Why Flip the Nursing Classroom?

Introduction

Nursing educators are so innovative and imaginative, true explorers on the landscape of the profession of nursing. I have learned so much from those before me, and as a result, I am eager to share some of my knowledge in return. When I think of the professors that took me under their wing, I am so thankful that I have had so many excellent nurses showing me how to teach and assess student learning. You see by trade I am a nurse practitioner and until my doctoral program, never had any formal training on how to educate, what curriculum meant, and what in the world the American Association of Colleges of Nursing (AACN) was. I simply found a passion to share knowledge with others and that bloomed into the nursing education career that I am experiencing today. As I write this text, I am thinking of those who have come before me as well as those who are following behind. I am keenly aware of my place in this spectrum, and feel privileged that you, a fellow nurse educator or nursing student, would choose to read about my ideas.

This text was written for those who have no idea what the flipped classroom is but are intrigued and for those who have a good idea what the flipped classroom is and are looking for some guidance. My work with the flipped classroom has been a true adventure, full of valuable experiential learning. I tend to jump into a new idea about teaching and learning with both feet regardless of the warning signs. Okay, I admit, I didn't even look for any warning signs before I jumped

on this one. I saw such an exciting potential for this method that I just went with it. But I believe that this blind leap of faith was for a purpose. I learned so much from my experiences in flipping trial and error that helped me to form ideas about the flipped classroom and how it can be implemented specifically within nursing education. I made many mistakes that have all helped me to learn the right and not so right ways to implement the flipped classroom in nursing education. So it is my goal for you to learn from my mistakes and gain this knowledge for yourselves in an easier manner.

Once I took time to find texts and information about the flipped classroom, it was clear to me that this was *a* teaching and learning method explored primarily in the K-12 classrooms. Although there are many of us out there flipping our nursing classrooms, there are not many publications, research articles, or self-help guides to make the process an easier one. I hope you will find this text to be extremely timely and useful to your nursing education classroom and to your students. I have had the privilege to work with some pioneers of flipping who have taught me many more strategies and "secrets" of the trade so to speak. The compilation of knowledge about the flipped classroom within nursing education and the lack of higher education textbooks to help instructors attempt to flip were the impetus for this book.

Throughout my many nursing education experiences, it was not uncommon to find myself in a classroom with a lecturing instructor performing monotonous PowerPoint karaoke. Perhaps you can relate to the scene. As the lecturer discussed the finer points of acid-base balance, I attempted to furiously take notes and simultaneously listen to the lecture. Just as I would get done writing down one point, I would miss the next important point about the process that was being relayed by my instructor. I always seemed to be too busy writing to really listen. Somewhere around slide 47, I began to realize that I didn't understand one or more parts of the intricate acid-base balance that would be occurring within my soon-to-be patient's body. Instead of stopping the instructor, I allowed the lecture to continue

on with additional content building upon that which I did not understand. I didn't ask a question for fear of being identified as "that person" in the class who wasn't getting it. Sometimes I was so lost I didn't even know what question I should ask to help my confusion. Frustrated, I would go home to read and re-read the chapter or try to reach out to my peers who might be able to help me understand the content. Most of the time this was a disappointing venture, because I would soon find out that they didn't really get it either.

Because most nursing instructors have been educated through these types of lectures, it is not uncommon for them to teach the way in which they were taught. Even though I consider myself to be a fairly entertaining lecturer, I have those moments when I am watching the students in my classroom slowly fade into a coma as I attempt to dazzle them with the best of my lecturing ability. I have often wondered when my aptitude to entertain a crowd became such an integral part of my teaching regimen. I have been a nurse educator for quite some time and have talked to many fellow nurse educators. In my conversations with other nurse educators, it has been confirmed that many have had similar experiences with lecture in their own classrooms. It would be safe to say that the majority of educators might agree that even the most engaging of lecturer has noticed the occasional yawn, spaced-out face, or ever-texting student in the crowd.

It is understandable why students might lose attention during any lecture. They are, after all, human. Most of us know that the average attention span of an adult learner has been estimated at around 8 seconds, down from 12 seconds less than a decade ago (Statistic Brain Research Institute, 2015). Some experts believe that the increasing external stimulation of the human brain from various mobile devices, stimulating video games, and flashy Internet websites may be to blame for the decreased attention span of today's students. In the last 18 years that I have been in the nursing education classroom, I have noticed more and more of these types of digital devices, laptop computers, tablets, digital phones, and the like on the desks of

my students. At times I find myself wondering if these students are really paying attention to the class or busy updating their Facebook accounts.

I do remember a student several years ago shout out during class with joy as she was able to obtain tickets to the Colorado Rockies baseball playoff game. This was indeed a shocker for me as her instructor, because she had been so diligently watching the screen of her computer in what I had assumed was her concentration on the PowerPoint slides I had provided prior to class. It was not however a surprise to those around her, who had seen the other side of that screen all along. They of course shared in her joy while she interrupted my lecture and class to describe just how close she would be to the baseline. Unfortunately, this is the type of technology multitasking that students are engaged with in our classes. This student quickly explained to me that there was no disrespect to me as an instructor, but it was after all the playoffs. I did not share in her joy or accept her explanation for why she was physically but obviously not mentally present in class that day. Needless to say we had a little talk after class and she assured me it would not happen again . . . until next baseball season?

This example is just one of the many stories to describe and helps to explain how many of our students are not above "multitasking" in the classroom, which is a facade all in its own. Researchers such as Earl Miller, a Picower professor of neuroscience at Massachusetts Institute of Technology (MIT), continue to report that multitasking is a myth, regardless of the current technology that allows people to believe in the notion (Hamilton, 2008). Humans cannot do more than one task at a time, but are efficient at switching attention from one task to another very quickly. This ability fools us into thinking that we are "multitasking," when really we are splitting our attention quickly, only mentally present for seconds at a time. We may think we are doing more things and in fact may get more things completed, but are we doing things correctly or to the utmost of our ability? This is another question altogether.

How Are the Students of Today Unique?

