

The **3**i's of Technology Integration

by Donato Napoletano, DMD

The words “technology integration” can be seen in just about every field today. In education, for instance, technology integration can mean learning how to use technology as an educational tool in the classroom. In the retail industry, it can refer to the use of software to track inventories. But what do these two words mean in the world of dentistry?

In dentistry, technology integration can be applied to a wide array of technologies. Modern dental technology can be broken down into three categories:

❶ **Office management** — These technologies (such as computers and practice-management programs) help simplify office operations, but are not used in direct patient care and, therefore, do not require us to change the way we perform procedures on patients.

❷ **Diagnostic** — These technologies (such as laser cavity detectors — e.g., DIAGNOdent — and digital radiography) are used directly on patients, but they also do not require us to change the way we perform procedures.

❸ **Procedural** — These technologies (such as lasers, CEREC, and dental operating microscopes, to name a few) are obviously used in direct patient care and do require learning new methods and techniques for providing treatment to patients.

In this article, we will explore the true meaning of the word *integration* and how it pertains to integrating procedural technologies successfully into daily practice. I hope you never view the word *integration* in the same light again.

Let's begin by defining the words *technology* and *integration*, and learn why these two words are seen together so often and why they complement each other so well.

The true meaning of technology

Technology, by definition, means: ❶ *the systematic treatment of an art or science*; ❷ *the practical application of knowledge*; ❸ *materials, tools, and techniques that make life easier and work more productive and enjoyable*.

All of these definitions clearly imply that we all use technology every day in our practices. When we hear or see the word *technology* in dentistry, we automatically think of some elaborate piece of equipment, such as a laser. This is a misconception. In dentistry, although technology can refer to a laser, it can also be a new procedure, technique, or hand instrument. It basically means anything that helps make our lives easier and our work more enjoyable.

We have all heard the terms “good technology” and “bad technology.” But it is important to note here that the word *technology*, by itself, is neither good nor bad. It can be either or both depending on how it is used. New

THE 3 i's OF TECHNOLOGY INTEGRATION

procedural technologies like lasers often require learning not only how to perform a new procedure, but also the science behind the technology so that it can be applied in a “good” and safe way. Although the words *science* and *technology* are very closely related and contribute to each other, *science* is concerned with how and why things happen, whereas *technology* focuses on making things happen.

But technology alone cannot make anything happen — we need to learn how to use it first. This is best accomplished through professional training sessions. Once we learn how to use a new technology, we then have to learn how to implement it effectively in our dental practices, and this is where the word *integration* comes in.

The meaning of integration

Integration, by definition, means: ❶ to unite with something (or someone) else; ❷ to make or become whole or complete; ❸ to form, coordinate, or blend into a functioning unified whole.

“A functioning unified whole,” I think, describes integration best. Technology by itself is basically useless unless it can be combined with something (or someone) else and blended into a functioning, unified whole.

To illustrate, let's consider a simple hammer. We all know how to use this technology, but for most of us, simply knowing how to use it does not make it an integrated technology. I do not see my hammer and me “functioning as a unified whole,” especially when I'm constantly hitting the wrong nail, namely the one on my finger! For a carpenter, however, the hammer is a truly integrated piece of technology, just as the dental handpiece is for a dentist. If you think about what integration really means in the truest sense of the word, can we honestly say that our dental handpieces were integrated fully by the time we graduated from dental school? Sure, I knew how to use handpieces well, but I could hardly say that my handpiece and I were functioning as a unified whole immediately following dental school, especially when compared to the level of integration I experience today.

Technologies like lasers operate, function, and interact with tissues in ways that I was not the least bit familiar with as a new graduate. Yet, I believed that once I returned from my training session I would be able to do all the procedures well right away! Who knows why I thought that. Perhaps I felt that the oral structures were

my territory and I could, therefore, easily learn to apply anything to them. (Why, I've even learned how to use a hammer and chisel in the mouth when removing tori without hitting my fingernail or, worse yet, the patient's head!) But reality soon set in. It wasn't going to be as easy as I thought. This became clear after a one-surface laser cavity prep took me over an hour to complete — and that didn't even include the 20 minutes it took to get things set up! But I was determined to give it my best shot. For the next week, I continued doing one-surface laser cavity preps at a rate of one per hour. I worked up to two preps per hour, and before I knew it, integrating new technology had become so much fun that it became my new hobby.

