this context.

A functionality missing from virtually all listening material is the ability to click on a word or phrase in a caption (automatically pausing the video) and get an instant popup definition in the desired dictionary. However, this is possible within transcripts for videos at the Clilstore site (http://multidict.net/clilstore/), a multilingual project funded by the European Union.

Play Speed Controls: One of the more remarkable affordances of digital technology is the potential to speed up or slow down speech rate. This is done through programs and media players that compress or stretch the time domain of the digital signal without shifting the

frequencies of the sound waves. This means that language learners can slow the speech rate down to allow for more processing time, but that the pitch of the voice still sounds relatively natural. So, unlike analogue systems where slowing speed also means lowering pitch, the original pitch can be maintained at the changed speed. Results of early research with slowed speech were somewhat mixed, but Zhao (1997) demonstrated clear advantages for comprehension when learners were allowed to control the speed rather than teachers or researchers.

Shifting from research to practice, an important work in this area is Rost and Wilson (2013). Most previous books that focused on the teaching of second language listening, like Field (2008) and Flowerdew and Miller (2005), have limited references to computer‐based technology. As noted above, Vandergrift and Goh (2012) devote a full chapter to it, emphasizing the role of metacognition in the selection of tools and techniques for listening. In contrast, in Rost and Wilson, the use of digital technology is interspersed throughout as a natural part of language instruction.

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The book is organized around the concept of active listening, which they paraphrase as "engaged processing." Building on prior theory, research, and practice, they conceptualize listening across five frames: affective, top‐down, bottom‐up, interactive, and autonomous. For the affective frame, for example, student motivation is a key element. With respect to technology integration, the authors suggest how activities involving personal interests like hobbies can be supported through learner selection and the presentation of YouTube videos. In another suggested activity, Wrong Words, they direct the teacher to select songs and play mp3 recordings or online music videos. The lyrics to the songs are downloaded from one of several suggested websites, and the teacher changes the text to include words that sound similar to but are different from the actual lyrics. The learners' task is to locate the mistakes in the transcript when they hear the music played. There are similar examples provided for the next three frames.

It is in the autonomous frame, however, that technology moves into playing the most central role. Rost and Wilson note that new technologies allow for out‐of‐class listening,

individualization of goals and tasks, and strategic use of comprehension and learning supports of the types described in Cardenas‐Claros and Gruba's (2013) help option typology.

The majority of the ten activities described in their chapter on the autonomous frame require listening mediated by technology, and several others include an optional technology component.

Examples include using transcripts with online listening materials, listening to news sites, listening‐based Webquests (http://webquest.org), creating a listening library of online materials, interacting through web‐based discussion boards, using online listening games, and learning something new through narrow listening (Krashen, 1996) using multiple short audio or video clips on the same topic.

A key concept in developing autonomy for continuing a student's progress in listening outside of class and once the course is over is learner training. Romeo and Hubbard (2010) report on a pervasive learner training model employed in an advanced ESL listening course that

incorporated a three‐hour independent listening project each week. The model integrated technical training (how to use the controls and help options in media players and dedicated listening sites), strategic training (what to do to enhance comprehension and learning, especially of new vocabulary), and pedagogical training (why to utilize certain techniques and procedures, such as pre‐listening and dictation, for specific objectives). Through pre‐ and post‐testing, they found substantial gains on a listening proficiency test. Evidence from weekly reflective reports, bi‐weekly individual tutorials, and exit interviews showed qualitative changes in the way students approached their independent listening, greater reflectivity over time, and a more positive attitude toward listening. A subsequent paper (Hubbard and Romeo, 2012) examined diversity among students in several areas including the selection of material and development of different sets of preferred strategies. The conclusion was that although all students benefited to some degree from learner training, some incorporated it more rapidly and successfully into their work than others. The study underscores the fact that response to training is highly individual and may be affected by factors outside the control of instructors.

Current Trends and Future Directions

A growing trend in multiple areas of language learning is the use of mobile devices, and listening is no exception. Demouy and Kukulska‐Hulme (2010) report that the majority of students in an online French course were initially not using the mp3 players they had to practice listening, but after a course project employing these players, "They quickly saw the benefits of using their device to maximise exposure to the language in spaces and at times that suited their lifestyle". Kukulska‐Hulme (2012) notes that several interviewees in a study on mobile language learning, "…appreciated the experience of learning a language while not being fully focused on it, for example, by simultaneously engaging in another task, and they noted the unobtrusiveness of mobile learning. There was a sense of wanting to immerse oneself in the target language by listening to it often and getting used to its sounds and intonation" (5–6). This suggests a role for mobile devices in incidental rather than intentional language learning through listening (Hulstijn 2003b). Hoven and Palalas (2013) report on a design‐based research study for creating a system to enhance ESP (English for specific purposes) learners' listening skills

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using mobile devices. The project employed podcasts, many of which were produced by students themselves either individually or collaboratively.

Podcasting is highly beneficial for learners for example they can

- ❖ Record classes
- ❖ Students record episodes
- ❖ Good for assessing pronunciation
- ❖ Short radio shows
- ❖ Flexibility
- ❖ Playback
- ❖ Synchronization of Episodes
- ❖ University FM Radio

- Learners and teachers can create their podcasts for their classrooms. They can use the following sources: Podomatic (http://www.podomatic.com): Get a free podcast, share your favourites.
- GabCast (http://www.gabcast.com) Is a podcasting and audio blogging platform offered to virtual communities, individuals etc
- ODEO (http://www.odeo.com): Insert your audio and create a podcast to share in your blog.

Through highlighting listening, it integrated other language skills into tasks as well, in particular speaking and vocabulary development. Another trend in the development of content for listening involves the collection of enriched media for the learner in terms of topic, language level, and other features, a process known as content curation (Hubbard 2011). Curation offers both teachers and learners access to freely available online material, providing them with additional information relevant to making informed choices. Lying somewhere between unordered collections and fully articulated listening lessons, curated collections for listening ideally involve the input from a language learning expert. Analogous to a curator in a museum, a curator for listening materials locates and collects them, organizes them into logical groups and sequences, provides language-level information of various sorts (vocabulary level, speech rate, speaker accent, etc.), and adds pedagogical support (pre‐listening information, key vocabulary, etc.). Ideal content characteristics for a curated set of materials include being freely and legally

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available, likely to be interesting to the targeted audience, good technical quality, stable, accompanied by captions and/or transcripts, and linked to complementary material. A prototypical source meeting these requirements is www.ted.com: an example of curated TED Talks by the author is available at http://web.stanford.edu/~efs/TED1. As noted previously, the Clilstore site (http://multidict.net/clilstore/) also includes curated material for listening. In this case, audio and video content from over 50 languages is available, indexed by Common European Framework levels and accompanied by transcripts linked to a variety of bilingual dictionaries.

Little has been said here about the interactive listening typical of face‐to‐face encounters.

The role of technology in the past has been primarily in (1) demonstrating interactive listening through recorded examples of it and (2) enabling audio and video computer‐mediated communication (CMC). An understudied and underdeveloped area is the digital recording and subsequent analysis by learners (alone, with peers, or with an instructor) of the language that appears in those contexts. Applications such as Evaer (http://www.evaer.com) allow both audio and video recording of Skype interactions, for example. For both online social interactions and online language course work, such technologies can be an important new source of feedback to learners, allowing them to replay what they heard. As Robin (2007) points out, “The notion that L2 learners must grab a flow of speech on the first try or lose the meaning is valid only for those events where the audio is not repeatable”. Perhaps as important, recording technology allows us to capture not just the meaning but the form for future reflection and learning.

Looking to the future, one could produce a wish‐list of resources and technologies, some of which have already been mentioned. Larger and more sophisticated curated collections can assist both teachers and learners in selecting materials that provide a close match to their needs. Media players optimized for instant repetition, adjustment of play speed and capability of streaming any online video would be helpful, as would a technology to automatically double or triple the pauses between thought groups to increase available processing time. The affordance of time-shifting as embodied in instant repetition, play speed controls, and automatic pause insertion has the potential to influence perceptual accuracy and potentially the process and

quality of connected speech processing. Along with these technologies, it will be important to adapt existing strategies and procedures and create new ones more targeted at capturing the power of such mediation.

Yet we can only go so far in predicting what future technologies will bring to second language listening. At the time of this writing, smart watches are bringing wearable computers into our everyday lives, and 3D immersive environments are on the rise. How will these and other innovations impact the field? Moving forward, the rapid pace of technological change means that it will be even more important to consider the affordances digital technology offers in general rather than in device or environment ‐ specific terms so that research and practice from today can transfer and still have relevance in the future. Simple binary questions like "Are L2 video captions helpful or not for language learning?" are no longer appropriate if they ever were. Rather, using frameworks such as those described here and others yet to be developed, we need to continue to expand our research base to understand the conditions under which such features

are more and less helpful, passing those findings on to developers, teachers, and learners who will, in turn, help us to refine them.

