



# Affordances of Flipped Classrooms: Unveiling the Paradox of Basics and Key Principles of Flipped Learning

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## Authors' contributions

*This work was carried out in collaboration among all authors. Author SV designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors RKT and LS managed the analyses of the study. Author LS managed the literature searches. All authors read and approved the final manuscript.*

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## ABSTRACT

The flipped classroom is an active, student-centered strategy that has been developed to enhance the quality of the classroom era. For many years up till now, language experts have been seeking better ways to teach and learn. Flipped learning in the classroom that spreads rapidly throughout the world is not well established. All through the history of teaching and learning, traditional methods have come and gone. Despite traditional methods, modern methods tend to be more of a student-centered, constructivist, inquiry-based one. "Flipped learning" is an eye-catching model that has recently become popular. This article seeks to provide perspectives into flipped classes: roles, processes, and step-by-step what really happens inside and outside! That is to attract attention to its potential in the education field and provide to make it recognize more by educators and researchers. To this end, it has been tried to clarify the benefits and constraints of what flipped classroom strategy is all about.

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## 1. INTRODUCTION

### 1.2 What is the Flipped Classroom?

The "flipped classroom" teaching technique (also known as the "inverted classroom") has gained a lot of coverage in educational circles. The idea is that rather than taking up limited class time for an instructor to introduce a concept (often via lecture), the instructor can create a video lecture, screen cast, or vodcast that teaches students the concept, freeing up valuable class time for more engaging (and often collaborative) activities typically facilitated by the instructor.

Also it is a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom. It moves tasks into the classroom, including those that may have typically been called homework. Students watch video lectures in a flipped classroom, collaborate in online debates, or perform study at home while participating in topics in the classroom with a mentor's guidance. Alison King published "From Sage on the Stage to Guide on the Side," in 1993, in which she reflects on the value of using class time for creating meaning rather than transmitting knowledge. Although the idea of "flipping" a classroom is not explicitly illustrated, King's work is frequently cited as an impetus for an inversion to allow for constructive learning in the educational space.

Although procedural knowledge is arguably the best form of knowledge to be taught using the flipped classroom approach, the other three types of knowledge are factual (knowledge describing the fundamental elements that a person must know), conceptual (knowledge of the relationship between classifications and categories), It is also possible to teach cognitive intelligence (knowledge of one's own cognition) using this approach. It is important to remember, however, that much more time and consideration would be required to use the flipped classroom technique.

Flipped classroom provides all in one. First, the learners feel essential and accountable, keeping them as the center. Having the responsibility, the students get engaged and have the opportunity to learn independently. The learners do not feel alienated by having technology included in the

teaching atmosphere. Having a more relaxed atmosphere, the students don't feel nervous and have time to interact with the peers and the teacher, to practice more, and feel safe when get stuck. Flipped classroom all in all provides students the true duty and opportunity to be the true and active learning actors.

The flipped classroom is an innovative variant of student-centered learning with the potential to address the issues raised in the international literature. In a flipped classroom lecture materials are usually assigned as take-home tasks, accessible through online modalities. This allows the lecturer-student class contact time to be devoted to addressing student questions and problem-solving in teams [1,2]. Flipping the focus of class time allows students to take increased responsibility for their own learning through active investigation both in and out of class time. This changes the class time focus and dynamics from the transmission of knowledge to one involving collaborative, interactive learning and just-in-time teaching [3]. It provides more flexibility for lecturers and students to participate in the discussion and collaborative and guided problem solving activities in ways that are known to address student misconceptions and support the mastery of threshold concepts.

All through the history of teaching and learning, traditional methods have come and gone in search of better ways to teach and learn. Methods can basically be split into two as traditional and contemporary techniques. Modern techniques tend to be more of a student-centered, constructivist, inquiry-based method. The main difference between traditional methods and the modern methods is their reliance on the learner/student or the teacher. The situation for the former is that in the teaching phase it requires the instructor as "everything." The traditional teacher-centered method takes the teacher as the "sage on the stage" [4]. Flipped classroom strategy is expressed in its simplest meaning as "what is accomplished at school done at home, homework accomplished in home done at class" [5].

