

Exploring Student Motivation and Performance in the Flipped Classroom: A Case Study of Nursing Students

Aziz Naciri ^{1*}, Mohamed El Hajji ², Mohamed Radid ^{3,4}, Ahmed Kharbach ^{5,6}, Ghizlane Chemsî ^{1,4}

¹Laboratory of Sciences and Technologies of Information and Education, Faculty of Sciences Ben M'Sik, Hassan II University of Casablanca, MOROCCO

²Regional Center for Careers Education and Training, Agadir, MOROCCO

³Laboratory of Physical Chemistry of Materials, Faculty of Sciences Ben M'Sik, Hassan II University of Casablanca, MOROCCO

⁴Observatory of Research in Interdisciplinary Didactics and University Pedagogy, Faculty of Sciences Ben M'Sik, Hassan II University of Casablanca, Casablanca, MOROCCO

⁵Laboratory of Biostatistics, Clinical Research and Epidemiology, Faculty of Medicine and Pharmacy of Rabat, Mohamed V University, Rabat, MOROCCO

⁶High Institute of Nursing Professions and Technical Health, Agadir, MOROCCO

*Corresponding Author: Aziz.naciri-etu@etu.univh2c.ma

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ABSTRACT

Introduction & Background: Technological progress has transformed all areas including the field of education and training. This has allowed us to take advantage of the functionalities offered by information and communication technologies to improve learning experiences. This research aims to explore the motivation and performance of nursing students in the flipped classroom compared to the traditional method.

Methods: This pre-experimental study was conducted on a single group pretest-posttest with twenty students using two distinct teaching methods (the traditional method and the flipped classroom) in the community health planning course. In pre-test and post-test, motivation and performance scores were calculated, respectively, from the motivated strategies for learning questionnaire and the results of the performance tests. Pretest and posttest scores were compared using the Wilcoxon signed-rank test.

Results: The findings showed that the motivation scores of all students (n=20) were positively improved in the flipped classroom compared to the traditional method. Specifically, extrinsic goal orientation (p=0.021), control beliefs (p=0.019), and self-efficacy for learning and performance (p=0.016) were the motivational subcomponents that were significantly improved. However, intrinsic goal orientation (p=0.055), task value (p=0.866), and test anxiety (p=0.6) did not show a statistically significant. On the other hand, student performance was significantly improved in the flipped classroom (14.4±2.57 vs. 17.7±1.28, p<0.001).

Conclusion: This innovative approach is an essential alternative for improving the quality of nursing education.

Keywords: computer-assisted instruction, distance education, nursing students, problem-based learning, performance

INTRODUCTION

The nursing education system is evolving to help nursing students acquire the necessary knowledge and skills for effective nursing practice [1]. Indeed, skills based on active learning and critical thinking enable the delivery of adequate and quality care [2]. However, the traditional teaching methods currently used in nursing education do not develop students' reflective thinking skills [3]. Digital technologies in education can replace a passive learning environment characterized by a direct transfer of knowledge (from the teacher to the learner) with a more interactive learning environment [4]. As a hybrid learning approach, the flipped classroom promotes active learning [5,6]. It is a teaching model in which learners receive course content outside the classroom (educational resources, educational video vignettes, and quizzes) through a learning platform. While, class time is focused on active learning approaches (problem-solving,

application exercises, discussion activities, and team learning). This method has several advantages and some limitations. Students come to the classroom well prepared in a flipped classroom, with similar information and relevant knowledge ready to be applied. This process promotes active engagement in activities that encourage active learning [7]. These involve different levels of Bloom's taxonomy [8]. In addition, active participation in class activities increases students' level of motivation [9]. Although the flipped classroom method has many advantages, it presents some challenges that make it difficult to implement. First of all, the teacher must devote a lot of time and effort before the class, especially to preparing the teaching video vignettes [10]. Furthermore, this method leads to difficulties and resistance to the new expectations and responsibilities imposed on students [11]. Moreover, limited access to digital technologies and the Internet can impede their learning [12]. Similarly, students who are not motivated to attend classes outside of class may not benefit from in-class activities [13].

Table 1. The teaching-learning process adapted during this study

Teaching method	Activities to be carried out outside the classroom	Classroom activities
Traditional	Pre-reading of articles made available to students	Listening Take notes Asking questions
Flipped classroom	Task-based learning View instructional video capsules on Moodle Respond to video and/or quiz worksheets posted online Discussion in the forums	Practical workshops Drawing with flip chart Case studies Discussions Problem solving

