The end of education as we know it?



By: Paul A. Fugazzotto, DDS; Academy News Editorial Consultant Effective and meaningful education was undermined and essentially destroyed in 1974. Learning algebra and calculus became pointless. Intellectual laziness won out over conceptualization and true understanding. The calculations necessary for an 18-yearold junior in college to succeed at analytical chemistry became instantaneously available to all, with minimal effort. Why subject oneself to the rigors of physics or advanced organic chemistry when you could have "Einstein in your pocket" for \$175.00? Better to play poker in the lounge and flag football on the turf. Passing tests, "getting good grades," would be effortless, requiring only an electrical outlet. How did this happen? Texas Instruments released the SR-50 handheld electric calculator. Teeth were gnashed and manual cranial depilation was carried out throughout the colleges. Professors loudly bemoaned the destructive impact of this demonic instrument upon education and learning, while quietly fearing that their usefulness was at an end. Fortunately, the predicted apocalypse failed to materialize. Did significant cheating occur while the administration and faculty were deciding how best to meet this new challenge? Undoubtedly. However, the ultimate outcome was the integration of this technology into the educational process, freeing students from mundane tasks, and affording the time for more meaningful exploration of the topics in question. Geoffrey Hinton, a pioneer of deep learning and winner of the 2018 Turing Award, is now "scared" of the technologies he helped build. Instrumental in the creation of backpropagation, an algorithm which allows machines to learn, Hinton worries what will happen when "machines become smarter than us," an eventuality all AI researchers are confident will come about. But wait. Yann LeCun, Meta's chief AI officer, agrees that machines will become smarter than humans, but believes "intelligent machines will usher in a new renaissance for humanity, a new era of enlightenment." "Technology is not an instrument, it is a way of understanding the world" - Martin Heidegger Educators are worried that ChatGPT will render research papers, written examinations, and theses meaningless. Why

spend hours doing research or writing papers when ChatGPT can do it for you while you have a pastry and a double espresso? Irena Sailer, DDS, MS, chair of fixed prosthodontics and biomaterials at the University of Geneva, is concerned about the integrity of such student research and written theses. However, rather than attempting to ban ChatGPT use, a pointless and ostrich-like endeavor, Dr. Sailer is considering the institution of oral examinations and theses presentations to appropriately assess student mastery of the subjects in question. While ChatGPT certainly poses a potential threat, and must be effectively integrated into the educational process, is its 10 use the greatest challenge one faces while educating and preparing students for the rigors of dentistry? Unfortunately, no. As AO Fellow Clark M. Stanford, DDS, PhD, MHA, dean and professor at the University of Iowa College of Dentistry notes, dentistry in North America "is still based upon the concepts put forward in the 1920s by William Gies, a biochemist from Columbia University. He created the framework of the curriculum we think of as dental education today, which has not changed since 1927. The classic model is the 2 x 2 year curriculum: two years of basic science and simulation pre-patient training, followed by two years of clinic. The challenge for dental education has always been that we take medical school and a residency, and we put them together in three-tofour years of dental school." Dr. Stanford states that "one of the challenges is, what do we take out of the curriculum to add in new things like digital workflows, and the issues and concepts around implant placement and risk planning. Students come in thinking they're going to have all this in-depth clinical experience in implant placement and implant restoration, and they don't even know how to take out a tooth, lay a flap, and suture with any competence. In dental education, we struggle. We want to add these things, but also don't want to create the idea that if a student placed one implant in dental school, he or she is therefore competent to place implants." Dennis P. Tarnow, DDS, clinical professor of periodontology and director of implant education at Columbia School of Dental Medicine, concurs and believes that COVID exacerbated the problem. "The pandemic has put dentistry as well as other disciplines two years behind. I train multiple graduates right out of school coming into graduate programs; first year perio, pros, oral surgery. I've been doing it for years and I know these are bright kids. They are now the least prepared students I have ever seen, and that doesn't mean they're stupid. They are just as smart as the other kids were, but they had no patients to treat. The lectures were all on Zoom, so they never got a personal connection with the professor the way we did. I find myself teaching them junior dentistry as opposed to graduate program concepts. I ask, 'How many of you have done a crown on a human being? On an implant? How many of you have put a crown on?' The answers are 'I did one. I did three.' That's not

