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The Effectiveness of Applying the Flipped Classroom Strategy in Improving Self-Efficacy and Academic Achievement of Students During COVID-19 Pandemic

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Abstract:

This study investigates the effectiveness of the flipped classroom strategy in enhancing self-efficacy and academic achievement among second-year Master students of Counseling and Guidance at El-Oued University during COVID-19 pandemic. A total of 88 students (male and female) were randomly assigned to experimental and control groups. The experimental group experienced the flipped classroom approach while the control group followed traditional instruction. Self-efficacy was measured using the Schwarzer & Jerusalem scale (1989), and academic achievement was assessed through course grades. Results indicated significantly higher post-measurement self-efficacy and academic achievement in the experimental group compared to the control group. Additionally, the experimental group demonstrated significant improvements in self-efficacy and academic achievement from pre- to post-measurement. The findings suggest that the flipped classroom strategy is a viable and effective alternative to traditional distance learning in Higher education during crises.

Keywords: Flipped classroom, Self-efficacy, Academic achievement, Distance learning, Traditional learning, Higher education, Course grades.

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Introduction

Higher education is an essential stage in students' lives, crucial for their socialization, academic development, and preparation for future professional life. University serves as an educational incubator where students develop their personalities, acquire cognitive and behavioral skills, and achieve self-efficacy. This self-efficacy boosts their self-confidence, helping them accomplish academic achievements and life goals.

Self-efficacy is a fundamental criterion for students' success or failure in both study and life. It serves as an internal motivator, driving learners to perform at their best to accomplish tasks perfectly. Conversely, when self-efficacy diminishes, students' motivation decreases, making them less likely to pursue their goals successfully, leading to failure and reluctance to attempt. Students with a strong sense of self-efficacy focus on analyzing problems to find appropriate solutions, while those who feel incompetent tend to turn their thoughts inward, exacerbating their problems (Bani Khalid, 2010, p. 415).

In the same vein, Badawi (2001) added that self-efficacy helps students face the psychological and academic pressures that hinder their performance. Learners' self-efficacy levels rise through practice and continuous training in various academic skills (p. 151).

The correlation between self-efficacy and various academic variables has demonstrated its impact on students' compatibility and academic achievement, as shown in studies by Multon et al. (1991), Shukullaka (2013), Azar (2013), and Tenaw (2013). These researchers found that self-efficacy positively affects students' academic performance. This correlation indicates a statistically significant relationship between competency and achievement across different fields of study, enhancing students' academic performance, as claimed by Zimmerman (2000, p. 8).

To achieve the positive impact of self-efficacy on students' academic achievement, active learning strategies should be employed to stimulate students' learning motivation and allow them to demonstrate their roles as key participants in the educational process.

Due to the critical period following the spread of the Covid-19 virus, most educational institutions and universities were forced to close and adhere to home quarantine for a significant time. However, as the situation evolved, universities transitioned to distance learning as an alternative to face-to-face education. In Algeria, many universities struggled with the necessary capabilities for effective distance education, leading to delays in lesson completion and irregular academic activities. In response, the Ministry of Higher Education and Scientific Research mandated that all Algerian universities implement blended learning. They adopted batching and rotation methods for student attendance to respect social distancing and reduce the number of students on campus (Lassoued et al., 2020).

Accordingly, the researchers adopted the flipped classroom strategy as a form of blended learning. This approach involves traditional teaching processes being applied outside the classroom, where students engage with the material before class, thus changing the learning style. The flipped classroom is a teaching strategy that can attract students' attention, excite them, and shift them away

from a predominantly traditional environment, making learning more enjoyable and engaging (Strayer, 2007, p.17).

Many educational studies have confirmed the effectiveness of the flipped classroom as a modern educational strategy in enhancing self-efficacy and achievement among university students. For instance, a study by AlJaser (2017) showed that using the flipped classroom strategy increased academic achievement and self-efficacy among female students at the College of Education at Princess Nourah bint Abdulrahman University in Saudi Arabia. The study found that higher scores on achievement tests were associated with greater self-efficacy.

