# EVALUATION OF BLENDED APPROACHES IN BASIC FIRST AID TEACHING: SIMULATION, FLIPPED CLASSROOM AND TRADITIONAL METHOD

**Dr. Nesibe SIMSEKOGLU**
ORCID: 0000-0002-6461-7961
Hamidiye Faculty of Nursing
University of Health Sciences
Istanbul, TURKIYE

**Dr. Serap PAMAK BULUT**
ORCID: 0000-0002-1501-4144
Hamidiye Vocational School of Health Services
University of Health Sciences
Istanbul, TURKIYE

**Dr. Beliz YEKELER KAHRAMAN**
ORCID: 0000-0003-3063-1658
First and Emergency Aid Program
University of Health Sciences
Istanbul, TURKIYE

**Dr. Filiz YAGCI**
ORCID: 0000-0001-5574-9922
Faculty of Art and Science
Uludag University
Bursa, TURKIYE

**Dr. Semsi Nur KARABELA**
ORCID: 0000-0003-2562-3004
Department of Infectious Diseases and Clinical Microbiology
Bakirkoy Dr. Sadi Konuk Research Hospital
Istanbul, TURKIYE

**Received:** 08/09/2024 **Accepted:** 10/02/2025

## ABSTRACT

With the increasing use of technology in education, new learning and teaching approaches have begun to emerge. In order to choose an effective teaching method, it has become important to determine students' opinions and satisfaction levels towards these methods. This study aims to determine student evaluations and satisfaction levels towards simulation, flipped classroom, and traditional teaching methods used in teaching "Basic First Aid" courses and the relationship between them. This quasi-experimental study was conducted with 150 university students who took the Basic First Aid course. The data were obtained with the demographic data form, the 'Training Practice Evaluation Form' aiming to evaluate the training method of the students, and the 'Satisfaction with Training Methods Questionnaire' aiming to define the students' satisfaction with the training method. Descriptive and comparative analyses were used to evaluate the data. The mean score of the Training Practice Evaluation Form was 49.97±13.68 and the mean score of the Satisfaction with Training Methods Questionnaire was 54.55±16.07. There was no statistical significance between the scales in terms of different teaching methods used. It was determined that the participants evaluated the teaching method used in the Basic First Aid course positively and their satisfaction levels were high.

**Keywords:** First aid, training models, teaching, satisfaction.

## INTRODUCTION

Developments and changes in the field of technology have a significant impact on society and social life. The education sector is one of the areas where extraordinary changes have been experienced in terms of learning and teaching experience as a result of the advancement of information technologies. Especially the innovations in internet and communication technologies have paved the way for the emergence of alternative models for the field of education (Khan *et al.*, 2012; Jebraeily *et al.*, 2020). E-learning, simulation, virtual reality, artificial intelligence, cloud computing, peer education, standardized patient, gamification, flipped learning, and project-based and interactive learning are some of these methods (Hernon *et al.*, 2023).

Due to the changes in health service delivery and students' learning skills, traditional teaching methods have become unable to meet the needs of health education. There is a need for new and innovative teaching methods that enable students to learn actively and continuously, support the application of knowledge, encourage deep learning, and develop critical thinking skills and personalized. With the developments in Information and Communication Technologies, this need has started to be met by using e-learning methods in health education (Jonker *et al.*, 2018; Martin-Garcia, 2020; Jebraeily *et al.*, 2020). However, it is emphasized that e-learning methods alone will not be sufficient in the teaching process of departments such as medicine, nursing, midwifery, and care technician, which are based on interventional practices. For this reason, one of the main approaches to educational practices is the blended (hybrid) learning method in which e-learning is combined with traditional classroom-based education. The use of blended teaching methods in undergraduate education is not new. While approximately 50% of undergraduate education in the USA uses the blended learning method, after the COVID-19 pandemic, all Higher Education institutions in Turkiye have been allowed to offer 40% of the courses in their curriculum through distance education (Council of Higher Education, 2021). In a systematic review published by the World Health Organisation (WHO) in 2015, it was emphasized that studies on blended learning methods are mainly based in developed countries. However, the COVID-19 pandemic is considered a turning point for blended learning in universities (Castro, 2019; Jebraeily *et al.*, 2020; Nikolopoulou and Zacharis, 2023). The COVID-19 pandemic has had a high impact on education worldwide and almost all educational institutions have been forced to switch to fully online or blended learning. This major and sudden transition, for which no country was prepared, has created the need to identify teachers' and students' perceptions, feelings, and attitudes towards blended learning.

Blended learning, which is a potential outcome of an advanced technology-based learning system, provides equal opportunities in education as it offers access to educational content regardless of time and place (Khan *et al.*, 2012; Mellati and Khademi, 2019; Jebraeily *et al.*, 2020; Nikolopoulou and Zacharis, 2023). According to the results of the research, it was reported that the blended learning method had a positive effect on students' academic achievement level, motivation, learning responsibility, and peer interaction. Blended learning also provides convenience for faculty members by offering a proactive, independent, flexible, and student-centered educational approach (Khan *et al.*, 2012; Jonker *et al.*, 2018; Mellati and Khademi, 2019; Jebraeily *et al.*, 2020; Nikolopoulou and Zacharis, 2023). Despite all these positive features, there are some challenges that students, teachers, and institutions need to consider when using blended learning. The challenges are generally related to technology, funding, management, resources, infrastructure, culture, and skills. These challenges need to be addressed through broader and multidisciplinary research that examines the social, pedagogical, economic, demographic, and financial aspects of education and the outcomes of implementation (Khan *et al.*, 2012; Castro, 2019).

## The Importance and Purpose of The Study

Considering that the blended learning method continues to be used intensively at the end of the COVID-19 pandemic, it has become important to plan multifaceted studies to meet this need (Khan *et al.*, 2012; Ramirez-Arellano *et al.*, 2018; Banihashem *et al.*, 2023). Although research on blended learning has increased as of March 2020, more research is needed to identify opportunities and threats for the smooth implementation of the method and to identify students' perceptions of blended learning environments. It is thought that this study will contribute to meeting this need by examining student experiences towards the blended learning method (Jebraeily *et al.*, 2020; Nikolopoulou and Zacharis, 2023).