There are some authors that do not believe that students are hindered at all by their attention span, but by the style of teaching within the classroom. They argue that students who have a difficult time sitting still or paying attention in a classroom might be the same students who can sit for hours in front of a video game or movie that they find interesting. Mark Prensky (2010) poses some important differences about students of today in his text about teaching digital natives. This group of student has learned to focus on what interests them and on things that make them feel like an individual versus part of a group. He posits that in the increasingly populated world with multiple choices at the fingertips, the need for differentiation, personalization, and individualization have become a necessity in the young people of today. If we think about the world that these students are living within, it is filled with opportunities on social media to "create" their own digital identities and footprint on the social media landscape. The term "digital branding" or "personal branding" describes how students are creating a digital identity for themselves. There are some very popular websites that were created for this type of individualization, creating a chance to show everyone else in the world who they are and what they are thinking, doing, and feeling at any given moment. This group is called *"**digital natives**."*

Palfrey and Gasser (2008) define *digital natives* as those born after 1980, when digital technologies, social media, and Web-based informational systems were already in full swing. Major aspects of the digital native's life, such as social interactions, friendships, and information gathering, are mediated by social digital technologies. The digital native has never known any other environment, but to date there has not been a generation that has lived from birth to death within the digital era (2008). By contrast, many faculty are considered "digital immigrants." *Digital immigrants* are those who remember a world before the widespread use of the home personal computers, the World Wide Web, various forms of social media, and handheld devices. Most faculty and others born before 1980, never even owned

a cell phone until the mid-1990s whereas children now as young as 5 years old are accessing handheld devices on long trips in the car with their parents thinking how blessed their children are to have that kind of technology at their fingertips. Parents are raising little digital natives who know how to run some of the Internet sites and programs better than their parents do. It is incredible that children are growing up with the ability to "google" any subject and find the answer. By contrast, digital immigrants had to dig through dusty encyclopedias that were 10 years out of date and sometimes never found the answer to their questions, even in a well-stocked library. Digital immigrants used to write letters to one another and wait weeks for a response, had only three channels of television with wavy lines through each picture, and met people at the ice cream shop, park, or at a school dance rather than finding one another on Facebook or some other digitally created society. Digital immigrants only learned to email and search the Internet when they were already nursing professionals, or at least when they were in school. And yes, some nursing professionals learned how to type on an old electric typewriter with keys and corrective fluid! Kids today don't know how lucky they are to have the delete button and spell checker on the computer. Nursing professionals have the vast knowledge about the profession that they can share with the next generation and are in a prime position to use this digital world to their advantage. But how do we go about teaching this digital native student community effectively? What do these digital natives want to see within their educational experience? Prensky (2010) has conducted almost a thousand interviews with digital native students and has found the following to be true:

1. They do not want to be lectured to.
2. They want to be respected and trusted, and to have their own opinions and have those opinions be heard, valued, and for them to count.
3. They want to follow their own interests and passions.
4. They want to create using the tools of their time (including the digital tools).

5. They want to work with their peers, share ideas, and be a part of group work and projects, but also want to prevent slackers from getting a "free ride."

6. They want to make decisions and at least share control.

7. They want to be able to connect with their peers, share their opinions not only in your class but also with the world.

8. They want to not only cooperate with one another, but also compete against each other.

9. They want an education that is not only relevant, but also real (Prensky, 2010, pp. 2–3).

Although this list seems like narcissistic expectations with which Prensky agrees, he also believes that continuing on with this as the main thought is a mistake of educators. Instead, educators need to think of these expectations as a change of the times and reflective of the fact that students want to learn differently today, because they live in a digital world. Students want to learn from educators, but they also want their education to be immediately relevant to their role within society, their profession, and the world. This forward thinking of the digital native students puts them in a global mindset that nursing educators can really take advantage of.

Even though the digital native seems to be a bit spoiled by their self-serving digital world, consider some of the additional challenges that they may be facing while in nursing school. For example, the average nursing student is more likely to be dealing with additional social and financial challenges than students in the past. The twenty-first century student obtains less sleep on average (University of Georgia, 2015) and a financial condition that may require them to be employed while in college, in some cases close to full-time employment (CBS News, 2013). Many students are returning for a degree after they begin their families as well. The added domestic tasks of the average student, coupled with sleep deprivation and the need to work while in school leaves little time for studying.

I had an interesting conversation with a group of students in the hallway one day. Being in their major medical-surgical nursing course, I asked them how they were getting through the large amount of reading that they undoubtedly had been doing. They reported that they really liked their course and felt like their professor was very knowledgeable, which did not surprise me. What did surprise me was their comment about not having to buy the textbook. Of course this piqued my interest as an instructor, because I assumed all students not only purchased the textbook, but at least attempted to read every page I had recommended for their learning. After further probing, these students reported that they had a required textbook clearly listed in the syllabus, but their instructor told them everything that they needed to know in lecture anyway, so why buy the book or read it for that matter? The students noted that they could just search on the Internet for a Web-based video on the topic instead of reading about it in the expensive, oversized required textbook. The students did not see anything abnormal about this approach at all, a stark contrast to my viewpoint. This was just their reality and current learning culture. I soon realized that *I* was the one with the outdated expectations. I had "grown up" in a different educational time than these students, and came to recognize that my expectations were coming from my past education, not the current state of our digital world. Now don't get me wrong, I still have a required textbook and plenty of required readings. But now my class is not filled with lectures where I basically tell them everything that they should have read in the textbook anyway. Instead, they are asked to do their readings and then watch a short highlights or clinical pearls video I create for them that augments their reading at home. Once they get to my classroom, they are ready to apply the information they have read and learned from their readings and the videos at home.

How Can Flipped Learning Be Effective in Nursing Education?

Nurse educators are up against some major barriers as they teach this digitally intelligent and stimulated population. Although the healthcare system and nursing in general have undergone some major

revisions, many of the educational classrooms have not followed suit. This book is about a teaching method called *flipped learning* or the *flipped classroom* that has the potential to change teaching and learning for nursing education. We can teach in a way that reflects the changing landscape of nursing education and the technologically savvy students within. Although there appears to be no "educational utopia," we do have the power as individual educators to transform our classrooms with the goal of maximizing the best learning outcomes for our over-stressed and over-stimulated students.

