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Q & A with Ed Tech Leaders

Interview with William Huitt

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1. What first got you interested in online instruction and educational technology?

I earned my first degree in business and marketing in the 1960s. As part of that experience I used a terminal connected to a mainframe for data analysis. In the 1970s, I learned to program in several languages to fulfill my language requirement for the PhD. I completed my dissertation using a typewriter. So when I first had the opportunity to use a desktop, I was interested in how it could increase my productivity in data analysis and writing, and I had the skills to develop and/or modify programs to address these kinds of productivity tasks.

I purchased a TRS-80 (each separate program was stored on a cassette tape) and started experimenting. I was one of the first in my work group to use an Apple and an IBM computer for productivity tasks. When the Apple II arrived, I had small children (twin boys) and got interested in learning activities.

At the time (early 1980s) I was teaching courses at the community college level on the Navajo reservation in Arizona and producing handouts using mimeograph equipment. I began to think about how I could store the handouts on the college server so students could access them from any of the computer labs that were available on campus. I anticipated that this would become readily available, so I began to develop materials that would go with each of the units in the courses I was teaching.

In the late 1980s, I was teaching undergraduate and graduate courses at the university level. All of my colleagues were developing programs for stand-alone computers, but I thought the future of computing lay in connectivity. I continued to develop materials that could be placed online. I was also teaching off-campus courses where students had limited access to the library.

I began to work with the first GUI interface, Mosaic, after I saw a graduate student assistant use it in the early 1990s. I put all lecture notes, classroom activities, and papers I had written on the campus server and began to experiment with "flipping" the classroom. I prepared audio tracks for the PowerPoint presentations I had developed for face-to-face instruction and had students listen to those before they came to class. We would then have a classroom activity that explored the material in more depth. To be honest, that really did not work very well in the 1990s. Students were accustomed to the relatively passive nature of face-to-face classroom instruction, and they resisted the more active process of learning outside the classroom and then extending that through active learning in the classroom.

I also began compiling a relatively large set of materials that were available online related to the topics I was teaching. As I continued to teach off-campus courses, these articles began to supplement and then replace the articles I was making available to students. I also compiled related Websites and videos.

All of these experiences prepared me to develop and deliver some of the first online courses at the university where I was teaching. I have now been teaching online courses for about 15 years. I expect that the online teaching experience, especially the development of MOOCs, will

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dramatically change that process in the relatively near future. Hopefully, I will have the opportunity to continue the learning and development process.

2. Way back in the year 2000, you did "An exploratory analysis of students' preparation and interest in taking an online course." What has changed since then?

At that time only about 25% of students had enrolled in a course that used a Learning Management System such as BlackBoard. Only about 50% of the students had used a program such as Yahoo Messenger (a forerunner of Skype or Google+) to interact at a distance, and only about 10% had used a program such as Netmeeting for an active Webinar experience. At the time there was no YouTube or iTunes University that I could use as a way to store material I wanted students to access as part of the learning experience. Today the situation is dramatically different. However, I teach mainly PhD students, who are older, and they are struggling with using Dropbox or Google Apps, tools that high school students use with some regularity. I suspect this generational challenge will be a part of the use of technology for quite some time, as the introduction of new tools is accelerating.

However, I think the reasons for taking a course or an entire program online are basically the same: the convenience of not having to travel to take a course, the ability to resolve schedule conflicts, or the ability to take a course that is not offered regularly at a particular institution. Also, I think the reasons to avoid online instruction are basically the same. Some students prefer the relatively passive face-to-face lecture model; sometimes they complain that they have to "teach themselves" in an online course.

What they mean is that they want someone to distill the information into a listening/viewing (rather than a reading) experience that they can simply memorize, pass a test, and get credit, so that they can get on with "important things" in their lives. As an example, when I asked one middle-aged gentleman in a graduate class why he was having difficulty in learning to use APA formatting style, he said it was because I had not *taught it.* Even though I had prepared multiple instructions with examples, had provided Frequently Asked Questions with screen captures, and had provided extensive feedback on the three papers he had submitted, I did not provide a lecture and a test on that content and so had not *taught it.* I expect that experience will not change in the future. Some students will expect to use the same instructional techniques they used in their K–12 education; when that does not match the current learning system, they will conclude they have not been *taught correctly.*

