Using Cell Phones and SMS in Second Language Pedagogy
A review, with implications for their intentional use in the L2 classroom.

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Abstract

The traditional SLA classroom has been radically redefined by the advent of virtual learning communities. Computer-mediated language learning has become significant, and increased use is made of wireless networked mobile computers to facilitate internet-based language learning. Meanwhile, cell phones are becoming ubiquitous. Students presume their right to personal use during class, frustrating teachers who regard this as disruptive.

However, cell phones in class can provide ubiquitous computer-mediated SLA. Existing research provides a general orientation and conceptual framework, and identifies their relevance to task-based learning, potential for distributed practice, and suitability for encouraging classroom interactivity.

An important usage of cell phones in the L2 classroom is capturing SMS into a database that is displayed on a message board. Teachers can use computers to send SMS to students, with particular advantages for administrative purposes. The challenge is to ensure that permitting cell phone use in class does not open a Pandora's box.

1. Introduction

Figure 1. The likely shape of things to come: The long-awaited Apple iPhone [1]

The rapid pace of technological innovation is impacting upon Second Language Acquisition, where the advent of virtual learning communities is radically redefining the traditional concept of the classroom. Computer Mediated Language Learning (CMLL) has become a significant area of research and practice. Warschauer [2] notes that increasing notion is being given to mobile computer mediated language learning, as American schools create one-to-one classroom environments mainly through connecting laptops wirelessly to the Internet. Meanwhile, the cell phone is becoming ubiquitous. Prensky [3] maintains that penetration rates exceed 100% in some countries, implying individuals own and use two or more such devices; the disposable cell phone is already patented and being manufactured. Cell phones are becoming increasingly sophisticated in terms of their bundled capabilities, which now include web browsers, still-cameras, sound- and video-recorders, MP3 players, video and TV displays, games, GPS devices, long-distance digital walkie-talkies, electronic bilingual dictionaries, speech recognition and text-to-speech conversion. The enthusiastic response to Steve Job's introduction of the Apple iPhone in recent days is indicative of the tremendous worldwide interest in such convergence information technologies.

Apple touts the quad-band GSM iPhone as a mobile phone, an Internet communications device, and a widescreen iPod, all wrapped up in one. It offers Mac OsX, flash-based memory, a touch-sensitive display which when the phone is rotated automatically changes betweeen portrait and landscape by means of an accelerometer, an HTML e-mail client supporting rich HTML and inline images resembling OsX's Mail application which works with POP3 or IMAP e-mail accounts, free BlackBerry-style "push" IMAP e-mail, a full SMS text-messaging client, PDA capabilities, Visual Voicemail, Safari web browser, Google maps application and a 2-megapixel camera. Meanwhile, Chinnery [4] has identified Internet access, voice- and SMS text-messaging, cameras and even video-recording as common cell phone features that enable communicative language practice, access to authentic content, and task completion. Prensky observes that the browser in web-enabled phones puts a dictionary, thesaurus and encyclopedia into the hand of every student: access to Google and other text search engines turns their cell phones into research tools. He advises educators to better serve their students by redefining open-book testing as open-phone testing, to encourage rather than quash student innovation. At the same time, student expectations of being entitled to access their cell phones for personal use during class have steadily risen, causing understandable frustration from teachers who regard this phenomenon as disruptive to the educational process.

This review springs from such first-hand frustration, and the insight that generated: what might happen if instead of trying to ban cell phones in class, their use was encouraged and adapted to the task of Second Language Acquisition? Others, notably Dias [5], have had a similar intuition. Prensky observes [6],

Despite what some may consider cell phones' limitations, our students are already inventing ways to use their phones to learn what they want to know. If educators are smart, we will figure out how to deliver our product in a way that fits into our students' digital lives - and their cell phones. Instead of wasting our energy fighting their preferred delivery system, we will be working to ensure that our students extract maximum understanding and benefit from the vast amounts of cell-phone-based learning of which they will, no doubt, soon take advantage.

Research is beginning to be conducted in this area, with Chinnery recently reviewing applied fusions of m-learning and language learning, while acknowledging that research in this area is scarce. Diaz surveyed cell phone usage among students, then ruled out their use during class, while implementing a

BBS that was accessible from student cell phones. Morita (cited in Prensky), evaluating the use of differently formatted English language lessons, found cell phone users continued to access the lessons longer than computer users. But such research is still limited, and Prensky acknowledges that the number of people doing cell-phone based learning research outside of Asia is exceeding small; consequently I include only two papers that specifically address the topic.