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Lesson 14

Technologies for Teaching and Learning L2 Speaking

- Theoretical frameworks
  - Sociocultural theory
  - The Interactionist Hypothesis
  - Autonomy and student agency
  - Cognitive perspectives on speaking proficiency: Accuracy, complexity, and fluency
- CALL pedagogical frameworks for speaking: Task-based instruction (TBI)
- CALL learning environments
- Tutorial CALL and speaking
- Feedback with tutorial CALL
  - Computer-assisted pronunciation training (CAPT)
  - Asynchronous CALL storytelling
  - Digital sound tools: Unleashing student creativity
  - CMC

Theoretical Frameworks

In theoretical terms, the use of CALL to promote L2 speaking is framed by some of the same fundamental ideas normally aired in the L2 literature. Each of the theories described here has a different way of conceptualizing how L2 learners develop their ability to speak, and therefore each provides a useful perspective on how instruction can help.

Sociocultural Theory

Fundamental to all modern language instruction—face - to - face in the classroom or virtually through CALL—is Vygotsky´s (1962) notion of the Zone of Proximal Development

(ZPD) in sociocultural theory (Lantolf and Thorne 2007). The idea that two or more individuals working together can produce more accurate, or at least more elaborate, L2 utterances underlies

all L2 group activities. In essence, Vygotsky asserted that language, first or second, is always learned and used in a social setting. Accordingly, any CALL pedagogy for speaking must necessarily be situated within this broad framework of providing students with ample opportunities to collaborate with other speakers, native or non - native, with the resulting benefits of participating in language interactions with others. Vygotsky's seminal ideas also underlie the approach of other L2 researchers, known as interactionists, who sought to reinterpret the role of input in more complex ways than what Krashen (1985) had espoused.

The Interactionist Hypothesis

Schmidt (1990) observed that all L2 learning requires learners to first notice their deficiencies or gaps between their present L2 capacity and where they still need to go, as loosely defined by what a native speaker might be able to do with the target language. Long (1991), Long and Robinson (1998), Varonis and Gass (1985), Gass (1997)—to cite only a handful of the many studies carried out in this area—have shown that small groups of learners interacting with other learners or native speakers tend to engage in the negotiation the meaning of unfamiliar structures—whether words, grammar, or pragmatic situations—especially when breakdowns in

communication occur. Gass (1997) described this process of negotiating meaning as an important mechanism for priming the pump of second language acquisition (SLA). A pedagogical approach developed to create opportunities for noticing during meaning ‐ oriented learning activities is Focus on Form (FonF, Long, & Robinson, 1998) where the breakdowns, once again, give rise to an examination of new linguistic structures that remain to be learned and controlled by the L2 learner.

Still other researchers, such as Ellis and Sheen (2006), have focused more specifically on the feedback learners received when breakdowns occur, which includes linguistic recasts or reformulations that more proficient partners provide L2 learners in response to the ongoing

conversational exchanges. As part of this feedback routine, Swain (2000) also included the L2 speaker´s feedback loop that arises when pressed to produce output during a conversation; in other words, at the moment of speaking, the L2 learner must try out specific grammatical forms

and lexical items, which in turn, results in felicitous or infelicitous utterances. The process of trying something out can be a point of learning, particularly if the speaker notices his or her lack of knowledge and then discovers how to modify and improve the original utterance.

Autonomy and Student Agency

In general, current constructionist educational approaches endorse a more student-centred learning environment over a traditional teacher-centred model. Accordingly, many researchers have focused attention on creating an atmosphere where the principles of student autonomy and self ‐ agency are heightened (Little 2007), which is especially relevant for the CALL context (Blin, 2004; Guillen, 2014; O´Dowd, 2007; Schwienhorst, 2008). Briefly, autonomous learning means that students take responsibility for their learning process, which should not be confused with self ‐ instruction. This approach emphasizes learner empowerment, language reflection, and, finally, appropriate L2 usage. The teacher is involved at all stages as a guide, whereas with self ‐ instruction there is no instructor presence at any point.

In the CALL context, increased student agency not only guides how students use technology but also implies that they become creators of L2 texts through their active creation of blogs, wiki entries, chat exchanges, audio and video postings (Blake 2013). Some blog creation sites have been shared with you.

- ***Blogger (http://www.blogger.com):*** It is a free blog publishing tool from Google for easily sharing your thoughts with the world. *Blogger* makes it simple to post text, photos and video.

- ***Wordpress (http://www.wordpress.com):*** It is web software you can use to create a beautiful website or blog.

- ***Blog (http://www.blog.com):*** It provides a fully-featured publishing platform for *free. B*

Cognitive Perspectives on Speaking Proficiency

Accuracy, Complexity, and Fluency

A cognitive perspective on speaking proficiency is useful for understanding the intended outcomes of speaking pedagogy. Cognitivists see it as consisting of three separate but interrelated constructs (House, &Kuiken 2009): (1) accuracy (i.e., the lack of phonological, lexical, or grammatical errors), (2) complexity (i.e., the number of words or clauses per T - units or sentences; see Bardovi - Harlig 2012), and (3) fluency. Unfortunately, none of these factors is easy to define or measure (Kormo, & Denes 2004). For instance, the concept of L2 fluency depends on a series of relative time measures such as the delivery speed and length of the utterances, the number of pauses, repetitions, lexical lapses, or discontinuities/ interruptions in spontaneous speech. Clearly, not all native speakers would score well concerning these factors, let alone L2 learners, making these constructs difficult to pin down in absolute terms when assessing L2 speaking proficiency.

Hulstijn (2011) considers speaking accuracy to be part of what he calls the basic linguistic proficiency that all native speakers have acquired, but the complexity and, to some

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extent, fluency, belongs to the realm of extended linguistic proficiency that is attained only by advanced study of the L1 or the L2. In Hulstijn's framework, an evaluation of speaking should not confound the characteristics of basic vs. extended linguistic proficiency. Nevertheless, in practice, both researchers and instructors look to L2 students to perform well on both scales at the same time when they are speaking. In other words, instructors expect learners to improve globally in terms of accuracy, complexity, and fluency, while also commanding a good pronunciation or accent, the latter being something that is extremely difficult for any adult L2 learner to obtain.

To further complicate matters, speaking proficiency also depends on the type of task the L2 student is asked to carry out, which is the focus of the next section. Not all tasks contribute equally to the goal of increased accuracy, complexity, and/or fluency, as Bachman and Savignon (1986) observed long ago about the ACTFL Oral Proficiency Interview, a widely recognized measure of speaking proficiency, and has since been an area of extensive research and theorizing.

Likewise, all CALL speaking activities take place in response to specific task requirements. Accordingly, task type must always be part of the pedagogical considerations for using CALL to promote speaking.

CALL Pedagogical Frameworks for Speaking

Task-based instruction (TBI)

In the previous section, we briefly reviewed some of the important theoretical notions that underlie best practices in L2 teaching, whether in the classroom or in a CALL supported environment. A sound curricular implementation of some of these tenets is perhaps epitomized by task‐based language teaching (TBLT), although this general label can refer to any number of realizations that underscore language production and analysis of meaning through real‐world

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activities, collaborations, and problem‐solving or information‐gap activities (Robinson 2011; Skehan 2003; Willis and Willis 2009; see also Gonzalez‐Lloret, this volume for further discussion). Most of the time, a TBI approach also includes an analytic post‐phase that carefully studies the linguistic structures needed to accomplish the assigned tasks (Willis 1996). Skehan (2003) suggests that the best tasks are those that (1) are carefully structured with both a pre‐planning and a post‐task phase, (2) are organized around familiar information, (3) require analysis or justification, and (4) are interactive or dialogic in nature by virtue of asking the participants to work together. Obviously, the role of the instructor in choosing appropriate tasks is indispensable, especially in CALL contexts where students are necessarily required to be more autonomous while actually completing the task.

CALL Learning Environments

A common misconception about CALL is that it only refers to specific programs or mobile apps when, in fact, CALL activities not only consist of asking students to engage with the L2 by responding to prompts given by the computer, but also deal with students engaging in

conversations with another person mediated through the use of the computer. The first case is called tutorial CALL and the second, social CALL, or computer-mediated communication (CMC). CMC activities themselves can be further divided into asynchronous communication events (ACMC) in deferred time or synchronous chat (SCMC) carried out in real‐time. Each CALL context has its own unique set of affordances, as do the tasks themselves (Skehan 2003). Creating an online curriculum for L2 speaking, then, is not so much about choosing one type of CALL activity over another, but rather about combining the CALL tools and appropriate tasks in a variety of productive ways for L2 development (Chapelle 2001; Doughty and Long 2003; Hampel 2006). Both tutorial CALL and ACMC tend to allow students more pre‐planning time, which should enhance speaking accuracy and complexity and lower individual frustration levels, while SCMC often stimulates students to produce more utterances (Abrams 2003) with a fluency that mirrors more closely the spontaneous turn‐taking behaviour found in real-world, face‐to‐face conversations. Skehan (2003) and Robinson (2011) have endeavoured to untangle the

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complex relationships that exist among language tasks and the main components of speaking proficiency: namely, accuracy, complexity, and fluency. No single task and no single CALL activity can be expected to address all three aspects of speaking proficiency at the same time. Nevertheless, the language profession needs to cultivate better knowledge of the CALL options and their corresponding affordances, as we will outline below.

