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# Does an Online Computer Based Critical Care Orientation Program Support the Learning Needs of a Multigenerational Workforce?

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DOES AN ONLINE COMPUTER BASED CRITICAL CARE ORIENTATION PROGRAM SUPPORT  
THE LEARNING NEEDS OF A MULTIGENERATIONAL WORKFORCE?

A Major Paper Presented

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## DOES AN ONLINE COMPUTER BASED PROGRAM

### Abstract

The complexities of today's health care system challenge acute care hospitals to provide comprehensive nursing orientation programs while meeting the needs of a multigenerational workforce. To prepare nurses to provide the highest quality of care for patients, nursing orientation must provide updated content, be cost effective, time-sensitive and comprehensive, stimulate critical thinking skills, and include relevant evidence-based knowledge. Although a comprehensive nursing orientation is essential to every area of practice, specialties, such as critical care nursing, require specialized knowledge and additional skill sets that necessitate a more comprehensive training program while being sensitive to the needs of a multigenerational workforce. These considerations produce additional challenges for hospital orientation programs when considering the lack of available educators, projected nursing shortage, limited resources to accommodate multiple learning styles, and the current influence of healthcare economics. In an attempt to address orientation challenges, organizations such as the American Association of Critical Care Nurses (AACN) have developed online programs. The purpose of this paper is to evaluate one such program, the AACN Essentials of Critical Care Orientation (ECCO) program. ECCO was evaluated to determine if this online computer based orientation program would support the learning needs of multigenerational critical care nurses. Twenty-one nurses representing four generations of nurses from 11 hospitals in the United States completed an 18 question survey. Although the survey results supported the ECCO

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program as a useful tool for critical care orientation, the results indicated additional educational methodologies are needed to meet generational learning needs.



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Does an Online Computer-Based Critical care Orientation Program Support the Learning  
Needs of a Multigenerational Workforce?

**Problem Statement**

The complexities of today's health care system include many challenges for nursing. Hospital-based nurses are expected to function and use critical reasoning while under pressure. This becomes increasingly difficult in an environment where the acuity of patients changes from one moment to another (Curran-Smith & Best, 2004; Gerkin, Taylor, & Weatherby, 2009). Maintaining the knowledge and skills to provide safe patient care is especially significant today because there are four generations of nurses working together, with each generation having its own unique talents and learning styles (Palumbo, McIntosh, Rambur, & Naud, 2009). These diverse generational styles can influence the learner's expectations and performance and may result in the need for educators to revise teaching methodology (Gabbert, 2008).

The U.S. Department of Health and Human Services Administration (USDHHS, 2002) projected a shortage of one million Registered Nurses (RNs) by the year 2020. The lack of experienced registered nurses has necessitated the hiring of graduate nurses into critical care settings, thus requiring additional or alternative educational considerations (Cato & Murray, 2010; Lavoie-Tremblay, Leclerc, Marchionni, & Drevniok, 2010; Morris, Pfeifer, Catalano, Fortney, & Hilton, 2007). Collectively, these factors increase the need for more comprehensive orientation programs that will address individual learning styles. If successful, the results should be evident, with more

competent practitioners, improved patient safety, and increased healthy work environments for healthcare workers (Thomason, 2006).

The purpose of this paper is to address the following question: Does the AACN Essentials of Critical Care Orientation 2.0 (ECCO) program support the learning needs of today's multi-generational critical care nurses?

### **Literature Review**

A comprehensive review using PubMed, CINAHL and Cochrane Database (2002-2010) was performed using the following keywords: nursing orientation; nursing education; critical care orientation; characteristics and generations; learning theories; ECCO program; on-line education; generations/learning; and technology and orientation.

### **The Current State of Acute Care Hospitals in the US**

Today's proposed healthcare reforms are directed at expanding healthcare access to more Americans. These reforms will impact hospitals' abilities to optimize the care they provide while meeting the additional requirements directed at providing quality health care and improved safety for patients (American Hospital Association [AHA], 2010). The expansion of health care will result in a projected 18% increase in the patient population greater than 65 years old (USDHHS, 2002). This projected population increase, along with the expected advancements in medical technology, will add to increased patient acuity (Cleary, 2010; Paterson, 2010; Robert Wood Johnson Foundation, 2009) and subsequently require additional nurses. This is especially significant for hospitals since hospitals are the major source of demand for Registered Nurses (RNs) (USDHHS, 2002). In 2004, 56.2% of working nurses practiced in acute care hospitals (Siela, Twibell, & Keller, 2009). These projected changes in health care and increased demand for nurses present a number of challenges for nurses working in acute care hospitals.



**Demands for nursing care.** Health care reform will present many challenges for nurses (Cleary, 2010). Challenges that occur in the acute care setting will be influenced by the projected nursing shortages. Although we are experiencing a shortage today, by the year 2020, the future projected shortage of RNs in the US is in the millions (Chestnutt & Everhart 2007; USDHHS, 2002). Increased patient acuity necessitates that nurses stay current with evidence-based knowledge and are provided with the skill sets required to be clinically competent. This knowledge must also incorporate new skill sets appropriate to meet ongoing technological advances. Agencies concerned with improving health care, such as the Robert Wood Johnson Foundation, support and acknowledge the use of technology and believe that technology will ultimately make it easier for nurses to provide direct patient care (Hatcher et al., 2006). These challenges, including the nursing shortage, increased patient acuity, and increased medical technology, prompt additional considerations that are relevant to the educational preparation and ongoing educational needs of nurses (Gerkin et al., 2009).

**Critical care challenges.** The projected shortage of nurses, increase in patient acuity, and increased medical technology present additional challenges for critical care nurses because of the need for specialized knowledge and additional skill sets required for this population of patients (Chesnutt & Everhart, 2007; Thomason, 2006). The nationwide shortage of hospital-based nurses will necessitate the utilization of less experienced nurses in the critical care areas (Chesnutt & Everhart, 2007). In the past, graduate nurses were seldom hired into a critical care area without at least one year of



medical surgical experience (Morris et al., 2007). Today, critical care areas must hire both experienced and non-experience nurses (Thomason, 2006). This mix represents nurses of different generations who share differences in prior experiences, behaviors, learning needs, and who have diverse expectations of the workforce and different values and beliefs (Weingarten, 2009). These generational differences reinforce the need for institutions to find innovative ways to prepare these nurses with the skills and knowledge required to provide safe patient care (Clausing, Kurtz, Predeville, &Walt 2003; Curran-Smith & Best 2004; Paterson, 2010; Thomason, 2006; Wieck, Dois, & Northam, 2009).

### **Multigenerational Considerations**

Today's workforce includes four generations of nurses spanning more than 22 years (Paterson, 2010). Generations have characteristics and values that are consistent with their generational era, which in turn influence the way they learn (Clausing et al., 2003; Cordeniz, 2002; Gleeson, 2007; Lavoie-Tremblay et al., 2010; Palumbo et al., 2009; Walker et al., 2006; Weingarten, 2009). These four generations include Veterans, Boomers, Generation X and Millennials (Generation Y).

Veterans born between 1920 and 1939, aged 68 to 89 (Paterson, 2010) are traditionalist, tend to stay in one place, are respectful of authority, value hard work and discipline (Wieck & Northam, 2009) but are slower in adapting to new technology (Lavoie-Tremblay et al., 2010). Learning preferences for this generation include typical classroom set-up using an instructor (Gleeson, 2007).

Baby boomers, born between 1946-1964, make up 45% of the nursing workforce (Paterson, 2010). They are optimistic, enjoy learning, workaholics, work hard and will sacrifice for the group (Wieck et al., 2009). Many of them have worked in the same institution for many years (Clausing et al., 2003). Their learning preferences include teaching others, preference for small group discussions, and they are amiable to debates while being considerate of other's input (Gleeson, 2007; Wieck et al., 2009). A nonauthoritarian environment is best for this generation (Paterson, 2010). Challenges for this cohort in the critical care areas might include complex technology, such as use of computers and complexity of equipment (Weingarten, 2009).

Generation X, born between 1960 to 1979, and aged 30 to 49, consists of 42% of the nursing workforce (Paterson, 2010). They are highly independent, technologically literate, and seek balance between lifestyles and work (Cordeniz, 2002; Walker et al., 2006). Learning styles of Generation X include informal settings, the need to understand the relevance of the information provided, along with knowing the expertise of the instructor. They learn better on an individual basis and on their own timeframe (Gleeson, 2007). They are willing to explore various methods to achieve a goal (Paterson, 2010).