This study aims to determine student evaluations and satisfaction levels towards simulation, flipped classroom, and traditional teaching approaches used in teaching the "Basic First Aid" course.

With this research, answers to the following questions were sought:

- What is the level of satisfaction of higher school students with the method used in teaching basic first aid courses?
- What are the opinions of higher school students about the effectiveness of the method used in teaching Basic First Aid courses?
- What are the independent variables affecting the satisfaction and effectiveness of the Basic First Aid course?

## METHOD

Since the participants in this study could not be randomly assigned to groups, it was designed as a quasi-experimental type. Quasi-experimental design research is a method used to reveal cause-effect relationships between variables (Buyukozturk, 2015). The research was conducted in February-June 2021 at the Vocational School of Health Services affiliated with a state university in Istanbul.

## Participants

The population of the study consisted of students studying at the Vocational School of Health Services of a state university in the Spring Term of the 2020-2021 Academic Year and taking the Basic First Aid course. No sample calculation was made in the study. It was aimed to reach all Anesthesia, Home Patient Care, First and Emergency Aid, Pathology, and Medical Laboratory Technician program students who took the Basic First Aid course in the spring semester (n=198). The study was completed with a total of 150 students in the Experimental I group (n=39), Experimental II group (n=81), and Control group (n=30). The Basic First Aid course was taught by simulation method to the First and Emergency Aid Programme in the Experimental I group, by flip-face teaching method to the Anaesthesia and Pathology Laboratory Techniques Programme in the Experimental II group, and by traditional teaching method to the Home Patient Care and Medical Laboratory Technician Programme in the Control group. Since the effectiveness of the teaching method currently used in each program was examined in the study, randomization could not be made. The flow chart of the research is given in Figure 1. In the Spring Term of the 2020-2021 Academic Year, students studying at the vocational school of health services of a state university in Istanbul, who took the Basic First Aid course for the first time and who agreed to participate in the study were included in the study.

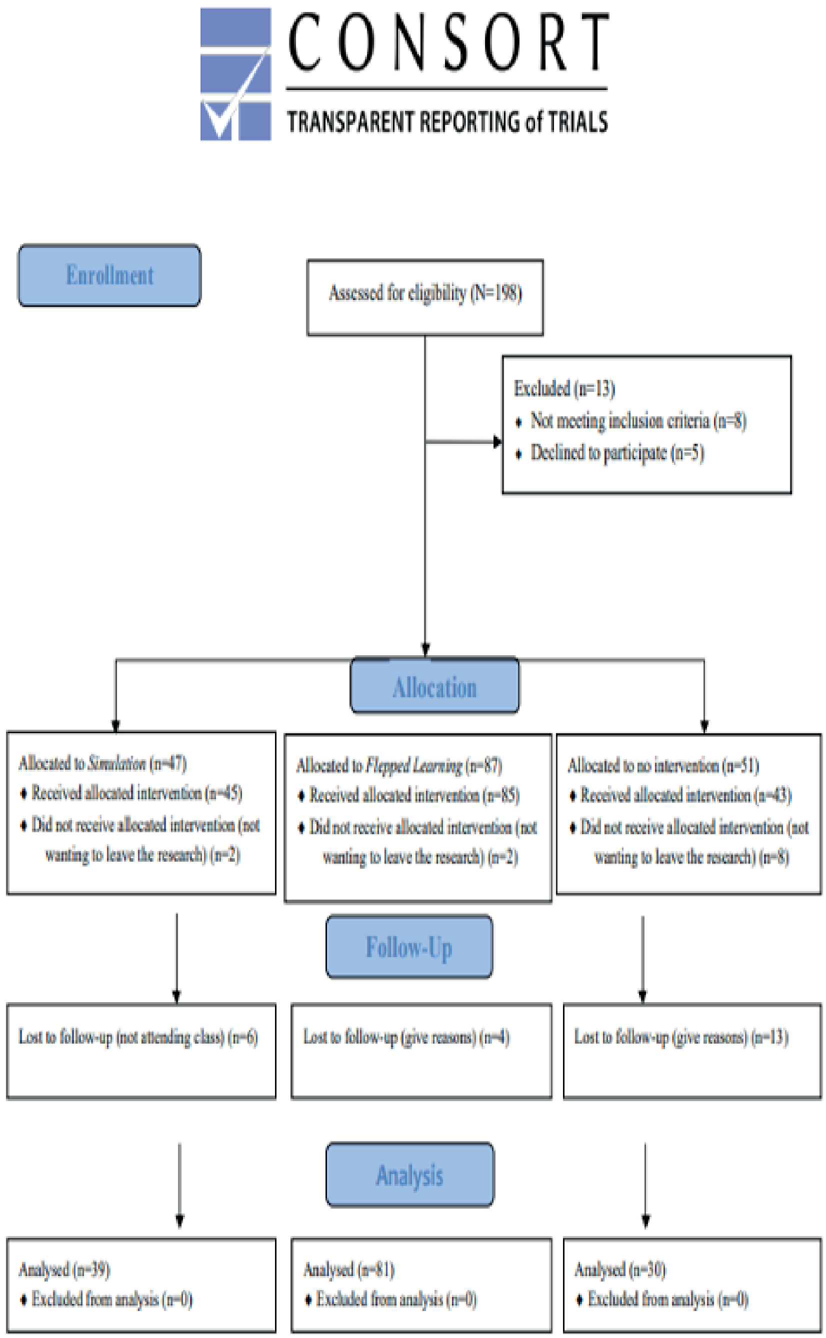


**Figure 1.** The flow chart of the research

## Data Collection and Analysis

The questionnaire to be used to collect the research data consists of three main parts. The first section includes the "Introductory Information Form", the second section includes the "Training Practice Evaluation Form", and the third section includes the "Satisfaction with Training Methods Questionnaire". The research data were collected online via mobile phone at the end of the Spring Term of the 2020-2021 Academic Year in approximately 7-8 minutes.

### Research Implementation

This research was conducted with students who took the "Basic First Aid" course for a total of fourteen weeks in the Spring Term of the 2020-2021 Academic Year. Before the experimental application, laboratory and online learning environments were designed for the experimental groups, and different contents were created for both groups.