Remember the scenario in the acid-base balance lecture at the beginning of the chapter? Think for a moment how much different that educational interchange might have been if each student could have watched the lecture at home on their personal computer or other device prior to coming to class? Each student would have had the ability to stop and restart the video or rewind to areas that they didn't understand. Each student would have been able to take notes on what the professor had said during the video because they were able to pause the video at the specific point of misunderstanding. Imagine the potential for individual learning if each student could search for the answer to their own question as they put the lecture on hold. My students have often told me that I talk too fast in my lectures. I jokingly tell them that they need to think faster to keep up with me. But truly they have a point here. Depending on the students in the classroom, I think about 80% of them keep pace with the lecture and my pace of speech. What happens to the other 20%? Now imagine that all of the students who had a hard time keeping up with my lecture can now not only "pause" me to write things down, but could also slow my speech down to a desirable level. This idea really resonated with me, because students have the power that they need to move through the lecture material at their own pace. Those who kept pace also have the opportunity to view and review again the lecture to help solidify their understanding. If they want, they can even speed up the video to save them some time (as long as I am *nowhere* near to hear the faster more high-pitched mouse-like version of my voice in this mode!). The point is, the students have

my lecture at their fingertips and can move through it at their own pace. They can take notes at their own speed, and more importantly, take the time to write down their questions and bring them to class. In the classroom setting, each student's questions are addressed individually as part of the flipped classroom model.

Before I started to use the flipped classroom, I would use quite a bit of Socratic Method to attempt to engage the students while in lecture. Of course, I noticed that most of the time, the same 4 or 5 students answered all of my questions. So I started writing every student's on my roster down on a 3 × 5 card at the beginning of the semester. I would shuffle them at the beginning of class and then pick names randomly from the top of the "deck." I still do this within my flipped classroom because it insures that each student is getting a chance to participate in a discussion. It was when I started this method of randomization of student engagement in the classroom that I noted some glaring cultural differences in my students. Some of the cultural backgrounds of students would lend them to being more quiet and shy, while other cultures did not mind at all talking or even shouting over one another to get into the mix of the discussion. I have noticed that when using the flipped classroom, students from various cultures feel more comfortable sharing their ideas, particularly one on one and in smaller groups. Part of the classroom strategies I will discuss in this text will show more of how to engage students of varying cultures into the mainstream discussion and class activities.

So What Exactly Is Flipped Learning?

Over the past several decades, nursing educators have attempted many different and innovative teaching and learning techniques. Providing a learning environment that is more active than passive has been gaining popularity in many nursing classrooms, and in most cases the benefits to nursing students seem to outweigh the extra planning and class preparation time of the faculty. Many of these so-called "active learning" strategies, problem-based learning, cooperative learning

and the like, have changed the way nursing content is delivered in many programs and classrooms across the nation. So what is the big deal about flipped learning or the flipped classroom?

How is flipped learning any different than what is already being done within the nursing classroom? Largely the answer lies in the burst of technology over the last several years. Within this surge in technology, the ability to record lectures and provide them in easily accessible ways to students is one of the key factors in the flipped learning model. The Flipped Classroom is a term coined by two high school chemistry teachers, Jonathan Bergmann and Aaron Sams (2012). Dealing with catching students up after excused absences, these two innovators learned about "lecture capture software" that would record a lecture on the computer screen (screen capture) with the instructors talking students through slides in a compact recording. These recorded lectures were made available to the students online to view at their convenience. Seeing the potential for more meaningful interaction time with students in the classroom, they decided to "flip" the traditional homework time with the traditional in-class lecture time. In this new "flipped classroom," the students watched a recorded lecture originally delivered during the in-class time and used class time to work through problems and homework to apply that material while their teachers were present (**Figure 1-1**). The ability to use screen capture software and launch it online to a student audience made this type of teaching and learning atmosphere possible.

Along with the original definition of the flipped classroom or flipped learning already reviewed, an official definition has been developed by the experts at the Flipped Learning Network.

Flipped Learning is defined as a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides the students as they apply concepts and engage creatively in the subject matter (The Flipped Learning Network, 2014).
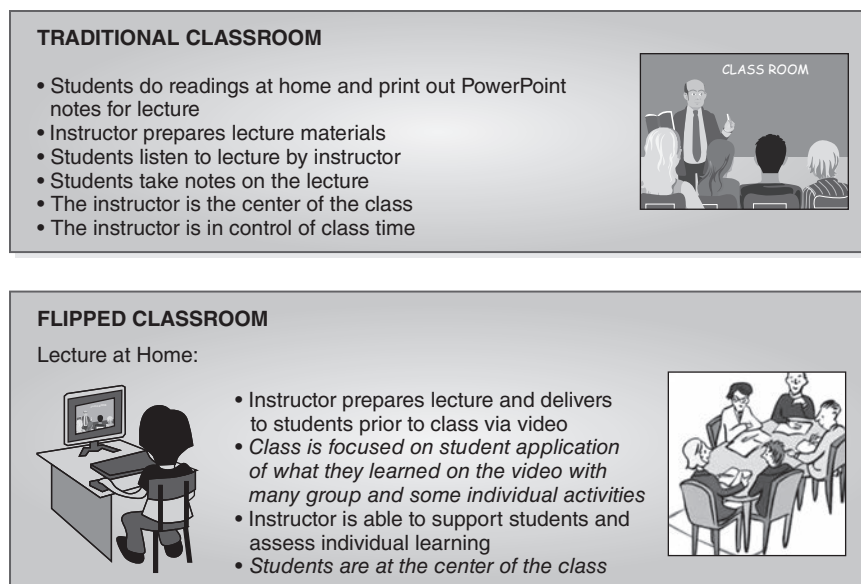
Figure 1-1 What does it look like?

Notice that the definition does not mention anything about video capture of lectures. The main idea behind the flipped learning model is to *maximize the time the students and faculty have during the face-to-face* time in the classroom. The flipped model is not about delivering course content online only, students working without any structure, working in isolation or spending their entire class time at a computer screen. The flipped model is an opportunity for increased contact time between faculty and students engaging the application of course content rather than lecture format where material is delivered to students by the instructor. The model requires that students take responsibility for their own learning in a classroom learning environment that involves application of rote information and engagement of each and every student in the classroom. This class description fits perfectly with nursing education due to the need for students to be able to critically think through patient symptoms and interventions within short periods of time. Please see **Table 1-1** for a comparison of the flipped model and traditional lecture teaching methods.

