Integrating Educational Technologies
into the Culinary Classroom and Instructional Kitchen

The integration of educational technologies has and will continue to change the nature of education. From the advent of the printed word to the current use of computer assisted teaching and learning, the use of technology is an integral part of modern day realities and approaches to education. The purpose of this paper is to review some of the educational technologies which have been integrated into the culinary classroom and instructional kitchen.

According to Walden (2005), educational technology, is "a systematic, iterative process for designing instruction or training used to improve performance [and] encourage wise use of systems, environments, tools, products, and strategies that can enhance human learning and competence" (p.1). Cuban (as cited by Hunter, 1998) contends that:

> Educational technology is any device available to teachers to use in instructing students in a more efficient and stimulating manner than the sole use of the teacher's voice. Hardware and software, the tools itself, and the information the tools conveys define the technology (p.3).

The question arises then as to how does the integration of educational technology relate to the culinary classroom and instructional kitchen? When answering this question, it is first important to understand the relationship between cooking, technology, and education.

Cooking is as old as the advent of fire. The application of fire "completely transformed food from raw to cooked, which allowed humans to eat otherwise

indigestible foods and made food preservation possible" (Civitello, 2004, p.3). Cooking

has come a long way from that simple roasted animal, using one of the earliest

technologies known to man, that being the rubbing of sticks or stones to create a spark

which resulted in fire. Over the millenniums, cooking technologies have changed, and

with those changes, the demand for skilled cooks, able to use those technologies, has

increased.

Historically, most cooks learned through an apprenticeship system (VanLandingham,

1995) , in which they worked under the tutelage of a qualified chef. The apprentice

learned through practical experience, not always understanding the theory. Over the past

century, the practice has changed, with the introduction of professional cooking schools.

Nowadays, most aspiring cooks learn the theory of cooking prior to facing and

experiencing the reality of the culinary world. It is in both culinary classrooms and

teaching kitchens where educational technologies are now being integrated as part of the

educational process.

But why use technology or integrate it into the culinary curriculum? According to

Herndon (2002), society has become dependent on technology and technological literacy

has become imperative. Herndon (2002) further asserts that:

> Educators are responsible for teaching the necessary skills to become not
> only successful employees, but also productive members of our society. For
> educators to accomplish this task, they must provide opportunities for
> students to use technology during the process of learning at the elementary
> level and continue through middle and secondary school (p.1).

The usage and learning of technology should not stop at the secondary school level. It

should continue at the post-secondary or tertiary level. This argument is supported by the

Government of Ontario's requirement that students enrolled in Culinary Arts programs in

community colleges achieve basic levels of computer proficiency prior to graduation (Ministry of Education and Training, 1997).

The introduction of educational technologies into the culinary classroom and instructional kitchen must come with a caveat, that being the temptation of replacing an inexperienced culinary educator with a video tape or entirely replacing classroom instruction with a computer based tutor (Spector, 2001) or other types of technology. Computers, being one form of technology, according to Gross-Davis (2001), "can transform course notes into overheads, create high-quality complex illustrations, do real-time calculations and processing, engage students in interactive collaborations , and bring text, graphics, animation, sound and video into the classroom" (p.334). Even so, Gross-Davis (2001) cautions the use of high end technology for low end instructional practices.

Technology, if used improperly, can propagate poor educational practice and in some instances, impede learning (Spector, 2001); however, when used properly, technology can help promote learning (Spector, 2001), transform learning, and, according to Imel (1998), technology should never be seen as an add-on. Rather, it should compliment the human instructor, creating an environment of hybrid instruction.

Hybrid instruction is described as a course that combines face to face instruction with computer based learning (Murphy, 2003). It is also referred to as blended learning, mediated learning and web-enhanced instruction. According to Landau, (as cited in Glass, 2003) in some ways, it is the middle ground between our society's adolescent love affair with technology and the ancestral need for human contact and a sense of belonging. Spector (2001) states that "hybrid or mixed-delivery solutions can offer a path for

graceful growth and development while retaining the best features of proven solutions"

(p.35).

Before integrating technology of any sort into a learning environment, it is important

to have a plan. According to Anderson & Perry (1994):

> Just as a cookbook has recipes that, if followed generally, will lead to
> delicious cuisine, a technology plan has the potential for providing directions
> to success [and that] the optimum plan will embody the dreams, aspirations
> and visions of individuals involved and interested in the maximally-effective
> education for that community (p.2).