The students in the Experiment-I group (Simulation learning model) were informed about the theoretical part of the course in the classroom environment and the applications were shown by demonstration method using simulator models. Students were allowed to practice the applications on model simulators and feedback was given for incomplete/incorrect applications. Incomprehensible points were repeated and discussed. While simple model simulators were used for applications such as the Heimlich maneuver, the adult HAL S1000 ALS simulator model with high reality features was used for basic life support applications. HAL S1000 is a wireless, computer-connected full-body patient simulation designed for comprehensive emergency response and advanced life support simulation-based training. After the theoretical knowledge of Basic Life Support (BLS) training was given to the students according to the current guidelines of the European Resuscitation Council (ERC-2021), a demonstration was performed by the instructor. Then, under the supervision of the instructor, the students were asked to apply the BLS steps as taught in the simulation model. Students were evaluated according to the application steps of BLS; pre-procedure preparation, appropriate position, ensuring airway patency, accuracy of the location of compression, depth of compression, speed of compression, chest relaxation time, and artificial respiration support. Incorrect information and applications of the students who performed the application were immediately corrected by the instructor, and it was ensured that the student could repeat until he/she performed the correct application.

The students in the Experiment II group (flipped classroom model) were given access to course content (video, presentation, and e-book) in the online learning environment before the class hour. Students were asked to study the topics from these sources until the lesson time. During the lesson, the Kahoot (2012, Norwegian University of Science and Technology) application was used to compete with multiple-choice questions, the results were evaluated and the subjects that were not understood were repeated. Care was taken not to assign the activities as homework.

The students in the control group (traditional teaching method) were taught the traditional subject in the classroom environment. Slide and question-answer techniques routinely used in the lectures were used. At the end of the fourteen-week training period (June 2021), students were asked to answer the survey questions. The survey application took approximately 7-8 minutes.

### Data Analysis

Data analysis was performed using the SPSS 25 package program. Percentage and frequency values were presented for categorical variables and arithmetic mean and standard deviation or median, minimum, and maximum values were presented for quantitative variables according to their conformity to normal distribution. The chi-square test was used for comparisons between two independent categorical variables. In the comparison of categorical variables and quantitative variables; firstly, the conformity of the data to normal distribution was determined using the Shapiro-Wilk test. If the data showed conformity to a normal distribution, an independent sample T-test was used to compare quantitative variables with categorical variables containing two categories, and one-way analysis of variance (ANOVA) was used to compare quantitative variables with variables containing more than two categories. If a difference was detected as a result of one-way variance analysis, appropriate post-hoc methods were used to determine which category or categories the difference was caused by. In case the data did not conform to a normal distribution, the Mann-Whitney U test was used to compare quantitative variables with categorical variables containing two categories, and the Kruskal Wallis H test was used to compare quantitative variables with variables containing more than two categories. If a difference was detected as a result of the Kruskal Wallis H test, the categories were compared in pairs with the Mann-Whitney U test to determine which category or categories the difference originated from. In analyzing the relationship between two quantitative variables, Pearson correlation was used if the data conformed to normal distribution, and Spearman correlation was used if the data did not conform to normal distribution. A value of $p<0.05$ was accepted for statistical significance.

## Strengths and Limitations of the Study

Comparing three different methods for teaching Basic First Aid courses and reaching 80% of the sample constitutes the strength of this research.

Since the collection of the research data coincided with the period when the COVID-19 pandemic was widely experienced (February- June 2021), the use of the online environment constitutes the limitation of the research. In a period of many uncertainties, students' adaptation to the course was negatively affected. In addition, the inadequate follow-up of absenteeism during this period hurt the number of students who participated and completed the study.

The findings obtained from the research should not be generalized to the whole society due to the limited sample representation.

## Ethical Aspects of the Research

The research protocol was evaluated by the Health Sciences University Hamidiye Scientific Research and Publication Ethics Committee and found appropriate in terms of medical ethics with the decision number dated 29.06.2020. Permission was obtained from the relevant institution for the implementation of the research in a state university. The purpose, duration, plan, how and where the data will be used, and what is expected from them were explained to the individuals included in the study through the Informed Voluntary Consent Form prepared by the Declaration of Helsinki. In the light of the principle of willingness and voluntariness, written consent was obtained online for their inclusion in the study.

## The Scales

*Introductory Information Form:* It consists of a total of 15 questions, 11 multiple-choice and 4 open-ended questions, including demographic data of the students and information about the Basic First Aid course.

*Education Practice Evaluation Form (EPEF):* This form was developed by Yilmaz *et al.* (2018) to evaluate educational practices (Yilmaz, 2018). It consists of a total of 18 items and each item is evaluated as highly sufficient (4 points), sufficient (3 points), partially sufficient (2 points), and insufficient (1 point). The lowest score that can be obtained in the evaluation of the scale is 18 and the highest score is 72. The increase in the scale score indicates that the students evaluate the educational practice positively, while the decrease in the scale score indicates that the students evaluate the educational practice negatively.

*Satisfaction Survey on Training Methods (SSTM):* The questionnaire developed by Gurpinar *et al.* (2005) consists of 16 propositions (Gurpinar *et al.*, 2005). One of these propositions is "I am generally satisfied with this training method" which questions the satisfaction with the training. The other propositions consist of 16 propositions aiming to determine the opinions about the contribution of the training method to the student's learning and professional life. Each proposition is scored according to a 5-point Likert scale (1- strongly disagree, 5- strongly agree). The lowest score that can be obtained in the evaluation of the scale is 16 and the highest score is 80. The increase in the average scale score indicates that the satisfaction level of the students regarding the education method has increased, while the decrease in the average scale score indicates that the satisfaction level regarding the education method has decreased.

In this study, Cronbach's Alpha values of the scales were calculated. Accordingly, while the Cronbach's alpha value was found to be 0.84 in the validity and reliability study of the SSTM scale, it was found to be 0.958 in this study. The Cronbach alpha value of the EPEF scale was found to be 0.84. The results obtained show that the responses to the data collection forms of this research are highly reliable (Capik *et al.*, 2018).