Tutorial CALL and Speaking

Tutorial CALL allows students to engage in different forms of self‐directed speech practice in the absence of conversational partners or classroom instruction. While classroom

instruction provides opportunities for students to notice gaps in their L2 knowledge, individual language practice facilitates not only memory storage but also the retrieval of L2 words, collocations, and other details about appropriate usage (Loucky, 2006; Teixeira, 2015). Fortunately, computers are a good fit for this type of speak‐aloud individual practice, especially for languages with a heavy morphological burden or unfamiliar sounds.

Ideally, students should sub‐vocalize or speak out loud when they are learning vocabulary lists (Arispe, 2012). In the past, many tutorial CALL programs have been tagged with the unfavourable name of drill and kill, but Hubbard and Siskin (2004) have argued convincingly that tutorial CALL has a well‐justified place in the language curriculum. Usually, the speaking tasks offered by tutorial CALL programs ask students to compare their audio recordings with those of native speakers of diverse accents. Nevertheless, one obvious drawback of this type of exercise for improving L2 speech is the lack of any feedback. Here is where programs that offer some form of automatic speech recognition (ASR) can play an important role.

Feedback with Tutorial CALL

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ASR systems work best when applied to clearly circumscribed linguistic sub‐domains or micro‐worlds: for example, words that only deal with the family or some other specific semantic domain, or important phrases used most often in public places such as banks, airports, pharmacies, and so on. Accordingly, the ASR system asks students to carry out specific tasks, such as individual sound practice, word recognition, or short sentence repetition (Ehsan, & Knodt, 1998). Several commercially available programs provide ASR capabilities: for example, Dragon Naturally Speaking or Dragon Anywhere app from Nuance.com, and TeLL Me More, an algorithm that has been recently integrated into the RosettaStone.com online exercises.

The Dragon software offers a set of intriguing dictation tools that turn foreign language speech directly into text for American English, Australian English, Asian English, Indian English, UK English, Dutch, French, German, Italian and Spanish. This dictation tool is normally

marketed to businesses, but there are obvious applications for the L2 curriculum. If the L2 pronunciation of a target word or phrase deviates too much from the statistical norms programmed into Dragon, the written dictation will come out corrupted and, therefore, oblige the user to analyze and restate the utterance in a more comprehensible way, thus providing an excellent feedback loop along the lines of forced output as described by Swain (2000). Plagwitz (2014, 2015) described how he used a similar tool from Windows, the W7ASR automatic speech recognition software (now available for Chinese, English, French, German, Japanese and

Spanish), to carry out this type of pronunciation practice both in and outside of class by having students convert previously designed writing practice into speaking activities with the feedback loop being provided by the output of the text files. Dictation studies have a long and valued track record in foreign language instruction, as Swain and Lapkin (1998) have shown in their dictogloss implementations. Surprisingly, few CALL studies or practical applications have taken advantage of dictation software such as Dragon, despite its obvious affordances for enhancing L2 speaking—something that the CALL field needs to look at more closely in the future.

Rosetta Stone has also incorporated an ASR feature into its exercises, available in 25 languages, and based on the TeLL me More algorithm originally developed by Auralog.com. These exercises tend to focus on single-word recognition, short collocations, or phrases. The ASR routines offer students a wave‐analysis comparison of their recordings with those of a native speaker, but the visualizations are based on sound intensity and entail some trial‐and-error experimentation on the part of the learner in order for them to be helpful as feedback. Rosetta Stone also offers online tutoring and its version of a social network, but that service falls under the heading of CMC discussed below.

Computer‐assisted Pronunciation Training (CAPT)

Pronunciation and intonation, of course, are part and parcel of learning to speak an L2 well.Many researchers (Bley‐Vroman, 2009; Hulstijn, 2011) have argued that learning native‐like pronunciation and intonation is a difficult or even impossible goal for most adult L2 learners and, in the overall scheme of communication, may have less importance than gaining adequate control of the frequently used lexical and grammatical structures of the target language.

However, O'Brien (2006) has argued that effective communication cannot take without comprehensible pronunciation and, therefore, it merits serious attention. Since class time is limited, the tutorial CALL context, again, becomes the ideal venue for computer-assisted pronunciation training (CAPT), which is designed to allow students to take control of their learning in the risk-free environment offered by working with a non‐human helper. In other words, CAPT software provides more practice time, patience, flexibility, and no penalties for making errors. Eskenazi (1999) has stressed the importance of implementing CAPT software in a way that offers diverse speech sounds from different speakers and registers.

Chun's research (1998, 2002) has focused on giving students clear feedback about L2 intonation through the use of CALL software. Both Chun (1998) and O'Brien (2006) have stressed the importance of linking instruction on L2 pronunciation with that of L2 intonation.

Gorjian, Hayati, and Pourkhoni (2013) have extolled the virtues of having students study L2 pronunciation and intonation using the PRAAT acoustic analysis software. However, as in the case of the TeLL Me More sound graphics, students need training on how to use these visualizations to improve their accent and prosody and only students who are committed to understanding and making use of visualization techniques may see their pronunciation improve. Once again, the issue of student autonomy raises its head here.

Asynchronous CALL Storytelling

Students can also become multimedia storytellers by using digital storyboard applications such as StoryKit to produce their narratives complete with captions and audio recordings. With this program, students work either individually or in groups to bring their narratives to life with images, photos, text bubbles, and audio recordings. In the process, the participants receive

feedback from the teachers and their peers on their L2 speaking while working on projects that are meaningful to them—their own multimedia creations.

VoiceThread.com provides another popular and easy ‐ to ‐ use online tool to combine images, photos, text, and audio comments with the added advantage that individuals from different geographical sites can easily collaborate on a VoiceThread project. When VoiceThread slides are shared online, the creators can allow anyone with an Internet address (URL) to add comments or answer questions posed by the creators, thereby enriching the entire project. The

creator/instructor can always maintain control over which comments are posted by choosing the < moderate comments > option under the publishing menu. Because VoiceThread permits the formation of learning groups at a distance, it might also be considered a form of asynchronousCMC, but we have included it in tutorial CALL because individuals can always develop single ‐ authored presentations on their own in a completely independent fashion. In practice, VoiceThread can be used to conduct both tutorial CALL for speaking or asynchronous CMC.

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Learners should use the following storytelling tools:

- **Omeka** : Open or Hosted resource for archiving and displaying images and content. Free
- **Timeline.js** : Using Java and a Google Sheets template, you can quickly create interactive timelines with images, videos and other content.
- **We Video** : All in One, scalable web based story editor
- **Neatline** : Mapping and Timeline Tool for Omeka Projects.

- **ArcGIS Online** : University of Minnesota ArcGISonline Server access.

- **Census Data Viz** : Examples of data visualizations from Census Data.
- **Canva** : Freemium graphic design tool with infographic templates.

Digital Sound Tools: Unleashing Student Creativity

In addition to the applications presented above, L2 students have at their fingertips many digital tools that can easily be used to embellish their own stories with images and sound to produce multimedia materials for the Web.3 Blake and Shiri (2012) described how the first year Arabic students at UC Berkeley demonstrated their speaking progress at the end of the term by publishing their audio‐enhanced finished products on YouTube.com. Several groups of students in this Arabic class opted for simple hand illustrations with hand‐written Arabic captions, adding in later their audio narration (http://www.youtube.com/watch?v=Gc4gw6Ig564). These easy‐to‐use techniques result in an impressive finale to a language course to the great satisfaction to both students and instructors alike and can be viewed by the entire class to provide feedback on the students' L2 speaking.

We recommend some authentic video sources to use in the ESL classroom.

- University channels (Berkeley, Harvard, Standford, Oxford etc)
- All major TV channels – BBC/ITV/Sky
- News sites – BBC/The Argus
- YouTube (TEFLclips)

- TrueTube
- Videojug
- National Geographic
- Real English and other EFL video sites
    - ❖ 100 best video sites for ESL

http://www.edudemic.com/best-video-sites-for-teachers

- **JenniferESL: With over 153,000 subscribers, Jennifer's best videos are her lessons on idioms (kitchen idioms, driving idioms, colour idioms**
- **MisterDuncan: Considered one of the original English teachers on YouTube. He covers lessons on fluency and speaking English naturally.**
- **Voice of America Learning English: Join over 98,000 other subscribers and learn English with captioned news reports read at a slower speed.**
- **BBC Learning English: Another popular site, with over 64,000 followers.**

CMC (Computer Mediated Communication)

The other important CALL context deals with using the computer to mediate communication between people; what researchers in the field refer to as CMC. CMC has a long and established record starting with asynchronous textual exchanges. The main thrust of earlier CMC studies was to show that online text exchanges produced opportunities to negotiate meaning and to generate feedback in ways similar to what had already been documented in face - to - face encounters (e.g., Abrams, 2003; Blake, 2000; Loewen, &Erlam, 2006; Meskill, 2005; Pellettieri, 2000; Peterson, 2009; and Warschauer, 1997; to name only a few). Early on in this line of research, Kern (1995) noticed that there existed many linguistic similarities between

L2 oral speech patterns and asynchronous computer writing, which is why we include SCMC textual exchanges in this chapter on L2 speaking, although other writing considerations are involved here as well (undoubtedly, some degree of sub - vocalization is occurring when people write via the computer keyboard, although this has not been sufficiently studied, as yet).