Table 1-1 Comparison of Traditional and Flipped Classrooms

	Traditional Classroom	**Flipped Classroom**
Definition	Traditional teaching is concerned with the teacher being the controller of the learning environment. Power and responsibility are held by the teacher and teachers play the role of instructor (in the form of lectures) and decision maker. They regard students as having "knowledge holes" that need to be filled with information. In short, the traditional teacher views that it is the teacher that causes learning to occur.	Flipped learning is defined as a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides the students as they apply concepts and engage creatively in the subject matter.
Context	The instructor provides a lecture, perhaps intertwined with Socratic method type questioning, providing a "sage on the stage" atmosphere. The instructor is the main conduit of knowledge delivering content to the students.	The instructor's lecture is captured with technology and provided to the students prior to class. In class the instructor becomes the "guide on the side," helping the students with common questions and application of the materials.
Philosophy	The instructor causes learning to occur in the form of lecture and audiovisuals.	The students learn by active methods and application.
Tools	PowerPoints with slides of material to cover, notes for students to follow, perhaps use of video	Lecture capture loaded on Web or learning management system, high-speed Internet access, tools for engaging learning activities during classroom time allowed
Assignments	Readings, reviewing notes of lecture slides	Readings and viewing lectures prior to class Assignments vary depending on methods used in classroom and methods of evaluation employed.

(*Continues*)

Table 1-1 Comparison of Traditional and Flipped Classrooms (Continued)

	Traditional Classroom	**Flipped Classroom**
Advantages	Instructor able to deliver content that is important and necessary to cover during classroom time. Students are used to this type of educational environment for the most part. Easy to lecture and deliver information to students.	Allows students to be more engaged in their own learning. Allows for different learning styles and cultures to be accommodated. Forces students to be engaged and active learners in the classroom. Allows for the instructor to answer questions and correct errors in thinking that may go unnoticed in a traditional classroom. Ability to use technology that digital students are comfortable with. Uses time effectively for full content delivery.
Limitations	Puts learner in an inactive role. Time limitations to provide active learning activities.	Requires an understanding of technology and how to use. Students resistant to method at first. Faculty need to spend more time to prepare when lecture materials may be already done.
Challenges	May not actively engage learners. Allows students to be passive in the teaching/learning environment.	Difficult to change culture of learning once already established. Technology can be difficult to use and does not always work the way it should. Takes a significant amount of preparation time.

Although the term and associated concepts of the "flipped class-room" are new, the active teaching and learning are not. It is not uncommon for nursing faculty to provide a teaching/learning environment that requires the student to actively learn the material and apply it to real-life scenarios. Some other terms that have been used to describe an active or more student-engaged learning environment

include blended learning, collaborative learning, and active learning. When viewed through the lens of the educator who has been involved in this type of classroom for years, the flipped classroom model may appear to be an old strategy with a new name. However, those who have done in-depth reading and research on the flipped classroom recognize several key differences inherent in the model. One possible reason for the excitement attached to the term "flipped classroom" comes from the addition of technological advances to the application of the teaching/learning process. In a way, the educator can have their cake and eat it too.

One of the main barriers to providing a more active learning environment for many educators has been the increasing amount of material that needs to be covered coupled with the shrinking amount of face-to-face time with the students in the classroom. There never seems to be enough time in a 2- or 3-hour class period to both deliver a lecture about important concepts and also engage students in active learning. I have always invited students to ask questions in the classroom during lectures, but have found that doing so at times took time away from the other students' learning atmosphere who had different questions. Similarly, those who understood everything were left idle during the time it took to explain the concept and answer an individual student question. As you know, this is just an open invitation for students to disengage and move on to other tasks, particularly with digital devices in the classroom, happy to assist with their "mind vacation."

With the flipped model, I have found time to address individual questions from my students with a small group instruction design. As an instructor, I am able to get to every student's questions about the material that they have he or she has viewed ahead of time in the pre-class video. In a way, this allows the "mastery" learning that Bergmann and Sams (2012) have discussed in their flipped learning publications. Although in nursing we tend to keep every student on the same subject for each class, I have found that with the flipped model, I am able to address individual learning needs and allow

students to move on with other content once they have mastered the objectives of the unit. Of course, the mastery model takes quite a bit of preparation on my part as the instructor, but it is not as bad as one might think. I simply plan for those students who are grasping concepts more easily to move on to more complex issues. I have done this by preparing several case studies of increasing difficulty. I will admit I am new at the mastery model, but I am finding that it does allow more accommodation for different learning paces that we often see in a group of students within the classroom.

How Can I Flip My Hybrid Course?

We have discussed what the flipped classroom looks like in the typically face-to-face classroom we are accustomed to, but what about other forms of course delivery? Hybrid course delivery is defined differently by each institution, but a general definition includes blending some in-class time with online class time. What differs per institution is the amount of the course that should be online within a hybrid, versus totally online, versus totally in-class time frame. Most universities allow for somewhere around 20% of a face-to-face to be online, but around 40% to 50% of the course within a hybrid course, and of course an online course is in most cases 100% online. Some individual definitions from specific universities may be helpful, for these see **Table 1-2**.

Conducting the flipped model in the blended or hybrid format should make quite a bit of sense. Instructional designers are experts at developing a course and its related objectives around any type of format. It would be my first suggestion to take advantage of any of these experts that may be available to you in your area. Their expertise can help you in planning your hybrid course and implementing the flipped model within. In general, the online portion of the course lends itself well to implementation of the video lecture material. Along with the assignment of the video lecture, it would be my advice to assign some sort of evaluation method to accompany the video lecture. The easiest of these assignments or learning assessments, in my opinion, is an online quiz. There are some faculty who

Table 1-2 Definitions of Hybrid Course Format

Oregon State University (OSU)	"A hybrid course blends online components and required face-to-face class meetings. A substantial portion of the learning activities are delivered online . . . face-to-face meeting time is reduced by 40% compared to traditional on-campus course" OSU (2015).
The George Washington University	"A hybrid approach to education (also known as 'blended'), whether in a single course or threaded throughout a program, balances face-to-face and online environments. A course is generally considered hybrid when the percentage of work done online is between 30–70%" (The George Washington University, 2015).
Northern Virginia Community College (NOVA)	"Typically, your hybrid course will meet 50 percent of the time in the classroom and 50 percent online" (NOVA, 2015).
West LA College	"A hybrid class combines classroom learning with online learning. In a hybrid course, a significant portion of the class learning activities are online, which reduces the amount of time spent in a traditional, face-to-face classroom" (West LA College, 2015).

are adamant about not providing online quizzes, knowing that the students will use resources and not be observed by faculty. Of course, this provides a perfect environment for cheating. I used to share this viewpoint as well. But now I have come to realize that if students are accessing their resources, they are just emulating the same type of activity I want them to as practicing nurses. I want them to be able to understand what resources to use and how to access them. To that end, part of the learning assessment in an open-book, open-note online quiz is finding the correct resources in a reasonable amount of time, and applying that information to find out the answer to a question. This is not unlike the fast-paced clinical environment the students will be working in as nursing professionals.