# FINDINGS

The findings related to the sociodemographic characteristics of the individuals included in the study and the Basic First Aid course are given in Table 1. Accordingly, 70% (n=105) of the participants were female and the mean age was 21.2±2.81 years. It was determined that 29.3% (n=44) of the participants were

Pathology Laboratory Techniques Programme students and 41.3% (n=62) were graduates of high school. It was determined that 64% (n=96) of the participants suggested that the teaching method used in the Basic First Aid course should be used in other courses. It was determined that 24% (n=66) of the participants stated that the teaching method used contributed to reinforcing the information learned as an advantage, while 24% (n=30) stated that not being able to practice was a disadvantage.

**Table 1.** Sociodemographic and basic first aid course characteristics of the participants (n=150)

| | Experimental I<br>n(%) | Experimental II<br>n(%) | Control<br>n(%) | Total<br>n(%) |
|---|---|---|---|---|
| **Gender** | | | | |
| Male | 11(25) | 8(17) | 26(58) | 45(30) |
| Female | 28(27) | 22(21) | 55(52) | 105(70) |
| **Program** | | | | |
| Anesthesia Technician | - | 37(24.7) | - | 37(24.7) |
| Pathology Laboratory Technician | - | 44(29.3) | - | 44(29.3) |
| Home Patient Care- | | - | 10(6.7) | 10(6.7) |
| First and Emergency Aid | 40(26.7) | - | - | 40(26.7) |
| Medical Laboratory Technician | - | - | 19(12.7) | 19(12.7) |
| **Graduated high school** | | | | |
| Anatolian High School | 15(28) | 15(28) | 24(44) | 54(36) |
| Health vocational high School | - | 1(11) | 8(89) | 9(6) |
| High School | 24(38) | 6(10) | 32(52) | 62(41.3) |
| Other | - | 8(32) | 17(68) | 25(16.7) |
| **Method Used** | | | | |
| Simulation | 39(26) | - | - | 39(26) |
| Flapped | - | 81(54) | - | 81(54) |
| Traditional education | - | - | 30(20) | 30(20) |
| **Should the method used to be applied to other courses?** | | | | |
| Yes | 17(17) | 19(20) | 60(63) | 96(64) |
| No | 12(27) | 11(25) | 21(48) | 44(36) |
| **Advantage of the Method** | | | | |
| Reinforcing learning | 11(17) | 42(63) | 13(20) | 66(24) |
| Opportunity to see mistakes | 4(13) | 19(61) | 8(26) | 31(12) |
| Similarity to real environment | 7(21) | 10(30) | 16(49) | 33(13) |
| Teaching while having fun | - | 25(100) | - | 25(9) |
| Doesn't matter place or time | - | 18(100) | - | 18(6) |
| Do not require coming to class prepared | - | 24(83) | 5(17) | 29(10) |
| Providing an interactive Environment | - | 22(56) | 17(43) | 39(15) |
| Increasing interest in the lesson | - | 9(70) | 4(30) | 13(5) |
| No advantage | 5(28) | 4(22) | 9(50) | 18(6) |
| **Disadvantage of the Method** | | | | |
| Inability to access the internet or computer | 6(33) | - | 12(67) | 18(15) |
| Not being able to practice | - | 16(53) | 14(46) | 30(24) |
| Inability to master the subject | 5(56) | - | 4(44) | 9(7) |
| Having distance education | 13(43) | 7(23) | 10(34) | 30(24) |
| No downside | 5(14) | 6(16) | 26(70) | 37(30) |
| | **Min** | **Max** | **Ort±SD** | |
| Age | 18 | 33 | 21.2±2.81 | |

The mean EPEF and SSTM scale scores of the participants related to the Basic First Aid course and their relationships in terms of the method used were analyzed (Table 2). Accordingly, the mean EPEF scale score of the participants was 49.97±13.68, while the mean SSTM scale score was 54.55±16.07. The mean EPEF and SSTM scale scores of the participants for the Basic First Aid course were analyzed in terms of three different teaching methods used and it was determined that there was no significant difference between the groups.

**Table 2.** The relationship between the scales in terms of the method used

| | Experimental I | Experimental II | Control | Total | Min-Max | F | p |
|---|---|---|---|---|---|---|---|
| **EPEF** | 48.08±11.81 | 47.97±12.99 | 51.63±14.67 | 49.97±13.68 | 17-68 | 1.295 | 0.277 |
| **SSTM** | 52.41±12.63 | 50.4±17.08 | 57.12±16.86 | 54.55±16.07 | 16-80 | 2.43 | 0.092 |

Some socio-demographic characteristics affecting the mean EPEF and SSTM scale scores of the participants regarding the Basic First Aid course are presented in Table 3. Accordingly, it was determined that the mean EPEF scale score of female participants was significantly higher. The mean EPEF and SSTM scale total scores of the participants who did not feel ready for an internship with the training for the Basic First Aid course were found to be high. Participants who wanted the teaching method applied for the Basic First Aid course to be used in other courses were also found to have high mean EPEF and SSTM scale total scores. EPEF and SSTM scale total scores were compared in terms of 'age', 'program of study', and 'type of high school graduated from' variables and no statistically significant difference was found (p>0.05).

**Table 3.** Comparison of socio-demographic characteristics and scale scores (n=150)

| Variable | | n(%) | EPEF Mean± SD | SSTM Mean± SD |
|---|---|---|---|---|
| **Gender** | **Male** | 105(70) | 45.65±12.23 | 53.50±11.42 |
| | **Female** | 45(30) | 50.53±13.79 | 57.00±17.77 |
| | | | t=2.180 | t=1.223 |
| | | | **p=0.033*** | p=0.223 |
| **Do you feel ready for your internship with the theoretical training you received?** | **Yes** | 72(48) | 44.83±12.75 | 51.65±15.12 |
| | **No** | 78(52) | 49.23±12.70 | 57.23±16.55 |
| | | | t=-2.114 | t=-2.149 |
| | | | **p=0.036*** | **p=0.033*** |
| **Would you like this teaching method to be used in other courses?** | **Yes** | 96(64) | 51.30±11.63 | 61.36±13.57 |
| | **No** | 54(36) | 39.68±11.62 | 42.44±9.98 |
| | | | t=5.727 | t=8.327 |
| | | | **p=0.000*** | **p=0.000*** |

*p<0,05*

## DISCUSSIONS AND CONCLUSION

The aim of this research, which was carried out with a quasi-experimental design, was to determine student evaluations and satisfaction levels for simulation, flipped classroom, and traditional teaching approaches used in teaching the "Basic First Aid" course.