The teacher teaches, gives instructions, explains the items whereas the students just stand still and they are just expected to learn. The teacher is the essence, the controller, the center, seems to be all; whereas learners are only passive

puppets expected to "know" what is "taught." In contemporary methods/models, the situation is just the opposite. They rely on the student, take the learner as the core, and expect the teacher to lead the way. The students are the real actors in their learning process. As in the famous saying of Confucius "I hear and I forget, I see and I remember, I do and I understand." real learning only takes place when the learner participates actively in the teaching process. When the students are actively involved in the learning process, they become more aware of and responsible for their own learning, which provides self-confidence, self-awareness, responsibility and autonomy.

Today's students are faced with intensive cognitive challenges. Students are in need to be prepared to solve problems, predict outcomes, and deal with novel clinical scenarios to cope with Bloom's cognitive domain. Moreover, students are in intense need for developing higher order thinking skills (HOTs) as per [6]. Various definitions were used by many researchers to define higher-order thinking skills. According to [7] they mentioned that HOTs is "a cognitive process that involves analyzing, evaluating, and creating in the cognitive domain. Therefore, teaching methods must be adapted to prepare students effectively.

Technology has invaded our lives so much that we cannot even move without it. "While traces of the main components of the ancient techniques still find their way into our range of pedagogical therapy choices, our profession has appeared in an age of knowing a wide range of language teaching environments and purposes and an even greater amount of student requirements, learning styles and affective characteristics" [8].

The flipped classroom strategy advocates touting numerous benefits. Most seem plausible benefits (e.g., time increases for more engaging instruction), particularly for those teaching in hybrid or mixed environments composed of some mixture of F2F (Face to Face) and online instruction; however, the strategy also has its limitations.

First, the quality of the video lecture may be very poor; even though an instructor might be outstanding in F2F settings, he or she may not produce a quality video instructional and/or technically. Second, taking for granted that all students are able to view the video lecture on their own computers, the conditions under which

they might view the video may not be the best for learning any concepts (e.g., a student might view a video while also watching a baseball game and listening to music). Third, students may not watch or comprehend the video and therefore be unprepared or insufficiently prepared for the more engaging activities that will occur F2F. Fourth, students may need a lot of scaffolding to ensure they understand the material presented in the video.

Flipped classroom is not a specified model but a model that educators use by using distinct equipment to compensate for students' requirements. Since teachers in different countries use flipped classroom with different methods, this has resulted in changing the concept of flipped classroom to flipped classroom approach. It is stressed that this fresh method can be used with distinct techniques of teaching [9].

## 2. KEY POINTS

The flipped or inverted classroom is a new and popular educational model in which activities traditionally carried out in the classroom (e.g., presentation of content) become home activities and activities that usually constitute homework become classroom activities [10].

The Flipped classroom is almost like a modern paradigm and style of teaching. Flipped classroom is a form of learning that makes it easier and more convenient to use technology to make teaching in the classroom easier and thus allows the teacher to save all class time in teacher-student interaction instead of lecturing. Flipped teaching gives the teacher extra time to get in contact with the classroom learners, transferring the time of lesson to households through pre-recorded videos.

Flipped classroom approach has four different elements. It is stated that in order to accomplish this strategy, educators must take into account these four components.

The properties of this approach which its English correspondence is "Flip" are explained like this by referring first letters:

### 2.1 F (Flexible Environment)

It indicates provision of time and place flexibility of learning.

Having a flexible environment, the student's don't feel tense and nervous, don't need to rush to get every detail in a compact lecture, rather based on the flexibility, Students can get assistance from their colleagues or consult with their teacher whenever they want. In the same way, getting rid of the heavy burden to "teach" through a compact lecture got pushed for time, the teachers also feel free to have extra time for other activities, and for real practice Having a favorable, stress-free atmosphere promotes better learning.