Other online learning assessments to assign in the online portion of a hybrid course might be assignment sheets directly related to the video lectures, group discussions, small group, and other assignments that involve engagement with additional resources or the community.

For example, in a hybrid community health course, one might have a unit about community resources that stretches over both online and in class-time periods. Depending on the type of objectives written for this section, it would be helpful to do a lecture video on community resources, and the importance of a nurse understanding community resources for referral to serve a variety of patient populations. Split the class into small groups, each with a different assignment related to community resources. For example, one group would be assigned resources related to poverty, another would be assigned resources for the psychiatric population, another group would look at resources for women, another for children, another for the elderly, another for the immigrant population, and so on. For the online portion of the course, the student would watch the lecture video and then have an assignment related to seeking out the resources for their assigned group. Of course, a formal set of goals or objectives for the assignment and a rubric to help guide students in the assignment would be helpful. I always try to put in the assignment some kind of engagement with the community resource, like a short interview with a central employee at one of the resources the student has found. Most community agencies are very willing to help with these types of assignments, particularly when I contact them ahead of time and let them know that the students may be requesting a few minutes of their time.

When the class meets for face-to-face time, each student will be asked to bring their assignment and share the community resources they learned about. Let's say that there were 36 students in the class and 6 groups of 6 students looked at similar resources. A jigsaw is a helpful in-class teaching/learning strategy in which one student from each group is reassigned into a group that contains one student from each of the other groups. The newly formed groups, each with a student that reviewed and accessed different community resources, is assigned the task of creating a "community resource guide" that can be then be distributed to the rest of the class. The jigsaw is one of my favorite activities, but it is difficult to explain in narrative form. For more on this type of interactive teaching/learning method, please see the In-Class Activities chapter.

How Can I Flip My Online Course?

The online course environment is not directly conducive to the flipped learning model, because the flipped classroom as it is defined is focused on maximizing the face-to-face time between faculty member and student. Online courses do not typically have any face-to-face time with the instructor, so this produces a bit of a challenge. There are some instructors that are using a modified version of flipping within the online environment. The video lecture material is delivered in the same way as in the traditional flipped or hybrid formats. The instructor sets up "virtual office hours" 2 or 3 times a week. During these office hours, the instructor opens some type of digital, virtual classroom environment where the students are encouraged to access the instructor, ask questions, and complete other assignments. Within most learning management systems, there is an online video chat available. To really make this type of online classroom flipped, the students need to commit to one of the times available in order to engage with the faculty member as part of their coursework. Many students choose online courses due to their asynchronous nature and freedom from any specified class times they need to be present during the course. Requiring any face-to-face time in a course designed and advertised in the course catalogue as totally online may cause some problems regarding student expectations of the course. If this type of flipping online format would be used, it would be highly recommended that it is listed as such within the course syllabus and course catalogue, and that students receive some sort of percentage of their course grade for being "virtually present" in these predetermined class times.

Flipped Learning—Can It Address the Current Challenges of Nursing Education?

It is probably obvious to even the most novice of nurse educators that prelicensure nursing curricula are bulging at the seams with content that needs to be covered for basic entry into practice knowledge. The American Association of Colleges of Nursing (AACN) Essentials

for Nursing Education have provided curricular suggestions for undergraduate and graduate programs of nursing for decades. These essentials for college and university education for professional nursing were first published in 1986, with revisions in 1998 and 2008 (AACN, 2015). Each revision has provided more detailed and complex content for nursing curricula to cover at both the graduate and undergraduate levels. With so many topics and multifaceted issues for nurses to learn on top of the crucial skill performance in clinical settings, it is becoming more and more difficult for nurse educators to meet the essentials set forth by the AACN for nursing education. This text suggests that nurse educators take advantage of the stair-step learning opportunities of Bloom's taxonomy (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956) to help with this dilemma.

What's Bloom's Got to Do With It?

Most, if not all, educators are familiar with Bloom's taxonomy. The taxonomy is a classification system of the different objectives that educators set for student learning within a course or program. So where did Bloom's taxonomy come from? The idea of a classification system for student learning was formed at an informal meeting of college professors attending an American Psychology Association Convention in Boston in 1948. This group of experts lead by Benjamin Bloom, an American educational psychologist from the University of Chicago, was interested in a theoretical framework that could be used to facilitate communication among examiners and promote the exchange of test materials and ideas about testing. It was also thought that such a framework could stimulate research examining the relationship between exams and education. The discussion led to a realization that a system classifying the goals of the educational process would be the natural basis for the framework as they are used to build curricula and shape the associated student outcome assessments (Bloom et al., 1956). The committee met yearly and developed the first iteration of what is known as Bloom's taxonomy. Within the original taxonomy were three domains: cognitive, affective, and psychomotor. In the 1990s a former student of

Bloom's, Lorin Anderson, led a new group of cognitive psychologists in the updating of the original taxonomy.

Bloom's taxonomy assumes that within the three domains of cognitive, affective, and psychomotor, learning at higher levels is dependent on having obtained prerequisite knowledge and skills at lower levels. The photo depiction (**Figure 1-2**) of the original taxonomy indicates that students must master content first by remembering, then by understanding, followed by applying that information, and then finally being able to use that information for analysis, evaluation, and creation of new knowledge.