3. Are you still using the 4MAT system to design Web-based instruction? How have things changed over the years?

For those who are not familiar with the 4MAT system, it is a combination of direct instruction and constructivism that is focused on addressing different learning styles. Bernice McCarthy, using David Kolb's framework of four different types of learners, identified four different questions that engage learners:

1. *Concrete-Random or "Imaginative Learner"*—demands to know "Why" he or she should be involved in this activity; the instructor should engage learners in a concrete experience and reflection activity.
2. *Abstract-Sequential learner*—wants to know "What" to learn. Learners want to integrate the reflective analyses into concepts and then develop the required concepts and skills that allow them to analyze, classify, and develop theories. Instructors should guide, and sometimes direct, these learning experiences.
3. *Concrete-Sequential learner*—wants to know "How" to apply the learning. Learners want to practice concrete steps and then "tinker" with the knowledge and skills as they seek to improve their learning. Instructors should provide opportunities to make concrete applications using abstract concepts and principles.
4. *Abstract-Random learner*—asks "If" this is correct, how can I actively modify it to make it work for me. These students want to create or adapt and enjoy taking a risk. Instructors should provide tasks that allow them to do this.

While it is sometimes difficult to develop individual lessons for an online learning format, when one focuses on units or the entire course, the system is quite useful. For example, in a course on learning and instruction, I focus first on an overview of the movement to the digital, information, conceptual, global demands of the 21 century and have learners describe the new skills they have learned and how they have integrated digital technology into their professional and personal lives. As we discuss each of the learning theories, learners discuss how a particular theory might be used to help others gain the knowledge and skills they have mastered. This is done multiple times as they "practice" connecting theory to their personal experiences. We then discuss instructional paradigms, and each learner develops a personal statement regarding the teaching/learning process with support for the literature we have read in the course.

4. Task analysis has been around for years, but how do YOU specifically use it in your work?

In my opinion, task analysis is one of the most important tools for planning instruction. The first step is to identify the task that learners should be able to accomplish at the end of the teaching/learning process. This is fundamental for both behavioral planning approaches as described by Robert Mager over 40 years ago, an information processing approach as described by Norman Gronlund, or a more constructivistic approach as described by Jay McTighe and Grant Wiggins.

It is then necessary to look at the component parts of the activity and decide how to approach the teaching/learning process. A behaviorist will directly teach the specific tasks to mastery and then integrate them at the end. An instructor using the information processing approach will have students construct a framework and then fit the components into that framework as they are mastered in an iterative fashion. A constructivist would provide learning experiences that ensure the students will focus on mastering the components while engaging in a learning task.

I take a fairly eclectic approach depending upon the characteristics of the learners (especially age and prior experience with what is to be learned) and the cognitive load demanded by the learning experience. This approach might be thought of as one of discovering what Lev Vygotsky describes as the learner's Zone of Proximal Development. My approach has been heavily influenced by my engagement in sports in my youth. I never had a coach start a season with a focus on the basic skills of the sport. We always had some conditioning activities followed by some fairly free flowing engagement in the sport.

Then we would focus on a specific skill and integrate that into the game. I can remember having some intense instruction in a small group when the coach saw that several of us did not know how to bunt effectively. Everybody practiced that as part of hitting practice, but we had a much more intense instructional experience because we were so far behind the average player.

For example, when I am teaching graduate classes I emphasize the competence of using APA formatting style. At the beginning of the course, I will provide multiple resources with a rubric of what is expected. For the first submission, I will focus on a properly formatted title page and references. I will then add in the proper use of headings and citing references; on the third submission I will focus on all aspects of APA formatting. I have found that students in programs where other professors are addressing APA style, a gentle reminder in terms of specific feedback is all that is necessary. For students in programs that do not emphasize this set of competencies, I have to take a much more direct approach with even more learning aids and sometimes even have to have a phone conversation with a student and go over the details in a very direct, step-by-step manner.

5. How is "educational accountability" being used, or is it really in place? And what should teachers know about it?

My opinion is that we must all be held accountable for the work we do as professional educators, but we should not be held accountable for something that is beyond our ability to influence. A colleague and I use the acronym WYMIWYG (What You Measure Is What You Get) to focus on the importance of assessment and evaluation. Having a specific target and having feedback on the processes related to hitting the target are two of the basic principles of learning. At the same time, it must be acknowledged that standardized measures of learning address a lot more than what happens at school and in the classroom. Educators should be held accountable for adding value beyond that provided by the home and the community.