## **2.2 L (Learning Culture)**

In traditional teacher centered approach the source of knowledge is teacher. There is a transition from teacher-centered strategy to student-centered strategy in the flipped classroom strategy.

Rather than being a passive object of teaching, the students are actively involved in their learning process and have the chance to participate in each step. The students have their own way in the process as the core of learning and in this way they learn and understand profoundly.

## **2.3 I (Intentional Content)**

Flipped classroom educators both think about how education is used to provide fluency and how they can develop cognitive understanding of students.

Deciding on the content and planning the learning process, the classroom time is maximized and much time is left for other strategies, and interaction. This offers more of a better and more efficient time in the classroom.

## **2.4 P (Professional Educator)**

The responsibility of flipped classroom educators is more than the ones using the traditional approach. During the course educators keep continuous observation of learners, and keep track of evaluation of their research and feedback. Deciding on the material, adjusting the materials, selecting approaches, maximizing interaction time in the classroom, and shortening the classroom are the teachers' roles.

This framework was conceptualized to account for a variety of learning modes, and so its implementation requires the creation of flexible learning environments that may involve, for

example, the physical rearrangement of learning spaces and the increased use of digital technologies.

## **3. FLIPPED CLASSES**

Flipped classes, however, is a step ahead of the use of classroom videos [2]. It illustrates the distinction between computers or instructional TV approaches traditionally used and inverted classes. It is implied that the inverted classroom concept is fresh with its periodic and systematic use of interactive strategies in the teaching process.

Flipped classroom strategy is not synonymous with internet videos; the significant point is the interactive activities that take place while teachers and students face each other. Rather than teacher, it's not using video. Students don't work unsystematically. It is not students who spend in front of a laptop all the course duration. It's not about a student who is all aloof while learning.

Flipped courses are locations intended to maximize the interaction time of the classroom rather than the time of lecture. This allows educators as well as learners to communicate more, has more time to use, learn and teach additional strategies in depth [11]. As seen in below.

Displayed in Fig. 1 inverted learning simply incorporates the basics of blended learning, digital learning materials, reviewing and strengthening, and more teacher-student interaction.

Traditional classes lack many characteristics that can be offered by flipped classes. Mainly the most significant lack of traditional classes is that they rely so much on teacher speaking time and lecture, so students don't even have the opportunity to speak and communicate. Simply put, there is no need for lessons in a flipped classroom. The students don't feel alone with the job to be accomplished as flipped learning switches "homework at home" and "classroom lecture" to "home lecture" and "class homework" switches. They can get help whenever they want. "The class will be suitable for the constructivist approach because the class time is freed from the didactic lecturing of the teacher allowing a huge variety of activities, group work and discussions that provides an interactive environment for the students" [12].