It could be argued that using only lecture during the face-to-face time available in the nursing education classroom engages the student at the lowest level of Bloom's taxonomy. What if we could engage the student with lecture material at these lower levels of the
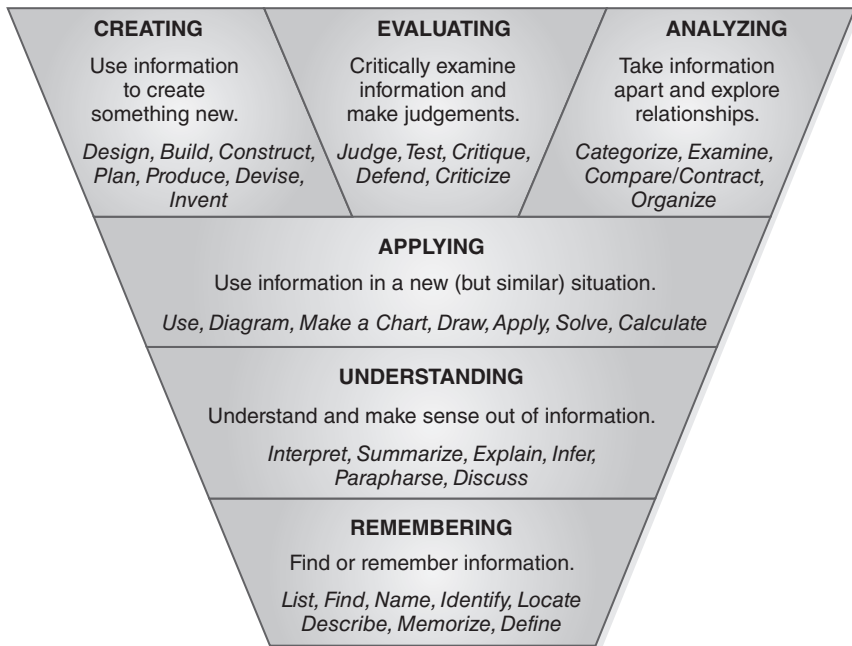
CREATING
Use information to create something new.
Design, Build, Construct, Plan, Produce, Devise, Invent

EVALUATING
Critically examine information and make judgements.
Judge, Test, Critique, Defend, Criticize

ANALYZING
Take information apart and explore relationships.
Categorize, Examine, Compare/Contract, Organize

APPLYING
Use information in a new (but similar) situation.
Use, Diagram, Make a Chart, Draw, Apply, Solve, Calculate

UNDERSTANDING
Understand and make sense out of information.
Interpret, Summarize, Explain, Infer, Parapharse, Discuss

REMEMBERING
Find or remember information.
List, Find, Name, Identify, Locate Describe, Memorize, Define

Figure 1-2 Bloom's taxonomy.

taxonomy prior to them coming to our face-to-face classroom? How much farther could we move up the Bloom's taxonomy ladder if we had students apply their knowledge and understanding of content with the instructor there to help them do so? Would it be possible to then teach at a higher level of the taxonomy every time we have face-to-face classes? It seems that this would be entirely possible and not only that, very feasible. By providing any rote memorization and lower levels of remembering and understanding through lectures at home prior to coming to face-to-face classes, students would be ready to apply the material and move toward analysis and the critical thinking realm that educators desire of their students.

In the flipped classroom model, the educator is still able to provide a lecture that is recorded and provided to the student online. When the students come to class (in the best-case scenario), they have already heard the lecture that the educator would have normally delivered in the face-to-face classroom. The preview of lecture material opens up the scheduled classroom time for more engaging teaching/learning activities with the nurse educator as the guide on the side. The time spent on lecture-type material is replaced with time to help each student or group of students apply the material, ask questions about how the concepts can be applied to a patient case scenario, and provide a more active way to learn.

Flipping the Classroom in Light of the IOM Report and Benner's Latest Work

In the most recent Institute of Medicine (IOM, 2011) report on the future of nursing and nursing education, nursing education and practice experts from across the nation gathered their expertise to address the most important issues in the profession to date. The experts published suggestions on "how to teach" nurses include guiding students in the integration of knowledge from the clinical, social, and behavioral sciences with the practice of nursing in order to enhance development of critical thinking skills. Also included in

the recommendations was development of a curriculum that supported best practices in teaching and learning.

The most recent text by Finkelman and Kenner (2012) focused on how nurse educators should implement the IOM recommendations to prepare the next generation of nurses. Within the main summary points from the February 2010 Forum on *The Future of Nursing Education* are many areas where use of the flipped classroom has the potential to address key issues found within our existing educational system. **Table 1-3** provides a few of these content items along with how the flipped classroom has the potential to address or at the very least assist with integration of the recommendations. The flipped learning model has the potential to help nurse educators implement these IOM recommendations in a meaningful way using something as simple as a new teaching and learning strategy.

Benner, Sutphen, Leonard, and Day's (2010) work echo many of the same suggestions as Finkelman and Kenner (2012) on how to transform nursing education. Benner and colleagues' work with the Carnegie Foundation for the Advancement of Teaching culminated in a national study focusing on nursing education and a text titled, *Educating Nurses: A Call for Radical Transformation.* The goal of the study the book was founded upon was to understand how nurse educators were preparing students to enter the profession. This work is just phenomenal, and provides a framework for change within the way we educate nurses. These authors posit that "a significant gap exists between today's nursing practice and the education for that practice, despite some considerable strengths in nursing education" (2010, p. 4). Adding more and more to each curriculum will not be sufficient, because the quality of what and how we teach must be at a higher level to meet the challenges of the changing healthcare landscape of the nation. Even if there were no nursing shortage and no shortage of nursing faculty, nursing education would still be in need of dramatic change to meet the demands of current nursing practice (2010).

Table 1-3 IOM Forum on the Future of Nursing Education and Flipped Learning

The Future of Nursing Recommendation	How Can Flipped Learning Address the Recommendation?
"The new basics in nursing education include collaboration within the profession and across other health professions, communication, and systems thinking" (Finkelman & Kenner, 2012, p. 37).	Several of the in-class activities students will engage in within the flipped model can help foster communication and systems thinking. Although this is not different than other collaborative learning styles of learning, it does provide more time for these types of activities.
Nurses, particularly nurse educators, need to keep up with a rapidly changing knowledge base and new technologies throughout their careers to ensure a well-educated workforce.	The key term in this recommendation is new technology. If we can master the current technology and help our students to do the same (or maybe vise versa), flipped learning will augment knowledge base about how to adapt to new technologies of a similar nature.
Technology that fosters problem-solving and critical thinking skills in nurses is essential for nursing education to produce sufficient numbers of competent, well-educated nurses.	Even though this recommendation is focused somewhat on high-fidelity simulation, it also speaks to the need for more problem-solving and critical thinking skills. Within the flipped classroom, students engage at a higher level of learning taxonomy and are able to work on critical thinking and problemsolving both individually and in groups. These environments foster not only knowledge building, but also a safe environment where there exists not only time for questions related to content, the class is structured around remaining questions and finding those answers.
In addition to necessary skill sets, nursing education should provide students with the ability to mature as professionals and to continue learning throughout their careers.	One aspect of flipped learning that I am excited about, is the potential to create a "spirit of inquiry" for each and every student in the classroom. In the evidence-based world we now live within in nursing, we no longer just listen to someone tell us what we need to know. Instead, we are knowledge seekers. We go out and find what we need to know to safely care for our patients at the highest levels of quality. If we can teach our students to do this every day or every week in the classroom and the clinical settings, we could come a long way in the development of a generation of life-long learners.

