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# As I haven't seen a T-cell, video-streaming helps: Nursing students' preference towards online learning materials for biosciences

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## ABSTRACT

**Background:** Educational research continues to seek answers for the most effective teaching strategies instructors should utilise in teaching bioscience courses. However, there were only few recent studies seeking for empirical evidence on nursing students' preferred learning styles and needs to effectively learn biosciences.

**Aim:** This study surveyed nursing students about their preferred study materials for bioscience courses and explored the reasons behind such preferences.

**Methods:** A descriptive research approach was undertaken using a survey tool asking nursing students their preferred study resources measured through the frequency of use. Open survey questions were also included allowing narratives for reasons of preference and non-preference. Descriptive statistics for frequency distribution and NVivo for categorising written narratives were used for data analysis.

**Findings:** Online video streaming was the most preferred study material with almost 60% of students who completed the survey responding 'very often' in terms of frequency of use. Required textbooks were the least popular in terms of use. Individual written narratives from open survey questions explored factors influencing preference and non-preference of particular study materials formed four major categories such as: learning needs and styles, accessibility, material content and lacks interaction.

**Conclusion:** Enhancing student support for online learning platform is critical particularly in maximising effective utilisation of the resources students find beneficial in learning bioscience concepts.

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## Problem or Issue

Only few recent studies sought for empirical evidence on nursing students' preferred learning styles and needs to effectively learn biosciences.

## What is already known?

Contemporary strategies utilised in teaching biosciences to health students complemented the traditional lecture sessions with innovative online learning platforms.

## What this Paper Adds

Nursing students preferred online and video materials in learning biosciences. Factors influencing preference and non-preference of particular study materials were learning needs and styles, accessibility, material content and lacks interaction.

## 1. Introduction

Contemporary strategies utilised in teaching biosciences to health students complemented the traditional lecture sessions with innovative online learning platforms (Gresty & Cotton, 2003; Raynor & Iggulden, 2008; Swift et al., 2016; Todorovic, Johnston, Fenwick, Williams-Pritchard, & Barton, 2017). Hands-on activities through laboratory work in conjunction with the latest technology facilitated comprehensive teaching delivery of bioscience concepts and have undoubtedly advanced teaching strategies (Gordon & Hughes, 2013; Johnston, 2010). However, despite recent technological developments such as the rise of interactive learning programs, the perceived difficulty experienced by nursing students in learning bioscience remains (Craft, Hudson, Plenderleith, & Gordon, 2017; Craft, Hudson, Plenderleith, Wirihana, & Gordon, 2013; McVicar, Andrew, & Kemble, 2015). Furthermore, the dialogue and pedagogical inquiry on the best teaching methods suited for biosciences continue even in our most recent times (Ralph, Birks, Cant, Tie, & Hillman, 2017).

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Technology has driven contemporary teaching-learning philosophies and methods of instruction. For example, advancements in health informatics are becoming one of the benchmarks in the preparation of various health disciplines' academic curricula (Carbonaro et al., 2008). Educational research continues to seek answers for the most effective teaching strategies instructors should utilise in teaching bioscience courses (Taylor, Ashelford, Fell, & Goacher, 2015). Furthermore, academics' judgment has also been examined in terms of identifying the bioscience topic contents deemed necessary and beneficial to nursing students (Birks, Ralph, Cant, Hillman, & Chun Tie, 2015). However, to date, there are only very few studies presenting empirical evidence from nursing students' and registered nurses' preferred styles and needs in learning biosciences (Birks, Ralph, Cant, Tie, & Hillman, 2017; Johnston et al., 2015; Owens & Moroney, 2017).

Earlier research argued that health students who have lower academic performance in biosciences tend to generally underperform for the whole study program (Wong & Wong, 1999). However, the limited focus on students' learning styles suggested a disproportionate attention given towards teaching and learning mechanisms involved in bioscience education for nurses. Sound application of educational philosophy within current teaching methods in nursing recognises student-centredness and experienced-based approach (Decelle, 2016). Such approach suggests nursing students' effective engagement in biosciences through educational medium that interests them to learn.