In order to better inform this potential research area, I therefore commence with the comprehensive review of the field of computer-mediated second language learning provided by Thorne and Payne's [7] *Evolutionary Trajectories, Internet-mediated Expression, and Language Education,* which makes significant reference to the use of cell phone technology. The review then considers two papers that precisely focus on the topic area, coincidentally both referring to EFL in Japan. In *Cell phones in task based learning Are cell phones useful language learning tools?,* Kiernan and Aizawa [8] report on a classroom research project aimed at evaluating the use of mobile phones as tools for classroom learning, identifying task-based learning in pairs and small groups as a promising place to develop mobile phones as learning tools, and suggesting tasks encourage the kind of L2 negotiation that comprises a key element of language acquisition. Meanwhile, in *Using mobile phones in English education in Japan,* Thornton and Houser [9] present three studies in mobile learning, polling university students regarding their use of mobile devices, emailing English vocabulary lessons to their mobile phones, and creating a Web site explaining English idioms which students access through 3G mobile phones. Finally, it is suggested that the research into the general application of cell phone technology to the classroom presented in Markett, Arnedillo-Sánchez, Weber, and Tangney's [10] *Using Short Message Service to Encourage Interactivity in the Classroom,* suggests specific applications to Second Language Learning through encouraging class interactivity by means of completing student-initiated interactivity message loops. In class, anonymous student SMS are captured onto a laptop, read by the teacher, and responded to verbally; the threaded archive is later posted on a Web page, enabling teacher and students to respond with further SMS.

This review thus considers opportunities for the intentional use of cell phones in the L2 classroom together with their practical implications, to take advantage of the potential of what is rapidly becoming a means of ubiquitous computer-mediated second language learning and teaching.

2. Summaries

2.1 Evolutionary trajectories, Internet-mediated expression, and language education

In their stand-alone article introducing a special issue of CALICO Journal dedicated to computer-mediated communication (CMC) in L2 education, Thorne and Payne [11] describe the transformations in everyday communicative activity accompanying the evolution of communication technologies, and their pedagogical potential to SLA. After providing an overview of synchronous computer-mediated communication (SCMC) and Internet-mediated intercultural communication, they identify generational shifts in Internet technologies, addressing contemporary environments of blogs, wikis, podcasting, device-agnostic CMC forms, and intelligent computer-assisted language learning advances. Throughout the article, they discuss fusions of media technologies and their implications to L2 pedagogy. In particular, students' lives are critically mediated by participation in digital communities. Ubiquitous computing is emerging through widespread cell phone voice and text messaging as students are coming to expect perpetual contact with peers and family.

2.2. Cell phones in task based learning Are cell phones useful language learning tools?

Noting that Internet access and email capability have transformed cell phones into sophisticated communication tools, Kiernan and Aizawa [12] address whether, despite being a distraction in the classroom, mobile phones could potentially be useful language tools; and how specifically could they be used in task-based learning? They report on a classroom project with Japanese freshman university students, who were firstly surveyed regarding their cell phone use, and pre-tested to determine their knowledge of target learning structures. Secondly, tasks were created that could be readily performed as speaking or email tasks, information gap activities being designed to promote interaction. Three groups of paired learners then attempted the tasks via mobile phone speaking, mobile phone text messaging, and PC emailing respectively. Learners were post-tested to assess short-term learning gains.

2.3. Using mobile phones in English education in Japan

Recognising the popularity of web-enabled mobile phones among young Japanese, Thornton and Houser [13] question the extent to which university students are utilising mobile phones for educational purposes, and measure their reaction to educational material specifically developed for mobile phones. Firstly, they polled students to determine patterns of usage of mobile devices, the mobile phone functions used, and the types of educational activities considered useful. Secondly, to promote regular study, they emailed English vocabulary lessons at timed intervals, comparing the results with the study of distributed hard copy and of identical material posted on their mobile phone web site. Thirdly, they created a Web site that used student-produced video animations to explain English idioms. Students were then provided with video-capable mobile phones and evaluated the animations.

