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Fatima Zohra Benzert[1] & Hanane Sarnou, P.h.D.[2]
Faculty of foreign languages
[1&2]Abdelhamid Ibn Badis University, Mostaganem 2700, Algeria.
Laboratoire dimensions socio-pragmatique et pragma linguistique dans les manuels scolaires de langues etrangères en Algérie.

INVESTIGATING THE POTENTIAL OF THE FLIPPED CLASS IN FOSTERING STUDENTS' CONTENT UNDERSTANDING AND FACILITATING DIFFERENTIATION

Abstract

Academic communities in many parts of the world have adopted various digital innovations as educational, pedagogical tools to remove the barriers that have characterized the traditional way of teaching and learning. The flipped class is an exemplary outgrowth of this attraction for teaching assisted by technology, which the Algerian higher education system can exploit. In essence, flipping the classroom is the model in which the lectures are moved from the usual institutional environment to a web-based platform where learners can access them at home. This study seeks to explore the potential of the model to advance students' content understanding, elevate engagement, and allow the use of differentiation strategies. To achieve these objectives, a mixed-methods research design, including qualitative and quantitative methods, was employed to collect relevant data for this research study. The research tools used were: an observation, an experiment, and a questionnaire for the students. The findings revealed that inverting a classroom improves understanding of concepts and encourages learners' engagement. The results showed that it is possible to differentiate the instruction through reversing the classroom.

Keywords: content understanding, differentiated strategies, engagement, the flipped class.

1. Introduction

With the escalating prevalence of diverse technologies, teachers, educators and concerned scholars are offered seismic waves of new affordances for their ongoing pursuit for better teaching practices and, consequently, optimal learning experiences. In several corners of the globe, practitioners are experimenting with a range of digital innovations that facilitate the realization of existing learning theories and paradigms that used to be incredibly challenging without current advancements. An increasingly renowned manifestation of this is the flipped classroom model of instruction. It refers to the practice in which the traditional instruction of a course is inverted; this means that lecturing is shifted to a virtual space where it can be accessed, or "attended", by students using the electronic medium of videos in advance of the physical classroom session. In this manner, the totality of class time is redesigned for more active learning practices to accomplish desirable educational outcomes such as content understanding and facilitate engagement as well as accommodate students' needs in the learning process.

In theoretical terms, these ideals associated with the flipped classroom represent a promise for the present educational system to remedy the pronounced cleavage between what we know and what we do in practice. Our knowledge of how generally learning occurs and how teaching must conform to it is as up-to-date as that of most others operating within a different system. The theories that account for learning abound on myriad philosophical, cognitive, and psychological fronts. In addition, we are familiar with them. We recognise how to achieve deep understanding of concepts; we are aware of how to create immersive environments; and we are

[1] **E-mail**: m.f.benzert@gmail.com
[2] **E-mail**: bh_sarnou@yahoo.fr

acquainted with students' differences that inevitably affect their learning trajectories. Yet, most of the teaching methodologies in the Algerian context are nowhere near effective enough to enable the application of our knowledge of these three instances. Unfortunately, the ambitions of many teachers to accomplish them are stifled or pressured into suppression by the traditional demand to primarily complete curriculum objectives of imparting all content which consumes the better part of any session. Indeed, the grip of out-dated instructional customs still holds firm on to our pedagogical activity. To investigate what is mentioned above and how the flipped classroom can bridge the gaps between learning and teaching, we have formulated the following questions:

1. To what extent is the flipped class beneficial in fostering students' content understanding?
2. To what extent is the flipped class beneficial in promoting students' engagement?
3. How possible is it for the flipped class model to enable differentiated instruction?

Answering the above research questions, we hypothesize that students understand better in a flipped classroom. Furthermore, we conjecture that the majority of them will be engaged in the in-class part of the model. The teacher's focus within the classroom can, to some extent, be directed not only towards assigning activities and orchestrating discussions grounded on what students were exposed to in pre-class lectures but also to guide learners through the intricate process of applying what they learnt, eliminating different ambiguities in understanding, providing feedback as well as suggesting strategies appropriate for most individuals.

In consistence with these questions and hypotheses, this research aims to disclose the effectiveness of the model in promoting content understanding and persistent engagement. This study is a revelation of the model's potential in facilitating the incorporation of strategies to differentiate instruction.