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Interesting enough, Kern found that the experimental group exchanging text messages via Daedalus.com writing software produced more utterances with more complexity than the control group speaking to each other in a face‐to‐face context.

Further evidence suggesting that SCMC writing helps L2 speaking emerged from Payne and Whitney's (2002) study where student keyboarding had a significant effect on improving L2 speaking proficiency. Nowadays, the linguistic congruities between texting and speech hardly would surprise anyone, especially given the way people generate tweets on Twitter or text on mobile phone. Despite being a form of written communication, tweeting has been proven to be an effective tool for creating what sociocultural research calls a community of practice with geographically disperse speakers, native and non‐native, who tend to respond back and forth as if they were chatting to each other in a cafe (Lomicka, & Lord, 2011).

Gradually, SCMC began to include the exchange of voice‐over IP sound (VoIP), giving speakers two channels in which to communicate (Blake 2005). Many learners continued to prefer keyboarding perhaps because of its visual persistence (the text stays on the screen) and extra processing time in comparison to the pressures of responding quickly to audio prompts. In the case of Sauro's (2009) study, the preference for keyboarding took on gender overtones. Two Japanese students of English, one male and one female, were assigned a collaborative CALL task. The male participant started by dominating the voice channel (VoIP) to take control of the task, which prompted the female participant to switch to using only the text chat modality to communicate. Eventually, her behaviour forced the male partner to follow suit, tone down his aggressiveness, and respond to her textual directions and entries to finish the assigned task together.

VoIP sound soon gave way to true telephonic sound (i.e., synchronous audio) and now, synchronous video. Today´s CMC tools seamlessly combine asynchronous (text) and synchronous (sound and/or video) channels. Each application accents certain affordances, as Lafford and Lafford (2005) have analyzed in detail. Videoconferencing tools promise a

communicative experience most like face - to - face encounters, but this modality also demands lots of bandwidth, which puts great pressure on the user's local network. If the local network is not robust, instructors need to make informed choices to use tools that are less greedy for bandwidth. Adobe's Connect is perhaps the most complete videoconferencing program, but its cost is high and usually, only institutions can afford it (Connect demands lots of bandwidth, too). Skype is free and ideal for working in pairs. For larger group chats up to ten individuals, Google Hangout is also free and provides a transparent interface that leverages many of Google's other applications such as YouTube, Google Drive, and other third party Google friendly applications.

In addition, many learning management systems (LMS) operate on platforms that allow users to record videos on the fly using Flash plugins to smoothly incorporate these clips into the LMS message system, posts, or discussion forums. The real question is how to design activities with these tools to enhance L2 speaking opportunities. Guillen and Blake (2015) have examined

the speaking benefits from allowing students to post their best video recording through an LMS platform, with the added benefit of being able to rework and improve their video responses until they finally capture their best effort. These researchers found that the students' asynchronous video postings in Spanish exhibited more complex sentences and better accuracy than in their conversations from synchronous video sessions—as Robinson (2011) might have predicted given the increased planning time afforded by the asynchronous best recording format. Again, the choice of task is all - important (Hampel, 2006) and needs to be carefully thought through by the instructor because speaking proficiency, as we have previously discussed, involves accuracy, complexity, and fluency.

Nevertheless, certain linguistic structures, such as intricacies of the Spanish subjunctive, in this particular case, will continue to cause difficulties for the students at the intermediate level

no matter the instructor's interventions or assigned tasks. L2 acquisition takes a long time, which is another motivation for using CALL in the foreign language curriculum as a way of increasing the time on task (Munoz, 2006, 2008).

The availability of fully synchronous video has put SCMC activities at centre stage concerning fostering L2 speaking. Videoconferencing has become the norm for most telecollaboration (O'Dowd, 2007), tandem learning (Guillen, 2014), and social media exchanges (Lin, Warschauer, and Blake in press)—all topics that are addressed elsewhere in this volume.

Synchronous speaking tasks now form part of most hybrid or fully online language courses(Blake, 2011). Videoconferencing gives students an alternative to the speaking practice that is assumed to occur in the classroom. In fact, small group videoconferencing—for example, with one instructor working with two to three students—represents a far more intensive speaking experience than sitting in class and responding only two or three times in an hour. During the hour‐long videoconference session, students are constantly taking turns speaking in the L2, which can be an extremely active and rigorous experience by the students' admission (Blake, 2015). Naturally, the instructor must prepare the conversational tasks ahead of time so that the

students know exactly what to expect and are primed with the appropriate vocabulary and grammar constructions needed to bring the task successfully to completion. In this way, students can gradually build up greater fluency and smooth discourse transitions, which are important components of speaking proficiency.

Unfortunately, speaking progress via videoconference usage has not been well tracked or measured to date, partly because defining the construct of speaking proficiency remains a daunting, if not insurmountable, undertaking (Hultstijn, 2011) whether in the face‐to‐face or CALL context. Hulstijn (2015) has recently challenged researchers in the L2 field to test out empirically whether or not speaking proficiency should be conceived as a continuum or, as he has suggested, a dichotomy (i.e., basic vs. extended linguistic proficiency). These same L2 theoretical issues are relevant to CALL research, as well, and deserve serious attention in future CALL research.

Chatbots have revolutionized academia as well as business. Amazon and other international e-commerce tycoons use these chatbots. Dialogflow, a platform supported by

Google, can train chatbot without any coding skill, even students of humanities have modified and built new chatbots from scratch. These chatbots have been designed with variety of technology, diversified instances in different languages of the world for instance Babbel, Rosetta Stone, Duolingo, Memrise, Andy, Mondly etc

In the course of discussing SCMC, we do not wish to imply that videoconferences are exactly like face‐to‐face exchanges with all the same transparency, despite the existence of the computer screen mediating the experience between interlocutors. Ware and Kramsch's (2005) warnings, which were made concerning ACMC exchanges, should still be heeded: the interface changes the conversational dynamics. Students and instructors alike need the training to help to avoid, or at least come to understand better, any intercultural miscommunications that might occur during these CALL contexts, especially during cross‐cultural Internet collaborations. As always, well‐designed tasks are needed to impact student outcomes significantly by promoting successful and satisfying online exchanges—videoconferencing being no exception.

Conclusions

At present, SLA theory is a long way from providing precise definitions for even such basic concepts such as speaking proficiency, especially when the choice of the task impacts student outcomes so dramatically and varies so much from one instructor to the next. With respect to stimulating L2 speaking, the different CALL contexts described here equip the instructor with a rich array of options that can be used to stimulate more and better L2 production.

Undoubtedly, one size does not fit all and teachers will have to adapt tasks and tools to each group of students they deal with. Likewise, new tools are being invented all the time, which is a good thing but it also creates the daunting task for the instructor of keeping up with these changes in the CALL field. Using technology can be intimidating because it keeps changing so

rapidly. Continued training in the use of CALL applications to promote L2 speaking, or any other aspect of language proficiency, should be part of everyone's agenda.

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Lesson 15

Technology-Enhanced SLA Research

- Defining SLA and SLA research
  - Cognitive approaches to SLA
  - The interaction approach
  - Sociocultural theory
- Defining SLA-relevant research in computer-assisted Language learning (CALL)
  - Three SLA‐relevant CALL studies
    - Cognitive approach
    - Interactionist approach

- Sociocultural theory

Defining SLA and SLA Research

Second language acquisition (SLA) is the study of the human capacity to learn languages other than the first, during late childhood, adolescence, or adulthood, and once the first language or languages have been acquired (Ortega, 2009). Within the field of applied linguistics, of which SLA is a part, there is a distinction typically made between second and foreign language acquisition, with the former occurring where the target language (the language being learned) is spoken by the local community and the latter occurring in settings in which the target language is not spoken by the local community. In this chapter, the terms acquisition and learning will be used interchangeably as will the terms second and foreign language (L2).

SLA is a broad and diverse field, which has been rapidly expanding in scope and methodology ever since it emerged in the 1960s. Today the field remains interdisciplinary as it was in the past, with as many as 60 theories, models, hypotheses, and theoretical frameworks of SLA (Long, 2007). According to VanPatten and Benati (2010) some of the (broad) questions that SLA theories are developed to address include the following:

- What do learners do when acquiring another language?
- What stages of acquisition do they go through?
- What does their developing second language (interlanguage) “look like”?
- What is the nature of their errors?
- What factors affect SLA?
- What are the mechanisms that learners use to understand and produce an L2?
- How does fluency develop?
- How do we explain learner variability in the eventual attainment of an L2?

In attempting to answer these and other major questions, several competing SLA theories, approaches, and frameworks have emerged, bringing with them their own set of ontological, epistemological, and methodological stances, which largely determine the specific questions as

well as what the researchers count as data, and accept as evidence. This fact makes it difficult to talk about SLA as a cohesive entity. Accordingly, we frame our discussion of technology‐enhanced SLA research in terms of three theoretical frameworks that are widely researched and especially compatible with CALL inquiry: cognitive approaches, the interaction approach, and sociocultural theory.