A school that has a large majority of students coming from challenged economic communities and doing well on standardized assessments has added more value than a school with very few such students who earn equivalent test scores. Personally, I do not think that educators object to accountability; rather they object to accountability systems that are not equitable and do not address the requirements for adult success in the 21st century. Value-added systems of assessment attempt to address the first issue. As for the second issue, many people and organizations, such as The Partnership for 21st Century Skills, have made progress in identifying relevant knowledge, attitudes, and skills, yet measures of those do not hold the same value to policy-makers as the more narrow paper/pencil measures of basic academic knowledge and skills. This is a source of continuous discomfort for many educators.

I advocate every school being a school of choice with both vision and mission statements and corresponding curricula, pedagogy, and assessment procedures that directly address those. I believe it is inappropriate to attempt to reform schooling by requiring teachers to be individually accountable for results as measured on standardized tests. Rather, schooling must be understood as "team sport," with the team being the entire school. If teachers were provided the opportunity to develop and implement professional learning communities, if the focus were on the school with star teachers providing leadership in classroom practice, and if assessment of the whole student were the focus of the curriculum, rather than a narrow set of academic skills, I believe educators would welcome assessment as a means of demonstrating their professional expertise.

6. How can the average teacher guide students to develop capacities, acquire virtues, and provide service? And why do you think these things are important in this electronic, computerized age?

Focusing on the whole student is best done in a whole community ecosystem. Trying to place the total responsibility on individual teachers is simply an invitation for frustration and feelings of defeat. However, there are ways that academic objectives and more holistic objectives can be integrated into lessons.

For example, in the Brilliant Star Integrative Reading Project, I worked with practicing classroom teachers to develop lesson summaries that could be used to connect children's literature to a variety of academic disciplines. Each of the books focused on at least one (and often more) of the domains identified in the Brilliant Star framework (*http://www.edpsycinteractive.org/brilstar/brilstar.html*). I have also worked with PE teachers to integrate physical activity into academic lessons and with middle grades and high school teachers to integrate holistic objectives into academic units.

I am presently working with the Social and Behavioral Science Department at an international school to integrate holistic objectives into the standards and pedagogy of grades 6 through 12. The department decided that it should focus on students becoming knowledgeable thinkers who could access knowledge and communicate what they know. Subsequently, they have decided to create developmental rubrics for reading and listening, thinking like a social scientist in a specific domain such as geography, history, or sociology, becoming knowledgeable in the different subjects using Bloom's revised taxonomy, and being able to communicate through writing, speaking, and media.

The major point is that no single teacher or department needs to address every aspect of the whole child. My advocacy is that educators should select a desired holistic

objective on which to focus, get started, and expand from there as time and resources permit.

Technology can be a tremendous asset in this process because it is relatively easy to share resources and ideas with other educators around the world. And technology amplifies the thinking and communication skills as well as the knowledge that one can access and process. The term GIGO (Garbage In, Garbage Out) might be applicable; those who come to the technology with excellent thinking, knowledge, and communication skills will be much more productive in their connectivity activities than those with poor knowledge and skills.

A case can also be made that values and moral character development are even more important in the digital, global age. In the recent past, one could make a mistake and most people might not find out about it. In today's highly connected world, a mistake that ruins one's reputation can have long-term consequences. It is quite difficult to convince an adolescent or young adult that items posted on Facebook will be considered by a potential employer 10 or 15 years later, but that is a reality today.

7. What are some educational psychology principles that contribute to effective teaching and learning in an online environment?

In my opinion, the educational psychology principles that work in an online environment are extensions of those that research has demonstrated work in a face-to-face environment. The main difference is that the principles must be more directly and explicitly implemented. In a face-to-face environment, if the teacher makes a mistake, it can be quickly noticed and rectified. The teacher is embedded in the teaching-learning process and can respond in real time. In an online environment, the learners are typically working a significant amount of time on their own or with other learners in a discussion or work group. The instructor may not see any challenges for 24–48 hours.

These are the principles my colleagues and I articulated from the research on face-to-face teaching. I have provided some actions that instructors need to take to implement them in an online environment.