Afia's study (2019) demonstrated the effectiveness of a training program for flipped learning in developing achievement and academic self-competence and efficacy among students at Imam Abdulrahman University in the Faculty of Sciences and Humanities in Saudi Arabia. Several studies have recommended using the flipped classroom strategy in higher education, including those by Hasab Seydou and Kabir (2018), Afia (2019), Hewary (2020), and Al-Qahtani (2021). These studies highlight the importance of this modern educational strategy in benefiting university students by providing them with behavioral skills in addition to the knowledge they receive inside and outside the classroom. These skills include independence in thinking and work, commitment to achievement responsibility, and the formation of leadership qualities that direct them toward self-learning and academic achievement, ultimately fostering academic and professional effectiveness and self-efficacy in the future.

The application of the flipped classroom strategy is relatively new at the University of El-Oued, particularly for graduating students, where it impacts their self-efficacy and readiness for professional life. This is evident in their performance in the course 'Guidance and Counseling Requirements in Light of Globalization.' This course aims to introduce students to the mechanisms of remote guidance and counseling and how to apply these mechanisms in a professional environment to enhance service effectiveness and engage more pupils in these services for their future academic and career paths. Therefore, the current study aims to assess the impact of the flipped classroom strategy on improving self-efficacy and academic achievement in this course among second-year master students of Counseling and Guidance at El-Oued University.

Consequently, the researchers formulated the following general question: What is the effectiveness of applying the flipped classroom strategy during the COVID-19 pandemic on improving self-efficacy and academic achievement in the course 'Guidance and Counseling Requirements in Light

of Globalization' for second-year master students in Guidance and Counseling at El-Oued university? The following hypotheses are proposed:

H1: There are statistically significant differences between the average scores of both student groups on the post-measurement of the self-efficacy scale, favoring the experimental group.

H2: There are statistically significant differences between the average scores of both student groups on the post-measurement of the academic achievement test, favoring the experimental group.

2. Method

This study adopted a semi-experimental approach to evaluate the effectiveness of the flipped classroom strategy in teaching the course of 'Guidance and Counseling Requirements in Light of Globalization' on improving self-efficacy and academic achievement among second-year master students in Counseling and Guidance. The study sample was divided into two groups: the experimental group, which was taught using the flipped classroom strategy, and the control group, which received traditional learning.

2. 1. Study population and sample

The study population comprised all second-year master students in Guidance and Counseling at the Faculty of Social Sciences and Humanities, University of El-Oued. This group included 150 male and female students for the academic year 2021/2022.

2.1.1. Exploratory study sample

The exploratory study sample consisted of 61 male and female students who were selected randomly. This sample was used to codify the study tool and to verify its validity before applying it to the main study sample.

2.1.2 . Basic study sample

The basic study sample was selected using simple random sampling for both the control and experimental groups. The experimental group was assigned tasks outside of class related to studying the course 'Guidance and Counseling Requirements in Light of Globalization.' This involved establishing student-teacher collaboration via email and messenger, with students receiving a series of lectures at the university.

The basic study sample comprised 88 male and female students. The distribution of the sample members between the two study groups is as follows:

Table 1: Sample distribution according to the study groups

Study groups	Number	Percentage (%)
Experimental group	44	50

Control group	44	50
Total	88	100

Table 1 shows that the sample percentage for both the control and experimental groups is equal, with each estimated at 50%. Therefore, the total sample constitutes 58.66% of the study population.

2. 2. Study tools

2.2.1. Self-efficacy scale

In this study, the General Self-Efficacy Scale by Schwarzer and Jerusalem (1989), translated into Arabic by Samer Radwan (1997), was used to measure an individual's belief in their capability to cope with various life problems. This globally widespread 10-item scale is characterized by appropriate validity and reliability coefficients, making it a trustworthy tool for measurement (Rudwan, 2010, p. 16).

Some psychometric properties of this scale have been estimated as follows:

- **Scale validity**

The construct validation of the self-efficacy scale was calculated, and the results are presented in the table below:

Table 2: The results of the correlation coefficient of each item with the total score of the scale

Item number	**Correlation value**	**Item number**	**Correlation value**
01	0.514	06	0.462
02	0.245	07	0.739
03	0.604	08	0.544
04	0.531	09	0.632
05	0.693	10	0.696

Table 2 shows the values of the correlation coefficients between each item and the total score of the scale, which ranged between 0.245 and 0.739. This confirms that the scale is valid and can be applied to the basic sample after ensuring its reliability. Correlation validity was also assessed between the self-efficacy scale and the self-effectiveness scale by Yang et al. (2010), translated into Arabic by Bani Younis (2013). The correlation coefficient was 0.58, which is a strong coefficient, supporting the validity of the scale.