The challenge in integrating the plan is twofold: identifying which stakeholder's

vision is correct and alleviating the fears of those who are resistant to the integration of

technology. This resistance may be due to a lack of understanding the technology,

possible obsolescence as a teacher, and perhaps the greatest of all, a fear of the unknown

and change. Bitner and Bitner (2002) identify eight areas of consideration for

successfully integrating technology into the classroom, those being:

1. Fear of change
2. Training in basics
3. Personal use
4. Teaching models
5. Learning based
6. Climate
7. Motivation
8. Support (p.96)

First and foremost on that list is the fear of change, and under that umbrella, the

integration of new teaching and learning technologies, which based on personal

observation seems to be prevalent among long serving faculty members at two local

community colleges currently offering culinary arts programs. Robertson (1998)

contends that long serving teachers who avoid the integration of computers are showing

their technological inadequacies or low-tech preferences, while Bitner and Bitner (2002)

assert that:

> Change of any kind brings about fear, anxiety and concern. Using
> technology as a teaching and learning tool in the classroom does so to an
> even greater extent since it involves changes in classroom procedures and the
> use of often –unfamiliar technologies' (p.96).

Culinary arts, and the teaching of it, has become very 'hi-tech', and unless teachers

are prepared to embrace change, veiled as technology, they will quickly fall behind and

continue to live in the past.

There will always be a demand for a fundamental '*lo-tech'* approach to the teaching of

culinary arts through transmission or apprenticeship. Those models are built on the

integration of kinaesthetic skills and the usage and development of the human senses of

smell, taste, and touch which are not easily replicated or replaced via technologies readily

available at this time. This approach is supported by Franklin (1995), who states:

> Every tool shapes the task…once a kitchen acquires a Cuisinart, suddenly
> every dish calls for speedy slicing and dicing and the cook sets aside old
> recipes…learning about the tool is important, while the new technology may
> help to achieve it, traditional tools will sometimes be of more tangible benefit
> (¶14).

According to Boshier (1999), "the degree and form of mediation is a useful way of

summarizing technology and research issues. It can be summarized in three types: Low

mediation environments (Type 1), medium mediation settings (Type 2), and high

mediation situations (Type 3)" (p.7). In a Type 1 environment, the use of technology acts

a supplement to traditional modes of instruction. In a Type 2 setting, the technology will

often allow for asynchronous interactions. In a Type 3 situation, "technology is an

essential part of the educational delivery [and may] lead to new ways [of] organizing

teaching and learning" (Boshier, 1999, p.7). An extension of the Type 3 situation could

be *knowledge building*, in which ideas are produced and continual improved upon, adding value to the community (Scardamalia & Bereiter, in press). Culinary education, at this time, is either a Type 1 or Type 2, although it could be argued that anytime a new recipe is created, it is Type 3, since a shared intellectual property had been contributed to a community knowledge base (Scardamalia & Bereiter, in press), that community being the culinary world.

Computers are an integral part of the integration of technology into the culinary classroom and instructional kitchen. According to Mandabach and Harrington (2004), "computer use is considered essential for culinary graduates and that a variety of applications should be integrated into the information system of the culinary programs" (p.4). Graduates of culinary arts schools are now expected to be computer literate, being able to use inventory, word processing, food costing, spreadsheets, recipe, and other industry-specific software programs.

It is the author's contention that technology is not all about software, hardware and computers. Technology can be as simple as a pencil, or even chalk and a blackboard. Other technologies can include film, radio, and television, with the oldest and most elementary educational technology being the printed word (Hunter, 1998).

Translated into the modern culinary classroom, that *printed word* is the text book. Most culinary textbooks are cumbersome and are not practical for use in the teaching kitchen since they take up so much of a very limited workspace. So then, what options are available?

One option is the use of personal digital assistants (PDAs). A PDA is far less cumbersome than a textbook and in some instances costs less than the textbook.

According to Brown (2001), one of the challenges in using PDAs is the lack of suitable software. That being said, a search of the Internet located several software programs that can be used on a PDA as part of a culinary education program. One such program is PDACookbook™, which among its features includes a recipe book/database, companion software and the ability to import recipes from MasterCook, another software title which has been integrated into several culinary textbooks. Integrating this technology into the culinary classroom or instructional kitchen has the potential for facilitating a more collaborative approach to culinary education. Students could now *beam* recipes to each other and work in a collaborative manner. Even so, collaborative learning must be facilitated and supported in an adequate manner by the teacher, (Volman & Eck, 2001) or in this case, the chef-educator.

Another manner in which technology is being integrated into culinary education is distance education. According to VanLandingham (1995), culinary education is becoming a virtual reality in which students will watch their instructors on television or webcam after picking up their school supplies (i.e. food) and follow along in the luxury or privacy of their own home kitchen. This utopian idea is far from practical, because of the kinaesthetic and sense oriented nature of cooking. Where this virtual reality might be of benefit is in offering distance education for the theoretical components of culinary arts curriculum.