- **Cognitive Approaches to SLA**

There are a host of cognitive approaches to SLA, which can be broadly classified into traditional information processing and emergentism (Ortega, 2009). Cognitivists believe that to properly understand the final state of fluent L2 development we need to understand the processes by which this expertise came about. Cognitive science is also concerned with functional and neurobiological descriptions of the learning processes, which, through exposure to representative experience, result in change, development, and the emergence of knowledge (N. C. Ellis, 2002). Information processing theories all share the belief that human cognitive architecture is made up of representations and access. Mental processing is comprised of automatic (unconscious) operations and voluntary or controlled (conscious) operations. Cognitive resources such as attention and memory are limited, and performance is variable and vulnerable to stressors, such as those factors that make a language learning task more difficult such as time pressure.

In contrast, emergentist SLA scholars argue for a usage‐based explanation of language development (including SLA). They argue that fluent language use is exemplar-based and is made up of "a huge collection of memories of previously experienced utterances" rather than knowledge of abstract rules (the latter explanation championed by generative linguistics). Emergentists take most language learning to be "the gradual strengthening of associations between co‐occurring elements of the language," and they see fluent language performance as "the exploitation of this probabilistic knowledge" (Ellis, 2002, 173). Cognitive theory directs researchers to investigate constructs such as working memory, which can be assessed through the use of technology.

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- **The Interaction Approach**

The interaction approach (IA) grew out of Long's Interaction Hypothesis, which was first developed in the early 1980s. Since then, it has been updated (Long, 1996) and rigorously researched. The IA essentially says that through input and interaction with interlocutors, language learners have opportunities to notice (Schmidt, 1990) differences between their formulations of the target language and the language of their conversational partners. They also receive corrective feedback, which both modifies the linguistic input they receive and pushes them to modify their linguistic output during the conversation. This interaction helps draw learners' attention to or lead them to notice a linguistic problem (Long, 1996).

Attention as a result of interaction may also lead learners to notice linguistic input in the absence of a problem. Interactionally modified input, is that which occurs as needed during goal‐oriented conversation and is argued to be more effective (in terms of learning the target word or structure) than pre‐modified input, which is modified to be target‐like before any learner error occurs (R. Ellis et al. 1999). An example of pre‐modified input might appear in a listening passage that provides simplified or glossed language for vocabulary referring to technical

concepts. Thus, the major constructs of this approach to SLA include input, interaction, corrective feedback, attention and output (Gass, 1997). Some of the most commonly investigated phenomena that inform these constructs include negotiated interaction (Long, 1996), whereby learners first have a breakdown in understanding and then regain understanding through a series of communication moves, such as recasts, which are a type of corrective feedback and learner uptake, whereby a learner appropriates the target language forms of their interlocutor in some productive way (Lyster, & Ranta, 1997). Such constructs have also been investigated in settings where technology is used to mediate the interactions.

- **Sociocultural Theory**

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Sociocultural theory (SCT) has its origins in the work of Russian psychologist Lev Vygotsky in the early part of the 20th century. SCT argues that while human neurobiology is a necessarycondition for higher mental processes, learning is essentially a social process whereby the most important forms of human cognitive activity develop through participation in cultural, linguistic, and historically formed settings such as family life, peer group interaction, and institutional contexts like schooling, organized social activities, and workplaces. SCT posits that everything is learned on two levels—first on the social level (between people) and only later on the individual level. Human mental functioning is a mediated process. That is, just as humans use material tools such as a hammer to mediate the act of building a table, we also can create and use inwardly directed symbolic tools such as language to mediate our psychological activity which connects the entire world in the global village. As children (and language learners) develop they move through stages whereby they are controlled first by the objects of their environment (object‐regulated), then by others in this environment (other‐regulated), and finally they gain control over their own social and cognitive activities (self‐regulated).

From the SCT perspective of SLA, language learning is facilitated by social interaction. During the interaction, learners and more capable peers engage in a collaborative dialogue involving scaffolding. This type of interaction is viewed as central to the learning process, as it facilitates the operation of the zone of proximal development (ZPD). The ZPD is "the distance

between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978). One of the most compelling aspects of the ZPD is that rather than measuring the level of development a learner has already attained, the ZPD is forward-looking in that it suggests that what one can do today with mediation is suggestive of what one will be able to do independently in the future. The notion of dynamic assessment and systemic‐theoretical instruction have recently emerged as pedagogical applications of SCT including applications using technology (Lantolf, & Poehner, 2014).

Defining SLA-relevant Research in Computer-assisted Language Learning (CALL)

The rapid development of computer technology has afforded SLA researchers many possibilities to investigate aspects of SLA theory, which are not available to them in a face‐to‐face environment. Most times this type of research employs computer technology as a tool to control or regulate some aspect of the instructional environment. Such studies, despite their use of computer technology, are not considered CALL studies since the study is not primarily concerned with employing computer technology for teaching and learning foreign languages. An example of this type of research is DeKeyser (2005) who used the computer to execute a speeded grammaticality judgment test. These types of technology‐assisted SLA studies have been outlined in detail elsewhere (Hulstijn. 2000), and will not be discussed here.

What is most interesting for this volume on Technology in Second Language Teaching andLearning is the difference between an SLA‐relevant question asked in a CALL study and one that does not yield SLA‐relevant results. That is to say, just as not all applied linguistics or L2 pedagogy research questions have direct relevance to SLA, not all CALL studies ask SLA questions or yield SLA‐relevant results. Indeed, SLA‐relevant CALL studies are still rather rare even if they are now growing in number and sophistication. CALL has only begun to emerge as a cohesive area of inquiry since the 1980s. During the early years, CALL was an avocation, not a vocation for most CALL practitioners (Fischer, 2012). Many came to CALL

from other academic fields having no formal training in CALL because of the newness of the field. Most early CALL scholars were faculty members in foreign language departments who had primary professional responsibilities in literature or linguistics. Fischer points out that in those days the technology was the focus, but in the 1990s a shift from technical matters to language learning matters occurred. Success in CALL no longer lay in writing software alone, but rather in using this software to help students learn L2 vocabulary and specific language structures, for example. In other words, interest grew in the use of computers for second language acquisition (Fischer, 2012).

Today, those interested in the nexus of CALL and SLA critically evaluate the use of

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a particular tool or app in terms of its potential for facilitating L2 learning. Embracing this challenge sets SLA‐relevant CALL inquiry apart from CALL research that is not SLA‐relevant. For example, CALL studies that solely explore learner attitudes toward using a given application in the L2 classroom or learner perceptions of an app's facility for L2 learning, though important and interesting, may not be directly relevant to SLA. In order to change CALL research to be SLA‐relevant, clear connections need to be made, for example, between student attitudes toward technology X and, say, learner motivation regarding their present L2 learning context. The researcher would work within an SLA theoretical framework that links attitudes, motivation, and instructed SLA.

Some of the questions that one needs to consider in determining the degree of SLA relevance of a CALL study are the following: (1) Is this study a CALL study? As mentioned above a CALL study is defined here as one that is primarily concerned with employing computer technology for teaching and learning foreign languages. Note that computer technology is broadly defined here and includes desktops, laptops, tablets, handheld devices, and smartphones, among other technologies, (2) Is the CALL study firmly grounded in an identifiable SLA theoretical framework? A theoretical framework refers to the theory or approach that researchers select to guide their research. It is the application of a collection of interrelated concepts and coherent explanations of certain phenomena that guide the research and allow researchers to test aspects of the theory and describe the results. The theoretical framework helps determine what

the researcher will measure, what variables will be examined, the relationship between these variables, and what research questions will be raised, (3) Does the study examine key assumptions, constructs, hypotheses, and so on, which are relevant to this theoretical framework for SLA? Not only do researchers need to introduce a theoretical framework that informs the study, but the study must also reflect an exploration of specific constructs and hypotheses that emerge from and are relevant to that same theoretical framework, and (4) Does the study explicitly or implicitly investigate some aspect of the argued affordances of CALL environments for SLA? In other words, there are some expectation that the affordances of the specific CALL environment in the study, including the specific CALL tasks in question (Chapelle, 2001), may impact some aspect of learner processes, interactional patterns or outcomes?

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The most compelling SLA‐relevant CALL studies are those that have a strong theoretical rationale for hypothesizing that the affordances of a specific CALL environment are likely to impact the results at a process or outcome level (question 4 above). For example, in an examination of explicit recasts in an SCMC environment, Smith (2012) argues that such written corrective recasts are necessarily more explicit (and therefore more noticeable) than those found in oral recasts due to the written nature of the medium itself as well as the message permanence afforded.

Three SLA‐relevant CALL studies

Using the four considerations discussed above, I outline three exemplary SLA‐relevant CALL studies from three of the most widely employed theoretical frameworks. Each of these studies focuses on computer‐mediated communication in one form or another, reflecting CMC's predominant position in CALL research in recent years.