When I speak with dentists who are having difficulty integrating various technologies, what they have in common is they don't allow enough time to complete procedures. This causes them to resort to more conventional means, which leads to nonintegration. Some dentists have other issues, too, like being matched up with the wrong technology or experiencing much resistance from their staff members. Issues like these can be avoided with proper guidance before you buy anything. To integrate any technology, you first must evaluate how that technology will impact your practice. Where do you start?

First, realize that the integration of anything new requires time — lots of it. The amount of time it takes can be significantly reduced, however, if you understand that in addition to time, other key elements are needed for integration to occur. View integration as a process made up of three subprocesses — gathering information, incorporating ergonomics, and developing an implementation plan — which I refer to as the 3 i's of technology integration.

The 3 i's of technology integration

The integration of new dental technologies does not instantly occur upon completion of a short training session. Nor does it occur a month later. It's not supposed to. Integration of dental technology will happen in our offices at various times for each of us, just as the integration of our handpieces happened at different times. In dental school, we had the luxury of time and the availability of resources, such as professors, to help guide us through the integration process. While it is true that professors and instructors are available at training sessions, we cannot always consult them for guidance when

Donato Napoletano, DMD, owns Donato Dental in Middletown, N.Y., where he routinely utilizes technologies such as CEREC, surgical microscopes, and four laser wavelengths in the diagnosis and treatment of caries and periodontal disease. He also owns Donato Dental Systems, a consulting company which helps dentists evaluate, select, and integrate various technologies in a systematic and time-efficient manner. Dr. Napoletano can be reached by e-mail at donato@donatodental.com or by phone at (845) 342-6444.



THE 3 i's OF TECHNOLOGY INTEGRATION

questions arise in our offices. Consequently, integrating sophisticated new technologies and procedures can be a very lonely and time-consuming experience. Although integration is complex and ongoing, it can be simplified considerably by systematically dividing the process into a series of subprocesses. Having had the experience of integrating dental operating microscopes (Global Surgical), three wavelengths of lasers (Ivoclar Diode, Hoya Conbio Er:YAG, and PerioLase Nd:YAG), and CEREC 3D (Sirona) in just 20 months, I noticed a common pattern developing in the process. Regardless of the type of technology I was integrating, certain aspects (or subprocesses) were exactly the same for all of them. If we were to express the entire integration process as an equation, it would look something like this: $(i + i + i) \times T = I$, where I = Integration, T = Time, and the three lowercase i's are for information gathering, incorporation, and implementation. Now, let's explore the meanings of each i and how it relates to the integration process.

information

Information is defined as *knowledge obtained from investigation, study, or instruction*. This is perhaps the most important i of all in that it is continually needed before, during, and even after a particular technology is integrated. Knowing what information to gather, where to find it, and how to use it to your advantage can be a bit time-consuming, but it is time well spent. It is absolutely crucial that you analyze as much information as possible before you purchase anything! This will help prevent costly mistakes like acquiring the wrong technology and later selling it on eBay®. Insufficient information is the biggest cause of such problems.

Prior to acquiring any technology, you must have enough information to decide whether it will perform the tasks you want to accomplish successfully. This is important when it comes to choosing the appropriate laser wavelength and manufacturer, for example. The right information will help you make an educated decision as to which manufacturer's features will work best in your hands. The best way to save time gathering this information is to consult a practitioner who has already integrated the technology you are interested in. A well-integrated practitioner is someone who uses a specific technology every day and "functions as a unified whole" with the technology. Technology integration consultants can also provide you with needed information and guide you through all other aspects of the integration process. Just as practice-management consultants can help dentists learn to manage their practices more efficiently, technology integration consultants can help dentists learn to integrate technology more efficiently. The more you know about a given technology, the easier it will be to envision using it before you even make the purchase.

