

Gaps in nurses' knowledge and application related to genomics exist. This project aimed to develop an accessible genomic education program for oncology nurses. Consequently, the flipped classroom strategy was used. This involved the use of prework consisting of an online genetics and genomics module and optional journal articles. In-person class time built on the prework and focused on specific clinical applications. Outcomes demonstrated that learners were highly satisfied with the educational format and that course objectives were met. Improvement in knowledge of basic genomic concepts, clinical applications, and resources was achieved.

#### AT A GLANCE

- The flipped classroom strategy aligns with adult learning principles and ensures that learners with varying levels of knowledge have similar foundational preparation prior to the classroom experience.
- Focusing genomic content on specific clinical applications keeps complex content manageable for learners.
- The flipped classroom strategy allows for flexible implementation and is replicable in other settings.

#### KEYWORDS

flipped classroom; genetics; genomics; nursing education; knowledge gap; prework

#### DIGITAL OBJECT IDENTIFIER

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# Flipped Classroom Strategy

An accessible, application-driven approach to genomics education

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In 2016, the American Nurses Association and the International Society of Nurses in Genetics revised and updated the scope and standards of practice for genetics and genomics in nursing and copublished 16 standards of practice for all levels of nursing in any practice setting (American Nurses Association, 2016). These standards are particularly relevant to oncology nursing because many diseases and treatments have a link to not only genetics, or the study of single genes, but also to genomics, which encompasses all genes and their interrelationships (Aiello, 2017). New genomic knowledge across the oncology care continuum has required nurses to increase their knowledge of genetics and genomics and learn how to promptly and accurately apply this knowledge (Beamer, Linder, Wu, & Eggert, 2013). This article will discuss focused content and an educational strategy used to introduce genomic applications within a specialty nursing practice.

## Background

Although attempts have been made to educate nurses on genetics and genomics, the application of genetics and genomics into clinical practice remains daunting to new and seasoned nurses alike (Bancroft, 2013). A systematic review by Anderson, Alt-White, Schaa, Boyd, and Kasper (2015) showed a gap in nurses' genomic literacy and that nurses were not confident or skilled in applying genomic concepts within clinical practice.

Oncology nurses within the specialty practice at the Mayo Clinic in Rochester, Minnesota, which is the authors' institution, are required to attain competence in a variety of skills within their specialty. Metrics to identify priority areas often focus on the frequency or complexity of the content or skill to be applied, or the risk to the patient. Time available to teach and assess required competencies in a classroom or other structured setting is often limited. As a result, use of an educational strategy that promotes efficient and effective use of nurses' time and focuses on clinical applications is essential. One such strategy that allows for flexibility of time and self-direction is the flipped classroom.

The flipped classroom strategy involves assigning prework for learners in the form of videos, animations, illustrations, readings, or other materials to be completed before the face-to-face class (Bergmann & Sams, 2012). Advantages of this strategy include providing learners with the ability to control the speed at which they progress through the content and the opportunity to review concepts before and after the class (Hurtubise, Hall, Sheridan, & Han, 2015). Learners with a great deal of knowledge about the content can spend less time reviewing prework than learners with little to no knowledge of the content. The intent is for learners to come to the in-person class with a common foundational framework. Class time is used to focus on applications of learned concepts. This is in alignment with adult learning