When the findings related to the sociodemographic characteristics of the individuals included in the study were examined, it was determined that the majority were females, the mean age was 21.2±2.81, and they were predominantly Health Vocational High School graduates and Pathology Laboratory Techniques Program students. The fact that the population of the study consisted of young individuals in the education period is associated with the result obtained in terms of age variable. The fact that the study was conducted in a vocational school of health services is thought to support the result that the participants were predominantly graduates of health vocational high school. It is expected situation that individuals want to continue their education in the field of health where they have more opportunities to find a job after graduation. In this study, the fact that the number of female students is higher supports the fact that the number of female students studying in associate degree programs in Turkiye in the 2020-2021 academic year is higher (Council of Higher Education, 2022) In studies examining different teaching methods used for interventional practices in health education, the demographic characteristics of students in terms of age and gender are similar to the results of this study (Chan *et al.*, 2019; Childs *et al.*, 2020; Nikolopoulou and Zacharis, 2023; Banihashem *et al.*, 2023). In contrast to the results of this research, there are also studies in which male participants are more common (Hori *et al.*, 2016; Bossman and Agyei, 2022). It is thought that the difference in the population constituting the sample may be effective in the different results obtained in terms of demographic variables.

In this study, the participants' statements about the advantages of the teaching method were analyzed. According to the participants of the Experiment I group, when the advantages of the simulation method were analyzed, providing an interactive environment ranked first, followed by the features of resembling the real environment, reinforcing learning, and providing the opportunity to see mistakes. The participants of the Experiment II group, in which the flipped classroom method was applied, stated that it provided advantages in terms of reinforcing learning, and teaching while having fun, and excitement, requiring preparedness for the lesson, providing an interactive environment, and providing the opportunity to see mistakes. The participants in the control group, where the traditional education method was applied, stated that the method had a positive effect on reinforcing learning.

The participants' statements about the disadvantages of the teaching method were also analyzed. Accordingly, the participants of the Experiment I group stated that not being able to access the internet computer and not being able to master the subjects were the disadvantages of the simulation method. The participants of the Experiment II group described not being able to practice the flipped education method and distance education as a disadvantage. The control group participants, on the other hand, stated that not being able to practice and not being able to access the internet-computer as disadvantages. The results obtained show that among the advantages of blended teaching methods, there are more statements about learning motivation, and among the disadvantages, there are statements indicating technical inadequacies. These results support the findings of the literature. In the studies in which the perceptions and attitudes of teachers and students in the blended teaching method were analyzed by SWOT analysis, the advantages of the method include high motivation level, encouraging teacher-student interaction, focusing on students' learning needs, self-learning, and problem-solving skills (Jebraeily *et al.*, 2020; Banihashem *et al.*, 2023). The disadvantages include a high workload, lack of an independent e-learning center for support services, lack of proper evaluation and supervision of virtual activities, lack of cultural preparation, and inadequate technical and human resources infrastructure (Jebraeily *et al.*, 2020; Banihashem *et al.*, 2023). In addition, it was stated that the blended teaching method provides access to more students, provides more permanent learning at students' own pace with an individualized educational environment, increases self-efficacy and self-awareness levels, and improves out-of-class activities and feedback (Castro, 2019; Banihashem *et al.*, 2023). In addition to all these issues, Khan *et al.* (2012) emphasized that the blended teaching method is more flexible, efficient, and accessible for teachers and students (Khan *et al.*, 2012).

In this study, the mean EPEF and SSTM scale scores of the participants related to the Basic First Aid course and their intergroup relationships were analyzed. According to the result obtained; the fact that there is no significant difference between the groups in terms of EPEF and SSTM scale mean scores indicates that the teaching methods used are evaluated at a similar level by the students and show similar characteristics in terms of satisfaction status.

In this study, the scores obtained from the EPEF and SSTM scales are above average and indicate that the participants evaluate the educational practice used positively and are satisfied with the method. It is seen that the traditional teaching method is the method that students find positive and are most satisfied with, followed by simulation and flipped classroom method respectively. This result is associated with the fact that students are more familiar with face-to-face learning environments and have limited experience with blended learning. Students' positive views towards blended methods may affect their decisions regarding the acceptance and use of the method (Nikolopoulou and Zacharis, 2023). Therefore, it is expected that the ranking of the method in which the students evaluate the teaching method positively and the method in which the satisfaction level is high will be the same.

The fact that the satisfaction levels of inversion and simulation applications, which have become increasingly widespread with the development of communication technologies, are lower than the classical lecture method may be associated with the traditionalist attitude of the students who make up the sample of this study. Students' openness to change and development and their level of readiness for the use of technology may also be effective in the emergence of this result. In cases where students have no choice but to adapt to online and innovative learning, it is thought that the disadvantages as well as the advantages of the methods are effective in the level of satisfaction.

In the literature, it is seen that in the studies in which the traditional approach is compared with innovative methods, unlike the results of this research, it is seen that the innovative methods have more positive effects (Corrêa *et al.*, 2022). In Chan *et al.'s* (2019) study, the level of satisfaction with the video-based teaching method used in the basic first aid course was found to be high (Chan *et al.*, 2019). In a study examining the quality and satisfaction levels in the emergency training course for nurses with a multi-criteria hybrid network structure model, the satisfaction level of the method was found to be high (Hu *et al.*, 2023). In a Ghana-based study, it was reported that technology anxiety, instructor factor, course, and technology quality had positive effects on perceived satisfaction and performance levels towards innovative teaching methods. In addition, it was emphasized that the ease of using these methods, manpower intensity, and financial capital also increased satisfaction levels and performance (Bossman and Agyei, 2022).