Millennials, Generation Y or Nexters, born from 1980-1999, are aged 10 to 29 and make up 10% of the current nursing workforce (Paterson 2010). They are the most culturally diverse generation (Clausing et al., 2003; Walker et al., 2006), are self-reliant, and the most technologically advanced generation (Walker). Millennials are used to

being busy and want more structure with learning activities (Paterson, 2010). They prefer working as a team, are collaborative, want flexible work hours, and are predicted to change careers 5 to 8 times during their work lives (Clausing et al., 2003). This desire to change careers makes them more challenging to retain in the workforce (Weingarten, 2009). Millennials' learning preferences include role playing and group activities. They need to be actively engaged in their learning and need to understand why information is important to them. They prefer teamwork and technology. A study by Lavoie-Tremblay et al. (2010) reviewed the perspectives and experiences of generation Y (Nexters), with the goal of finding ways to retain new nurses. This qualitative study was conducted in Canada in 2007 and included six acute care hospitals. Eligibility to participate included age of 27 years old or younger and working as a nurse not more than a year. Total sample size was 35 new nurses. The mean average age was 24.1, with an average of 10.0 months of work experience. This descriptive analysis was guided by interview questions and focus groups consisting of two to four participants and semi-structured individual interviews. Interview questions (audiotaped and transcribed) addressed motivations and needs at the beginning of employment and strategies for retaining younger nurses. The results of the study concluded that peer and monetary recognition were key motivators. Orientation programs were considered factors that influenced retention rates. Additional results validated the need to be challenged, the desire for flexibility with shifts and scheduling, preference for consistency in the unit they worked



on, and ongoing training to provide them with the ability to be prepared for all situations.

These generational values and learning preferences need to be recognized and used as guidelines to evaluate or implement new orientation programs.

### **Nursing in Hospitals: Orientation Programs**

**Overview of types.** Today, most nursing orientation programs are traditionally structured, using lecture formats, clinical rotations, and unit preceptors (Gerkin et al., 2009; Thompson, 2006). Content and consistency of programs vary depending on material used, instructors' backgrounds, and availability of additional resources. Some hospitals use blended programs, which include combinations of online programs, simulation, and classroom lectures. Others rely on didactic consortium programs, involving multiple institutions pooling educational resources in an attempt to provide more efficient use of educational programs (Chen, Chang, Hung, & Lin, 2009; Peterson & Van Buren, 2006; Thomason, 2006). Although didactic consortium models are economical and labor-friendly, these consortium-based education classes are time-sensitive and dependent on each hospital's schedule. Some orientation programs have no structure and rely solely on preceptors to orient new employees (Thomason, 2006). These preceptors can encounter numerous challenges, such as lack of reference resources, heavy patient assignments, misuse of current evidence-based practices for procedures, and lack of knowledge to incorporate the theoretical perspective with

clinical knowledge. Additionally, there are limited numbers of experienced preceptors to train new orientees.

Considering these variations in orientation programs and the learning needs of different generations, hospitals need to develop more effective ways to address multiple learning needs of different generations. These orientation programs should include consideration of individual learning needs, provide a consistent content, reflect evidence-based practice, be convenient for the user, acknowledge adult learning styles, address employees with various skill sets and diverse backgrounds, and be cost effective (Peterson, 2006).

**Critical care programs.** In an effort to address these concerns, a national randomized survey done in 2005 by Thomason (2006) reviewed critical care orientation programs in 24 hospitals located in 23 US states. The purpose of the study was to review nursing orientation and post orientation practices in adult intensive care units (ICUs). Forty-six percent of these hospitals were academic teaching facilities and 54% were nonteaching or community facilities. Twenty-seven percent were Magnet accredited, with 33% non-Magnet hospitals that indicated they were in the process of applying for accreditation or were interested in accreditation in the future. Two methods of data collection were used. One included telephone interviews using a random sampling of hospitals that was obtained from an American Hospital Association guide. Once each hospital was identified, a researcher called the ICU educator to request his/her participation using a standardized interview tool. The interview lasted



approximately 10 minutes. The second method was an electronic mailing of a survey tool. In this method, the hospital's Clinical Nurse Specialist (CNS), who was identified by the list published by the National Association of Critical Care Nurse Specialist, was asked to complete the survey and return it within a week.

The instrument consisted of 35 questions that included demographics, educational methods, evaluation of orientation competence, and preceptor-specific questions. The tool was not tested for reliability or validity. This study found that most ICUs' length of orientation varied according to the experience of the nurse. The average length of orientation for an experienced ICU nurse was eight weeks; orientation for nurses with previous (non-ICU nurse) nursing experience was 12 weeks, and orientation for a newly licensed nurse or new graduate was 17 weeks. Methods of training varied. Eighty-seven percent of hospitals used a form of didactic classroom education, with an average time spent in the classroom setting of 10 days and an average of 73 classroom hours. Only 20% of hospitals shared resources with another hospital. Thirteen percent of surveyed hospitals used computer or online training without any classroom instruction; 41% of hospitals surveyed used a combination of both classroom and computer training. Of the total number of hospitals using a form of computer-based orientation models, 33% were using the AACN's ECCO program.

All hospital used three elements to assess the success of orientation: 1) the completion of competencies; 2) demonstration of knowledge, skills and attitudes to work successfully in the unit; and (3) evidence of being a safe practitioner. Preceptor

training was surveyed, with 80% providing a formalized preceptor training program. Retention rates were measured, and available data confirmed an 85% retention rate over a year. There were no differences in orientation practices related to geographical region. This study provided a summary of the present orientation programs used in critical care areas. Although it was reported that effective orientation can provide positive retention and satisfaction, further studies are needed to determine the best practice for orienting generations of new ICU nurses.

An orientation program using on-line modules may provide additional advantages for a multigenerational workforce. Paterson (2010) acknowledged that the future nursing shortage will force hospitals to look at various ways to retain, recruit, and educate nurses while being sensitive to generational differences. This recognition is also important in order to build a cohesive work environment. Establishing healthy work environments can promote improvements in patient care, decrease risk of errors, and decrease staff turnover. Paterson suggested using computer or Web-based formats as strategies to address the learning needs of generations, but stressed the need for educators to evaluate participants' comfort level with computers before initiating a program.

Correlating computer training and success with on-line education was addressed in a study by Juin-Shu, Kuan-Chia, Wey-Wen, & Ting-Ting (2007). The purpose of the study was to investigate the relationship between nurses' competency with informatics and satisfaction with informatics. This was a cross-sectional research study that applied

descriptive and correlational designs. The participants included 218 nurses who completed four hours of educational network training. At the completion of the program, participants were asked to complete 60 online questions that included data related to demographics, nursing informatics competency, and satisfaction with network education. The average age was 27.09 (SD=3.61), and mean clinical working experience was 2.2 years (SD=3.61); 70.2 % owned computers, but one third had never participated in on-line courses. Results demonstrated a positive correlation between nursing informatics competency and birth age ( $r=.246$ ;  $p<.001$ ) and total clinical working experience ( $r=.311$ ;  $p<.001$ ). Factors that demonstrated significant positive relationships to informatics competency were level of education, clinical level ratings, internet connection, hours per week spent on-line and on-line course experience. The conclusion was that age, educational levels, clinical levels, and computer/on-line experiences were significantly correlated with predictors of informatics competency and success with internet education. This study also suggested that learners should obtain competency training in technology before participating in on-line education.

### **Essential of Critical Care Orientation program**

In an attempt to address orientation challenges for critical care units, organizations such as the American Association of Critical Care Nurses (AACN) have developed online orientation programs for critical care nurses. Essential of Critical Care Orientation (ECCO) 2.0 is an on-line program that was introduced in 2002 by AACN. The AACN was established in 1969 as the American Association of Cardiovascular Nurses,



and in 1971 changed its name to AACN for the purpose of including all nurses in critical care areas (AACN, 2009a). The AACN represents the largest specialty nursing organization (Peterson, 2006).

ECCO 2.0 was initially introduced by AACN in 2002 and revised in 2008 as a result of feedback from learners and learning administrators (AACN, 2009b). This revision incorporated current evidence-based practices, interactive modules and case studies to encourage the development of critical thinking skills (AACN). ECCO is a self-paced, interactive, evidence-based, Web-based program, with 10 interactive learning modules that focus on body systems (AACN). Each module reviews anatomy and physiology, nursing physical assessments and diagnostic techniques, invasive procedures, theoretical foundations, references, and case studies.

**Evaluations of ECCO.** Peterson and Van Buren (2006) evaluated the ECCO program after it had been instituted at a hospital for three years. The ECCO program was instituted because of the many difficulties the hospital encountered with running a critical care orientation program for a limited number of new ICU nurses. Prior to this program, new orientees were placed on units for up to six months before they had classroom content. This delayed classroom instruction was also a burden on the preceptors. The decision to purchase the program was based on the following: AACN would maintain the program with updates of content and assist with technological difficulties; cost comparison of the existing orientation practice to ECCO; and the ability to start the program immediately on hire. The CNS, clinical educator coordinator, and

assistant manager were the site managers for the program. The site managers were responsible for checking the progress of orientees, had unlimited access to the modules, and determined if additional materials were needed to reinforce specific requirements of the institution. Learning outcomes for each individual were determined by test scores included at the end of each module, preceptors' evaluations of clinical performance while on the units, and documentation on the unit-specific orientation form.