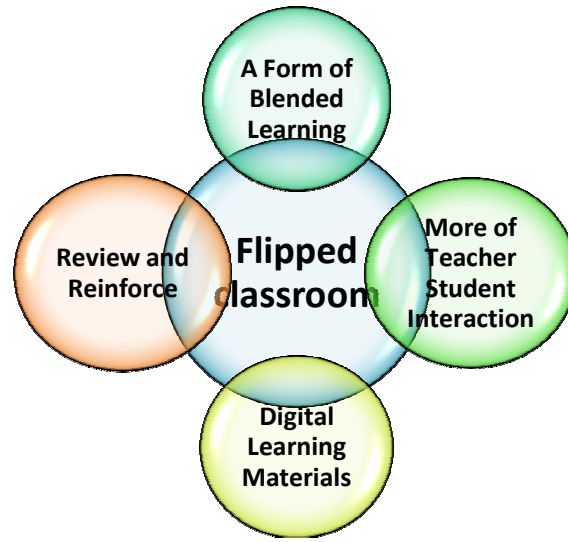


Fig. 1. Flipped instruction

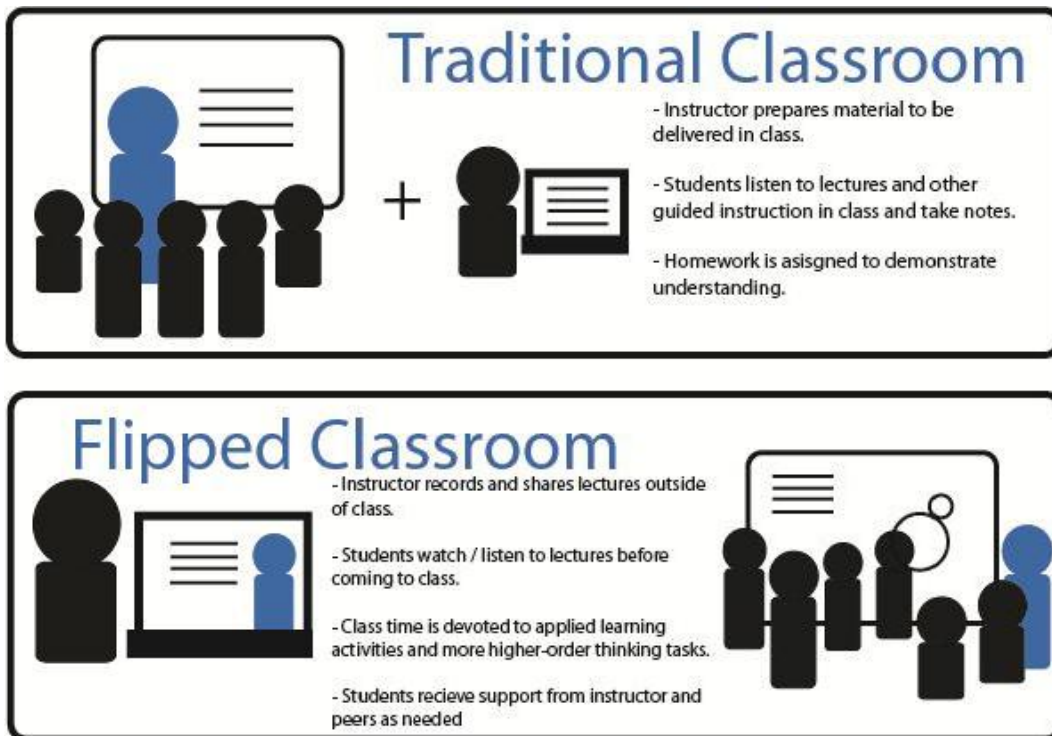


Fig. 2. Traditional classroom vs. flipped classroom

A flipped classroom, therefore, does not necessarily mean flipped learning. There are different interpretations of this approach and associated variations in implementation strategies. For this article, as described by the FLN and endorsed by [10], we will use the term 'flipped classroom' to refer to the teaching and

learning mode in which direct instruction shifts from the community learning space to the individual learning space, The resulting group space is transformed into a lively, engaging atmosphere in which the teacher directs students as they apply ideas and participate in the subject matter creatively [13].

#### 4. THE ROLE OF TEACHER

Teacher role is the most important factor in the flipped approach to the classroom. The roles of flipped classroom educators are presented below;

- Correcting misunderstandings and creating teaching situation based on questioning [10].
- Making one to one interaction with students [14].
- Individualization of learning for each student [15].
- Use of appropriate learning technology equipment [16].
- Creating interactive discussion conditions and increasing participation of students [17].
- Sharing classroom lecture videos [18].
- Feedback through pedagogical methods [19].

The flipped classroom approach also requires teachers be intentional about their selection of content and so necessitates the evaluation of which content should be taught directly and what materials students should be allowed to initially explore on their own outside of the group learning space. This is evident when a teacher prioritizes concepts used in direct instruction for learners to access on their own, creates or curates relevant content (typically videos) for students to access, and differentiates content to make it accessible and relevant for individual students.