- **Scale reliability**

The reliability of the scale was calculated using half-fractionation method and Guttman's equation, resulting in a value of 0.74. This is a good coefficient that confirms the scale's reliability. Additionally, Cronbach's alpha was applied to the entire scale, yielding an estimated value of 0.75, which is also an acceptable measure of reliability.

2.2.2. The academic achievement in the course of guidance and counseling requirements in light of globalization

Second-year master students in Counseling and Guidance were evaluated in the course 'Requirements of Guidance and Counseling in Light of Globalization' through classroom presentations. Students were asked to preview and prepare these presentations in small groups outside of class. The academic achievement of the students was measured by their cumulative average (continuous evaluation grades), reflecting their understanding of the scientific material covered in the course.

2.3. Application procedures

The procedures for implementing the study were carried out according to the following steps:

(1). Estimation of some psychometric properties of the self-efficacy scale.

(2). Pre-application of the self-efficacy scale to ensure the equivalence of the control and experimental groups.

Table 3: Significance of the differences between the average scores of experimental and control groups in the pre-measurement of self-efficacy scale.

Scale	Group	Number	Arithmetic mean	Standard deviation	The calculated value of "*T*"	Level of significance	Decision
Self-efficacy	**Control**	44	25.63	3.13	0.56	0.57	insignificant
	Experimental	44	25.27	2.89			

The results in Table 3 show that the *T*-value of 0.56 is not significant, indicating no statistically significant differences between the average scores of the control group and the experimental group in the pre-measurement of the self-efficacy scale. This confirms the equivalence of the two groups before the experiment, ensuring that it does not affect the study's results.

(3). Teaching the course of guidance and counseling requirements in light of globalization:

The course was taught during the first semester of the 2021/2022 academic year, with one session per week. The class was delivered in two formats: traditional teaching for some groups and the flipped classroom method for others. In the flipped classroom, students were provided with the complete lesson syllabus in advance and were required to prepare class presentations that included lesson explanations, discussions, and student interactions. Throughout the course, students received guidance and support from the teacher both in class and outside of it via email and messaging.

(4). Checking the moderation requirement:

To assess the normality of the distribution of the study sample, the Kolmogorov-Smirnov test was applied. The calculated *Z*-value was not statistically significant at the 0.05 level, indicating that the scores of the study sample are normally distributed. This confirms that parametric tests can be validly used for subsequent statistical analysis of the data.

2.4. Statistical processing

The Statistical Package for the Social Sciences (SPSS, version 25.0) was used for analysis, applying the following statistical methods:

T-Test for Independent Samples: To identify differences between the averages of two independent samples.

T-Test for Correlated Samples: To identify differences between the averages of two related samples.

Blake's Modified Gain Ratio: To evaluate the effect of the intervention.

H3: There are statistically significant differences between the pre and post-measurements of the self-efficacy scale for participants in the experimental group, with improvements observed in the post-measurement.

3. Results

After applying the self-efficacy scale to the sample members, the results were analyzed. These findings will be presented and discussed in relation to the study hypotheses, in the order they were proposed.

3.1. Results related to the first hypothesis

The first hypothesis states that there are statistically significant differences between the average scores of students in the control and experimental groups in the post-measurement of the self-efficacy scale, favoring the experimental group. The obtained data are as follows:

Table 4: The significance of the differences between the average scores of students of the two groups (control and experimental) in the post-measurement of the self-efficacy scale

Control group *n*=44		**Experimental group *n*=44**		**The calculated value of "*T*"**	**Level of significance**	**ETA square η^2**	**Effect size**
$\bar{x}$	σ	$\bar{x}$	σ				
25.63	**3.13**	**32.22**	**2.29**	**11.26**	**0.000**	**0.595**	**large**

Results from Table 4 show that the *T*-value of 11.26 is significant at the 0.001 level, indicating statistically significant differences between the average scores of students in the control and experimental groups in the post-measurement of the self-efficacy scale, favoring the experimental group. This suggests that the use of the flipped classroom strategy during the global pandemic (COVID-19) improved the self-efficacy of students in the experimental group compared to those in the control group who were taught using traditional methods.