There are also studies in the literature that support this research result and report that simulation and flipped education methods have a positive effect on learning performance, academic success, and group work (Chen *et al.*, 2023; Nikolopoulou and Zacharis, 2023). In a randomized controlled study based in Taiwan, it was determined that the augmented reality teaching method had a positive effect on nursing students' self-confidence, knowledge, and skill levels regarding pediatric first aid practices, compared to the traditional method (Chen *et al.*, 2023). In a randomized controlled study based in China, the effects of first aid training given using three different teaching methods: interactive group, video, and traditional teaching, on the retention of teachers' knowledge, were examined and it was stated that the video method was more effective (Li *et al.*, 2020). In a study based in India, Gambia, and the USA, the effectiveness of the Chatbot, which advises on first aid in case of a heart attack, was examined. Although the chatbot provides instructions consistent with current guidelines for first aid; It has been stated that it is not a reliable source of information about first aid because it has incomplete, inaccurate, and misleading instructions (Birkun and Gautam, 2024). While Banihashem *et al.'s* (2023) study found a significant difference between teachers' and students' attitudes and feelings towards the blended teaching method and their perceived teaching and learning performances, unlike this study, no significant difference was found in terms of satisfaction (Banihashem *et al.*, 2023). There are also satisfaction studies in the literature regarding different educational contents in which the blended teaching method is used. In a Netherlands-based study investigating the effectiveness of blended methods used in mathematics teaching; It has been stated that the model is promising in increasing learning performance, offers a more active learning experience compared to the traditional method, and this leads to more participation and interaction. It has been stated that especially the flipped teaching method offers a higher educational opportunity (Gordijn *et al.*, 2017). In another study where the digital competencies of education faculty students were examined using blended methods, it was reported that the digital competencies of the students were at a medium level. In the study, it was determined that the blended teaching method had a positive effect on the participants' digital knowledge and usage levels compared to the traditional method (Guillen-Gamez *et al.*, 2020). In a study where the effectiveness and satisfaction level of first aid training given with the traditional method for young mental health was examined with more than 800 participants, it was concluded that the method was effective and the satisfaction level was high (Childs *et al.*, 2020). Similar to this result, in a randomized controlled study based in Brazil, it was reported that in the 6-month follow-up of the flipped and traditional teaching methods used for the geriatric competencies of health department students, both methods positively affected the student's knowledge and attitude levels, but no significant difference was found between the methods (Corrêa *et al.*, 2022). In a Riyadh-based study evaluating the blended teaching method used in English language education; It has been stated that self-efficacy and verbal ability are important predictors of online performance, and the level of satisfaction is high (Fadda, 2019). In another study examining the current use of educational technologies in teaching clinical psychomotor skills in nursing and midwifery education, it was reported that simulation, video, and virtual reality methods were widely used and student satisfaction with these methods was high (Hernon *et al.*, 2023).

In this study, some socio-demographic characteristics that affected the participants' EPEF and SSTM scale score averages regarding the blended teaching methods used in the Basic First Aid course were examined. Accordingly, it was determined that female participants evaluated the training application positively. In studies examining different educational methods used for interventional practices in health education; Students' satisfaction levels towards blended teaching methods are similar to the results of this research in terms of age and gender (Banihashem *et al.*, 2023). On the other hand, no significant difference was found in a study where the blended teaching method was evaluated in terms of gender variables (Guillen-Gamez *et al.*, 2020). When looking at the effect of demographic characteristics on blended learning perceptions in Nikolopoul *et al.'s* (2023) research; It was stated that there were significant differences in terms of gender, department, and year of study (Nikolopoulou and Zacharis, 2023). Unlike this study, it was stated that male students had more positive perceptions about learning, and female students had more positive perceptions about motivation. The fact that there is no difference in terms of age variable in this study is associated with the fact that university students are in a similar age range. On the other hand, in a study comparing the satisfaction of cardiopulmonary resuscitation training given in schools among different age groups, it was reported that the satisfaction levels of primary school students were higher (Hori *et al.*, 2016).

In this research, it was determined that the participants who did not feel ready for the internship due to the training they received for the Basic First Aid course evaluated the training application positively and were satisfied with the applied method. It is thought that the internship-specific concerns of students may also be effective in this result. Although the students are satisfied with the teaching method, it appears that the method is not sufficient to reduce the level of anxiety about the internship. In a study conducted with students in the physiotherapy department, it was reported that the blended teaching method was effective in improving internship competencies and reducing anxiety (Ruiz-Ruiz *et al.*, 2023).

In this research, it was determined that the participants, who suggested that the method used in the Basic First Aid course be used in other courses, evaluated the training application positively and were satisfied with the method applied. When the students' suggestions for the use of the teaching method used in the Basic First Aid course in other courses are examined, the main ones are; It is seen that the traditional teaching method, simulation, and flipped classroom method are included. It is expected that students want the teaching method they are satisfied with to be applied in other courses as well. In a Turkiye-based study where the satisfaction and behavior of students using distance education during the COVID-19 pandemic period were examined within the framework of the Technology Acceptance Model, perceived benefit and performance expectation had a significant impact on satisfaction and behavioral intention; It was concluded that satisfaction had a significant effect on behavioral intention (Avci and Yildiz, 2021). The result obtained supports the findings of this research. In this research, participants' evaluations and satisfaction levels regarding educational practices; It was also examined in terms of variables such as 'age', 'program studied', and 'type of high school graduated from', but no significant difference was found.

The findings from this study differed greatly from the literature. Studies in developing countries have not yet focused on the perceived satisfaction and performance of blended approaches. The level of scientific progress of developed countries that are pioneers in technology is incomparable with their developing counterparts. Therefore, it is expected that the findings in the literature focusing on developed economies regarding innovative teaching methods are not like the findings on developing countries.

In line with the findings obtained from this research, it was determined that the participants evaluated the teaching method used in the Basic First Aid course positively and their satisfaction levels were high. Satisfaction with the teaching method used; It was determined that it was affected by 'gender', 'readiness for internship' and 'recommendation for other courses'. No significant difference was found between the methods in terms of satisfaction.