Thirteen orientees completed an evaluation after completion of the course. Of the 13, 85% indicated their learning needs were met; 62% indicated their needs were met or exceeded and would recommend this program to others. Additional advantages to using this program that were cited included: features such as self-paced, just-in-time training; option to be done at home; independence; consistency; and program maintenance by AACN. The disadvantages of the program included difficulty spending long periods of time in front of the computer and the lack of a hard copy of content (this has been added to program since this study). One participant reported he/she could have learned more in a classroom and with hands-on learning. The authors also thought that results of the ECCO program were based on the users' efforts and desires to learn, and found that it was more difficult for new orientees who were older, although no age was mentioned. Additional suggestions on the evaluations were to use ECCO with some traditional group learning in order to allow face to face activities, and to use the ECCO



program for new hires on the telemetry unit and chest pain evaluation unit. Since this article was published, a new version of the ECCO program was released by AACN.

A more recent review that included the AACN's ECCO program was done by Morris et al. (2007). A prospective, quasi-experimental design with both quantitative and qualitative methods was used to evaluate a new critical care model in an 800-bed university affiliated medical center that included 5 ICUs: surgical, medical, neuroscience, cardiothoracic and coronary care. The objectives were to determine the effect of this new orientation model on retention, satisfaction, turnover, vacancy, preparedness to manage patient assignments, length of orientation, and cost of orientation. This new critical care orientation model was instituted to meet the needs of nurses with various levels of experience including new graduate nurses.

This model was learner-centered and provided different educational tracts based on the needs of experienced critical care nurses, experienced non-critical care nurses, and graduate nurses. The program used the AACN's ECCO program and the Pulmonary Artery Catheter Education Project (PACE) for a more in-depth program on hemodynamics, classes and simulation sessions, video training, and testing. Learning needs were initially assessed using the Basic Knowledge Assessment Tool (BKAT). The BKAT is a standardized test that has established validity and reliability and is used to measure basic knowledge in critical care nursing (Chestnutt & Everhart, 2007). Based on the BKAT results, an individual learning plan or pathway was proposed for each nurse. At the completion of orientation, data was collected from 173 participants. Eighty-

seven percent of the new hires (n=171) were female and 13 % (n=26) were male. The mean age at hire was 28 years. One hundred and nine nurses had less than one year of experience, 37 nurses had one or two years, 15 had three to five years, 17 had 5 to 10 years, and 3 had more than 20 years of experience.

The results demonstrated that the new orientation model improved retention rates of newly hired nurses of all ages from 91.2% to 93.7%. Turnover rates decreased from 8.77% to 6.29%, and ICU position vacancy rates decreased from 14.3% to 4.8%; however, the length of orientation remained the same. Since this study used the ECCO program in combination with different teaching modalities, it is difficult to determine how the ECCO program influenced the orientation model.

The ECCO program was used (Brady, Molzen, Graham, & O'Neil, 2006), in addition to patient simulator technology, as a suggested innovative model for critical care orientation. This model utilized a collaborative partnership with other community hospitals sharing the on-line ECCO program with a simulation lab. The authors suggested steps to develop community educational collaborative programs. This cost-effective model uses the ECCO program for knowledge acquisition with reinforcement during clinical days with preceptors. The simulation portion provides practice with didactic skills, encourages clinical decision making in critical situations, and enhances problem-solving skills. This blended learning experience requires a collaborative effort with other institutions and educators but could prove superior to existing orientation programs.

In conclusion, most of the literature reviewed acknowledged the need for innovative ways to implement nursing education and nursing orientation. After reviewing the literature, it appears the ECCO program, when used as a blended learning approach, supports the needs of all generations. Program specifics include flexibility of learning, consistency of content, evidence-based literature that is relevant to the job, and ability to individualize modules based on the learner's past experience, thereby acknowledging learning needs of the adult learner. An additional consideration to support the use of the program is the potential cost effectiveness, when considering the improvement in retention rates associated with effective orientation programs (Peterson, 2006). The potential for using the program for orienting additional nursing departments, such as the emergency room and PACU areas, is also strength. However, there are also disadvantages to using the program. Since it is a self-paced program, it may be problematic for with those who lack motivation and for those who are motivated by social interaction (Olka, 2006). The ECCO program also requires basic computer skills to navigate through the modules; however, this can easily be determined and addressed prior to the participant initiating the program.

The conceptual framework used to develop this project will be discussed next.



### **Conceptual Framework**

Knowles' Adult Learning Theory will be used as the framework to guide this program evaluation. This framework is based on principles or assumptions of the individual adult learner's needs. Knowles' framework will be used as a reference to evaluate whether the AACN online ECCO program can support the learning needs of a multigenerational workforce.

Andragogy is the term used when referring to the education of adults. Knowles defined andragogy as both an art and science that helps adults learn (Knowles, Holton, & Swanson, 2005). It includes core principles of adult learning along with the learning principles used to teach adults. These core principles represent a process model for learning. In a process model, the teacher includes the learner as an active participant and provides the learner with procedures and resources to help him/her acquire information and skills (Knowles et al., 2005). This process model has been used as a guide in designing adult classes and multimedia on-line programs, evaluating the effectiveness of classes, and assisting educators with adult learning training.

Malcolm S. Knowles originally introduced the andragogy theory in the US in 1970, and later modified it to include six core principles or assumptions. These principles are included in the most current model (Figure 1), the Andragogy in Practice Model (Knowles et al., 1998). This is a conceptual framework which systematically applies andragogy across multiple areas of adult learning practice.

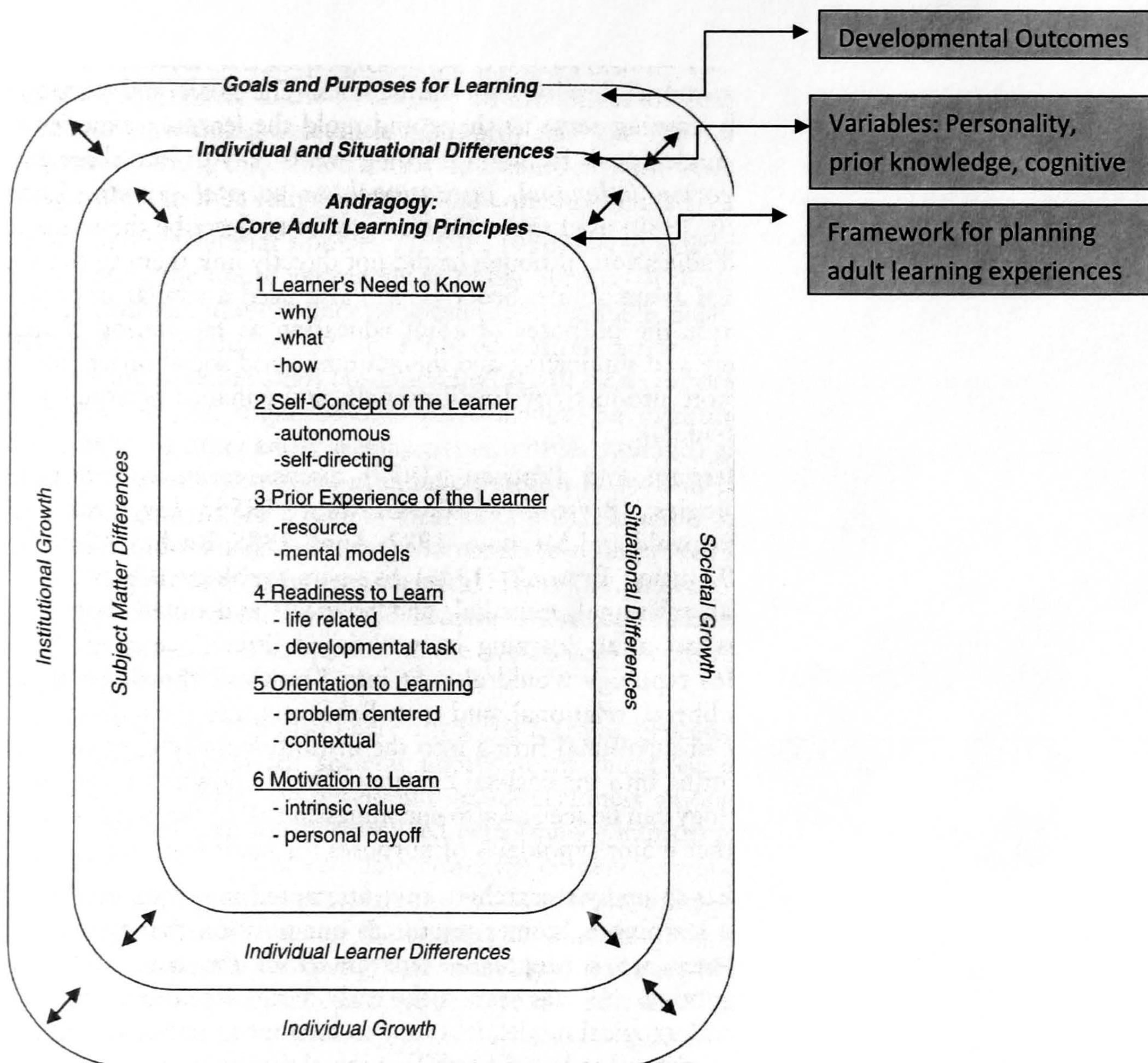


Figure 1. Andragogy in practice. From Knowles, Halton, & Swanson, 1998.