2.4. Using Short Message Service to encourage interactivity in the classroom

Acknowledging that interactivity in the classroom promotes learning, Markett, Arnedillo-Sánchez, Weber and Tangney [14] describe their research project *PLS TXT UR Thoughts*. They define interactivity as a message loop originating from and concluding with the student. Recognising the ubiquity of mobile phones among students and the interactive potential of Short Messaging Service (SMS), they deliberately introduced mobile phones and SMS within the classroom. Students sent SMS in real-time via their personal mobile phones. A lecturer used a modem interfacing with customised software to produce SMS files on her laptop, in order to view the messages on-screen and verbally develop the interactive loop in class. The SMS were also made available online after class, which allowed interactive loops to develop further through threaded comments.

3. Evaluation

3.1. Style, title, and abstract

All four papers are informatively entitled, and Thorne and Payne's paper poetically so, though fittingly it is left to the reader to trace the trajectories. All four abstracts correctly summarise their respective papers, but Thorne and Payne's abstract is overly dense and needs to be expanded, while Kiernan and Aizawa's abstract, although a model of clarity, could be shortened. Each paper uses standard methods of citation and reference, and is properly formatted.

3.2. Thorne and Payne's overview

Thorne and Payne's research does not lend itself to direct comparison with the other articles, so is in part evaluated separately. The authors undertake an important review of current trends in the use of technology in L2 education, which they combine with an imaginative preview that serves to enumerate potential possibilities. Their synoptic examination of relevant factors maintains a credible balance between significant framing questions and issues, and details and concrete examples. A succinct overview of SCMC L2 research, and insightful description of the increasingly prevalent uses of the Internet to mediate intercultural communication for SLA purposes, provide an effective base from which they develop a comprehensive frame of reference for understanding technology-mediated L2 learning and use.

3.3. Sense of purpose

The remaining three articles are understandably far less ambitious in scope, and more concrete in application. Kiernan and Aizawa, and Thornton and Houser, appear more clearly focused in their research than Markett, Arnedillo-Sánchez, Weber and Tangney.

3.4. Participants

While Keirnan and Aizawa's subjects throughout were freshman engineering majors, Thornton and Houser's polled female students from a range of fields of study, pushed emailed mini-lessons to two female EFL classes, and had college sophomores evaluate the video-animated website, using contents previously created by teams of third and fourth year college students. Markett, Arnedillo-Sánchez, Weber and Tangney, whose subjects were undergraduate Computer and Society and postgraduate Ubiquitous Computing students, fail to recognise the biased nature of their sample. Both majors would be relatively sophisticated in their appreciation of technology, and their enthusiastic attitudes, which were measured, could hardly be considered representative of students.

3.5. Materials and procedure

All three studies of university students include adequate descriptions of the materials used. Kiernan and Aizawa, and Thornton and Houser, provide ample figures and tables whose clarity aids presentation. Keirnan and Aizawa append a post-test sample and mobile phone/email survey, and are particularly clear in their description of procedure. This clarity is strengthened by their frankness in describing the pragmatic difficulties they encounter (student complaints about potential phone bills, unanticipated non-availability of a computer room, and relative unpopularity of the speaking tasks) and the subsequent procedural revisions that ensued (including changes in test format). They describe results where their students did very badly, and show refreshing candour in admitting to being over-optimistic in their hypotheses. Markett, Arnedillo-Sánchez, Weber and Tangney's utilise an 'in-class ICT tool' (a term I find too general), to capture in-class SMS sent to a central address. The teacher views these in an MsExcel database on a laptop, and responds verbally. An after-class ICT tool enables teachers and students to view threaded discussions online, and to respond with further SMS, completing interactivity message loops. Messages are anonymous to encourage interactivity among shy students, and are replied to via the central address. However the authors' formal analyses are bound to individual circuits, which they do not critically engage with, and the illustrations are cramped. Nor do they formally consider the centralised model of communication they exploit ('many-to-one-to-many'), nor contrast it with the decentralised formal structure of normal everyday SMS use ('some-to-some').

3.6. Replicability

Thorne and Payne's article does not lend itself to replication; but rapid technological evolution does suggest the appropriateness of subsequent and even periodic revision (whether by the authors or by others). While the other three studies are in principle replicable, this would in practice be constrained by the different technologies available at different times in different countries. Thornton and Houser contrast the

Japanese situation, where mobile phones provide limited but standard Internet email and subscribers have standard email addresses assigned to their phones, with the European and American situation, which initially provided only limited proprietary SMS text messaging, with gateways to and from standard Internet email. Kiernan and Houser exploit the ability of mobile phone emailing to allow carbon copies (Cc:) to be sent to researchers to collect data; but this would be problematic with SMS. Further difficulties are ensuring that all cell phones have L2 capability, and that students have adequate L2 ability to compose and send messages. In replicating Thornton and Houser's study, video-capable mobile phones and 3G service are needed; and preparing comparable video content would be difficult. Replicating Markett, Sánchez, Weber and Tangney's study requires a suitable means of capturing SMS messages (through an 'in-class interface'), and of students viewing these after class and responding (through an 'after-class interface').