To determine the effect size of the flipped classroom strategy on students' self-efficacy, the eta-square (η^2) value was calculated and found to be 0.595, which is greater than 0.14. This indicates a large effect size, demonstrating that the flipped classroom strategy significantly impacts the self-efficacy of the experimental group students. This finding aligns with the studies by Lin Lai and Hawang (2016), AlJaser (2017), and Afia (2019), which highlighted the effectiveness of the flipped classroom in enhancing self-efficacy among university students. The strategy helps students manage their time effectively outside of class, prepare effectively for learning activities before class, and engage more deeply with peers and instructors.

Taking advantage of the global pandemic (COVID-19) by assigning university students tasks and responsibilities outside the classroom can develop various traits and skills that prepare them to be responsible and effective citizens. Especially when assignments are collaborative, this approach fosters a sense of teamwork, encourages cooperation, interaction, and positive participation in learning activities. Such experiences help students become active citizens and improve their problem-solving abilities. These skills enhance students' self-confidence and increase their awareness of their competence and self-efficacy.

Therefore, the application of the flipped classroom strategy in teaching second-year master students in the course 'Guidance and Counseling Requirements in Light of Globalization' has enhanced their self-efficacy and helped them realize their potential. This improvement is attributed to the

collaborative teamwork both inside and outside the classroom, despite the challenges posed by the global pandemic (COVID-19) and the obstacles faced by university institutions.

3.2. Results related to the second hypothesis

The second hypothesis states that: There are statistically significant differences between the average scores of the students of the two groups (control and experimental) in the post-measurement of academic achievement test in favor of the students of the experimental group.

The data obtained were as the following:

Table 5: The significance of the differences between the average scores of the students of the two groups (control and experimental) in the post-measurement of academic achievement

Control group *n*=44		**Experimental group *n*=44**		**The calculated value of "*T*"**	**Level of significance**	**ETA square η^2**	**Effect size**
$\bar{x}$	σ	$\bar{x}$	σ				
26.79	**3.54**	**15.43**	**1.81**	**18.91**	**0,000**	**0,806**	**large**

Results from Table 5 show that the *T*-value of 18.91 is significant at the 0.001 level, indicating statistically significant differences between the average scores of students in the control and experimental groups on the post-measurement of academic achievement, favoring the experimental group. This suggests that the application of the flipped classroom strategy during the global pandemic (COVID-19) led to better academic achievement among students in the experimental group in the 'Guidance and Counseling Requirements in Light of Globalization' course, compared to students in the control group who received traditional teaching.

To determine the effect size of applying the flipped classroom strategy on academic achievement, the eta-square (η^2) value was calculated and found to be 0.806, which is higher than and exceeds the threshold of 0.14. This indicates a large effect size, suggesting that the flipped classroom strategy has a significant impact on improving the academic achievement of the experimental group students. This finding is consistent with the results of several studies that examined the effectiveness of the flipped classroom strategy in enhancing academic achievement among university students. Studies by Overmyer (2014), Hassan (2015), Guifang and Zhonggen (2016), AlJaser (2017), Seydou and Kabir (2018), Al-Rosaa (2018), Afia (2019), Hewary (2020), Ujan (2020), Al-Qahtan (2021), and Mansour (2021) consistently showed that experimental groups using the flipped classroom strategy

outperformed control groups in academic achievement post-intervention, highlighting the strategy's effectiveness in improving student performance.

Alzahrani (2015) noted that the flipped classroom strategy enhances university students' mental and cognitive learning skills, allowing them to utilize higher-order thinking skills more effectively than traditional methods, which leads to improved cognitive achievement. Al-Sherman (2015) also highlighted that the flipped classroom strategy accommodates individual differences among students and respects their unique personalities. This aligns with the principles of active learning strategies. Thus, the flipped classroom is a suitable approach for all students, as evidenced by improved academic outcomes compared to peers taught using traditional methods, despite of the current global pandemic conditions.