Nursing students undertake bioscience courses as part of the undergraduate nursing program. Nursing curricula globally acknowledge the importance of biosciences for nurses to efficiently and safely provide care in clinical practice settings (Smales, 2010). International dialogue and ongoing educational research addressing bioscience difficulties among nursing students in undergraduate education opens potential solutions and informed thinking in linking the effective use of bioscience knowledge to nursing practice.

### 1.1. Objective

The aim of this study is to determine the preferred study materials of nursing students for bioscience courses and to explore the reasons behind such preferences

### 1.2. Methodology

#### 1.2.1. Research design

A descriptive research approach was undertaken, which is suitable for this current study being a small-scale preliminary research (Richardson-Tench, Taylor, Kermod, & Roberts, 2014). The study utilised a survey tool asking nursing students' their preferred study resources measured through the frequency of use. Anonymous surveys are widely used in educational research, particularly in course evaluations (Immekus, 2016). The survey approach was also deemed most appropriate for this study in order to counter teacher influence in studies requiring information from students (Cohen, Manion, & Morrison, 2011). Also the survey has a space for writing comments and narratives at the end of the questionnaire, asking open-ended questions such as 'what are the main reasons for rarely using the study material as rated above?' and 'what are the main reasons for using the study material very often as rated above?' and 'what influenced your preference to use them rarely or more frequently?'. The open survey questions were designed to validate the data gathered from the frequency measurements.

#### 1.2.2. Setting

This study was conducted at a New Zealand School of Nursing. A convenience sample was drawn from first year undergraduate

nursing students enrolled in the year one Bachelor of Nursing bioscience papers. First year students were selected as the bioscience paper content includes a large component of anatomy and physiology, biochemistry, pathophysiology, pharmacology and microbiology.

#### 1.2.3. Data collection

Data was collected in a three year period, from 2015 to 2017, for nursing students enrolled in their first year of nursing training as part of a larger study on biosciences course delivery (current authors, 2017). Data gathering took place in the first semester when first year nursing students are enrolled in their initial bioscience paper. The survey tool was adapted with permission from Johnston and McAllister (2008), which has 20 items to rate on a five point Likert Scale from strongly agree to strongly disagree. Data reported in this article was the answers for item 20, asking nursing students to rate their preferred study materials for biosciences in terms of frequency of use. Frequency of use was qualified ranging from *very often*, *often*, *sometimes*, *rarely* and *never*. The tool also provided a space for open survey questions inviting narrative comments. Prior to administering the survey, content and face validation were undertaken by two academics ensuring applicability to the New Zealand context. An accumulated sample total of 156 students who completed the survey was included in this analysis. The survey tool was administered by an independent research officer to avoid influencing student's responses with lecturers being the researchers.

#### 1.2.4. Data analysis

The quantitative data from the survey was analysed using the SPSS 22 statistical program (IBM, 2013). Descriptive statistical treatment was utilised in computing for the percentage for frequency ratings given by participants on each survey item in the questionnaire. The results of analysis led to statistical presentation of results through tabular form. The narrative data from the open survey questions were managed using NVivo software (NVivo, 2012) and yielded observations from data set of codes, where visibility and frequency of written words used then formed the parent or major categories of the narratives (See Fig. 1). The content analysis aided by NVivo employed inductive approach, where researchers started from smaller initial codes and then categorising these to general codes (Creswell, 2002).

#### 1.2.5. Ethics

Ethical approval to conduct this research study was granted by the researchers' institutional Human Research Ethics Committee prior to collecting data. Consent was implied by the completion and return of the survey questionnaire. An independent research assistant administered the survey to avoid pressure to participate or influencing students' responses. Questionnaires returned did not have any identifying information.

## 2. Results

A sample size of 156 nursing students participated in the survey, which is 94% of the total student population enrolled in bioscience courses during the three-year period. Nursing students taking bioscience subjects in this current study preferred online resources and video materials for studying over textbooks and other media provided within the course (Table 1). Online video streaming was the most preferred study material with almost 60% of students who completed the survey responding 'very often' in terms of frequency of use. Required textbooks were the least popular in terms of usage. Video-capable study materials can be interpreted as popular among nursing students in this study. However, it was noted that this cohort of students preferred the online and live platforms

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