- **Cognitive Approach**

Payne and Whitney (2002) used Levelt's (1989) model of language production as well as key concepts from Working Memory theory (Baddeley, 1986) to explore whether SCMC can help

improve learners' L2 oral proficiency by developing the same cognitive mechanisms that underlie spontaneous conversational speech.

Is the study primarily concerned with employing computer technology for teaching and learning foreign languages?

Four sections of a third semester university‐level Spanish course were used for this study.

These were intact groups with the students in the experimental groups (meeting online in a chat room) engaged in the same activities on the same days as those in the control groups did face to

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face. All groups engaged in weekly threaded discussion as preparation for synchronous discussions, weekly online drills and practice activities with feedback, weekly online quizzes with feedback, independent viewing of the video accompanying the textbook, and a collaborative research and writing project involving multiple drafts of an essay. One important question when studying text‐based chat interaction is whether such interaction can yield cross‐modal benefits for spoken proficiency. They asked the following CALL‐related research questions: Can L2 oral proficiency be indirectly developed through chat room interaction in the target language? Can individual differences in working memory capacity effectively predict the rate of L2 oral proficiency development for different types of learners in a chat room setting?

Is the study firmly grounded in an identifiable SLA theoretical framework?

Though Levelt's model of language production is one of L1 production, many researchers have used and adapted this model to depict L2 language production processes. For example, deBot (1996) combined Levelt's model with Anderson's (1982) notions of declarative and procedural knowledge as he explored Swain's Output Hypothesis (1995, 2005) from a psycholinguistic perspective. Likewise, Payne and Whitney (2002) employed Levelt's model in combination with another psycholinguistic concept, working memory, to propose mechanisms that influence L2 acquisition. SLA studies have shown that verbal working memory capacity is

an especially important variable in predicting L2 vocabulary development and overall L2 proficiency.

Does the study examine key assumptions, constructs, hypotheses, and so on, which are relevant to this theory of SLA?

Key to many cognitive approaches to SLA are the constructs of controlled and automatic processing. All processing falls into one or the other category. Controlled processing involves "a temporary sequence of nodes activated under control of, and through attention by, the subject" (Schneider and Shiffrin 1977, 2–3). Put another way, controlled processing is that which is under the conscious and intentional control of the individual and these processes are constrained by the

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number of attentional resources available. In contrast, automatic processes are the activation of a sequence of nodes that "nearly always becomes active in response to a particular input configuration," and that "is activated automatically without the necessity for active control or attention by the subject" (2). That is to say, automatic processes require comparatively few cognitive resources and can be performed in parallel with other automatic processes. Initial learning requires controlled processes, which require attention and time. With practice the linguistic skill requires less attention and becomes routinized, thus freeing up the controlled processes for application to new linguistic skills. L2 learning, then, is viewed as the process by which linguistic skills become automatic. Cognitively‐oriented SLA researchers drawing upon Levelt's (1989) model acknowledge that controlled processing plays a central role in L2 production in terms of lexical access and articulation (at least until a high level of L2 proficiency has been achieved). Indeed, L2 fluency seems to vary as a function of automatic processing ability. In Levelt's (1989) model, working memory is associated with controlled processing. Since controlled processing plays such a central role in L2 lexical access and articulation, then limitations in working memory capacity are likely to have an impact on L2 performance and arguably SLA.

Does the study explicitly or implicitly investigate some aspect of the argued affordances ofCALL environments?

Payne and Whitney (2002) argue that the affordances of synchronous chat interaction can help to improve some L2 processes. For example, the rate of delivery during (written) SCMC interaction is much slower than that in spoken interaction. It should reduce the processing demand on learners. Also, the message permanence afforded by the chat environment allows learners to refresh memory traces, which is not possible in spoken interaction.

All of this suggests that learners with lower WMC will benefit from the SCMC environment where processing demands are reduced, but the task and other features of the interaction are the same. Essentially, then, in terms of the first research question, Payne and Whitney predicted (and found) that the participants in the CALL environment (experimental

group) would show at least the same degree of oral proficiency development over one semester as those participants in the control group. In terms of research question 2, there was a lower correlation between oral proficiency gain scores and one of the WMC tests in the experimental condition (SCMC) as compared with the control condition (F2F), indicating that learners with a lower WMC benefited from the chat environment.

- **Interactionist approach**

In a study of teacher‐learner (text‐based) SCMC interaction during online conferences, Smith and Renaud (2013) used eye‐tracking technology to explore the relationship between L2 recasts, noticing, and learning of the recast targets.

Is the study primarily concerned with employing computer technology for teaching and learning foreign languages?

This study examined the effectiveness of teacher‐provided corrective feedback during one-on-one online conference with students. The task was for students to meet virtually with the instructor and discuss (in the target language) a draft of a written assignment due the next week. The teachers were asked to provide full recasts to learners when it seemed natural to do so. Recasts may be defined as discourse moves by an interlocutor that, within the context of communicative activity, correctly restate or rephrase all or part of a learner's utterance to be

more target‐like by changing one or more sentence components, while still acknowledging and retaining its central meaning. For example, when a learner of German says something like Ich habe Hunger nicht* (I am not hungry) the teacher may provide the recast Ah, Sie haben keinen Hunger (Oh, you're not hungry). The online conferences were viewed by the instructors as part of the regular curriculum, and they typically held either face‐to‐face or online conferences with students for each of three major writing assignments over the course of the semester. In this way, instructors had integrated computer technology as a tool to facilitate the teaching and learning of the target language.

Is the study firmly grounded in an identifiable SLA theoretical framework?

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This study espouses a cognitive interactionist theoretical framework. From this theoretical perspective, corrective feedback provided in the form of recasts is thought to be especially beneficial for learners as they provide a focus on formal aspects of the learner's output as problems arise while retaining the overarching focus on meaning and not significantly hindering the flow of communication. That is to say, by using recasts (a form of implicit negative feedback), teachers may deal with many of their students' language problems incidentally while working on their subject matter of choice, with fewer of the interruptions and other unpleasant side effects caused by traditional overt "error correction" practices (Long, 2007).

Does the study examine key assumptions, constructs, hypotheses, and so on, which are relevant to this theory of SLA?

Attention to and noticing formal aspects of the target language are key elements in the interactionist approach to SLA. The assumption is that learners can attend to and make use of the positive input and negative feedback that recasts supply, provided that they can notice the recast's corrective intent. Smith and Renaud's (2013) study employed eye‐tracking technology as a measure of what learners attended to in the corrective feedback.

These eye‐movement records were compared with learners' performance on individually tailored post‐tests that consisted of both target‐like and non‐target‐like learner‐generated sentences from the original online conference. In this way the researchers could determine the degree to which learners attended each recast and, based on the post‐test results, they could calculate the effectiveness of the recasts.

Does the study explicitly or implicitly investigate some aspect of the argued affordances of CALL environments?

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The potential benefits of text‐based SCMC for language learning include increased participation among students, an increased quantity and heightened quality of learner output, enhanced attention to linguistic form, and an increased willingness to take risks with their L2. The slower speed of typing as well as a software‐ and network‐induced lag time between turns, coupled with the heightened salience of input and output afforded by the permanence of the written message on the screen means that interlocutors have more time to both processes incoming messages and produce and monitor their output. This increased planning time is argued to contribute to L2 performance by freeing up attentional resources. Learners have been shown to make use of this increased planning time to engage in careful production that results in the more complex language (Hsu in press; Sauro, &Smith, 2010). In this study, many instructors provided recasts were complex, whereby one recast targets more than one linguistic item in the participant's previous message. Although partial recasts that target a single linguistic item have been argued to be easier for learners to attend to, we might expect the increased processing time and message permanence afforded by the chat interface to mediate this partial/ complex issue by making the multiple targets in complex recasts more salient to learners.

- **Sociocultural theory**

Most of the current research on gaming in L2 settings espouses some form of sociocultural theory as its theoretical framework. For example, Rama et al. (2012) conducted a qualitative study that examined two college‐age Spanish learners' experiences while participating in the Spanish‐language version of the wildly popular massively multiplayer online game (MMOG) World of Warcraft (WoW).

Is the study primarily concerned with employing computer technology for teaching and learning foreign languages?

This study posed the single research question—what affordances for second language development and socialization might online gaming environments offer? As part of the class,

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participants were each given a Spanish‐language version of WoW. They were asked to play the game at their discretion throughout a seven‐week period and were encouraged to play about five hours per week. Data collection included journal entries kept by students reflecting on their gaming experience each week, regular meetings, and semi‐structured interviews with the instructor, and chat logs of the text‐based interaction that occurred during each gaming session. The gaming sessions occurred outside of the classroom, but were connected to a specific Spanish course and, therefore, can be viewed as extracurricular (Sylvén, &Sundquist, 2017).

Is the study firmly grounded in an identifiable SLA theoretical framework?

The authors explicitly identify sociocultural theory as the guiding theoretical framework. As mentioned above, SCT views language learning as emerging from the learner's interactions with other people and the environment, which are mediated by symbolic (in this case language) and material (in this case the WoW game) tools. Indeed, from this theoretical perspective, any opportunity for authentic and active interaction in the target language is viewed as beneficial for L2 learning. Further, as Vygotsky's Zone of Proximal Development (ZPD) emphasizes the interplay between a learner's capabilities and the learning environment, this study focused specifically on the interactions with Spanish native speakers by an expert gamer with lower

Spanish ability. These interactions were contrasted against the interactions of another student, who was a novice gamer but an advanced Spanish speaker.