On the other hand, learning motivation is a crucial research topic in the student teaching-learning process. Learning motivation is defined as a state of the students relating their perceptions and conceptions to their environment and generating engagement and participation in an academic task [14]. There are several theories of motivation. The present research will be limited to the model of motivation from a socio-cognitive perspective because it is strongly indicated for studying motivation in a digital learning context. This socio-cognitive approach emphasizes that academic motivation results from the interaction between learners' perceptions and expectations on the one hand and the different elements of their environment on the other hand [15]. The theoretical model selected for this research is Pintrich's expectations and value model [16]. Indeed, it is a robust model that synthesizes many research results, integrating the concepts of self-efficacy and intrinsic or extrinsic orientation of motivation. In our knowledge, there are no studies in Morocco that investigate the motivation and performance of nursing students during flipped learning. The study conducted among the trainee demonstrated the effectiveness of the said method and its ability to improve the performance of these learners [17]. Likewise, another study conducted at a Moroccan university reported that the flipped classroom significantly improved the learning of students with learning disabilities [18]. Indeed, the effect of the flipped classroom on student motivation and performance has been reported in several studies in different contexts. Some have indicated a positive effect on student motivation [19-21]. Others have justified its effect on student performance [22,23]. However, other research has noted that the method has no significant effect on student performance [24, 25]. Therefore, this study aims to explore the motivational level and performance of nursing students in the flipped classroom compared to the traditional method.

MATERIALS AND METHODS

Design

The study design is pre-experimental based on a single group pretest-posttest. The main independent variable is the flipped classroom method, and the dependent variables are student motivation and performance. The course, entitled "Community Health Planning," was 20 hours in length and was divided into two sessions of 10 hours each. The first session was conducted in a traditional teacher-centered method. The flow of information between the teacher and the students was mainly one-way. The classroom was organized with desks/chairs arranged in rows facing the blackboard, and students had no explicit tasks to prepare for class. The second session of the course was delivered using the flipped classroom approach using the MOODLE educational platform. Students

receive the lectures in online resources (usually interactive video vignettes) supported by quizzes and exercises. The released time in class is reserved for peer discussions and group projects, which will give meaning to the content put on the platform (Table 1).

Sample

The study was conducted among 20 students in the third year of the nursing program, option: Polyvalent nurse at the Higher Institute of Nursing Professions and Technical Health of Agadir, Morocco.

Data Collection

Student motivation

In this study, student motivation was measured using "the motivated strategies for learning questionnaire." It was developed from Pintrich's social-cognitive model. This instrument has been confirmed by several research studies [26, 27]. It consists of 31 items divided into six subscales: intrinsic goal orientation (4 items), extrinsic goal orientation (4 items), task value (6 items), control beliefs (4 items), self-efficacy for learning and performance (8 items), and test anxiety (5 items). A 7-point Likert scale was used for each item, ranging from "strongly agree" to "strongly disagree."

Student performance

The participants' level of performance was tested at the end of the implementation of each teaching method. Students took a test consisting of 07 questions (direct questions, MCQs, and open-ended questions). The questions in each test were designed to meet the pedagogical objectives of the course in terms of "memorization", "comprehension", and "application" of Bloom's taxonomy [28].

Data Analysis

For data analysis, we used IBM SPSS 25.0 and Excel 2016. Pretest and posttest scores were compared using the Wilcoxon signed-rank test. A p-value less than <0.05 was considered statistically significant.

Ethical Considerations

Written permission was obtained to conduct the study from the Higher Institute of Nursing Professions and Technical Health Agadir (N19-74). Written consent was obtained from all participants.

Table 2. Characteristics of study participants

Variables	Number of participants(%)
Genre	
Female	17(85%)
Male	3(15%)
Age: Mean(Standard deviation)	21.5(\pm 0.8)
Possession of a personal computer	18(90%)
Possession of a smartphone	20(100%)
Access to an internet connection	
Always	11(55%)
Often	5(25%)
Sometimes	5(25%)
Never	0(0%)
Knowledge of one or more educational platforms	0(0%)
Previous use of an educational platform	0(0%)

Table 3. Differences in student motivational scores between traditional and flipped classrooms

The measurement scale	Traditional method	Flipped classroom	p-value
	Mean(SD)	Mean(SD)	
Total motivation	30.23 5.04(0.33)	32.81 5.47(0.52)	0.046
Intrinsic goal orientation	5.29(0.7)	5.88(0.4)	0.055
Extrinsic goal orientation	5.04(1.06)	5.8(0.63)	0.021
Task value	5.48(0.8)	5.72(0.87)	0.866
Control beliefs	5.28(0.72)	5.95(0.02)	0.019
Self-efficacy for learning & performance	5.10(0.7)	5.54(0.54)	0.016
Test anxiety	4.05(1.07)	3.92(0.6)	0.600

RESULTS

Participants

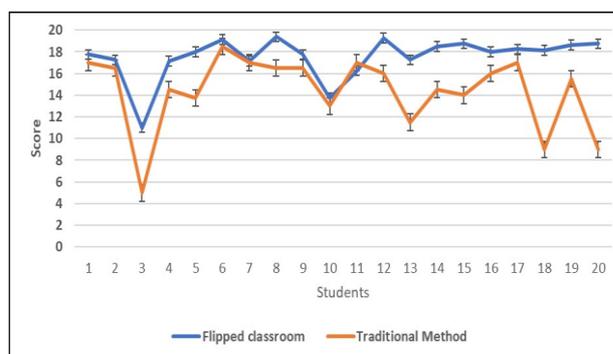
Out of 20 students, 85% were female, and the mean age was 21.5 years ($SD\pm 0.80$). All participants owned a smartphone, and 94.4% reported having a personal computer. The majority of students (55%) had constant access to an internet connection. However, all students (100%) expressed a lack of knowledge of educational platforms and reported never having used them (**Table 2**).