2. Theoretical Overview

2.1 . The Flipped Classroom

The flipped classroom is a student-centred paradigm of instruction wherein the teacher's part of lecturing is moved from the usual brick-and-mortar environment to an online space whereby the lecture content can be accessed by learners before coming to class; class time is, hence, allocated for discussions and hands-on activities for advanced application of the new concepts in a monitored arrangement (Tucker, 2012). The fundamental premise of this model is to harness the electronic medium of videos so that frontal instruction no longer dominates the better part of the classroom session (Horn, 2013; Johnson, 2013). In fact, a flipped classroom is "a combination of two established elements of education: the lecture and active learning" (Tétreault, 2013, p. 3).

The flipped classroom comes with some advantages that warrant experimentation, adoption and partial or complete integration of the model. Perhaps the most frequently acknowledged tenet of the flipped classroom is increasing and consistent student engagement. Pertinent research attests that learners are more involved in the flipped classroom environment in comparison to the traditional one. Additionally, active participation is more evenly shared across the entirety of the classroom attendants (Millard, 2012 as cited in Basal, 2015). It is conceded that a decisive contributor to this is pre-class preparation and timely familiarity with the subject of interaction. Furthermore, the literature in this respect is replete with associations to Benjamin Bloom's Revised Taxonomy, particularly the cognitive domain. The taxonomy is a framework of viewing a student's progress in the learning process that goes beyond the mere achievement of amassing an influx of information towards the development of what is conventionally termed as "higher order thinking skills".

2.2.Differentiated Instruction

Differentiated instruction is a framework of a set of generic strategies the teacher incorporates to address students' individual differences that inevitably shape and regulate their learning processes (Blaz, 2016). The teacher who differentiates his or her classroom intends to generate a wealth of inclusive and adaptive learning experiences that are far removed from the unitary "one- size-fits-all" instructional practices typical of traditional education (Anderson, 2016; Tomlinson, 2001).

According to Carol Tomlinson, a prominent advocate of this teaching philosophy, differentiated instruction brings together substantial perspectives from the fields of neural science and cognitive psychology on the nature of learning (McCarty, Crow, Mims, Potthoff and Harvey, 2016). Learners' readiness is concerned with his or her "proximity to the desired educational outcome based on background foundational knowledge, past experiences, opportunities for learning, and skill level" (Dosch & Zidon, 2014, p. 344). Intrinsically oriented motivation, "a natural wellspring of learning and achievement" (Ryan & Deci, 2000, p. 55), is ultimately dependent on whether or not students are interested in a particular subject (Ryan & Deci, 2000). Lastly, a student's learning profile encompasses the preferred learning style and the predisposition to certain intelligences as postulated by Sternberg and Spear-Swerling (1996) or set forth by Gardner (1993) in his Multiple Intelligences theory (Dosch & Zidon, 2014).

2.3. Differentiated Instruction and Flipped Classroom

Differentiation of classrooms is as undeniably necessary as it is overwhelmingly challenging. The large scope of demands that it entails, in theory, is enough to inhibit teachers from putting into practice in any typical classroom setting. Two intertwined factors to this exist in the forms of time and class size, especially at tertiary levels (Dosch & Zidon, 2014).

A recognized solution for this rests in the affordances that the flipped classroom offers. As elaborated earlier, by offloading the dominant part of traditional teaching outside of the classroom, i.e., lecturing, instruction is rearranged to "best maximize the scarcest learning resource—time" (Tucker, 2012, p. 82). In this way, the flipped classroom is consistent with the conditions for integrating differentiation strategies (Bergmann & Sams, 2012; Tétreault, 2013; Doubet & Carbaugh, 2015).

3. Methodology

In the quest to obtain reliable and relevant data, a mixed-methods approach was adopted in this study, encompassing questionnaire and experiment in concomitance with observation.

3.1.Context

The investigation was carried out at the University of Abdelhamid Ibn Badis, in the department of English language. The gaps that motivated the demand for this enquiry were pinpointed and distinguished through periodic observations of higher education experiences within the same setting; thus, it was only reasonable for it to be the sole context of our scrutiny all along the fulfilment of this research.

3.2. Procedure

We experimented with first-year master students of language and communication at the department of English language, Abdelhamid Ibn Badis University. The experiment, which took place during the second semester, lasted two weeks and was followed through with a two-session observation. In due course, a questionnaire was distributed to the participants as a concluding phase.