Does the study examine key assumptions, constructs, hypotheses, and so on, which are relevant to this theory of SLA?

The unit of analysis in this exploratory study was not only the affordances of the learning environment or discrete aspects of the individual learner's linguistic output (or input received), but rather the affordances for second language development and socialization that emerge from the learner's interactions within the learning context. Indeed, MMOGs are argued to offer a range of affordances for L2 learning due to the engaging communicative contexts of these

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environments. Play in these environments requires collaborative interaction, which in turn is mediated by meaningful target language use. From a sociocultural perspective, these interactions, often with more capable others, may provide opportunities for learners to build on their existing competencies in a supportive and engaging context.

The data analysis occurred in two steps. First, the researchers employed an inductive process aimed at identifying patterns in the participants' language use identifiable from the chat logs. These included type of utterance, length of pauses between utterances, the role that participants played in the exchanges, and changes over time. This phase also examined participants' journal entries and interview transcripts to identify emerging themes. Step 1 revealed the notion of affordances for language learning and socialization as an important organizing construct. The second step of the data analysis coded for specific examples of (and references to) affordances for language learning in the data. In addition to confirming affordances found in previous research on gaming in similar contexts, the study identified three new affordances of WoW: it allows for and supports the creation of safe learning and languaging spaces; it emphasizes communicative competence, or the ability to communicate meaningfully and effectively within a given context, and it promotes goal‐directed collaborative action between experts and novices.

Does the study explicitly or implicitly investigate some aspect of the argued affordances of CALL environments?

Text‐based CMC interaction has long been argued to reduce the anxiety felt by many learners as they attempt to communicate in the target language. This is largely due to the mediated nature of the online exchanges as well as the written modality. In a text‐based CMC environment learners are not required to speak, just type. This low‐anxiety setting has been described in previous game‐based research. Additionally, CMC interaction research has identified dyadic or small group interaction as the most likely to yield more linear and cohesive dialogue.

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Though not explicitly investigated, the creation and use of guilds (rather than the general chat channel) in this study, which afford more private and manageable chat interaction with smaller groups of people, is consistent with this CALL affordance. Further, synchronous CMC environments potentially offer extensive opportunities for purposeful target language use in an authentic and engaging communicative context. Not only can learners take risks with language (with little downside to non‐target like utterances in text‐based SCMC, at least), they receive a potentially vast amount of linguistic input from a variety of partners across many communicative contexts. They may review their own and others' target language use because of the message permanence and slow motion nature of the interaction (compared to that in F2F). Rama et al. (2012) describe this affordance in terms of the WoW space "providing opportunities for language learners to interact with native speakers in ways that allow time for reflection on language production" (335). One of the participants in this study (Silvania) made limited contributions to the group chat, however, these tended to be in complete, grammatically correct utterances. This participant's journal entries suggested that the CMC medium provided her with the opportunity and motivation to improve her writing (and speaking) skills. Though evidence of gains in specific aspects of language proficiency is sparse in this study (nor was such evidence explicitly sought), there is ample evidence of growing familiarity with certain Spanish vocabulary, expressions, and phrases that suggest a strengthening of learners' communicative competence in the MMOG environment. Upon seeing an example of one of the learner's chat

transcripts, the learner's professor commented to one of the researchers that the learner had completely formulated a question and expressed himself in Spanish in a manner that exceeded the level of most of the other students in the class. Though anecdotal, this expert comment may be taken as evidence of target language development that can be traced to participation in the MMOG. Indeed, just as CMC research, in general, has found increased participation among students, an increased quantity and heightened quality of learner output, enhanced attention to linguistic form, and an increased willingness to take risks with their L2, among other benefits, results of this study suggest that participation in these spaces can have a positive impact on students' confidence and perceived competence, as well as their willingness to interact in the target language.

Data in SLA-Relevant CALL Research

CALL researchers can employ computer technology to gather a variety of types of data that are not available to them in face‐to‐face learning settings. Generally speaking, CALL researchers collect and analyze SLA‐relevant learner data in two environments. The first type is that yielded by Human‐Computer interaction (HCI). An example of HCI is a learner independently using multimedia or a web‐based language learning program such as an e-tutor for learning German (Heift, 2010). The other type of learner data is that yielded by human-human interaction (HHI). In HHI learners use the computer as a vehicle for interacting directly with other language learners, native speaker peers, or teachers. An example of HHI is using a synchronous chat program to complete some language learning tasks with another learner. In both HCI and HHI computer technology can be especially beneficial in helping researchers capture the best possible record of how learners are engaging with computer programs and/or other learners. This can be referred to as learner process data (Chapelle, 2003). A distinct, but related affordance is that computers are well suited for simultaneously capturing multiple forms of learner data (allowing for richer interpretations and triangulation), which will potentially strengthen the plausibility of data‐driven interpretations they will make.

Multiple Modality Methods in Data Collection

The method of data collection employed has long been acknowledged to affect outcomes in applied linguistics research (Beebe and Cummings 1995; Smith 2012). Computer technology affords researchers with opportunities to simultaneously record visual, audio, and textual data in a way that is easily synchronized for later analysis. For example, relying solely on an audio file of a stretch of learner interaction may lead to a different interpretation of the data from a video record (plus audio) of the same interaction. In a study that illustrates this very point, Smith and Gorsuch (2004) explored the nature of task‐based learner‐learner interaction during SCMC.

Findings clearly showed video and audio data merged and re‐interpreted with traditional chat scripts can provide a fuller picture of what learners do while engaged in task‐based SCMC than chat scripts alone. The visual data captured also showed that other factors such as facial expressions and body language often provided essential information required to sufficiently interpret aspects of SCMC learner interaction. For example, facial expressions (if captured) can show an indication of non‐understanding in instances where the chat transcript and audio records do not, something that is very important from an interactionist theoretical perspective.

In an exploration of how task‐based language teaching (TBLT) operates in real teaching contexts, Seedhouse and Almutairi (2009) employed Transana3 software to align video, audio, and tabletop computer screen records with the transcripts of the interaction onto a single screen, making several data sources available simultaneously for a multimodal and holistic analysis. This approach allowed them to compare task‐as‐work plan (what is supposed to happen) with taskinprocess (what actually happens). Their findings suggest that during task‐based interaction, a significant amount of learners' attention is spent on coordinating verbal elements with non‐verbal elements of interaction and with task‐related actions in a precisely timed, multi‐dimensional manner. It is only through capturing and tracking multiple modalities of learner interaction is such subsequent analysis and conclusions possible. A study by Suzuki (2013)

conducted within a sociocultural theoretical framework also provides a clear illustration of the benefits of multimodal data collection.

Capturing Learner Process Data

Researchers investigate what students do when they use a particular program or tool (Fischer2007, 2012) or engage in a particular CALL task (Chapelle, 2001). Tracking techniques such as computer logs have shown that there is often a mismatch between students' reported and actual use of specific CALL program components. Fischer (2007) found that students were not

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consistently aware of what they did as they used a particular program, which calls into question the accuracy of their perceptions of the value of the program's components. Fischer (2007) also explained how tracking in CALL can be used to investigate SLA constructs such as input enhancement, negotiation of meaning, corrective feedback, noticing the gap, sociocultural learning, hypothesis testing, and metalinguistic reflections. He argues that through tracking learner behaviour many studies have not only confirmed the operation of fundamental SLA principles but have also extended our understanding of these principles.

For example, in terms of input enhancement, tracking shows that whereas perceptual saliency (e.g., adding colour and/or boldface) has an impact on students' behaviour, it is functional saliency (e.g., elaborating word meanings and grammatical features with multimedia annotations) which has an impact on students' learning.

Tracking Learner Behavior

Researchers track learners' behaviour by recording keystrokes, mouse clicks, scrolling up and down and other actions concerning a stimulus from the computer program (in HCI) or interlocutor (in HHI). When learners perform these actions is easily identified through timestamps. Moreover, researchers can use video screen capture programs to inspect how learner navigates a computer program or other online task in real-time. More recently, some researchers have been employing eye‐tracking technology in SLA‐relevant CALL studies. The following illustrates various forms of tracking used in such SLA‐relevant studies.

- **HCI (Human Computer Interaction)**

Drawing upon the SLA frameworks of strategies (Cohen, 1998; O'Malley, & Chamot 1990;Oxford, 1993), individual differences and learning styles (Reid, 1995; Skehan, 1989), Pujolà(2002) developed a web‐based ESL program, ImPRESSions, focusing on listening and reading comprehension for Spanish‐speaking students. The program presented the content of

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the same news stories in both written and video formats within the software, and students had virtually complete control over their learning in the program. Recording students' actions with ScreenCam as they used the program, Pujolà hypothesized that students with lower decoding abilities in English would make more use of the available transcripts and subtitles for the video clips than students with higher decoding abilities. However, he discovered that students within each group behaved in varied, idiosyncratic ways in how they navigated through the program and accessed its help devices. The tracking data allowed Pujolà to derive two categories of usage patterns: a global approach in which students infrequently sought the help of any kind and compulsive consultors in which students repeatedly clicked on various buttons, especially the rewind/replay buttons for the video clips because they thought they had to understand every detail of the material to be learned.