Considering that the use of blended teaching methods will continue after the COVID-19 pandemic, it has become important to determine the perceptions of teachers and students regarding these methods and the affecting factors. The findings from this study contribute to the gap in the post-pandemic literature regarding students' perceptions of the blended teaching method and the different effects caused by these perceptions. It will also guide the planning of curriculum studies that include effective teaching methods for teaching Basic First aid that students are satisfied with.

**Acknowledgements:** The authors are grateful to students who consented to participate in this study.

## BIODATA and CONTACT ADDRESSES of AUTHORS

**Asst. Prof. Dr. Nesibe SIMSEKOGLU** is a faculty member at the Hamidiye University Faculty of Nursing. She received her PhD in Fundamentals of Nursing in February 2023. Her academic interests include nursing informatics, healthcare technologies, innovative educational methods, care, palliative care, home care, spiritual care, pain, symptom management, and health literacy. He has 10 journal articles, 2 book chapters, and articles published in international and national indexes. He has also presented more than 30 papers at international and national meetings.

Nesibe SIMSEKOGLU
Fundamental of Nursing Department
Hamidiye Faculty of Nursing
Address: University of Health Sciences, 34674, Istanbul, Turkiye
Phone: +90 5539319791
E-mail: nesibe.simsekoglu@sbu.edu.tr

**Asst. Prof. Dr. Serap PAMAK BULUT** graduated from Ege University Faculty of Medicine and completed her general surgery residency at Haseki Training and Research Hospital. She earned her PhD in molecular oncology at the University of Health Sciences, where she currently serves as a faculty member. Her clinical and research interests include breast diseases, colorectal surgery, and wound and burn healing. She has successfully passed USMLE Step 1 and Step 2 CK exams, and has presented numerous papers at national and international congresses. Her publications appear in peer-reviewed journals. Her academic focus also includes surgical oncology and communication in healthcare.

Serap PAMAK BULUT
Department of Perfusion Techniques
Hamidiye Vocational School of Health Services
Address: University of Health Sciences, 34674, Istanbul, Turkiye
Phone: +90 5325671680
E-mail: serap.pamakbulut@sbu.edu.tr

**Dr. Beliz YEKELER KAHRAMAN** completed her doctorate in Internal Medicine Nursing at Istanbul University-Cerrahpasa Florence Nightingale Faculty of Nursing. She serves as a lecturer in the First and Emergency Aid Program at the Hamidiye Health Services Vocational School of Health Sciences University, Department of Medical Services and Techniques. She has lectured in various departments of the Faculty of Health Sciences and the School of Health Services and has published oral and poster presentations at national and international congresses. Her research interests include: Internal Medicine Nursing, Nursing Education, First and Emergency Aid Education, First Aid, Intensive Care Nursing, Cardiovascular Nursing, and Neurological Nursing.

Beliz YEKELER KAHRAMAN
Department of Medical Services and Techniques
First and Emergency Aid Program
Address: University of Health Sciences, 34674, Istanbul, Turkiye
Phone: +90 5054576173
E-mail: beliz.yekelerkahraman@sbu.edu.tr

**Dr. Filiz YAGCI** is a lecturer in the Department of Mathematics, Faculty of Arts and Sciences, Bursa Uludag University. She received her PhD in Mathematics in 2005. Her academic interests include mathematics and statistics. She has published 15 journal articles, two book chapters, and articles in international and national indexes. She has also presented more than 23 papers at international and national meetings.

Filiz YAGCI
Department of Mathematics
Faculty of Art and Science
Address: Uludag University, 16285, Gorukle, Bursa
Phone: +90 5079532062
E-mail: gfiliz@uludag.edu.tr

**Assoc. Prof. Dr. Semsi Nur KARABELA** completed her specialist training at Istanbul Haseki Training and Research Hospital in 2006. She is a faculty member in Infection Diseases and Clinical Microbiology at the University of Health Sciences. Her academic interests include Infectious Diseases, Vaccines, and Disease Prevention. She also has interests in Health Education and Health Management. She has published more than 30 journal articles in international indexes, three book chapters, and presented papers at numerous international meetings.

Semsi Nur KARABELA
Department of Infectious Diseases and Clinical Microbiology
Bakirkoy Dr. Sadi Konuk Researche Hospital
Address: University of Health Sciences, 34674, Istanbul, Turkiye
Phone: +90 5055628495
E-mail: semsinur.karabela@sbu.edu.tr

## REFERENCES

Avci, I. and Yildiz, E. (2021) 'Investigation of Satisfaction and Behaviors of Students Using Distance Education in the Covid-19 Pandemic Process within the Framework of Technology Acceptance Model'. *Gumushane University Social Sciences Institute Electronic Journal*, Vol. 12 No. 3, pp. 814–830. Available at: https://orcid.org/0000-0001-9112-5076.

Banihashem, S.K. *et al.* (2023) 'Modeling Teachers' and Students' Attitudes, Emotions, and Perceptions in Blended Education: Towards Post-Pandemic Education'. *International Journal of Management Education*, Vol. 21 No.2. DOI: 10.1016/j.ijme.2023.100803.

Birkun, A. A., and Gautam, A. (2023). Large language model-based chatbot as a source of advice on first aid in heart attack. *Current Problems in Cardiology*, Vol. 49 No. 102048. 10.1016/j.cpcardiol.2023.102048.

Bossman, A. and Agyei, S.K. (2022) 'Technology and Instructor Dimensions, e-Learning Satisfaction, and Academic Performance of Distance Students in Ghana'. *Heliyon*, Vol. 8 No 4. DOI: 10.1016/j.heliyon.2022.e09200.

Buyukozturk Sener. (2015) *Data Analysis Handbook for Social Sciences: Statistics, Research Design, SPSS Applications and Commentary.* Ankara: Pegem Academy Publications.

Capik, C., Gozum Sebahat. and Aksayan Secil. (2018) 'Stages of Cross-Cultural Scale Adaptation, Language and Culture Adaptation: Updated Guide.' *FNJN Florence Nightingale Journal of Nursing*, Vol. 26 No. 3.

Castro, R. (2019) 'Blended Learning in Higher Education: Trends and Capabilities'. *Education and Information Technologies*, Vol. 24 No 4, pp. 2523–2546. DOI: 10.1007/s10639-019-09886-3.