3.3.Participants

As previously presented, the selected sample is first-year master students of language and communication belonging to the department of English language, Abdelhamid Ibn Badis University. Only 14 students did agree to formally sign their consent to participate in this study and help to provide us with accurate data. This purposefulness in targeting this group lies in our knowledge with the fact they have not been exposed, explicitly or practically, to the educational model in question.

4. Data Analysis

In this section, we analyze content understanding and the questionnaire addressed to students.

4.1. Analysis of the Students Questionnaire

We attempted to cover all areas of the students' experience in the two sessions of the intervention in order to gain an all- around insight into their perspectives. To this end, we have decided to approach the analysis of the assortment of their responses by categorizing them into the targeted aspects of our hypotheses: content understanding, engagement, and the differentiation of instruction.

- *Content understanding*

Having gone through an experiment in which both lessons were given through the use of that digital medium, students were asked to compare between attending a video lecture and having the teacher give it face-to-face in class. The aim of this open-ended question was to discover whether the participants could notice and make use of the particularities of vodcasts and how that assisted them in reaching full comprehension. Some of the revelations are as follows:

"In contrast to classroom lectures, in videos, you can repeat the presentation as often as you like. If you do not catch it the first time, you rewind the video to the beginning."

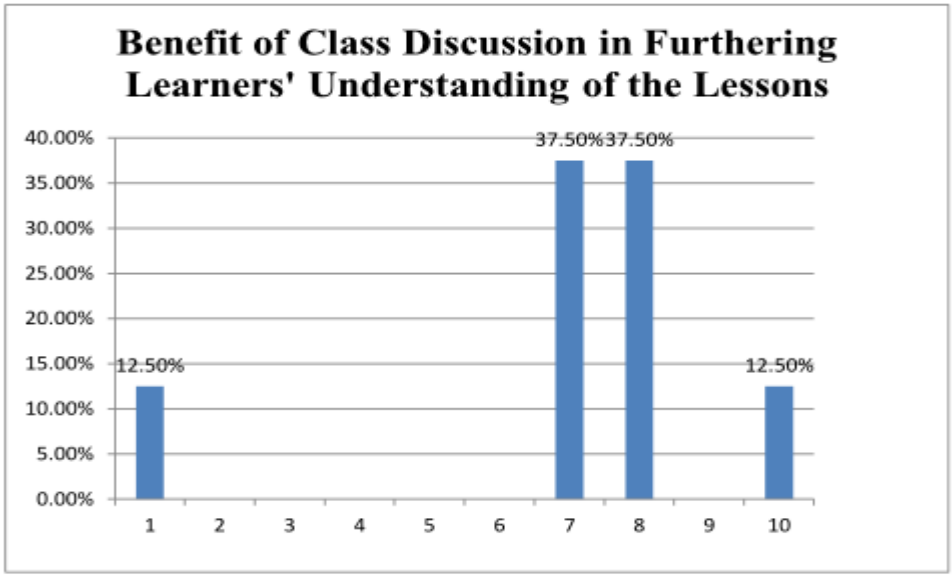
"Learning a lesson through a video gives more access to information. There is also the fact that visualizing the input contribute to a better learning process."

"In a way, videos are beneficial in the fact that you can repeat the parts that may be unclear until it they become clear. However, the major shortcoming lies in the fact that you cannot ask questions directly to the teacher for more clarifications."

"Students will have more opportunities to discuss the content of the lesson in class afterwards. The teacher is no longer the only knowledge provider; thus, students can take part in controlling their learning process."

These comments show that the distinctive conveniences of video technology that affords us the ability to pause at any given moment, rewind an entire segment or skip certain parts of the electronic lecture do indeed help students in achieving the required assimilation of the content. From a different dimension, videos incorporate multi-sensory modalities of processing information which, as illustrated by one of the answers in the visualisation of content, evidently reinforces reception.

Next, the graph below is a numerical presentation of the responses we obtained from question. Participants were asked to scale the extent to which in-class discussion of the lesson learned before the classroom session increased and deepened their understanding of it.