Finally, the role of the professional educator means teachers are available to students for individual, small group, and whole class feedback in real time as needed, conduct formative assessments during class time through observation and record data to inform future instruction. With regard to this pillar, [9] emphasize that instructional videos are not intended to replace teachers—instead, the teacher's role in a flipped classroom carries additional demands as they must determine when and how to shift direct instruction from the group to the individual learning space and how to maximize face-to-face class time.

In a traditional teacher-centred model, the teacher is the primary source of information; within a flipped classroom, however, a shift in learning culture occurs, as there is a deliberate

shift from a teacher-centred to a student-centred approach, with in-class time being used for exploring topics in greater depth and with increased interaction. According to FLN, this results in students being more actively involved in knowledge construction as they participate in personally meaningful learning.

#### 5. THE ROLE OF STUDENT

Student approach in flipped classroom transforms from passive knowledge recipient to active knowledge promoter. In this approach the roles of students are expressed below;

- Taking responsibility for their own teaching.
- Watching lecture video as before the course and preparing for the course by using learning materials [20].
- Making needed interactions, receiving and providing feedback with his instructor and friends [21].
- Participating in discussions within class [22].
- Participating team working [23].

Students are psychologically and physically well prepared for practicing interactive learning. It supports the students to participate, engage and constitute a deep meaning of learning. They should write notes, questions, and comments on the predetermined content. Inside the classroom, they get participated in a positive interactive environment. Students' satisfaction is a very important element in the learning process. Furthermore, successful learning is basically meant by satisfied students.

#### 6. PROCEDURE

It provides an overall look at the basic steps of flipped classroom as planning, recording, sharing, focus on the content, and focus on the output.

##### 7.1 Step 1: Plan

When we don't have a plan in place, nothing good ever comes in. Lessons have to be determined which are to be flipped in particular. Once decided, describe the key learning outcomes when the lesson is complete which is needed for the students to be taken away. The lesson plan will be guided by having these goals in place.

### 7.2 Step 2: Record

Once the learning goals are outlined, the content can be created. We need to figure out what needed to be delivered after the content has been created. Recording a screen cast is often the easiest way to get started. Make sure everything is included in a regular class lecture which is normally done.

### 7.3 Step 3: Share

It's time to share it with the students with the lesson content available for viewing. This is quite easy if we have an effective management system. All we need to do is upload the video and add to the course of students. We can then monitor the activity to ensure that the material is viewed by everyone logging in.

### 7.4 Step 4: Confirm

From the learning management system we choose, we will not be able to monitor all student activity in real time, so we should set up a mechanism that confirms that the student has viewed the content. A simple end-of-reading quiz (points added to the activity) is a good starting point. This will also enable us to deliver more effectively on the next step.

### 7.5 Step 5: Group and Monitor

Most of the activities will require us to group the students. Using the results of the quiz, we can now group students with those who may need some additional coaching who have a stronger grasp of the concepts. Make our self available as the learners go through the activity to provide guidance and ensure progress is made by everyone.

### 7.6 Step 6: Debrief

Bring all teams back together at the end of the event so that we can debrief the main goals presented in Step 1. Ask the learners questions and encourage a debate rather than a lecture [24].