This model demonstrates the three dimensions of andragogy, illustrated as three rings interacting to represent a three dimensional process. These three dimensions are 1) goals and purposes for learning, 2) individual and situational differences, and 3) andragogy: core adult learning principles.

Goals and purposes for learning are developmental outcomes related to the learning experience. The adult learner needs to see a reason to learn something, and needs to understand the goals and relevancy of a program and relate it to his/her own needs. Adults like to know how theory relates to a practical application for their jobs or personnel life. Individual and situational differences include variables that can influence learning, such as cognitive ability, personality characteristics, and prior knowledge affect learning. Adults are independent and want control over their learning. Retaining control results in better outcomes (Knowles et al., 2005).

The core adult learning principles are frameworks for planning adult learning experiences. These characteristics influence learning and also take into account the lack of homogeneity among learners and situations. Included under each of the three outer rings of dimensions are factors or considerations that can affect adult learning in various situations, such as: individual growth; institutional growth; societal growth; subject matter differences; individual learner differences; and situational differences (Knowles et al., 2005).

The inner section of the model, or the core adult learning principles, illustrates the six core adult learning principles or assumptions. The core learning principles are: 1)

learner's need to know; 2) self-concept of the learner; 3) prior experience of the learner; 4) readiness to learn; 5) orientation to learning; and 6) motivation to learn. These six core principles include characteristics that can serve as a guide for planning adult learning experiences. Collectively, this model reflects the diversity and individuality among adult learners, the influence or effect of different learning situations, and the complexities of the individual learning process (Knowles et al).

### **Application of the Model**

The three dimensions of the model can be applied to this program evaluation project. The outer dimension of the model represents goals and purposes for learning. These are considered developmental outcomes related to the learning experience. These goals are directed at either advancing the growth of the individual learner, the institution, or society. Measuring outcomes for individual growth can be achieved with the ECCO program by using the results of the exams provided at the end of each module to identify specific learning needs. Although this project is not measuring institutional growth, if the ECCO program fulfills the educational needs of all new employees, it is anticipated that the core goals of organizational performance will be achieved in the following areas: financial savings; positive patient outcomes; retention of nurses; and enhanced productivity of staff. The last potential goal or outcome on the outer ring is societal growth. This refers to putting knowledge into practice that should eventually influence society. While this will not be directly measured in this project, society always benefits when individuals work to their potentials.

The middle rings of this practice model include subject matter, individual, and situational differences, as these variables potentially impact the adult learner. The first variable, subject-matter differences, indicates that not all subject matter can be learned the same way. Staff nurses with more experience, both cognitively and technically, might grasp a program module faster than the less experienced nurse. However, an advantage with the ECCO on-line program is that it is self paced and allows the learner to review and advance as needed. Material can be reviewed up to one year. Another variable, situational differences, applies to any unique factors that influence learning. An example of this is situation-specific factors. Although orientation programs are time scheduled, various situations arise that can alter the schedule. Such situations include availability of preceptors, and depending on how many orientees are on a unit at any given time, availability of patients. This is an example of how having an on-line program available can facilitate its use as an alternative educational day.

Individual differences such as cognitive ability, personality characteristics, prior knowledge and skill sets all vary with adult learners. This program uses a variety of teaching methods, such as interactive modules and graphics, which acknowledge the diversity of individual learners, since some adults learn by reinforcement of materials and visual cues.

The six core principles can be applied to this program. The first assumption, learners need to know, relates to the fact that adult learners are relevancy-oriented and need to see a reason for learning. Learning must be of value and applicable to work.



Since the ECCO program is a comprehensive orientation program, it can be assumed to be both applicable and valuable in achieving some degree of competency. Adults are goal-oriented and usually know what they want to achieve. Providing online learning opportunities such as the ECCO program should assist the learner in attaining his/her goals.

The second principle is self-concept of the learner: adult learners are independent, self-directed, need to be active participants in learning, and prefer to be facilitators of their own learning. Therefore, providing online learning opportunities can allow participants to select what they feel is appropriate subject matter based on prior experience and knowledge. Knowles foresaw technology as one of the major forces shaping adult learning in the 21<sup>st</sup> century and a force that would be consistent with andragogy. Technology is associated with adults' desires to be self-directed in their learning and enables adults to access learning in a just-in-time mode with full learner control. Knowles' adult learning principles acknowledge the importance of adults having some control over their learning in order to prevent resistance to learning (Gabbert, 2008). Adults need an environment that allows them to take control and assume responsibility for their learning. Adult learners fear failure, so they need support with self-directedness and the ability to pace learning and monitor progress toward completion of goals. Self direction and pacing are advantages of the ECCO program.



The third learning principle reflects prior experience of the learners. Adults have past life experiences that influence their learning style. These experiences include work-related activities, previous education and training, and family experiences. Adult learners need to be acknowledged and respected for what they know and for their preferences for learning. Individuals vary in their approaches, strategies, and preferences during learning activities. Computer-based instruction enables adults to tailor their learning experiences to fit prior experiences. The ECCO program allows individuals to select alternative modules, based on the outcomes listed, if past learning experiences have made the learner proficient in selected areas.

The fourth principle, readiness to learn, develops from life situations and past problems. The decision to take a new position in the critical care area comes with the knowledge that there will be a comprehensive training and lengthy orientation. If an employee is not ready to learn, he/she may be predisposed to failure (Olka, 2006). Orientation to learning and motivation to learn are the final principles. Motivation to learn can include requirements for licensing or competency, learning new skills, adapting to a job change, complying with organizational directives, or any desire to solve immediate and practical problems (McEwen & Willis, 2007). Motivation for employees to complete this program is consistent with enhancing their knowledge of critical care, completing the requirements of their orientation program, and fulfilling self desires for advancement in their careers.

In summary, this model will be used as a conceptual framework to evaluate this program as it relates to the needs of the adult learner.

The program evaluation method, guided by the Center for Disease Control (CDC, 1999) framework, will be discussed next.

### **Program Evaluation Method**

#### **Purpose**

The purpose of this paper is to evaluate the AACN ECCO program and address the following question: Does the AACN ECCO 2.0 program support the learning needs of today's multi-generational nurses?

#### **Framework**

The Center for Disease Control (CDC) framework (1999) for Program Evaluation (Figure 2) provides a systematic approach to evaluating programs and will be used as a reference guide for this program evaluation. This framework utilizes six steps to evaluate practice and an additional four standards to determine if the evaluation will be effective. Both the standards and steps were used to assist with understanding the context of the program and to guide the evaluator in clarifying the process of the evaluation. The six steps of the program include engaging stakeholders, describing the program, focusing on the evaluation design, gathering credible evidence, justifying conclusions and lastly, ensuring use and share lessons learned. Each step systematically builds on the previous step. First, the evaluation practice steps will be described in full.

The first step in evaluating practice is engaging the stakeholders. The stakeholders are described as those involved, those who will be affected by what is learned from the program, and/or the primary intended users for the program (CDC). After the stakeholders have been identified, the next step is to describe the program. This includes the mission or objectives, expected effects or anticipated goal in using the