Chan, M.M. *et al.* (2019) 'MOOCs, an Innovative Alternative to Teach First Aid and Emergency Treatment: A Practical Study'. *Nurse Education Today*, Vol. 79, pp. 92–97. DOI: 10.1016/j.nedt.2019.05.008.

Chen, T. *et al.* (2023) 'The Role of Pre-Class and in-Class Behaviors in Predicting Learning Performance and Experience in Flipped Classrooms'. *Heliyon*, Vol. 9 No. 4. DOI: 10.1016/j.heliyon.2023.e15234.

Childs, K.K., Gryglewicz, K. and Elligson, R. (2020) 'An Assessment of the Utility of the Youth Mental Health First Aid Training: Effectiveness, Satisfaction, and Universality'. *Community Mental Health Journal*, Vol. 56 No. 8, pp. 1581–1591. DOI: 10.1007/s10597-020-00612-9.

Corrêa, C.P.S. *et al.* (2022) 'Short and Medium-Term Effects of Different Teaching Strategies for Interprofessional Education in Health Professional Students: A Randomized Controlled Trial'. *Nurse Education Today*, Vol. 117. DOI: 10.1016/j.nedt.2022.105496.

Council of Higher Education. (2021) *Practices Guide for Education and Training Processes During the Global Pandemic*. *Higher education board*, available at: https://cprguidelines.eu/ (accessed 14 July 2023).

Fadda, H. Al. (2019) 'The Relationship Between Self-Regulations and Online Learning in an ESL Blended Learning Context'. *English Language Teaching*, Vol. 12 No 6. p. 87. DOI: 10.5539/elt.v12n6p87.

Gordijn, J., Oosterhout, A. and Dijkstra, W. (2017) 'Innovation Mathematics Project, Blended Education in Practice: A Case Study at Delft University of Technology'. In *EDULEARN17 Proceedings*. IATED, pp. 9940–9950. DOI: 10.21125/edulearn.2017.0881.

Guillen-Gamez, F.D., Mayorga-Fernandez, M.J. and Del Moral, M.T. (2020) 'Comparative Research in the Digital Competence of the Pre-Service Education Teacher: Face-to-Face vs Blended Education and Gender'. *Journal of E-Learning and Knowledge Society*, Vol. 16 No. 3, pp. 1–9. DOI: 10.20368/1971-8829/1135214.

Gurpinar E, *et al.* (2005) 'Evaluation of Problem-Based Learning Implemented at Akdeniz University Faculty of Medicine by Education Facilitators'. *World of Medical Education*, Vol. 28 No. 20, pp. 9-12.

Hernon, O. *et al.* (2023) 'The use of educational technology in teaching and assessing clinical psychomotor skills in nursing and midwifery education: A state-of-the-art literature review'. *Journal of Professional Nursing*, Vol. *45*. Pp. 35-50. DOI: 10.1016/j.profnurs.2023.01.005.

Hori, S. *et al.* (2016) 'Cardiopulmonary Resuscitation Training in Schools: A Comparison of Trainee Satisfaction among Different Age Groups'. *Keio Journal of Medicine*, 65(3), pp. 49–56. DOI: 10.2302/kjm.2015-0009-OA.

Hu, W.L. *et al.* (2023) 'Identification of Critical Quality Factors and Critical Satisfaction Gaps in Emergency Training Courses for New Nurses by the Multi-Criteria Network Structure Model'. *BMC Medical Education*, Vol. 23 No.1. DOI: 10.1186/s12909-023-04330-0.

Jebraeily, M. *et al.* (2020) 'Evaluation of Blended Medical Education from Lecturers' and Students' Viewpoint: A Qualitative Study in a Developing Country'. *BMC Medical Education*, Vol.20 No.1. DOI: 10.1186/s12909-020-02388-8.

Jonker, H., Marz, V. and Voogt, J. (2018) 'Teacher Educators' Professional Identity under Construction: The Transition from Teaching Face-to-Face to a Blended Curriculum'. *Teaching and Teacher Education*, Vol. 71, pp. 120–133. DOI: 10.1016/j.tate.2017.12.016.

Khan, A.I. *et al.* (2012) 'Study of Blended Learning Process in Education Context'. *International Journal of Modern Education and Computer Science*, Vol. 4 No. 9, pp. 23–29. DOI: 10.5815/ijmecs.2012.09.03.

Li, F. *et al.* (2020) 'Effects of Three Different First-Aid Training Methods on Knowledge Retention of Caregivers and Teachers: A Randomized and Longitudinal Cohort Study in China'. *Public Health*, Vol. 178, pp. 97–104. DOI: 10.1016/j.puhe.2019.08.021.

Martin-Garcia, A.V. (2020) *Blended Learning: Convergence between Technology and Pedagogy.* Springer International Publishing. Vol. 126.

Mellati, M. and Khademi, M. (2019) 'Technology-Based Education'. In *Advanced Online Education and Training Technologies*. pp. 48–62. DOI: 10.4018/978-1-5225-7010-3.ch003.

Nikolopoulou, K. and Zacharis, G. (2023) 'Blended Learning in a Higher Education Context: Exploring University Students' Learning Behavior'. *Education Sciences*, Vol. 13 No. 5. DOI: 10.3390/educsci13050514.

Ramirez-Arellano, A. *et al.* (2018) 'Factors Affecting Student Learning Performance: A Causal Model in Higher Blended Education'. *Journal of Computer Assisted Learning*, Vol. 34 No.6, pp. 807–815. DOI: 10.1111/jcal.12289.

Ruiz-Ruiz, B. *et al.* (2023) 'Competence Development in an Undergraduate Physiotherapy Internship Program during the COVID-19 Pandemic: A Blended Learning Approach'. *Sustainability (Switzerland)*, Vol. 15 No. 15. DOI: 10.3390/su151512052.

Yilmaz, B.C. (2018) *Examination of the Effect of Satisfaction and Anxiety Levels of Nursing Students of Using Simulation Based Training Method in the Management of Preeclampsia Patient Care*. Ege University Health Sciences Institute.