## 8. HOW CAN THE FLIPPED CLASSROOM STRATEGY BEST ARE USED?

The flipped classroom has attracted scholarly attention especially due to its inclusion of improved technologies. Hence, research on the flipped classroom has increased in recent years; six inductive categories were established for the benefits (learner outcomes, pedagogical contributions, dispositions, interaction, time efficiency, and other), [25]. Each inductive

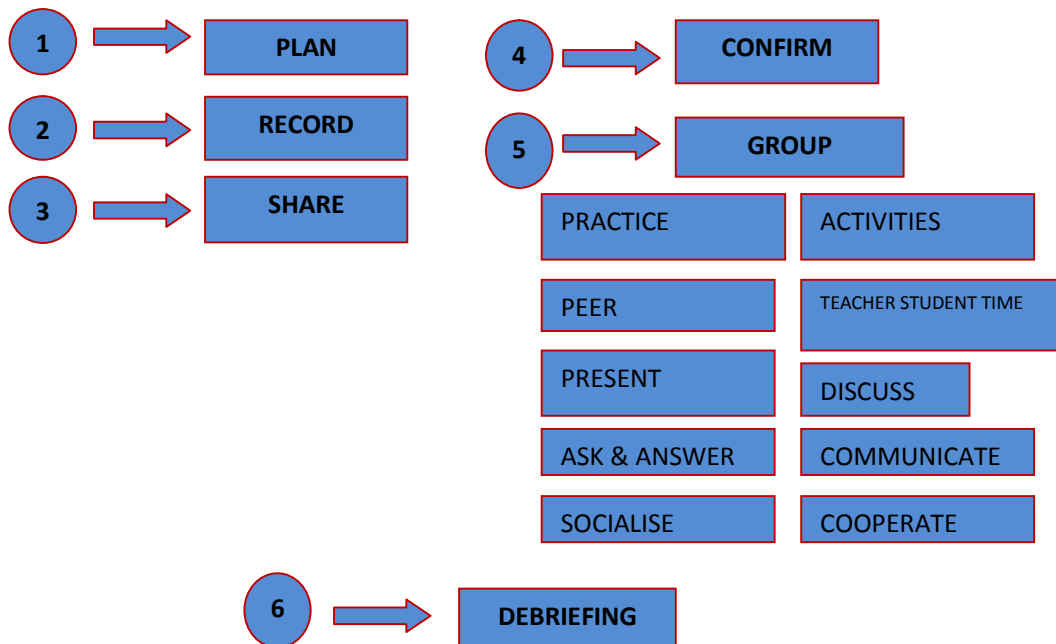


Fig. 3. Flipping the class procedure

category is then divided into detailed sub-categories based on where the benefits naturally match (Mention in Table 1).

## 9. ADVANTAGES OF FLIPPING

Flipped classroom uses technology to invert the traditional courses. At home, the students watch the videos alone at varying speeds as they like and it doesn't matter how many times they watch. The case is just to get the gist. They decide for themselves. Independent

learning is promoted in this way. Flipped teaching fosters peer communication, interpersonal skills, interaction, and collaboration. Flipped classroom also provides time for teacher to actively get in touch with the students. Although with flipped learning teachers are not preparing or broadcasting lecture videos but preparing within class activities and integrating them to flipped classroom approach. Unlike what is known, this technique improves teachers' duties rather than relieving them [26].

**Table 1. Benefits of flipped classroom strategy**

<b>Inductive categories</b>	<b>Sub-categories</b>
Learner Outcomes	Improves learning performance Satisfaction, Engagement, Motivation, Increases knowledge Improves critical thinking skills Feeling more confident Promotes creativity Focus on Problem solving skills Better retention Improves application Improves ICT skills
Pedagogical Contributions	Flexible learning Enables individualized learning Enhances enjoyment Better preparation before class Fosters autonomy Offers collaboration opportunities Enables more feedback Fosters higher self-efficacy Provides peer-based learning Increases study effort Supports interest in the course Improves attendance Suitable for large group teaching Decreases withdrawals Offers collaboration opportunities Enables more feedback
Time Efficiency	More efficient class time More time for practice
Dispositions	Positive feedback from students Positive perceptions (students) Positive attitudes Positive perceptions (teachers)
Interaction	Interaction (Students-Instructor) Interaction (General) Interaction (Students-Students)
Other	Less anxiety Cost effective Students adapt quickly



Therefore, a flipped classroom video lecture about how to solve a quadratic equation in which an instructor describes and models how to solve this type of problem would be a good use of the strategy.