Graph 3: Benefit of Class Discussion in Furthering Learners' Understanding of the Lessons

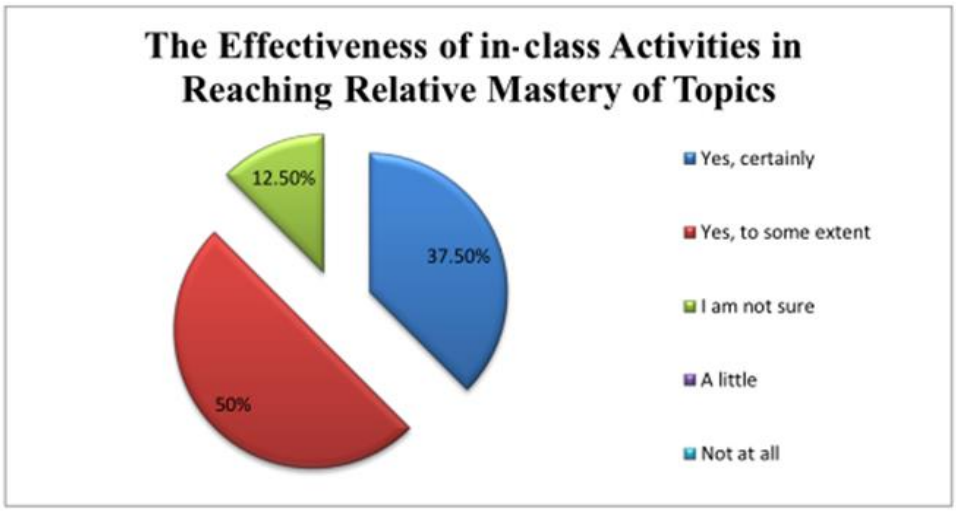
Clearly, we noticed that the majority of the ratings (87.5%) are variably on behalf of the belief that class discussion is an effective strategy to advance students' understanding. In the process of reading the graph, one's attention can be drawn to the two equal percentages of 12.50% that stand on completely opposite extremes; one side of this spectrum has considered the strategy to be utterly efficacious, whereas the other side has given it the lowest rating. Students have elaborated on their choices of ratings in the upcoming terms:

"Discussing a subject in the classroom helps a lot to advance my learning and mastery of a particular topic since everyone gives his or her opinion about the topic in the classroom. At the end of the discussion, I choose what is beneficial for me to fill any existing gaps in my learning of concepts."

"Discussions, in this case, involves more of the essential peer-instruction which I reckon helps me assimilate the lesson much better, this is certainly elevated the easier student-to-student communication becomes."

"Discussion may open my mind to different points that will surely diversify my perspectives of viewing the studied concepts."

The last findings to analyse about this hypothesis concern the concluding phase of the flipped classroom, i.e. activities. We sought to know through question 10 whether the tasks – carried out individually or collectively- that followed the discussions could aid the students in accomplishing relatively sufficient mastery of the addressed topics. The figure below depicts their ensuing responses:



Graph 4: The Effectiveness of in-Class Activities in Reaching Relative Mastery of Topics

The gathered data showed that 37.5% of the informants are in favour of the idea that in-class activities boost their ability to climb the ladder of Bloom's Taxonomy in no specific order, this includes enhanced content understanding. 50% are, to a lesser extent, in agreement with the formers while the minority (12.5%) could not translate their impressions into certain words. Some of them have justified their answers in the following lines:

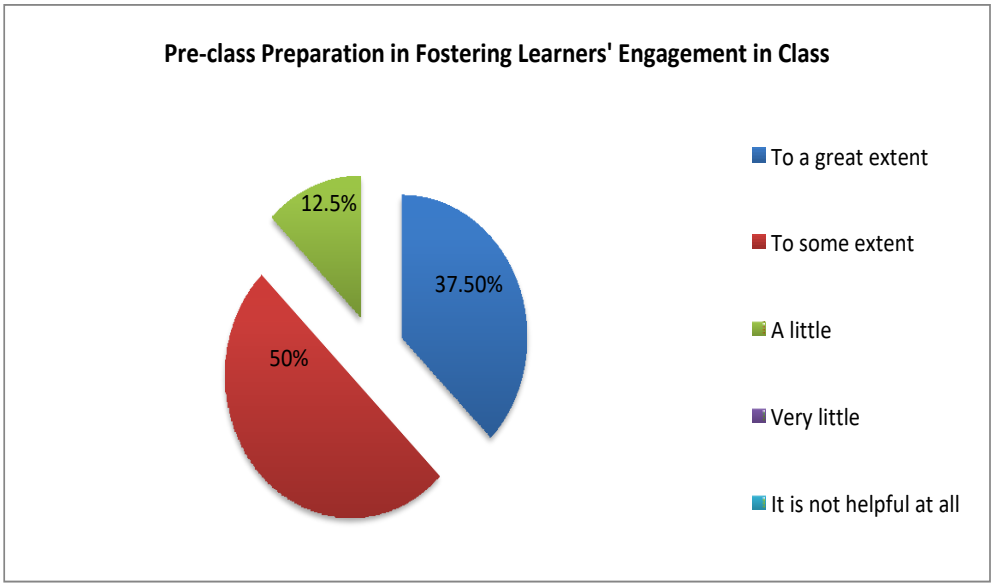
> *"I think initiatory vocalized contemplations and knowledge sharing are a theoretical side of the tackled topic, the understanding of which or lack thereof manifests concretely through authentic tasks. It is easy to put in practice the previously learned concepts."*