Complementary to distance education is online learning. According to Carr (as cited in Patten, 2001) "the advantage of learning together in a collaborative online environment is the level of *asynchronous contributions* from students and professors" (¶ 5). According to Santich, Whyte, Shannon, and McHolm (2002) there is a demand for

flexible delivery of curriculum in post secondary education. Santich et al. (2002) are currently monitoring the progress of an online gastronomy program offered by Le Cordon Bleu cooking school and Adelaide University. Hoefully, the MA in Gastronomy will meet the expectations of a collaborative learning experience combined with flexible delivery and meet the demands of those 'just for me learners' as identified by Santich et al. However, there are problems with online learning in a culinary arts program. According to Jarvis (2004), one of the problems facing online delivery is the attrition rate. Only eleven of twenty students in his online course completed it. He also found online courses to be very time consuming, especially at a developmental level. Yet, Jarvis (2004) points out that teaching the theory component of culinary courses online will allow for the freeing up of physical resources, such as the lab (instructional kitchen), with improved economy and facility usage.

Streaming video is another technology, which, according to Strom (2002), is a low resource, cost effective and easily delivered manner of instruction. Streaming video allows for images to be sent to a computer without needing to be downloaded. In most instances, there is no sound attached to the video images. The streaming video can be repeated in a loop, constantly played, or upon demand. At Manchester Metropolitan University's School of Food, Consumer, Tourism and Hospitality Management, and as part of the Click and Go Video project, streaming video with recipes and instructional information are being integrated into the kitchen classroom. According to Strom (2002):

> Reactions from students have been mixed, particularly in terms of getting to grips with new technology and a new way of working. Keyboard interaction was also seen as a problem in a kitchen area when students have their hands immersed in food! Interestingly, all the students strongly requested to have audio instructions added to the video clips, to help then focus their attention during the video (p.3).

Using a streaming video allows for the lesson to be taught and reviewed a multitude of times without fatiguing the instructor. What is of concern here is the lack of a 'live' chef/culinary educator. With so many variables or 'what if' scenarios in cooking, questions will and do arise. A streaming video does not have the capability of responding to those questions. Watching a streaming video over and over again is akin to learning by rote, and pedagogically speaking, it is not always the best method, since it does little to develop the critical thinking skills of the learner. A hybrid model, in which a streaming video is played, with a qualified instructor to monitor and facilitate the skills being taught is a possible solution.

On the cutting edge of technology with the potential for educational applications is haptics, which is the experience of touching and manipulating objects or environments. (Glass, 2003). According to the Human Performance Centre (as cited in Glass, 2003) ,a haptic interface is a force reflecting device, which allows a user to touch, feel, manipulate, create and/or alter simulated three-dimensional objects in a virtual environment . Most of these interfaces are geared towards surgeons and astronauts, allowing them to practice in risk free environments. There has been some research into applications that could be of benefit to culinary students. According to Iwata, Moriya, Uemura, and Yano (2003), "the Food Simulator is a haptic interface that displays biting force. It is designed to fit to the user's mouth, where it delivers the captured force of real food and auditory and chemical sensations associated with eating" (¶ 1). This technology is both cost- restrictive and years away from mass usage, but has the potential to revolutionize culinary education by allowing students to build on their senses of taste and texture in a virtual manner.

The integration of educational technology into the classroom is a reality which cannot be ignored (Pea & Cuban, 1998). Educational technology has become part of the fabric of current educational practice, one which educators should now accept and use. In the culinary classroom and instructional kitchen, the role of educational technology is and should continue to be one of a complimentary nature, which supports kinaesthetic experiences, collaborative learning, and face-to-face encounters, (Pea and Cuban, 1998) rather than replacing it. In both the culinary classroom and instructional kitchen, technological changes and innovations are a reality. As with educators, aspiring culinarians must be aware of current technological advances in order to remain competitive and current (Cullen, 2000). Both educational technologies and recipes contain several ingredients and directions, which, when used correctly can result in a wonderful creation, be it knowledge or food. Here's hoping that recipe is properly researched, developed, and adhered too.

References:

Anderson, L. & Perry Jr., J. (2004). *Technology planning: Recipe for success.* Retrieved

    November 21, 2005 from: www.nctp.com/html/tp_recipe.cfm

Bitner, N. & Bitner, J. (2002). Integrating technology into the classroom: Eight keys to

    success. *Journal of Technology and Teacher Education.* 10(1). 95-100

Boshier, R.(1999). *Crosscurrents: The confluence of education and technology.*

    University of British Columbia, Technology and Education Research Network.