3.7. Implications

Thorne and Payne's paper is particularly insightful in providing a *general orientation* to the revisioning of the use of cell phones in the L2 classroom, recognising them as a potential means of ubiquitous computer-mediated L2 learning. Their broad *conceptual framework* also suggests the integration of other technological aspects into the L2 learning process, e.g. delivering MP3 podcasts to students' cellphones; using cell phone voice messaging to contribute to collaborative podcasting; and 'moblogging': using cell phone web-browsing and messaging to collaboratively publish wikis, and to add comments to blogs, with obvious applications to field trips. This integrative process should become even richer as digital convergence enables synergetic exploitation of multiple crossover technologies.

Keirnan and Aizawa's paper identifies the relevance of *task-based learning* to the use of mobile phones as learning tools. A significant aspect of their findings is that student use of mobile email to undertake tasks, while slower than the use of PC email, nevertheless compared favorably, as mobile phone users kept their messages to a minimum, but managed to communicate effectively. (The word limit on SMS might actually be an advantage for low-level students, who have difficulty forming long sentences). The costs for students of cell phone speaking tasks are an inhibiting factor. Mobile phone keyboards may be easier to use for students who have not mastered a computer keyboard. Data entry for mobile email (and

SMS) is limited in the quantity of the language that can be used, and in the speed with which it is keyed in; but as the technology evolves and the demand for text messaging consolidates, these factors should improve (through foldable keyboards, the design of mass-market smart phones that facilitate data entry, T9 technology that suggests words on the basis of keys typed, previous texts and the phone dictionary, and the iPhone's automatic error detection / text prediction).

Thornton and Houser identify *distributed practice* as being superior to massed practice for storing items in long-term memory, and offering a promising rationale for developing mobile phones as learning tools. They found that delivery of foreign language vocabulary lessons via mobile phone email is effective and received positively by Japanese university students, and suggest email and SMS provide push media for identifying and teaching words in structured ways that support long-term memory storage.

Although Markett, Arnedillo-Sánchez, Weber and Tangney seem constrained in their imagination, their emphasis on *classroom interactivity* is relevant, and could be readily extended in class by displaying the teacher's message board via digital white-board, large VDU, or video-projection. All class students could read all SMS on a central console (while retaining anonymity), encouraging students to respond to student SMS, and promoting greater interactivity in class. The role of the teacher would then become more that of a facilitator to interactive discussion.

4. Synthesis

The articles reviewed argue that cell phones offer a significant opportunity to satisfy the demand for ubiquitous computing, with Thorne and Payne's exploration of technologies and their uses in L2 education offering an effective conceptual framework for engagement with this field. But as Keirnan and Aizawa, and Thornton and Houser note, Japan has a relatively low penetration rate of PCs; consequently the advantages to exploiting cell phone usage are less compelling in countries with high levels of access to PCs, such as Korea. Thornton and Houser, like Thorne and Payne, also suggest exploiting the multimedia capabilities of 3G phones to display Web-based videos and 3D animations, but draw attention to the lengthy time they take to prepare. While their use is increasingly feasible, it is dependent on the penetration rate among students, and on coverage. Thornton and Houser observe that students are not yet using mobile Web for educational purposes, in part, because few university teachers offer Web-based

information, or online course segments, which I argue is evidence of the critical generational gap Thorne and Payne identify between younger digital natives, (who have grown up with a digitally mediated life from childhood), and older non-natives, (who have not).