incorporation

Incorporation, by definition, means *to introduce as an integral part or to combine with something (or someone) else*. Incorporation and integration both involve combining things, but incorporation is distinctly different in that it does not mean "functioning as a unified whole." In the case of lasers, for instance, it simply means introducing the laser and adapting it to its physical surroundings in an ergonomically friendly fashion. This could mean thinking about where the laser is going to be stored when not in use and devising a protocol of how it should be transported and readied for use safely. It means preparing the office with additional electrical outlets or air hook-ups that are conveniently located and easily accessible. In other words, successful incorporation of any technology means that it is accessible and easy to put into operation. Proper incorporation ensures that the technology gets set up quickly, which ensures that it gets used regularly. Regular use of the technology will result in smoother, faster integration. If the technology is not adequately incorporated into its physical surroundings, it will make implementation close to impossible.

implementation

Implementation, by definition, means *to put something into effect according to a plan or procedure* (the key word here is "plan"). For this very critical part of the integration process to proceed smoothly, an implementation plan is essential. Without an implementation plan, the integration process will be a bumpy ride and take considerably longer to execute. A well-structured implementation plan can also serve as a means to measure the progress of the entire integration process. The implementation plan should be structured as a series of subplans:

① *A staff training and motivation plan* — Your staff will be your strongest asset when integrating technology. Educate them as much as possible about how the technology works and what the benefits are to patients. This will help increase their motivation level. Try to include your team in the entire integration process as much as possible. Make a plan that outlines the specific duties for your staff members. This may include such things as transporting and setting up the equipment, or preparing patients for the procedure and explaining to them what they are about to experience.

② *A scheduling plan* — Adequate time must be scheduled when implementing any new technology. Initially, I would recommend doubling the normal appointment time for procedures and cutting back as comfort levels increase. No one can effectively learn how to integrate anything new if adequate time is not available. I realize that doubling the appointment time sounds drastic and costly, but in the long run it will save you time in the overall integration process, and will significantly reduce

THE 3 i's OF TECHNOLOGY INTEGRATION

the frustration level. Insufficient time allotted for new procedures is another big reason why some technologies never get integrated and end up being listed on eBay®! Think about it: You've just spent a lot of money acquiring a technology and even more money on training. Does it really make sense to skimp on the time needed to integrate the technology successfully?

④ *A procedural plan* — This plan merely requires making a list of the types of procedures you want to perform with your technology in order of complexity. With CEREC, for instance, it means starting out with posterior restorations and then progressing to anterior restorations. With hard-tissue laser procedures, it means starting with single-surface preparations and progressing to multiple-surface preparations. With surgical microscopes, it means starting out with procedures in the anterior region and progressing toward the posterior. It is important to note that some form of magnification should be used for all laser procedures regardless of laser or tissue type. Most laser procedures will be very difficult, if not impossible, to implement without the use of magnification.

Conclusion

A properly structured plan will not only aid in the implementation process, but will serve as an effective way to evaluate the entire integration process. This kind of feedback is helpful in identifying which of the 3 i's needs further investigation and should reveal where in the process problems are arising. Knowing where the problems occur will make it easier to identify *why* they occur. Once you have this valuable information, figuring out how to address the problems should be easy, thus decreasing the time it takes to integrate procedural technologies.

Every time I see an expensive piece of technology for sale on eBay® or in a dental journal's classified section, I notice words like "barely used" or "like new." I can't help but wonder where in the integration process things went wrong. Was it due to insufficient information gathering? Was it the lack of an implementation plan? Was it due to unrealistic expectations set by either you or a sales rep? Was it due to the staff's resistance to change? Was it due to not using any magnification?

If you have acquired a procedural technology and are having trouble integrating it, please send me an e-mail describing where in the integration process you believe things went wrong. Maybe I can offer you some suggestions.

In addition to helping dentists who are having difficulty integrating technology into their practices, one of my main goals is to help them identify the technologies that will work best for them, so they can prevent the wrong technology from even entering their offices. The most important key to technology integration is assur-

ing that the right technology gets placed with the right doctor. As my very wise carpenter once put it: "You can't integrate a screwdriver to drive a nail!"

If you're considering adding new technology to your office, spend time gathering information and try to envision using the technology before you even buy it. Learn what technology will best drive that nail for you so you don't end up with a very expensive screwdriver!

DE