Drawing on constructs from processing instruction (VanPatten, 1993, 1997), noticing (Schmidt, 1990), and consciousness-raising tasks (Ellis, 1995; Smith, 1993), Collentine (2000) tracked the number of times students accessed various components of a Spanish learning program and the amount of time they spent on each. Using regression analysis he estimated the contribution of the amount of time spent on each component to students' post‐test scores. On the one hand, his analysis revealed that students' use of the audio component contributed significantly to their post‐test performance but that they underutilized this component as they (2001)

navigated through the program. On the other hand, students' use of the video component did not contribute to their post‐test performance even though they over‐utilized it.

- **HHI**

In her exploration of the relationship between linguistic complexity in the input in a 3D environment and subsequent learner output in SCMC, Collentine (2013) used the tracking mechanism built into the 3D environment to track the nature and amount of computer‐generated input, learner responses, and the order in which learners interacted with objects in the virtual world. Results of quantitative and qualitative analyses suggest that for linguistic

complexity to be evident in learner SCMC output, the input must have certain linguistic features and contain propositional information to assist learners in completing the task. Her data question the notion that linguistic complexity in input necessarily elicits linguistic complexity in output (Leow et al., 2003).

Writing from a cognitive interactionist theoretical perspective, Sauro and Smith (2010) examined the chat interaction by learners of German engaged in dyadic task ‐ based SCMC.

They examined typed and sent L2 output as well as that which is typed but then deleted (unsent) during synchronous written computer ‐ mediated communication. Video screen capture records were used to get at the unsent output, which is normally not available from chat transcripts. The chat interaction was coded and analyzed for syntactic complexity, productive use of grammatical gender, and lexical diversity. Results showed that chat output that exhibited evidence of online planning displayed significantly greater linguistic complexity and lexical diversity than chat output that did not exhibit online planning. They argued that L2 learners appear to make good use of the increased online planning time afforded by chat to engage in careful production and monitoring.

- **Eye Tracking**

CALL researchers have only recently begun employing eye ‐ tracking technology in explorations of instructed SLA in CALL environments. Eye tracking affords researchers the ability to capture aspects of learner process data not available during face ‐ to ‐ face interaction. Eye movements during reading (in this case during text ‐ based SCMC) can be used to infer moment ‐ by ‐ moment cognitive processing of a text by the reader without significantly altering the normal characteristics of either the task or the presentation of the stimuli (Dussias, 2010). These eye movements are considered indicators of perceptual and cognitive processes. For example, eye ‐ movement patterns reveal cognitive processes during pronoun resolution and co ‐ reference and resolving lexical and syntactic ambiguity during reading in both L1 and L2

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(Rayner, 1998). The duration of an eye fixation is interpreted as an indicator of the processing time applied to the object being fixated on. A long fixation duration indicates either difficulty in extracting information, or greater engagement with the object (Just, &Carpenter, 1976).

Smith (2010, 2012) investigated the use of eye‐tracking technology to help pinpoint learners' attention to and noticing of feedback in an L2 SCMC task‐based environment. Recasts were chosen as the specific type of corrective feedback (CFB) investigated. Using eye fixation data as a measure of "noticing events" learners were found to attend about 60% of the intensive recasts they received by a native speaker interlocutor. Lexical recasts were much easier than grammatical recasts for learners to notice, retain, and accurately produce on subsequent chat interaction and delayed written post‐tests.

Using heat map records and stimulated recall records, Smith (2012) found that both stimulated recall and eye‐tracking records were favourable predictors of learner noticing with the eye‐tracking record being slightly more discriminating in its prediction on immediate posttest success. There was no significant relationship between the linguistic category of the recast and noticing in the eye‐tracking condition. However, in the stimulated recall condition learners were much more likely to report having noticed recasts targeting semantic features than morphological recasts. This last finding has implications for SLA as it suggests that learners show evidence of heightened attention to recasts, regardless of the linguistic category of the

target. When considered in combination with the results from Smith (2010) these findings suggest that even with heightened attention on morphological recasts, learners were less able to attend to these features at a level that allowed them to make use of the teacher recast on the post‐test. For SLA theory this is important as it is consistent with previous research by Mackey, Gass, and McDonough (2000) and Nabei and Swain (2002) who had positive findings for noticing lexical feedback over other types. This evidence is also compatible with an input processing theoretical perspective (VanPatten, 1996), which argues that learners prefer to process information lexically over other features in the input and also emergentist notions of blocking and overshadowing (Ellis, & Sagarra, 2010).

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In simple terms, learners can conduct following types of researches in the perspective of CALL and language technology:

i. To test functionality, accuracy of language technology tools for instance Voyant, MONK, TAPOR, POS taggers, ManyEyes, DocuBurst etc

ii. To conduct HCI research, application of tools on humans and their cognition/ mind/ learning. To what extent how can a tool increase reading speed of learners. Usually, these are experimental researches with pre-test and post-test.

iii. Tools can be extended, or new languages can be included. Such work can be done with computer prgrammers.

iv. Humans exploit these tools for better learning an detaching purposes. One tool can be used in different situations to acquire different results for instance social media mining can be done for prediction of election results, detecting hate crimes, forensic linguistics, analysis of persons who want visa on arrival etc

v. Presently, the world has tilted to digital humanities, text mining and multidisciplinary studies.

vi. Open shelf, data visualization tools are in vogue. There is need to to introduce them in academia, research, pedagogy.

vii. New linguistic varieties should be built and analysed. Code mixed and code meshed language can be studied.

viii. New corpora are emerging for instance Coronavirus corpus has been built recently. They should be studied to explore idiosyncratic knowledge patterns.

ix. Review analysis of products and sentiment analysis have become very popular in the world.

x. Here are two hundred tools for learning and research. You can conduct research on them. Find them from the given link: https://www.toptools4learning.com/

xi. These text mining tools are in vogue in academia.

- **Voyant-tools.org** : "Voyant Tools is a web-based reading and analysis environment for digital texts."
- **Wordle** : A robust word cloud generator with extensive shape, color and font options.

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- **Google Books NGram Viewer** : Analyzes historical word occurrence, usage and changes over time and allows users to download data for more intensive research
- **Culturomics - Google Ngrams Addon** : An add-on for Google Ngrams to download data sets.
- **Time Magazine Corpus** : Offers access to American Mainstream Culutural Text Analysis via the complete text of the Time Magazine Archive (1923-2006)
- **Juxta** : Juxta is a cross-platform tool for collating, comparing, and analyzing any kind or number of textual objects

xii. These tools facilitate in data visualization.

- R-Project: R is an integrated suite of software facilities for data manipulation, calculation and graphical display.
- Data-Driven Documents (D3js) : D3.js is a JavaScript library for manipulating documents based on data. D3 helps you bring data to life using HTML, SVG, and CSS
- Walrus - Graph Visualization Tool : Walrus is a tool for interactively visualizing large directed graphs in three-dimensional space. By employing a fisheye-like distortion, it provides a display that simultaneously shows local detail and the global context.

xii. The given diagram illustrates the learning tools.

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Top 200 Tools for Learning 2018
Top 10
Use the interactive table to view tool categories
Compiled by Jane Hart from the results of the 12th Annual Digital Learning Tools survey

Conclusion

One of the major challenges in conducting SLA‐relevant CALL research is dealing with the seemingly irreconcilable relationship between fast‐paced technological development on the one hand and our need to fully explore in a principled way whether and how these technologies can be employed to facilitate second language acquisition, on the other. It is clear that the effectiveness of CALL for SLA cannot reside in the medium itself. Rather, effectiveness must be judged in how these technologies are put to use in ways that are consistent with theoretical and pedagogical developments in instructed SLA. Indeed, research suggests that L2 courses supported by instructional technology are at least as effective as and perhaps superior to those courses with no technology (Grgurović, Chapelle, and Shelley 2013), though it is difficult to imagine the latter. The current environment is fostering a degree of confluence of instructed SLA research with SLA‐relevant CALL research, which has the potential to inform and shape SLA theory. Likewise, assertions, predications, and expectations from SLA theory must "hold up" in CALL environments and F2F environments alike. It is precisely this convergence of SLA and CALL research that may provide the building blocks for a developing CALL theory, which, as Hubbard (2008) describes, reflects a set of claims about the meaningful elements and processes within some domain of CALL, their interrelationships, and the impact that they have on language learning development and outcomes.

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Xing, M., Zou, B., Wang, Y., Sun, M., & Xiang, C. H. (2014). Computer-Assisted Foreign Language Teaching and Learning: Technological Advances.

Recommended Books

The Use of Technology in English Language Learning: A Literature Review by Mohammad Reza Ahmadi

No Shelf Required: E-Books in Libraries. Editor: Sue Polanka

URLs

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https://online.purdue.edu/ldt/learning-design-technology/resources/designing-curriculums-around-technology

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