proficiency. That's not even competence." German Gallucci, DMD, PhD, chair of the Department of Restorative Dentistry & Biomaterial Sciences at Harvard School of Dental Medicine, concurs, stating that "predoctoral education is the critical step. When you teach a student how to place implants, at the very least, they should become proficient in treatment planning, diagnosing, and restoring implants at this point. I don't think this is happening in that comprehensive way. At the postdoctoral level, you come out of dental school with a basic, limited knowledge of implant dentistry. You go into specialty training from very limited knowledge to a hyper focused outlook. If you go into perio, you only learn surgery. If you go to pros, you only learn restorations. You have now burned a bridge to greater understanding and growth, and you may never recover. Never." In addition to shortcomings in technical proficiency, interdisciplinary treatment planning and the concept of comprehensive care become victims of the conundrum of "limited time to teach everything." Without a comprehensive outlook toward the patient and the patient's needs and desires, clinicians become nothing more than mechanical piece workers, with minimal impact on their patients' quality of life. The perio – pros programs of the 1970's and 80's such as BU, Penn and Seattle (to name but a few) were characterized by an intimate inter-relationship between all disciplines of dentistry. No work was performed without a comprehensive treatment plan having been agreed upon. When a completed case was presented to Dr. Gerald Kramer, the initial discussion of how to look at a patient, perform a thorough examination and diagnosis, and then formulate a multi-disciplinary treatment plan, was at least as valuable as the comments and guidance received regarding the actual therapies to be performed. As patient treatment becomes more siloed, as dental school departments build walls and moats to protect their territories, it is the students, and ultimately the patients, who suffer. So, what is the solution? Do you add another year of training to dental school education? The costs for such an education are already close to prohibitive for many people. Even those who manage to finance their educations often come out of school so deeply in debt that they choose less than ideal career paths and may still never "get out of the hole." Does a one-year post graduation residency become mandatory, if a specialty is not being pursued by the new dentist? Where do all of these residency positions come from and who funds them? Are most of the "basic science" requirements shifted to undergraduate education, becoming prerequisites to applying to dental school? While such an approach would help open up more time for clinical education in dental school, what is the personal cost to the student? College, in its true Continues on page 14 Dr. Paul A. Fugazzotto one's very life. Dr. Stanford related the following tale: "When I first started college, I went to talk to one of the faculty at the dental school and I said, 'should I be taking

this science class or this science class or this science class?" And she looked at me and said, "you're going to be treating human beings. I want you to take as many of the humanities as you can because we'll teach you the science. You have to be a humanist first." Dr. Tarnow highlighted another fundamental challenge faced by educators in the United States, that of attracting and retaining high quality educators. "It used to be that the chairmen of departments were really well-known names. They were the kings of dentistry, and almost everybody knew them. There are very few that are still out there. Now we're getting a lot of young people because they have their boards, which is great. But at the same time, people who have 20 or more years experience aren't staying because they're not getting paid. The academic world thinks it's great to be the chairman of a department, which it is. It's very prestigious. But at the same time the universities are not willing to pay the amount of money necessary to retain people. In Europe, faculty are paid two-to-three times what our people are paid. There, teachers stay there for life, until they're 65 or 70 when they're forced to retire. Professorships and chairmanships are a big to-do in Europe. They're sought after. Doctors want to become chairmen. Many years ago, Myron Nevins, DDS, was discussing his time teaching at Boston University as the clinical director of Dr. Kramer's periodontal program. "The excitement of what we were all doing; the interdisciplinary communication, treatment planning and teaching with Don Mori, DMD (prosthodontics), Herb Schilder, DDS (endodontics), and Anthony "Tiny" Gianelly, DMD, PhD, MD (orthodontics); the certainty that we were doing something special; it was like Camelot." Is the problem more than one of financial remuneration? Should the word "prestige" be accompanied by "respect?" Dr. Stanford again: "In the United States, we still have an attitude among the practicing community: 'Well, they couldn't do it, so they teach.' So, by extension faculty are the stupid ones that don't know how to do it. They would never survive in the real world. When someone hears that level of disrespect, they could be extremely bright, highly talented young periodontists who ask themselves, 'Why would I want to go work for the university when I'll be viewed as a failure by the practicing community?'." Dr. Sailer provides an excellent, succinct counterpoint: "We don't have these problems. Professors are respected and looked up to. Our faculty want to be here, want to become professors. It is both a vocation and a career." Of course, it can only help that Dr. Sailer's faculty are working with one of most incandescent stars in the field. It is absurd to assume that those who have devoted their careers to teaching and seeing patients intramurally, rather than in private practice, are somehow inferior clinicians. Would someone care to make that claim about Gerry Chiche, DDS? Perhaps Urs Belser, DMD? The list of examples of clinical excellence by full time professors goes on and on. Now what? Are we doomed? Not

according to Drs. Gallucci and Stanford. Dr. Gallucci identifies an advantage to the Zoom training which has become more prominent since the onset of the pandemic. "The access to education now, what we all learned from the pandemic about being connected, it's a huge opportunity. All of these connections are a form of education and have opened up a different way of mentorship. Now you can open your Zoom and have a study club with colleagues all over the world. It's way more efficient to disseminate knowledge." Dr. Gallucci also speaks of the need to better understand today's students, thus increasing education's effectiveness. "The new generation has different standards. Work/life balance is very important to them. They are leading a life that we as educators need to completely understand. I say with 100% conviction that this is what we need to do in education. When you and I went to school? There was a professor in front of the blackboard or whiteboard or greenboard. They would write something, and we would take a note and that was our way of getting the information, right? Now these kids, they have other sources of information. They don't need us to pass the information. But what they don't have is the ability to catalog that information, to analyze it. I believe this is the role of education. We become the guides for the students, to make sure they are getting and understanding the right information. Educators have to put their egos away a little bit. If we don't approach this generation of learners in that way, we are immediately disconnected." Could there be a clearer explanation of the dialectic, which is the underpinning of the Socratic method? Plato was not a lecturer, but an intellectual tyrant. He was a facilitator of knowledge and understanding. The definition of a true teacher. Dr. Stanford summed it up best when asked if he is optimistic about dental education: "Am I optimistic about education? Well, I have to be because, what's the alternative? There is an opportunity here, with the advent of technologies in healthcare and writ large across all of healthcare, for us to bring information that's relevant to the point of care in a way that is most comprehendible to both the provider and the patient, and to be able to make the best healthcare decisions moving forward. This is also an opportunity for us to educate."