Ortega, quoted in Thorne and Payne [15], observes that contrary to traditional interaction, the benefits of electronic interaction *increase* with group size. This, I suggest, strengthens the argument for the intentional use of the cell phone in the classroom as one means of accommodating increasing class sizes. Thorne and Payne consider task design and procedural processes critical for effective language-learning activity, and while Kiernan and Aizawa regard tasks as having the potential to extend from being an information gap activity resolved by pairs or groups, to freer exchange style activities engaged in with Internet key-pals, Thornton and Houser favor distributed practice to individuals, achieved by pushing SMS and email messages, which students can study while commuting. They also plan to add interactivity to their text material delivered via mobile phone email, to provide productive as well as receptive language practice. Similarly, Markett, Arnedillo-Sánchez, Weber and Tangney identify class interactivity as important in promoting a more active learning environment, and show how the use of SMS via cell phones can encourage this through completing student-initiated interactive loops between individuals.

5. Conclusion

I commenced this review with the insightful overview of computer mediated language learning provided by Thorne and Payne, who recognize ubiquitous computing to be emerging through widespread cell phone voice and text messaging, as students' lives are critically mediated by their participation in digital communities in a time of rapid technological change. Keirnan and Aizawa suggest task-based learning comprises a particularly appropriate method of cell phone-based L2 learning; while Thornton and Houser observe the capacity of the cell phone to receive and store pushed SMS and email media suits the distributed practice they consider effective. The fact that cell phones are nearly always at hand favours the intermittent study that contemporary students are likely to engage in; through smart phones they can access web resources and engage in tasks when convenient. New convergent technologies that provide increasingly sophisticated capabilities will inevitably amplify this trend towards ubiquitous computing and the concomitant use of task-based learning, distributed practice, and classroom interactivity in language learning. Apple's iPhone will likely emerge as a prototypical device in this regard.

In my opinion, Markett, Arnedillo-Sánchez, Weber and Tangney's paper has an important application to cell phone usage in the L2 classroom context, viz.: *capturing SMS into a computer database that is then displayed on a message board is of central importance to the effective use of cell phones in L2 learning contexts*. This enables the teacher to effectively monitor classroom activity and to rapidly respond verbally to specific requests. The teacher can make use of a full-size keyboard, and of the threaded discussions archived on the message board, to send SMS to students via computer. SMS can now be received online, and sent from a computer via the Internet; therefore a web-based message board solution for receiving, archiving, displaying, and sending SMS is the most feasible means of achieving this ability. Problems will likely arise in the considerable difficulty L1 native teachers working in L2 countries sometimes have in operating in a foreign culture and language. However, once such a solution is readily available, significant gains in effectiveness will be obtained through exploiting the ubiquitous and increasingly sophisticated nature of student cell phones. Learning materials and tasks can be distributed via SMS, both during and after class. Students can engage in individual, paired and group tasks using their cell phones, in communication with each other and with students from other classes and institutions. Classes can be administered via SMS, as individual students are informed of relevant material, reminded of overdue assignments, given feedback, and forwarded scores. Diaz observes it is not necessary for the teacher to use a cell phone; it is far more convenient to set up and maintain large lists using computer email software. This administrative potential is reinforced by Thornton and Houser's survey finding that students ranked administrative tasks highest in the desirability of mobile phone educational functions.

Warschauer observes that computers and the Internet are highly disruptive technologies that require extensive organisational restructuring and professional development for successful use. The challenge for implementing cell phones in the L2 classroom will be to ensure that this process does not merely constitute the opening of a Pandora's box, with students assuming free license to engage in off-task behaviour; but that they take full educational advantage of this readily available and rapidly evolving means of providing ubiquitous computer-mediated second language learning.
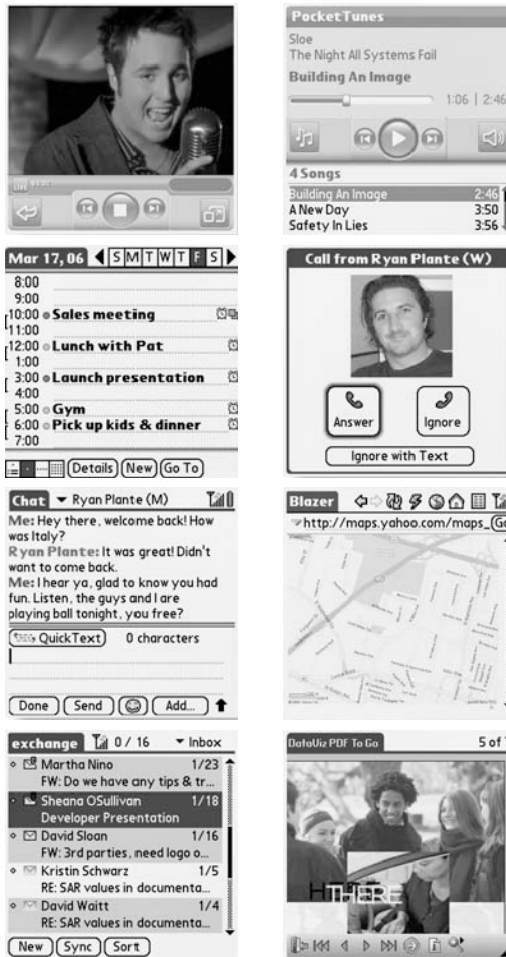
Figure 2. Nokia 9300 Smartphone, which opens to reveal a full QWERTY keyboard