Benner et al. (2010) have discussed the "theory" portion of the nursing classroom, which is referred to by the authors as "a range of substantive knowledge about nursing care, nursing theory, nursing science, biology, chemistry, and physics, and medical interventions that nurses need to master" (p. 13). During their research, the authors observed several nursing education classrooms and clinical learning experiences. While observing the "theory" classrooms (what others may consider didactic) they describe a learning environment in sharp contrast to the skillful and effective teaching approaches witnessed within clinical settings. First of all, the material was typically presented in a highly abstract way, with lectures that appeared to be standardized and delivered through slide presentations. The students were presented information about the physiology, disease categories, signs and symptoms, interventions, and outcomes to be memorized. The "presentation" word seems to stick out within this scenario. It was the authors' observation, one that was reinforced by faculty and students, that widespread reliance on slide presentation and standardized lectures was the norm within the classroom time provided. I love the scene these authors set—may I share it with you?

In our site visits we saw many classes begin with students opening their notebooks to an outline of the lecture and ending with the teacher at the front of the room having shown the last of dozens of slides. As the teacher glided from slide to slide, the students made notes in the margins of their course outlines, collectively turning their pages at every sixth slide. Discussion was cursory and some faculty even limited questions, not wanting to be pulled too far from the slide presentation (Benner et al., 2010, p. 13).

Although this way of teaching may seem tempting as a way to compress the bigger and bigger curriculum topics into the time allotted within the classroom, it is actually defies the way in which we learn. It also discourages the type of learning or environment that fosters the way a nurse must use knowledge as they think in ever-changing clinical situations, a necessary skill for successful nursing practice. Nursing is a practice discipline that relies on situation cognition and actions (Benner et al., 2010). If teaching occurs as in the

scenario of lecture above, students are learning about patient care in segmented chunks. My colleague, Katherine (Kat) Johnson, and I came to this realization within one of the family nurse practitioner (FNP) courses we taught together. We were using lecture as our main teaching strategy, with a little bit of Socratic method thrown in to keep everyone awake and alert (including ourselves). We were looking over one of the student exams together and began to realize that we were testing them using patient care scenarios. So really we were leaving a large portion of our job as educators up to the students to grapple with on their own time and without any guidance and/or assistance from us as their instructors. The proverbial light came on for us at that moment. We realized that we were not providing them the practice and application of the material in order for them to be successful on their exams and in the clinical settings. We were teaching them silos of information in class, and then expecting them to somehow miraculously put it all together expertly within a simulated clinical situation on their exams.

Similarly, Benner et al. (2010) found in their study what they described as "a tenacious assumption that the student learns abstract information and then *applies* that information in practice" (p. 14). They've suggested that learning complex and evolving information to apply in the high-stakes environment of nursing practice calls for "an ongoing dialogue between information and practice, between the particular and the general, so that students build an evidence base for care and thus learn to make decisions about appropriate interventions for the particular patient" (p. 14). If the students can build this knowledge base to apply to any patient care situation, they have come a long way in the journey of recognizing the critical, most urgent aspects of each individual patient they care for.

We can apply what we've learned from Benner's (2001) Novice to Expert work and from our knowledge of Cognitive Load Theory to our teaching within the classroom. Both theories focus on the fact that for learning to occur, the human brain must be able to practice, practice, and practice again. I am sure Benner is aware, but the

cognitive load theory fits very nicely with her work in applying the Dreyfus model of skill acquisition to the nursing profession. The more practice and exposure students have to different types of scenarios using the same basic information, the more expert their brain becomes at storing information into the long-term memory. That information can then be quickly recalled to short-term memory whenever it is needed. In the nursing education classroom, it is not uncommon for us to "present" a large amount of information using lectures and expect each student to absorb, understand, analyze, and then apply it to clinical situations. I think it is worth the time to take a closer look at Cognitive Load Theory.

Cognitive Load Theory (CLT) was first discussed by John Swellar and colleagues, who suggested that learning occurred best in an environment that appreciates the student's existing human cognitive architecture (Swellar, van Merrienboer, & Paas, 1998). The theory can be applied to how we design the way in which we teach students in complex and technically challenging professions such as nursing. According to CLT, instructors must have a solid understanding of how students are processing and storing data in the brain during any pedagogical event. Memory consists of both short-term and long-term memory (Atkinson & Shiffrin, 1968). According to CLT, learning occurs when there is accumulation of knowledge and addition to information within the long-term memory (Swellar et al., 1998). When a student begins to process new information, he/she does so first within the short-term memory, which contains sensory and working memory. Sensory memory is limited to about 20 seconds of attention capacity and allows for filtering of pieces of information as either relevant or non-relevant (Atkinson & Shiffrin, 1968).

Once the sensory memory has processed any new information, the student brain begins to analyze these elements within the working memory (Swellar et al., 1998). Working memory load can be described as the mental effort necessary to accomplish a task or tasks. Historical research on how the brain processes and stores information has shown that working memory can process about seven data

elements, plus or minus two, at one time (Miller, 1956). An example in the area of nursing education might be learning how to complete a physical assessment of the cardiac system. Students must apply previous knowledge about the cardiac system that they have learned in their anatomy and physiology (A & P) course and combine it with the newly presented material about the inspection, palpation, percussion, and auscultation needed to learn how to assess the cardiac system. Remember that the student's brain can only process about seven data elements at one time. Clearly there are more than seven data elements to process in the provided example. We are also assuming that students are easily and readily recalling information learned within their cardiac A & P, pathophysiology, and medical terminology courses. The number of elements working memory can process will decrease by about half that if the student is required to analyze, connect, or critically think about the elements rather than just retain them (Cowin, 2001). Using the cardiac assessment example, the student may be asked to connect and critically think about too many things at one time for real learning to occur. Understanding the concept of brain architecture, we as educators can begin to appreciate that "working memory is a paradoxical resource, because it's both the bottleneck and the engine of learning" (Clark & Lyons, 2008, p. 86).