Activating out-of-classroom learning during the COVID-19 pandemic by forming small collaborative groups has facilitated peer-to-peer teaching. This approach helps low-performing students better align with their classmates' understanding of learning activities, boosts their motivation to complete homework, and can lead to higher academic achievement compared to traditional teaching methods

3.3. Results related to the third hypothesis

The third hypothesis states that: There were no statistically significant differences between the pre and post-measurements of the self-efficacy scale among the experimental group students in favor of the post-measurement. The data obtained were as the following:

Table 6: Significance of differences between the pre and post-measurements of the self-efficacy scale of the experimental group participants

Pre-measurement *n*=44		**post-measurement *n*=44**		**The calculated value of "*T*"**	**Level of significance**	***D*-value**	**Effect Size**
$\bar{x}$	σ	$\bar{x}$	σ				
25.27	**2.89**	**32.22**	**2.29**	**14.10**	**0.000**	**2.126**	**large**

Results from Table 6 show that the *T*-value of 14.10 is significant at the 0.001 level, indicating statistically significant differences between the pre- and post-measurements of the self-efficacy scale for students in the experimental group in the course 'Guidance and Counseling Requirements in Light of Globalization.' Therefore, the third hypothesis (H3) is supported.

To determine the effect size of the flipped classroom strategy on students' self-efficacy, the Cohen's *d*-value was calculated and found to be 2.126, which is greater than 0.8. This indicates a large effect size, demonstrating that the flipped classroom strategy has a significant impact on improving the self-efficacy of students in the experimental group.

Blake's modified gain ratio was also calculated to assess whether the observed effectiveness was significant or due to chance. The results are as follows:

Table 7: Significance of modified gain ratio of the study sample in self-efficacy scale

	Value	**Modified gain ratio**	**Significance level**
Average scores of control group	**32.22**	**1.06**	**significant**
Average scores of experimental group	**25.27**		
d	**40**		

It is noticed from Table 7 that the modified gain is 1.06, which is less than Blake's gain ratio of 1.2. This indicates a lower effectiveness of the flipped classroom strategy during the COVID-19 pandemic in improving the self-efficacy of students in the experimental group in the course 'Guidance and Counseling Requirements in Light of Globalization'. This finding is consistent with Afia's (2016) study, which also found statistically significant differences between the pre- and post-application scores of the self-efficacy scale for female students in the experimental group, with improvements observed in the post-application.

4. Discussion

The educational goal of the flipped classroom strategy is to bring about a change in the concept of learning within the classroom environment, by moving from the philosophy of the centrality of learning around the teacher to the centrality of learning around the student. In this case, the student carries out the process of knowledge construction with an effective and positive continuity, and the teacher intervenes as a consultant and coach helping students to move from one level of knowledge to another

(Hasab Seydou & Kabir, 2018, p. 11-12). Furthermore, students' social competence can be enhanced by recognizing and leveraging their potential through independent learning tasks, achieving academic goals, and effectively completing homework and problem-solving.

Additionally, the self-efficacy gained through the flipped classroom strategy has a significant impact on students' personalities. This is evidenced by the current study's finding of statistically significant differences between the pre- and post-measurements of the self-efficacy scale for students in the experimental group of the 'Guidance and Counseling Requirements in Light of Globalization' course.

The application of the flipped classroom strategy as an alternative to traditional teaching during the global pandemic (COVID-19) has significantly contributed to students' integration into group learning and group discussion for practicing learning activities. This approach has notably enhanced students' self-efficacy due to the active learning tasks assigned in the course of 'Guidance and Counseling Requirements in Light of Globalization'.

The teacher's enthusiasm in creating an enjoyable learning experience and the students' increased engagement in independent and active learning have fostered a belief in their own potential and academic abilities, further boosting their self-efficacy levels.

Consequently, enhancing the self-efficacy levels of experimental group students using the flipped classroom strategy underscores the effectiveness of this approach for second-year master students of Guidance and Counseling during the global pandemic. It also highlights the importance of active learning within collaborative group work, supported by technological teaching tools, during the crisis.

5. Conclusion

This study proves the effectiveness of using the flipped classroom strategy in improving the self-efficacy and academic achievement of second-year master students of Guidance and Counseling program at [MASKED FOR REVIEW]. University during the global pandemic (COVID-19). It recommends adopting the flipped classroom strategy in university education as an alternative to distance learning during various crises and emergencies. This would require training both faculty members and students to implement the strategy effectively and providing the necessary resources for its success.

All in all, this research suggests applying the flipped classroom strategy to pre-university education stages and testing its effectiveness on students in improving their academic achievement, self-efficacy, and possibly other personality traits essential for their future academic and professional lives.

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