Student Motivation

Students' motivation was assessed at the end of the traditional method and the flipped classroom. The results showed that students had a higher level of motivation in the flipped classroom than in the traditional method (5.04 ± 0.33 vs. 5.47 ± 0.52 , $p<0.05$). Also, the motivational subcomponents that were significantly improved in the posttest were: extrinsic goal orientation ($p=0.021$), control beliefs ($p=0.019$), and self-efficacy for learning and performance ($p=0.016$). However, no significant difference was found for intrinsic goal orientation ($p=0.055$), task value ($p=0.866$), and test anxiety ($p=0.6$) (**Table 3**).

Student Performance

We assessed student learning outcomes after each instructional method. The results show that 95% of the students ($n=19$) achieved higher flipped classroom scores than the traditional method (**Figure 1**). In addition, a significant

**Figure 1.** Comparisons of nursing student scores in the flipped classroom and the traditional method**Table 4.** Comparisons of nursing students' grades in the flipped classroom and the traditional method

	Traditional method	Flipped classroom	p-value
	Mean(SD)	Mean(SD)	
Academic performance of the group class	14.4(2.57)	17.7(1.28)	<0.001

difference in total class performance was found in the flipped classroom (17.7 ± 1.28) vs. (14.4 ± 2.57) for the traditional method ($p<0.0001$) (**Table 4**).

DISCUSSION

This study aims to explore nursing students' motivation and performance in the flipped classroom. The results suggest that student motivation improved significantly during flipped teaching ($p<0.05$). These results are similar to studies [9,19,29]. The increase in student motivation scores in the flipped classroom has been explained differently in several contexts. The improvement in nursing students' motivation in the flipped classroom is due in part to the equitable, accessible, and repeated access to online educational resources, and in part to the respect for each student's learning pace [9]. The flexible learning environment supported by the flipped classroom also contributes to student motivation [20]. Furthermore, the increase in motivation was caused by various learning strategies such as critical thinking, task value, and peer learning [30].

Regarding motivational aspects in our research, the flipped classroom has a positive effect on three key components. The first is related to extrinsic goal orientation, in which students value academic success and approval from others ($p=0.021$). This result could be linked to the learning activities proposed in the platform in the form of diversified exercises (worksheets of the video capsule, quiz in the form of multiple-choice questions, and open-ended questions), creating a feeling of rivalry and competitiveness within the class group (having a good grade, a satisfactory ranking within the class). As for the second motivational aspect, control beliefs showed a significant improvement ($p=0.019$). Students believe that their academic performance is directly related to their efforts. This is probably due to the paradigm shift in the learning process. Since, in the flipped classroom, students are actively involved in the construction of their knowledge. Regarding the third component called self-efficacy for learning and performance, the post-test result is significantly improved ($p=0.016$). In this

motivational line, learners believe in their ability to adapt and control the behaviors necessary to achieve the required performance. This perception could be generated and consolidated by the flexible and supple learning environment, where freedom of expression and capitalization of learning through workshops meet the set learning objectives.

The present study recorded a significant improvement in student performance while switching from the transmissive to the flipped teaching approach ($p < 0.001$). This is consistent with the results of several studies in different settings [22,23]. The increase in performance was inherent in providing students with online video vignettes while allowing them to better assimilate the course before coming to class. As a result, the time freed up in class allows low-performing students to spend more time on practice exercises and correcting poorly learned sequences [23]. Moreover, another investigation [22], conducted at a medical university in China, found that improved student performance in flipped classrooms was strongly related to the intensification and diversification of classroom teaching-learning activities, with teachers having more time in class to facilitate discussions and answer quizzes rather than repeat rote didactics. In the present study, the improvement in the students' grade scores in the flipped classroom could be due, on the one hand, to intrinsic reasons related to the feeling of curiosity that immersion in this innovative teaching practice provokes. On the other hand, it could be due to the pedagogical video vignettes offered in the out-of-class platform. Furthermore, although an increase in motivation and performance was observed in students in the flipped classroom compared to the traditional classroom, this research did not identify the increase in motivation. However, previous studies have suggested a positive correlation between motivation and performance, indicating that there is also an improvement in academic performance when an increase in motivation is observed [31].

Limitation of the Study

This study has several limitations. First, we used a one-group pre-test-post-test design, so our data are limited in causal inference. Second, only 10 hours of a course were flipped. This time seems insufficient to assess nursing students' motivation and performance. Third, the study was based on a cohort of students from a single institution with a specific course. Student motivation and performance may differ from one institution to another, from one course to another.

CONCLUSION

The findings of this study showed that student nurses' motivation was improved by switching from the traditional method to the flipped classroom. Motivation subcomponents such as extrinsic goal orientation, control beliefs, and self-efficacy for learning and performance showed statistically significant improvement in the posttest. Furthermore, student performance in the flipped classroom method showed a statistically significant improvement over the traditional method. Future research is needed to investigate the factors influencing student motivation and performance in the flipped classroom.

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