## ***Overview of the Framework for Program Evaluation***

### **ELEMENTS OF THE FRAMEWORK**

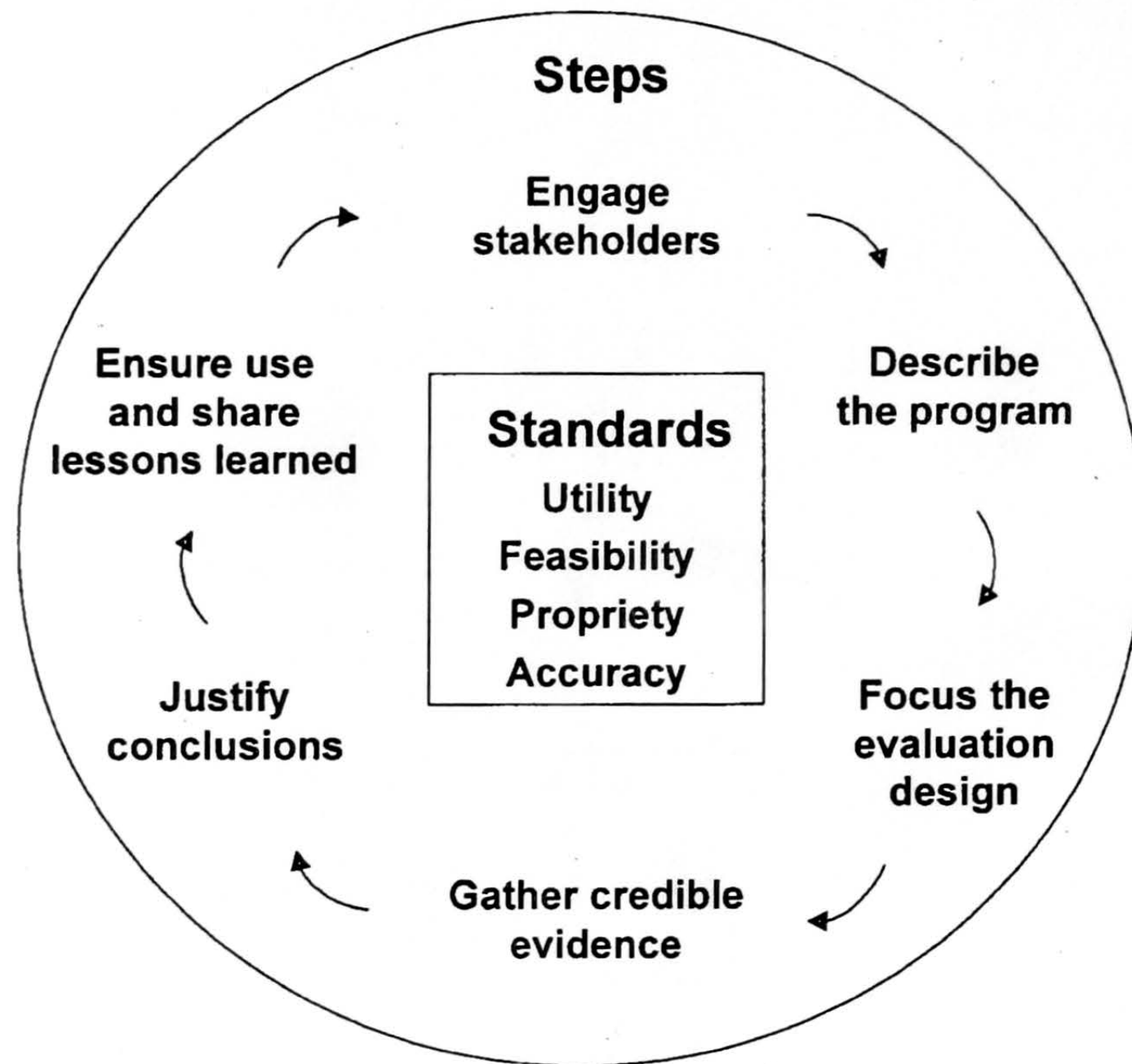


Figure 2. The CDC Framework for Program Evaluation

program, the resources utilized, and how the program is supposed to work. The next step, focus the evaluation design, defines the purpose of the design, methods, and agreements used to determine the evaluation design. Considerations during this step should include the standards, such as feasibility of resources, usefulness of the program, accuracy, and any ethical considerations. The next steps in program evaluation are gathering credible evidence and justifying conclusions. Gathering evidence, analyzing results, and interpreting data are used to justify or support conclusions. The final step,

ensure use and share lessons learned, involves using feedback and follow-up discussions to identify lessons learned and keep stakeholders informed of ongoing issues.

The standards for effective program evaluation are from the Joint Committee on Standards for Educational Evaluation (JCSEE; as cited in CDC, 1999), are approved by the American National Standards Institute (ANSI), and are endorsed by the American Evaluation Association. The standards help to determine if the evaluation will be effective. The standards include utility, feasibility, propriety, and accuracy. Utility relates to the information needs of the intended users; feasibility assures that the evaluation is realistic and diplomatic; propriety requires the behavior to be both legal and ethical; and accuracy requires that the information is accurate.

**The CDC framework applied.** The stakeholders involved in this program evaluation included hospitals, staff nurse, and nurse educators. Hospitals were stakeholders because they had a vested interest in positive patient outcomes and maintaining healthcare finance. If the ECCO program is effective, it is anticipated that the hospitals will benefit, with potential for improved patient outcomes due to increased knowledge of nurses, retention of experienced nurses, recruitment of new nurses, and increased satisfaction of nursing staff. The World Health Organization (WHO, 2006) proposed that focusing on improving recruitment and establishing methods to help the existing workforce perform more sufficiently would assist in decreasing the rate at which health care workers leave the workforce (Lavoie-Tremblay et al., 2010). This is significant because a recent finding stated that 30% of U.S. nurses

left their initial position within the first year of work (Lavoie-Tremblay et al.). Since the economic consequences of nurse turnovers in acute care facilities are equal to or greater than two times a regular nurse's salary (Hatcher et al., 2006), hospitals have a vested interest in finding ways to retain nurses.

Nurse orientees were also stakeholders since they should benefit from a program that provides up-to-date evidence, thus enabling them to improve their practice, facilitate the completion of orientation, and reinforce their existing knowledge (Brady et al., 2006; Morris, et. al., 2007). This on-line program might be especially beneficial to new graduates, many of whom would be more comfortable with technology. Older or experienced nurses who decide to move to a new or different specialty should also benefit because the program allows the user to review the objectives for each module and select ones needed to meet the requirements of a new job.

Nurse educators will be able to expand their own technological skills by using this on-line program while monitoring new employees' needs (Peterson & Van Buren, 2006). This program should assist the educator with determining the orientees' levels of competency during the program and before orientation is finished. Additionally, it should assist nurse educators to utilize their time more efficiently by allowing them to direct energies toward ongoing educational programs for other staff members.



### **Description of the Program Being Evaluated**

*Essential of Critical Care Orientation (ECCO) 2.0* is an on-line program that was introduced in 2002 by the AACN. The AACN was established in 1969 as the American Association of Cardiovascular Nurses, and in 1971 changed its name to AACN for the purpose of including all nurses in critical care areas. The AACN represents the largest specialty nursing organization (Peterson & Van Buren, 2006).

ECCO 2.0 was initially introduced by the AACN in 2002, and was revised in 2008 as a result of feedback from learners and learning administrators (AACN, 2009a). This revision incorporated current evidence based practices, interactive modules, and case studies to encourage the development of critical thinking skills (AACN).

ECCO is a self paced, interactive, evidence-based, Web-based program, with 10 interactive learning modules that focus on body systems (AACN). These modules include: an introduction to care of the critically ill patient; care of the patient with cardiovascular disorders; care of the patient with pulmonary disorders; basic hemodynamic monitoring; care of the patient with neurological disorders; care of the patient with gastrointestinal disorder; care of the patient with renal disorders; care of the patient with endocrine disorders; care of the patient with hematological disorders and multisystem disorders. Each system has subsets related to the system. For example, in the module *Care of the Patient with Neurological Disorders*, the first template is anatomy and physiology, followed by assessment and diagnostic techniques

which includes nursing physical assessment, neurological monitoring, ischemic and hemorrhagic stroke, and other pathological conditions.

The modules contain basic review of anatomy and physiology, assessment, monitoring, diagnostic, invasive procedures, case studies, theoretical foundation, references to support modules and test questions. Modules can be reviewed by the designated site manager, who usually is an educator, but cannot be modified. However, the user has the ability to review the objectives in the beginning of each module to determine if it would be beneficial to the learning plan. This feature makes the program more attractive to the adult learner who desires recognition of past experiences. Best practice recommendations are cited; for example references to the *Try This Series* from the Hartford Institute for Geriatric Nursing are provided.

Lesson objectives are defined at the beginning of each module. Graphics and audio video media are used to emphasis content. Each lesson defines the appropriate time for completion so that the learner can anticipate time frames. There is sensitivity to hospitals' needs for meeting patient standards that are required by regulatory agencies for accreditation purposes. For example, the introductory module identifies the care of specialty populations with disease conditions specific to that population. Also included are modules for pressure ulcers risk assessments using the Braden scale with classification and suggested interventions for prevention. Bariatric populations are addressed with nursing implications and follow-up considerations.

The program contains 47 contact hours with the possibility of additional contact hours if the Pulmonary Artery Catheter Educational Program (PACEP) program is completed by the employee. The PACEP program is a free, Web-based educational program related to pulmonary artery catheters and hemodynamic parameters that was developed by the AACN, the American Association of Anesthetists, the American College of Chest Physicians, the American Thoracic Society, The National Heart, Lung and Blood Institute, and the Society of Critical Care Medicine. The contents of the PACEP program includes identification of normal and abnormal hemodynamic values and comprehensive interpretation of data that includes waveform analysis as it pertains to medications, shock states, and other physiological concepts.

The cost for a yearly license is \$2000.00 with additional fees for each user. As a result of previous critiques from former users, the current edition provides tests and paper study guides for each participant. The program has been used in an estimated 600 hospitals in the US and Canada (AACN, 2009a).

The ECCO program is a comprehensive, evidence-based program that has all the elements to provide the user with the necessary knowledge to care for the critically ill patient. In addition to knowledge acquisition, it allows the user to access the modules 24 hours a day, acknowledges past clinical experiences, and allows the users to select their own learning path. ECCO allows user flexibility with accessing information on the participant's own time at work or at home. Although the program has many positive



features, the purpose of this program evaluation is to determine if the AACN's ECCO program can support the learning needs of today's multigenerational nurses.