- *Set the stage for learning*—in an online environment, this means, for example, that all materials must be easily accessible, all assignments must be easy to find, rubrics must be clear, a welcoming message at the beginning of the course must be included, and an opportunity for learners to share a bit about themselves and why they are engaging in this particular learning experience must be provided.
- *Explicitly define learning outcomes*—learners should know specifically what will be the focus of the learning experience and how learning and mastery will be assessed. These must be readily accessible to the learner.
- *Consider information processing and cognitive overload* — the course must be carefully organized so that every learning experience builds on prior learning experiences and that learners are provided an opportunity to describe their basic understandings, connect those to activities they will do or have done, and engage in analysis for the purpose of critiquing what has been done and creating something that is personally interesting and meaningful. Care should be taken to ensure that the average learner has the prerequisite knowledge and skills to successfully engage in the learning experience and that no task is so overwhelming that the learner wants to quit or cannot complete the assignment. For those learners that come to the learning experience not properly prepared because of past learning, extra support must be provided so that, if they are willing to spend some extra time, they can be successful in the learning experience.
- *Value learner diversity in terms of prerequisite knowledge and skills, learning styles, and cognitive, emotional, and social development*—think about the possible diversity of the learners in the online course and provide some questions or activities that will be interesting and meaningful to each learner at some point in the learning experience.
- *Use a variety of assessments of learning*—in an online environment this is often quite difficult, perhaps because of the restrictions of the Learning Management System used by the institution, the lack of skills on the part of the learners, or the focus of the program. For example, in a PhD program, the focus is on developing learners' independent inquiry, thinking, and scholarly writing competencies. Assessments that deviate from that are generally not welcomed by the program coordinators. However, I have developed Webquests that require learners to demonstrate both critical and creative thinking as part of an assessment process (*http://www.edpsycinteractive.org/webquest/index.html*).

8. How can we connect cognitive development and constructivism in the realm of online learning?

As you know, there are essentially two major views of cognitive development and constructivism that have impacted educators' thinking about the teaching-learning process. Jean Piaget focused his theory on the personal construction of mental structures, while Lev Vygotsky focused his theory on the social and cultural influences on learning. These two views might be considered as the two sides of a coin. For example, Piaget advocated that thought comes before language, whereas Vygotsky stated that language comes before thought.

In my opinion, it is important to provide both kinds of learning experiences for learners and to use techniques from both perspectives in designing instruction (including online instruction).

For Piaget, the basic task is independent investigation, and this is stimulated by disequilibrium between the learners' mental structures and successfully solving the task at hand. Therefore, the first task of the instructor is to create some disequilibrium between what each learner knows and can do and what is expected. This can be done by providing readings or videos that somewhat challenge the learners' mental structures, and then providing discussions or other activities that allow the learners to resolve those.

For example, in a discussion of the links between intelligence, learning, and mastery, I will provide several videos and readings that somewhat disagree with each other and then ask learners to provide a personal explanation that resolves those. At the end of the unit, I have students post a "review and reflect" statement; I am looking for students to make unsolicited descriptions of how they have changed their mental structures with regard to these concepts. I will change the reading and viewing assignments and rephrase the discussion questions until I can get at least one-third of the learners to make these types of posts.

On the other hand, Vygotsky advocated discovering the learner's Zone of Proximal Development (what can be learned with guidance beyond what the learner can already do without guidance) and then scaffolding a set of learning experiences that guide the learner to demonstrate mastery on the required task. This is very difficult to accomplish in an online learning experience because everything to be used in the learning process must be developed before the course begins. However, these scaffolded experiences can be developed over time as the instructor learns what different learners require to be successful.

For example, as previously mentioned, having learners master the intricacies of APA formatting is a challenge. Over the years I have developed templates, specific instructions, checklists, and detailed feedback notes, but some learners require even more. I believe it would be very helpful to have a set of programmed instruction modules available that learners could access when they are having difficulties on any particular detail of APA style. I have suggested something like that be developed at every institution I have worked with, but so far, at least as far as I know, that has not been created. Not all learners need such scaffolded instruction, but for the 10% to 20% that do, it would dramatically reduce the frustration of learning to demonstrate mastery of this set of skills.