Traditional techniques bring the learners to be educated as passive objects, and the learners feel that way. They feel worthless and believe they must obey what the teacher asks. Flipped classroom requires the learner as the heart, in total contrast to traditional techniques. Since the learners are the core, they feel that they are really accountable for their own learning, which promotes independent learning and student engagement, so they are on the path to autonomous learning. Therefore, "learning" becomes the goal of flipped learning rather than "teaching." Several researchers have successfully utilized Flipped classroom.

Williams [27] provided a literature review study on the use of internet-based technologies in higher education, concentrating on the key issues and existing problems when transferring courses to an electronic learning environment. The study indicated the requirements of future research concerning teaching and learning on electronic learning environments.

Hamdan et al. [9] demonstrated that one way of creating a learner-centered classroom environment is the use of flipped learning model. It is also illustrated that there are qualitative and quantitative research needs for pointing out how the potential of the model can be maximized.

Kim et al. [28] suggested further investigation to define design specifications that integrate flipped classrooms with technology and also suggested intensive research regarding the use of technology and superior assessment instruments.

Travis [29] claims that further research is necessary regarding the acceptance of flipped learning as a common pedagogical practice. Although the study of Travis [29] has shown students' responses regarding one semester in a particular field, more research must be conducted to test the efficacy of flipped learning, such as quantifying the learning of students from flipped learning.

Butt [30] investigated how students' perceptions of the use of class time change after being involved in a flipped classroom structure.

Although the results of the study consider student perceptions of learning experience, it does not comment on the success of the students in obtaining desired learning outcomes of the course. Further research is suggested to study the effect of a flipped learning environment on obtaining learning outcomes.

Baepler et al. [31] decreased face-to-face instruction from 150 minutes to 50 minutes a week and found that learning outcomes did not worsen. As a further study, it is recommended that the optimal amount of face-to-face instruction that provides the greatest learning benefit for students are investigated.

Simpson and Richards [32] demonstrated that the effectiveness of flipped learning course designs might be helpful for other faculties in designing courses more effectively regarding learners' needs. Nowise C et al 2016 [33] Deficiency in investigations concerning flipped classrooms was also emphasized: such as different teaching methods and designs must be used to make effective comparisons among student outcomes for courses. Roach T 2014 [34] In addition, it is also suggested to determine whether such course designs enhance the level of student comprehension by evaluation of the level of content retention and the ability of students to apply the content.

## 10. CONCLUSION

Flipped courses provide opportunities for the development of more independent students. Future studies could examine the suitability of the flipped classroom approach in other contexts, such as project-based inquiries or it could be used to teach a range of disciplines. Without a fundamentally changing teaching procedure, a flipped-classroom approach may also be adopted. This may be an encouraging finding for teachers who wish to consider incorporating advantageous aspects of this pedagogy into their teaching and learning practice without abandoning approaches that experience has shown are effective. The findings of studies confirmed the importance of adopting flipped learning in teaching strategies. Additionally, flipped classroom also allows observing the students how well they managed with given tasks and provided positive feedback to be able to continue with difficult and demanding topics. Students practiced the skills more successfully and efficiently. They had the opportunity to communicate and discuss with instructors more

deeply about the content. In addition, they should have enough time to attain the basic levels of thinking skills by themselves. The instructors provided the chance for meeting the higher-order-thinking skills and promoting student-centered learning using think-pair-share, group discussion, case studies and problem-solving skills. It can be concluded that utilization of the flipping learning method improved the students' higher-order thinking skills and engagement on post-test than pretest. Also, it increased students' level of satisfaction regarding the learning process of flipping learning than traditional learning. Use of the flipped classroom instructional model in higher education: instructors' perspectives" illustrated that in-class practice-led students' learning into a more positive interactive and more in-depth way, and improved students' higher-order thinking skills.

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### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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