### **Evaluation Design**

**Purpose.** The purpose of this paper is to evaluate the AACN's ECCO program and address the following question: Does the AACN ECCO 2.0 program support the learning needs of today's multi-generational nurses?

**Sample.** Participants included critical care nurses employed at hospitals throughout the country that were identified as using the ECCO program and who had agreed to voluntarily participate. Inclusion criteria included RNs who had completed the program within an eight month period of time. Exclusion criteria included participants who failed to complete the program.

**Procedures.** Several methods were used to contact hospitals including list serves, telephone interviews, and site referrals. List serves used included the National Association of Clinical Nurse Specialist (NACNS) List Serv, which is a network for sharing information and issues relevant to a CNS's practice and the Veterans Health Administration's CNS List Serv. The Veteran's Health Administration's on-line nursing educator's network was also solicited. Additional contacts were obtained through hospitals that had given contact permission to the AACN. During telephone interviews with personnel from these sites, additional referral sites or contact persons were obtained. These additional referral sites were contacted by telephone interview, and, if they were willing to participate, an e-mail was sent to confirm the agreement.

Target organizations were located throughout the US. Twenty two sites in 10 states agreed to participate. These states included Illinois, Arizona, Florida, Wyoming, Cleveland, Georgia, Texas, Virginia, California, and Minnesota. The contact persons included designated clinical educators, critical care Clinical Nurse Specialists, designated learning officers, education administrators, education coordinators and clinical education specialists. Some contact persons agreed to be the designated representative of that institution; while others referred to other personnel at the facility.

Following IRB approval, a descriptive survey was either e-mailed or mailed to a designated representative of that institution or directly e-mailed to individual participants who had been identified by the institution's contact person. The representative, more often the ICU nursing educator, agreed to identify participants, and distribute the informational letter (Appendix A) and the survey (Appendix B) to appropriate participants.

The informational letter addressed the purpose of the program and the estimated time frame needed to complete the survey. If a paper survey was preferred, it was sent to the site contact person who agreed to forward the informational letter and survey to appropriate participants, primarily staff that had completed the ECCO program within the past eight months. Most contact persons distributed the paper surveys to their participants immediately after they completed the program. Once completed, the contact person collected and returned the surveys by mail. Since this agreement was arranged beforehand, these sites were sent numerous paper surveys

with self-addressed envelopes. A total of 30 paper surveys with informational letters and self-addressed envelopes were mailed to four critical care educators.

Electronic surveys were also e-mailed to critical care educators who had agreed to participate. If an electronic communication method was used, the informational letter and survey tool was attached as a text document. The completed surveys were grouped together and returned to the surveyor as attachments. One educator chose to send the surveyor a list of 25 staff members who completed the program within the designated timeframe. The initial request for their participation was sent by the hospital educator as an e-mail. These 25 staff members were then contacted individually by the surveyor, using their e-mail address to reinforce the request for their participation. Only five surveys were returned from this group despite three additional e-mail reminders. The contact site educator indicated some of the participants who took the ECCO program were telemetry and PACU nurses and therefore did not participate.

**Instrument.** The survey tool used was developed by the researcher and was titled *Program Evaluation of AACN's ECCO* (Appendix B). This instrument was developed based on characteristics of adult learners, consideration to the characteristics of a multigenerational workforce and objectives and outcomes of the ECCO program. Only two questions regarding demographic data were included (length of nursing experience and age of participant) as it was believed extensive questioning could negatively impact willingness to participate.



Characteristics of adult learners were evaluated with questions designed based on Knowles learning principles such as motivation, reinforcement, enhanced productivity, autonomy and self-direction, goal orientation, foundations of life experiences, and knowledge. Questions evaluating both adult and multigenerational learners included evaluating ease of comprehension, program relevance to success of orientation, development of critical skills and confidence, age of participant, ease of comprehension, preference for learning, pace of learning, and computer literacy. Questions evaluating the ECCO program's objectives and outcomes were designed to include relevance of content, achievement of learning needs, technical ease, flexibility, and pace of modules. One open ended question was added for supplementary comments.

The survey questions were piloted by two participants who viewed the ECCO program during a demo trial. The demo trial period lasted three weeks and required permission by the AACN through the e-learning center. Modifications to the survey questions were made based on the feedback of participants. The final revised survey consisted of 18 questions with a response format that was Likert-based but varied depending on the content of the questions.

Next, results will be presented.

## Results

A total of 21 surveys were received from the identified sites. The results are illustrated in Table 1. In interpreting the responses, results were reviewed and compared to the current literature and descriptive properties of the ECCO program as provided by AACN.

The range of ages of participants that responded to the survey represented three generations of nurses working together in the ICUs. The generations represented include two Baby Boomers (9.52%), ten Generation Xers (47.62%), and nine nurses representing Generation Y (42.86%). As illustrated in question one, the participants' range of experience as a professional nurse varied; the majority of responders (n=7; 33.33%) had practiced from one to two years. Five nurses (23.81%) reported having practiced from 21 to 40 years, three nurses (14.28%) had less than one year experience, two nurses (9.52%) indicated five years of experience, and one nurse (4.76%) had 11 to 20 years of experience.

The results of question two indicated that prior to using the ECCO program, the majority of participants (n=10; 47.62%) used computers less than weekly; seven nurses (33.33%) indicated they used computers at least weekly, and four (19.05%) used computers at least monthly. Prior use of computers influenced the majority of responders' ability to navigate efficiently through the modules as indicated by responses derived from question six. Twelve (57.14%) participants responded that prior use

**Table 1.**  
***Program Evaluation of AACN's ECCO Questions***

Question	Response
1) How long have you been practicing as a Professional Nurse?	4.76% (n=1) < 6 months 9.52% (n=2) >6months<1yr 33.33% (n=7) 1 to 2 years 9.52% (n=2) 3 to 5 years 14.23% (n=3) 6 to10 years 4.76% (n=1) 11to 20 years 23.81% (n=5) 21 to 40 years
2) Prior to using the ECCO program how often did you use a computer or web-based learning program (CD-ROMS, webpage or similar)?	33.33% (n=7) At least weekly 47.42% (n=10) Less often 19.05% (n=4) At least monthly 0.00% (n=0) Never
3) Did you complete the modules within the program's designated timeframe?	47.62% (n=10) Always 47.62% (n=10) Most of time 4.76% (n=1) Some of the time 0.00% (n=0) Never
3) Did you complete the modules within the program's designated timeframe?	47.62% (n=10) Always 47.62% (n=10) Most of time 4.76% (n=1) Some of the time 0.00% (n=0) Never
4) Did you feel this program enabled you to learn at your own pace?	47.62% (n=10) Always 23.81% (n=5)Most of the time 28.57% (n=6)Some of the time 0.00% (n=0) Never
5) Did you experience any technical difficulties while using the program?	0.00% (n=0) Frequently 57.14% (n =12) Sometimes 42.86% (n=9) Never
6) Did you think your prior experience with computers enabled you to navigate more efficiently throughout the modules?	57.14% (n = 12) Always 33.33% (n=7) Most of the time 4.76% (n=1) Some of the time 4.76% (n=1) Never
7) At any point in the program, did you experience difficulty concentrating?	28.57% (n=6) Frequently 66.67% (n=14)Sometimes 4.76% (n=1) Never
8) At any time did you have difficulty comprehending the content?	0.00% (n= 0) Frequently 33.33% (n= 7) Sometimes 66.67% (n=14) Never
9) How effective were the practice exercises or lesson reviews located at the end of each module for reinforcing the content?	23.81% (n=5) Very effective 71.43% (n =15)Somewhat effective 4.76% (n=1) Somewhat ineffective 0.00% (n=0) Not effective



Table 1.