9. Who has influenced you, or made an impact on your work?

I started out in marketing and advertising and was influenced at that time by people such as Abraham Maslow and his theory of motivation and Allen Newell and Herbert Simon with their theory of problem solving. As I moved into business education and then into educational psychology, I was more influenced by the cognitive-behavioral paradigm that was popular at that time. While my approach was, of course, influenced by B. F. Skinner, I was more attracted to people like Ben Bloom and his work in developing the Taxonomy of the Cognitive Domain and Mastery Learning as well as Albert Bandura and his theory of Social Learning that attempted to integrate an information processing and operant conditioning approach to learning. I then became a student of Ira Gordon and began studying his systems approach to human development, and I was heavily influenced by Jean Piaget and Jerome Bruner, especially the latter's idea that anyone could learn anything if the learning process was properly designed. I also studied Uri Bronfenbrenner's theory of the ecology of learning and actually modified my PhD coursework to include courses in sociology and anthropology in addition to psychology. Later I began to study the work of Robert Sternberg and Howard Gardner and their theories of different types of intelligence. Lately, I have been very influenced by Martin Seligman and Ed Diener and their work in positive psychology and well-being. I think if one were to review the body of my work, these influences would be fairly easy to see.

10. What specific research would you suggest relates to improving students' academic performance in online classes? In other words, are there theories, theorists, or publications that you feel have a distinct contribution to online learning and educational technology?

In my opinion, for the most part, online instruction is not that much different from face-to-face instruction in terms of ideas about effective practice. For example, the seven principles identified by Arthur Chickering and Zelda Gamson almost 30 years ago are just as applicable to online instruction as they are in face-to-face instruction. Of course, there is a difference in the tools that might be used to implement these principles.

The exception might be in the theoretical work on Connectivism by such theorists as George Siemens, Stephen Downes, and Frances Bell. In my opinion, this is an extension of social cognitive theory where the digital nature of the interactions emphasizes that learners are embedded in overlapping and integrated networks. From this perspective, what any single individual knows is not as important as the extent to which the individual has access to, and contributes to, the development of those networks.

And, while I read journals such as *Internet and Higher Education* and the *International Review of Research in Open and Distance Learning*, I also read articles and white papers published by the International Association for K–12 Online Learning and interact regularly with educators involved with the International Society for Technology in Education. I personally do not think we have enough meta-analytic reviews of current practices in distance learning to draw any unique conclusions about best practices.

However, there is one practice that I believe needs to be modified for distance learning. The current course design process is referred to as a waterfall process, where courses are designed by experts and then implemented in a generic manner. That is, in many institutions the course development process is seen as separate from the instructional process. In my opinion, it is more productive to design a course using one of many Iterative design approaches. In this approach, a basic outline and set of materials are developed and then piloted by several faculty with a relatively small number of learners. Modifications are made during the course, and the modified materials are used in a subsequent beta-test learning experience with a wider variety of learners.

The developed course is then taught to a larger number of learners. In my experience, faculty and course designers are continually in a beta-test experience because new technologies and resources become available quickly, practically every six months. I am working with K–12 educators who are much more adept at integrating new technologies

into their instructional practice than are higher education faculty. Sometimes I think that we adults have to make an extra effort to keep up with children and youth. Right now it seems that we are slowing down their learning processes.

11. What have we neglected to ask?

I think one question that might be asked, based on a review of the body of my work is "Why and how did you move from a focus on improving academic achievement to a focus on developing the whole person?" While I have not completely stopped looking at improvement in academic achievement, it has certainly become a less important issue for me over the last 20 years.

In my opinion, a continued focus on academic achievement, especially as measured on norm-referenced standardized tests, is an indication that policy-makers are looking in the rearview mirror as the nation and humanity hurl headlong into the 21st century. Immanuel Wallerstein discussed the concept of the Age of Transition as an appropriate way to describe the movement from the Agricultural Age to a completely different digital, global sociocultural life that has been taking shape for at least 500 years. The 21st century will see an exponential change in that transition. Ray Kurzweil showed how humanity will experience as much change in the first 25 years of this century as was experienced in all of the 20th century, and that was greater than the amount of change experienced in the entire existence of human beings. It is simply not possible to lay out in any detail the life experiences that adults will have in the next 20 years, let alone those children and youth will have in the next 50 years.

My advocacy is that educators should focus on developing the whole person, not simply the cognitive-intellectual domain and accompanying academic knowledge and skills. That academic focus was certainly appropriate in the early part of the transition period, and there are millions of people who can still benefit from that focus. However, in my opinion, educators should focus on how technology can enhance the development of the whole person (social, emotional, spiritual, moral, etc.) rather than continue to focus only on academic learning. □

Suggested Readings

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