Smart cell phones for SMS and text-messaging, web browsing and streaming video / live TV.

Figure 3. BlackBerry 8700g quad band phone incorporating push technology [16]**, designed for global roaming in 170 countries for voice and 90 countries for data**

Figure 4. Palm Treo 700p with full QWERTY keyboard (above) and a variety of on-screen capabilities (left)

6. References

References marked with an asterisk indicate studies included in the literature review.

[1] Although the Apple iPhone has several buttons, it is mainly controlled via changeable onscreen buttons and icons. The 3.5-inch touch-sensitive display offers a resolution of 320x480 pixels at 160 pixels-per-inch, the user employing his or her finger instead of a stylus. The iPhone runs a version of OsX instead of a scaled down operating system, and includes a fully-featured version of Safari, which Apple describes as the first fully-usable HTML browser on a phone. The Safari browser includes a Google search bar, but a Google Maps application is also included.

[2] Warschauer, M., *Laptops and Literacy,* paper presented at the Annual Meeting of the American Educational Research Association San Francisco, California, April 2006. (Cited by kind permission of the author).

[3] Prensky, M., What can you learn from a cell phone? Almost anything! *Innovate 1(5),* 2005, retrieved May 8th 2006 from http://www.innovateonline.info/index.php?view=article&id=83

[4] Chinnery, G.M., Emerging technologies, Going to the MALL: Mobile assisted language learning, *Language Learning & Technology, 10 (1),* 2006.

[5] Diaz, J., Cell phones in the classroom: Boon or bane? *C@lling Japan The newsletter of the JALT-CALL Special Interest Group, 10(2),* 2002, pp.16-22 (Part 1), and *10(3),* 2002, pp.8-13 (Part 2).

[6] Prensky, M., What can you learn from a cell phone? Almost anything!, op cit., p.6.

[7]* Thorne, S.L. and J.S. Payne, Evolutionary trajectories, Internet-mediated expression, and language education, *CALICO Journal, 22(3),* 2005, pp.371-397.

[8]* Keirnan, P.J. and K. Aizawa, Cell phones in task based learning, Are cell phones useful language learning tools? *ReCALL 16(1),* 2004, pp.71–84.

[9]* Thornton, P. and C. Houser, Using mobile phones in English education in Japan, *Journal of Computer Assisted Learning 21,* 2005, pp.217–228.

[10]* Markett, C., I. Arnedillo-Sánchez, S. Weber, and B. Tangney, Using short message service to encourage interactivity in the classroom, *Computers & Education, 46(3),* 2006, pp.280-293.

[11] Thorne, S.L. and J.S. Payne, Evolutionary trajectories, Internet-mediated expression, and language education, op. cit.

[12] Keirnan, P.J. and K. Aizawa, Cell phones in task based learning, Are cell phones useful language learning tools?, op cit.

[13] Thornton, P. and C. Houser, Using mobile phones in English education in Japan, op. cit.

[14] Markett, C., I. Arnedillo-Sánchez, S. Weber, and B. Tangney, Using short message service to encourage interactivity in the classroom, op. cit.

[15] Thorne, S.L. and J.S. Payne, Evolutionary trajectories, Internet-mediated expression, and language education, op. cit., p.374.

[16] BlackBerry push technology means that email does not need to be retrieved, and that devices remain on and are continuously connected to the wireless network. Built-in support is provided for viewing email attachments in Word, Excel, PowerPoint, WordPerfect, and PDF formats. A threaded SMS message display allows scrolling through an entire conversation. With phone, Email, SMS, web browser, full QWERTY keyboard etc.

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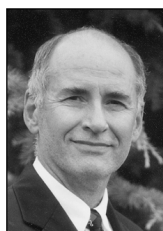
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