Brown, M. (2001). *Technology in the classroom: Handhelds in the classroom.* Retrieved

    November 21, 2005 from: www.education-world.com/a_tech/tech083.shtml

Civitello, L. (2004). *Cuisine and culture: A history of food and people.*

    Hoboken, New Jersey: Wiley

Cullen, N. (2000). *The world of culinary supervision, training and management.* Upper

    Saddle River, NJ: Prentice Hall

Franklin, U. (1995). *Community access to the information highway.* (Conference

    proceedings). Retrieved November 29, 2005 from:

    http://www.ncf.ca/ip/freenet/conferences/access95/proceed/day1/franklin

Glass, S. (2003). *The uses and applications of learning technologies in the modern*

    classroom: Finding a common ground between kinaesthetic and theoretical

    delivery. (ERIC Document Reproduction Service No. ED 477398)

Gross-Davis, B. (2001). *Tools for teaching.* San Francisco: Jossey-Bass

Herndon, S. (2002). *Technology vs. lecture in classroom guidance lessons.* Action

    Research Exchange, 1(2), Fall 2002. Retrieved   November 19, 2005 from:

    http://chiron.valdosta.edu/are/vol1no2/PDF%20article%20manuscript/herndon.pd

    f

Hunter, C. (1998). *Technology in the classroom: Haven't we heard this before?*

    Retrieved September 16, 2005 from: www.asc.upenn.edu/usr/chunter/edtech.html

Imel, S. (1998). *Technology and adult learning: current perspectives.* (ERIC Document

    Reproduction Service No. ED421639).

Iwata, H., Moriya, T., Uemura, T, & Yano, H. (2003). *Emerging technologies.* Retrieved

    November 21, 2005 from:

    http://www.siggraph.org/s2003/conference/etech/food.html

Jarvis, K (2004). *Online course development 101.* Retrieved November 19, 2005 from:

    http://www.cafemeetingplace.com/archives/mis_apr2004.htm

Mandabach, K. & Harrington, R. (2004). *Bytes to cook by: Tech in the culinary*

    classroom. Retrieved November 18, 2005 from:

    http://www.cafemeetingplace.com/archives/food4_jan2004.htm

Ministry of Education and Training, (1997) *Culinary Program Standard.* Retrieved

    November 30, 2004, from

    www.edu.gov.on.ca/eng/general/college/progstan/hosptour/culinary.html

Murphy, P. (2003). *The hybrid strategy: Blending face to face with virtual instruction to*

    improve large courses. Retrieved November 21, 2005 from:

    http://www.uctltc.org/news/2002/12/feature.php

Patten, P.J. (2001). *Study Compares Student-to-Student Classroom and Online Learning.*

    Retrieved November 21, 2005 from: http://www.athabascau.ca/media/ivey.htm

PDACookbook. [Computer software]. Retrieved November 19, 2005, from

    (http://www.wakefieldsoft.com/pdacookbook/)

Pea, R & Cuban, L. (1998). *The pros and cons of technology in the classroom.* Retrieved

    September, 20, 2005 from http://tappedin.org/archive/peacuban

Robertson, H. (1998). *No more teachers, no more books.* Toronto: McClelland and

    Stewart.

Santich, B., Whyte, I., Shannon, S. & McHolm, D. (2002) Gastronomy *Online:*

    Evaluating the Benefits of New Delivery Technology presented at CHRIE

    (International Council on Hotel, Restaurant and Institutional Education) Annual

    Conference Aug 7-10, 2002, Orlando, Florida

Scardamalia, M. & Bereiter, C. (in press). Knowledge Building. In *Encyclopedia of*

    Education, 2nd Edition. New York: Macmillan Reference,USA.

Spector, J.M. (2001). *An overview of progress and problems in educational technology.*

    Interactive Educational Multimedia, number 3 (October 2001), pp27-37.

Strom, J. (2002). *Streaming video: Overcoming barriers for teaching and learning.*

University of Manchester, Advanced Telematics Centre. Retrieved November 21,

2005 from: http://www.cde.athabascau.ca/ISEC2002/papers/strom.pdf

VanLandingham, P. (1995). *The effects of change in vocational, technical, and*

occupational education on the teaching of culinary arts in America. (ERIC

Document Reproduction Service No. ED 382832)

Volman, M. & van Eck, E. (2001). *Gender equity and information in technology: The*

second decade. Review of Educational Research; Washington, Winter 2001.

71(4). 613-644.

Walden, S. (2005). Educational Technology. In B. Hoffman (Ed.), *Encyclopedia of*

Educational Technology. Retrieved November 25, 2005, from

http://coe.sdsu.edu/eet/articles/edtech/start.htm