Here is the good news: unlike short-term memory, long-term memory is unlimited in its capacity (Vogel-Walcutt, Gebrim, Bowers, Carper, & Nicholson, 2011). According to CLT theorists, construction of schema can help students to store data into their long-term memories. *Schemas* are models or hypothetical structures that can assist a student in organizing knowledge about the world in which they live (Errey, Ginns, & Pitts, 2006). *Schema construction* promotes storage of information into the long-term memory and can help students not only learn, but also retain what they are taught.

Let's look at an example of a schema. When I teach about cardiac examination, I have the students envision the plumbing of the house. Sometimes I even have them draw on a piece of paper to the best of their ability, the plumbing of a house on a blank sheet of

paper. Somewhere within the center of the house, they draw a heart from which all this plumbing originates. When we begin to discuss congestive heart failure, we look at where the "plumbing" is backing up in the "house." When students see how the cardiac system is the same as something they are already familiar with, they can scaffold that information onto preexisting knowledge. This is schema formation. When the student is able to connect something from their long-term memory with newly acquired information, they can store the new information in their brains more easily, and learning and retention of that information occurs at a more rapid pace. This provides just one example of how "chunking" information into a schema can assist with understanding, learning, and retention of any new material. Many times the student will not have a schema on which to scaffold newly acquired knowledge. In this case, a new schema must be developed within the working memory. It makes sense that this will require an increase in mental effort or cognitive load. Within CLT this mental effort is referred to as the germane cognitive load (Swellar et al., 1998).

If we think about these concepts of CLT as we are designing how we will teach, we have to understand that working memory load is affected by two main factors. The first is how complex the material to be learned is (intrinsic cognitive load) and the second is the manner in which we as the instructor teach that material (extraneous cognitive load) (Swellar et al., 1998). These cognitive load principles must be added together to measure the student's cognitive load for learning the material. For example, if the intrinsic nature of the material is low, like memorizing five medical technology terms, extraneous cognitive load can be high without having much effect on student learning. To put it another way, if there isn't much to learn in the first place, or what needs to be learned is simple, we can be really ineffective at teaching the material, and the students will still be able to learn. However, if the student is asked to group these five medical terms together to describe how a disease process occurs and what nursing interventions they should apply, the intrinsic load of the material is increased. If we are not very effective at teaching

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this kind of complex material to our students (extraneous load), the additive effect of high intrinsic (content) and high extraneous load (teaching) may be too much for student learning to occur.

Unfortunately, the intrinsic cognitive load can't be changed, because it is a result of the type of material being delivered. I would consider most if not all of the material we teach nursing students to have a high or fairly high level of intrinsic load. Here is the good news! Nurse educators have the power to lower extraneous cognitive load for our students and decrease the overall effort it takes for learning to occur. If we engage the students using innovative instructional design, students have the potential to learn complex concepts more easily and be able to retain those concepts for further recall in subsequent nursing coursework much more easily. Thinking about the application of CLT, Benner's Novice to Expert, and Bloom's taxonomy in light of the prospects of the flipped classroom model, we as educators can greatly affect the way in which our students learn within our classrooms. I think that is very exciting news for the nursing education flipped classroom! (The concepts of cognitive load theory described here are only a small part of the overall theory. For more in-depth information, the reader is encouraged to access van Merrienboer and Swellar, [2010].)

So what are Benner and colleagues' ideas for a new vision for nursing education? Well, these authors, also educators themselves, understand that pressure to address the packed nursing curricula we discussed earlier. They believe that this pressure has almost forced nurse educators into "widespread reliance on, as one educator called it, 'canned PowerPoint teaching'" (2010, p. 8). They also note that "where the clinical and classroom instruction are not integrated or coordinated, students report a fragmented experience" (p. 12). A fragmentation within their learning environment can lead students to a superficial understanding and can alter their ability to make perceptive clinical judgments in a variety of patient care situations (2010). Consequently, it can also increase the overall cognitive load and negatively affect learning ability. In short, the way we have

been educating in the past, not connecting the students' classroom time to real-life clinical knowledge, can stunt their ability to develop critical thinking skills for their future practice. I don't know about you, but this really bothers me as an educator. I can also see Benner and colleagues' point when I look back over my nursing education. I often would learn about a topic in lecture, but not see a patient with that condition, or have to apply my knowledge to any kind of clinical picture until much later in an experiential, clinical learning environment. I remember having to re-learn much of the information needed for care of the patient when the opportunity did arise.

Now I understand that some of the timing just cannot be helped. We can never guarantee that our student will have a patient with myocardial infarction (MI) the same week that we teach on that content. But we could set up our classroom to require each and every student to apply their knowledge about care of an MI patient within the classroom and move them up the Bloom's taxonomy ladder. In this way, we have a real advantage to be able to help students in a virtually created clinical world right there in our classroom. We don't need a high-fidelity simulator for this classroom experience, although we can add that later on. We can be there with the students, walking them through how to apply their knowledge and think about nursing care, at the bachelor's master's or doctoral level, with the instructor there to guide their thinking.

How is this different than any other interactive or group-based learning? Well, it isn't at first glance. But with the flipped classroom, we have the ability to provide some homework prior to class within the video lecture. When the students come to the classroom, they can then apply that lecture material and any of their assigned readings to get into the heart of the matter, the care of the MI patient. As mentioned previously, this is a great way for us to have our lecture and interactive learning, too. I for one was not ready to let go of my lecture and what I still consider to be a big part of my job in *exchange* for active learning in the classroom. I think we would all agree that trying to apply something we don't understand just leads

to frustration and a defeated attitude. What we can do is keep that lecture-type teaching that we've come to revere and give it to the students online where they can use it at their own pace. Then when we have time with them in class, we can be more involved in helping them deepen their understanding and move on to application of rote information in a more active and experiential learning process. I think no one can state it better than Bergmann and Sams, "Flipped learning, at its core, is individualized learning" (2014, p. 7). As Benner and colleagues (2010) say, "classroom teachers must step out from behind the screen full of slides and engage students in clinic-like learning experiences that ask them to learn to use knowledge and practice thinking in changing situations, always for the good of the patient" (p. 14). I hope you are intrigued and ready to learn more about how to implement the flipped learning model into your nursing education classroom.

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