*Program Evaluation of AACN's ECCO Questions (continued)*

Question	Response
10) Did you have a clinical preceptor working with you on the unit during the time you were taking the ECCO program?	28.57% (n=6) Always 23.81% (n=5) Most of the time 23.81% (n=5) Some of the time 23.81% (n=5) Never
11) Do you think the <i>clinical time on the unit with a preceptor</i> provided you with the theoretical basis for developing critical thinking skills and the confidence to function safely in the unit?	20% (n=4) Always 45% (n=9) Most of the time 25% (n=5) Some of the time 10% (n=2) Never 0% (n=1) N/A
12) Do you think the <i>content of this program</i> provided you with the theoretical basis for developing critical thinking skills and the confidence to function safely in the unit?	14.29% (n=3) Always 47.62% (n=10) Most of the time 33.33% (n=7) Some of the time 4.76% (n=1) Never
13) Do you think the <i>combination of clinical time with your preceptor and the content of this program</i> were more beneficial in your development of critical thinking skills and confidence to function?	23.81% (n=5) Always 47.63% (n=10) Most of the time 23.81% (n=5) Some of the time 4.76% (n=1) N/A 0.00% (n=0) Never
14) Do you feel completing the ECCO program contributed to the success of your orientation period?	38.10% (n=8) Very effective 38.10% (n=8) Somewhat effective 4.76% (n=1) Somewhat ineffective 14.29% (n=3) Not effective 4.76% (n=1) N/A
15) Did you feel the content of each module was comprehensive and relevant to your professional practice as a critical care nurse?	33.33% (n=7) Always 57.14% (n=12) Most of the time 9.52% (n=2) Some of the time 0.00% (n=0) Never
16) Do you feel the content of this program is more comprehensive than other orientation programs you have taken?	28.57% (n=6) Always 52.38% (n=11) Most of the time 19.05% (n=4) Some of the time 0.00% (n=0) Never
17) Indicate your age	42.86% (n=9) 20- 29yrs 28.57% (n=6) 30- 39yrs 19.05% (n=4) 40- 49yrs 9.52% (n=2) 50- 59yrs 0.00% (n=0) 60 -69 yrs
18) Comments	

always influenced their efficiency in navigation through the modules, and seven (33.33%) indicated prior use of computers helped most of the time. When asked about completing the modules within the program's designated timeframe, 10 nurses (47.62%) always finished on time, while another 10 (47.62%) finished on time most of the time. The program enabled the majority of respondents to learn at their own pace: 10 nurses (47.62%) agreed that the program always enabled them to learn at own their own pace, five (23.81%) responded most of the time, while six (28.57%) indicated completion was achieved at their own pace some of the time.

Both questions seven and eight referred to concentration and comprehension with the content of the program. Twenty nurses (95.24%) reported frequently or sometimes having difficulty concentrating; 14 nurses (66.67%) stated they never experienced difficulty comprehending content, with another seven (33.33%) sometimes experienced this difficulty. The majority of responders (n=15; 71.43%) indicated the practice exercises or lesson reviews at the end of each module helped to reinforce the content. The content of the ECCO program was noted to be relevant most of the time (57.14%), with seven nurses (33.33%) indicating content was always relevant and two (9.52%) indicating content was relevant some of the time. Eleven nurses (52.38%) felt the program was more comprehensive than other orientation programs.

The ECCO program's contribution to the success of orientation was noted, with eight nurses (38.01%) responding it was very effective, eight (38.10%) responding it was somewhat effective, and three (14.29%) identifying the program as not effective. The

reported use of preceptors during orientation varied from always working with a preceptor (n=6; 28.57%), working with a preceptor most of the time (n=5; 23.81%), some of the time (n=5; 23.81%), and never working with a preceptor (n=5; 23.81%).

Question number 13 was directed at determining if the combination of working with a preceptor and the content of the program were effective in developing critical thinking skills and confidence to function safely on the ICU unit; five nurses (23.81%) indicated always, 10 stated (47.63%) most of the time, and an additional five nurses (23.81%) indicated some of the time.

Although open-ended comments were limited, one participant (age range 20-29) reported a preference for reading books over reading from a computer. Another commented on the excellence of the program and that applying the content of the program while working with a preceptor would enhance the program. A third comment indicated that the program was instrumental in making the transition from a new graduate to an ICU nurse.

Summary and conclusions will be presented next.



### Summary and Conclusions

The complexity of today's health care system, and the proposed expansion of health care for all Americans, requires more than ever that acute care hospitals provide comprehensive nursing care. In order to prepare nurses to provide the highest quality of care for patients, nursing orientation programs must be cost-effective, time-sensitive and comprehensible, stimulate critical thinking skills, and include relevant evidence-based knowledge while supporting the learning needs of multigenerations of nurses. The purpose of this paper was to evaluate one such program, the AACN ECCO program. ECCO was evaluated to determine if this on-line computer based orientation program would support the learning needs of today's multigenerational critical care nurses. Knowles' Adult Learning Theory was used as the framework to direct this program evaluation which was based on assumptions of the individual adult learners' needs. The CDC framework (CDC, 1999) for program evaluation was used to specifically guide the program evaluation.

Twenty-one nurses from 11 hospitals in the US, representing four generations of nurses, completed an 18 question survey developed by the investigator. The range of ages represented three generations of nurses working in the ICUs: Baby Boomers (n=2; 9.52%); Generation Xers (n=10; 47.62%); and Generation Y (n=9; 42.86%). The significant number of Generation Xers confirmed that increased numbers of new graduates are being hired into ICU areas (Morris et al., 2007). This diversity of generations reinforces the need to consider the generational differences when

evaluating learners' needs and preferences for teaching methods when developing critical care orientation programs (Paterson, 2010). Both Generation X and Millennials share learning preferences that include the use of technology, need for flexibility, dislike for group work, preference to read material first followed by lecture or case study, and preference for skills demonstration with return demonstration and, handouts corresponding to lectures (Walker et al., 2006). The AACN's ECCO program provides the readings, case studies, technology, independence, and use of notebooks to reinforce content but lacks interactive demonstration of skills. The preferred learning style for the Baby Boomers includes teaching others and preference for small group discussions (Gleeson, 2007; Wieck et al., 2009); neither preference is provided in the ECCO program. The majority of participants (n=10; 47.42%) indicated that they used a computer or web based program less often than monthly. This was surprising, since both Generation X and Y are technology oriented. However, this could reflect the institutions' lack of on-line programs or the participants' lack of access to a personal computer. Despite this, prior experience with computers enabled the participants (n=19; 90.47%) to navigate more efficiently throughout the modules. This confirms the need for a brief orientation to computers before this program is used (Lin, Lin, jiang & Lee, 2007).

The majority of participants (n=20; 95.25%) reported being able to complete the program in the allotted time frame most of the time. Yet, over one quarter of participants (n=6; 28.57%) were not able to learn at their own pace most of the time, which is relevant to consider in aiming to support the needs of adult learners. Since the

survey did not allow for comments after each question, one possible explanation for this discrepancy might be suggested from findings of Peterson et al. (2006), reported in regard to their experience with the ECCO program. Peterson et al. noted that some participants skipped over the contents of the modules and went directly to the test, thus not allowing for completion of the modules. Although the ages of the participants were not indicated in Peterson's review, generational characteristics might be considered, specifically, Generation Xers, who focus on outcomes instead of processes (Wieck et al., 2009) and explore different methods in order to attain a goal (Paterson, 2010). Of significance when considering the responses on this survey is that the majority of the respondents were Generation Xers.

Twenty participants (95.24%) reported at least sometimes having trouble concentrating. This is an important consideration for planning and limiting the length of time participants sit at the computer. Limiting the time participants spend on the computer was also addressed by Peterson et al. (2006) after a review of complaints from participants using the ECCO program. Some interventions that could be used include limiting the participants' time at the computer and allowing them to complete some modules at home, as well as assigning computer time to weekly work schedule.

Most participants (n=14; 66.67%) did not have difficulty comprehending content, while seven (33.33%) reported that they sometimes did. This would indicate a need for alternative methods to reinforce relevant content for a substantial number of participants. Respondents indicated the practice exercises or lesson reviews at the end



of each module reinforced the content (n=15; 71.43%). This appears to support the preferred teaching methods of Generation X or Millennials (Walker, 2006), but it is suggested that individual learning needs be assessed during the program.

Only slightly more than one quarter (n=6; 29%) of participants reported always having a preceptor assigned. This reinforces the inconsistency with nursing orientation programs reported in the literature, which includes not only the use of preceptors (Peterson et al., 2006), but also educational material used, instructors' background, and availability of additional resources such as simulation and online programs. When asked if working with a preceptor combined with the ECCO program was beneficial in developing the critical thinking skills and confidence needed to function safely, less than half (n=10; 47.63%) indicated this was effective most of the time. A little over half (n=11; 52.38%) indicated the program was more comprehensive than other orientation programs. These responses may validate the need to consider additional educational methods and/or reflect the need to assess competencies of unit preceptors. Additional considerations should include the hospitals' length of the orientation period and past nursing experience of responders.

Approximately twelve participants (57.14%) reported content relevancy to the practice of a critical care nurse. This was expected to be higher but might reflect participants working in ICUs that did not provide some of the interventions or procedures that are discussed in the body system modules. For example, not all ICUs use intracranial pressure monitors or continuous renal replacement therapy. Content

relevancy is an important adult principle desired by all generations and should be achieved by all participants.

The ability to draw conclusions from this program evaluation is limited based on the size of the sample. Despite repeated reminders, it was extremely challenging to receive completed data from participants. Several factors may have contributed to the overall number of responses. The limited time period in which to return the survey was identified as a barrier; as a result of time constraints, some nurse educators lacked the time to follow-up with targeted participants. The reality of extremely busy and challenging work demands faced by staff nurses may have made completing the surveys seem prohibitive. One nurse educator stated "It was like pulling teeth to get them to complete the survey." The need to mail surveys and rely on designated contact people to collect and return the surveys may have contributed to the limited number of responses. Also, the need for participants to have computer skills for downloading and returning surveys may have limited participation. Institutional restrictions on hiring new employees may have reduced the need for critical care orientation.

The survey used to gather this data was developed by the author for purposes of this research. The measure was pilot tested with a small number of nurses beforehand but that evaluation was limited. Although the questions were designed to reflect characteristics of adult learners, consideration to the characteristics of a multigenerational workforce, and the objectives and outcomes of the ECCO program,

the wording of some questions in retrospect might have been too burdensome and difficult to correlate with adult learning and generations.

In conclusion, in most cases, the ECCO program met the principles of adult learning by: providing in time training and consistency of content; using current technology; reinforcing relevancy of content to participants' learning needs; stimulating critical thinking skills; pacing of the program; and acknowledging individual learning styles. However, not all of the above were met by every participant. This is a concern when the expected outcome is competency and patient safety. In view of the diversity of nurses being hired in critical care areas, the results of this program evaluation appear to support the literature which indicated the need for additional educational methods in order to provide a comprehensive orientation for new ICU nurses. Although the survey results confirmed the ECCO program as a useful and comprehensive tool for critical care orientation with a multigenerational workforce, neither the literature reviews nor the survey supported the ECCO program being used as a sole methodology. It is recommended that a blended learning program that includes the ECCO program in addition to other resources such as high fidelity simulation, unit based clinical preceptors, and an individualized orientation program based on the learning needs and past clinical experiences would be an effective alternative.



### **Recommendations and Implications for Advanced Practice**

The critical care clinical nurse specialist (CNS), as an advanced practice nurse (APN) and expert clinical practitioner (Larsen, Logan, & Pryor 2003), is often expected to assume the multifaceted role of educator (McKinley, 2007), consultant, research facilitator, and leader, while ensuring the delivery of evidenced-based, quality patient care. However, these multifaceted roles, which are often dictated by organizational needs, are often challenged by limited allocation of resources. One such organizational need, as noted in this literature review, is a critical care orientation program. This is especially significant today when considering the multigenerational profile of nurses working together in critical care units. These generational nurses have diverse learning needs and diverse preferences for learning. Accordingly, to meet the learning needs of generations of new staff in the critical care areas, the APN, functioning as a consultant, educator and leader, must collaborate with the Education Department to find innovative ways to design and implement appropriate orientation programs.

In order to gather support for this organizational change, the CNS must first evaluate the existing clinical practice and incorporate research findings to develop a proposal that includes the most efficient educational methodologies that will meet the needs of nurses, patients, and the organization. Other considerations required to support a change in practice include providing a cost benefit analysis that justifies the cost of the program as well as data that demonstrates how it could positively impact the organization. These organizational benchmarks include increased productivity of nurses

and nurse educators, improvement in quality of patient care, decrease in the cost of products and services, and decrease in turnover rate of new employees (Lindy & Reiter, 2006). In addition to cost analysis, the CNS, working within an interdisciplinary team, provides leadership in developing plans to determine if these changes demonstrate an improvement in clinical practice as evidenced by the data. Key outcomes include improvement in the orientee's critical thinking skills and clinical decision making skills (Kaplow, 2002). Assuring the use of reliable and valid methods to measure these in diverse participants is key.

The CNS is also responsible for developing innovative educational technologies. High-fidelity simulation, recommended by the Institute of Medicine (IOM) as a best practice tool and instructional method in healthcare (Cato & Murray 2010), should be considered.

In summary, the CNS plays a key role in providing quality patient care and improving outcomes for patients. The CNS can provide a leadership role in any organizational change relating to nursing practice (Larsen et al., 2003). This includes assisting staff to understand research findings that will improve and support their practice, facilitating ongoing research to validate current evidence based practices, encouraging professional development and nursing competencies to match patient characteristics, collaborating with other disciplines to improve organizational and patient outcomes, and ongoing recognition of the needs of the current multigenerational workforce.

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Appendix A

Informational letter

*Dear Participant:*

You have been selected to participate in this program evaluation because you have taken the American Association of Critical Care Nurse's ECCO program during your hospital orientation. The main objective of this program evaluation is to evaluate the effectiveness of an on-line critical care orientation program with multigenerational nurses. It is important that you are aware that your decision to participate in this survey is voluntary. Your responses will be anonymous and your confidentiality will be maintained.

There will be no monetary benefit for your participation in this survey; however, the benefits of participation may give insight to other organizations that are interested in restructuring their critical care orientation programs.

There will be no physical risk in participating in this study; however, if at any time you are not comfortable with your decision, you may withdraw.

The survey should take approximately fifteen minutes to complete. Please place the survey in the envelope provided and return as soon as possible.

Thank you very much for assisting with this process.

Patricia Brady BSN, CCRN-CMC



Appendix B

Survey

**Program Evaluation of AACN's ECCO**

**Please place an X beside the best answer.**

1. How long have you been practicing as a professional Nurse?

<input type="checkbox"/> Less than 6 months	<input type="checkbox"/> 11-15 years
<input type="checkbox"/> >6 months <1yr	<input type="checkbox"/> 16-20 years
<input type="checkbox"/> 1- 2 years	<input type="checkbox"/> 21- 30 years
<input type="checkbox"/> 3 - 5 years	<input type="checkbox"/> 31- 40 years
<input type="checkbox"/> 6 - 10 years	
  
2. Prior to using the ECCO program how often did you use a computer or web-based learning program (CD-ROMS, webpage or similar)?

<input type="checkbox"/> At least weekly
<input type="checkbox"/> At least monthly
<input type="checkbox"/> Less often
<input type="checkbox"/> Never
  
3. Did you complete the modules within the program's designated timeframe?

<input type="checkbox"/> Always
<input type="checkbox"/> Most of the time
<input type="checkbox"/> Some of the time
<input type="checkbox"/> Never
  
4. Did you feel this program enabled you to learn at your own pace?

<input type="checkbox"/> Always
<input type="checkbox"/> Most of the time
<input type="checkbox"/> Some of the time
<input type="checkbox"/> Never
  
5. Did you experience any technical difficulties while using the program?

<input type="checkbox"/> Frequently
<input type="checkbox"/> Sometimes
<input type="checkbox"/> Never
  
6. Did you think your prior experience with computers enabled you to navigate more efficiently throughout the modules?

<input type="checkbox"/> Always
<input type="checkbox"/> Most of the time
<input type="checkbox"/> Some of the time
<input type="checkbox"/> Never

**Program Evaluation of AACN's ECCO (continued)**

7. At any point in the program, did you experience difficulty concentrating?
- ☐ Frequently
  - ☐ Sometimes
  - ☐ Never
8. At any time did you have difficulty comprehending the content?
- ☐ Frequently
  - ☐ Sometimes
  - ☐ Never
9. How effective were the practice exercises or lesson reviews located at the end of each module for reinforcing the content?
- ☐ Very effective
  - ☐ Somewhat effective
  - ☐ Somewhat ineffective
  - ☐ Not effective
10. Did you have a clinical preceptor working with you on the unit during the time you were taking the ECCO program?
- ☐ Always
  - ☐ Most of the time
  - ☐ Some of the time
  - ☐ Never
11. Do you think the *clinical time* on the unit with a preceptor provided you with the theoretical basis for developing critical thinking skills and the confidence to function safely in the unit?
- ☐ Always
  - ☐ Most of the time
  - ☐ Some of the time
  - ☐ Never



**Program Evaluation of AACN's ECCO (continued)**

12. Do you think the *content of this program* provided you with the theoretical basis for developing critical thinking skills and the confidence to function safely in the unit?
- ☐ Always
  - ☐ Most of the time
  - ☐ Some of the time
  - ☐ Never
13. Do you think the *combination of clinical time with your preceptor and the content of this program* were more beneficial in your development of critical thinking skills and confidence to function safely in the unit?
- ☐ Always
  - ☐ Most of the time
  - ☐ Some of the time
  - ☐ Never
14. Do you feel completing the ECCO program contributed to the success of your orientation period?
- ☐ Very effective
  - ☐ Somewhat effective
  - ☐ Somewhat ineffective
  - ☐ Not effective
15. Did you feel the content of each module was comprehensive and relevant to your professional practice as a critical care nurse?
- ☐ Always
  - ☐ Most of the time
  - ☐ Some of the time
  - ☐ Never
16. Do you feel the content of this program is more comprehensive than other orientation programs you have taken?
- ☐ Always
  - ☐ Most of the time
  - ☐ Some of the tome
  - ☐ Never

**Program Evaluation of AACN's ECCO (continued)**

17. Indicate you age (years).

- ☐ 20 - 29
- ☐ 30 - 39
- ☐ 40 - 49
- ☐ 50 - 59
- ☐ 60 - 69

18. Please comment on your experience with using this program and any additional comments/suggestions to improve future Critical Care orientation programs.

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DOES AN ONLINE COMPUTER BASED CRITICAL CARE ORIENTATION  
PROGRAM SUPPORT THE LEARNING NEEDS OF A MULTIGENERATIONAL WORKFORCE?

by

Patricia Brady

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