> *"I suppose that without the follow-up activities, it is difficult to check whether we fulfilled the objective of grasping concepts and ideas."*

These qualitative reflections denote that our respondents deem in-class activities that succeed discussions are effective in demonstrating and, consequently, consolidating their understanding.

- *Engagement*

Persistent learning engagement was empirically attested to be exceedingly induced in a flipped classroom environment in large part due to pre-class preparation before the session. We reformulated this fact in the form of an enquiry to explore whether this applied to the case of our participants. Students' answers to that question are portrayed in the following graph:

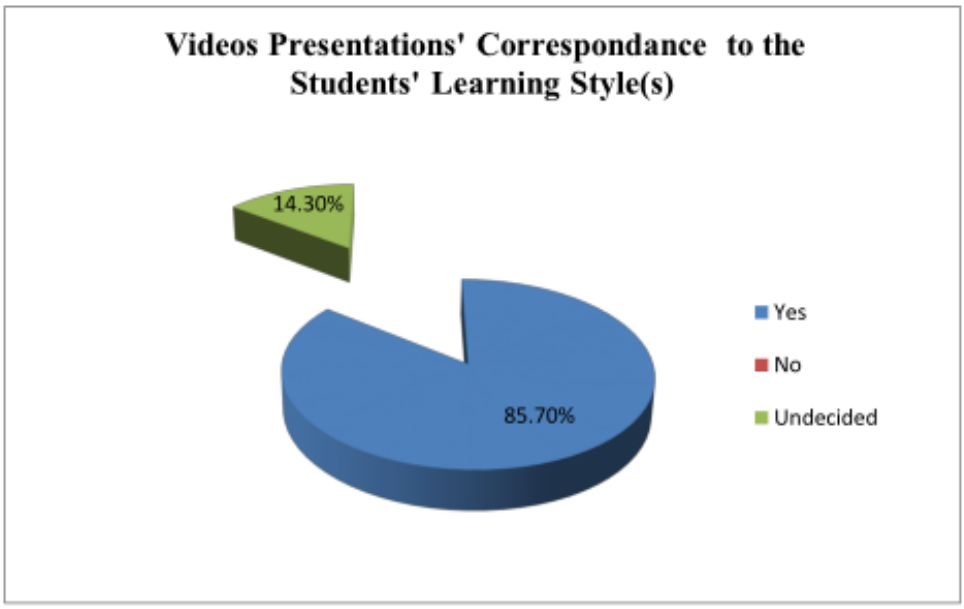


Graph 5: Pre-class Preparation in Fostering Learners' Engagement in Class

As it is noticed, 87.5% of the responses indicate that the learning environment during the experiment was more or less in line with the established belief that the flipped classroom encourages learners to be more engaged in class. However, we remarked that 12.5% of the participants do not attribute the stimulation of active engagement as a particular tenet to the model in light of the experiment.

- *Differentiated instruction*

In the figure below, are presented the participants' views on whether the presentation of the content in the video suited their learning style(s).



Graph 6: Videos Presentations' Correspondance to the Students' Learning Style(s)

The data gleaned and analysed lean heavily towards positive results. In more details, 85.70% of the respondents have stated that the lecturers in the vodcasts catered to their preferred style(s), but 14.30% of them claim that they were not on the receiving end of this advantage.

Lastly, we listed several formulaic sentences to describe one's individual needs in his or her learning process. These basic statements fit into the subjectivity categories of students in terms of readiness, interest and learning profile, as shown in the overview. Informants were

allowed to check off all of the lines that resonated with them. Next, they were asked to evaluate whether the flipped classroom environment allows for proper differentiation. To put it differently, we have investigated if they believed in the teacher's ability to respond to those needs under this arrangement. The graph below represents their stances

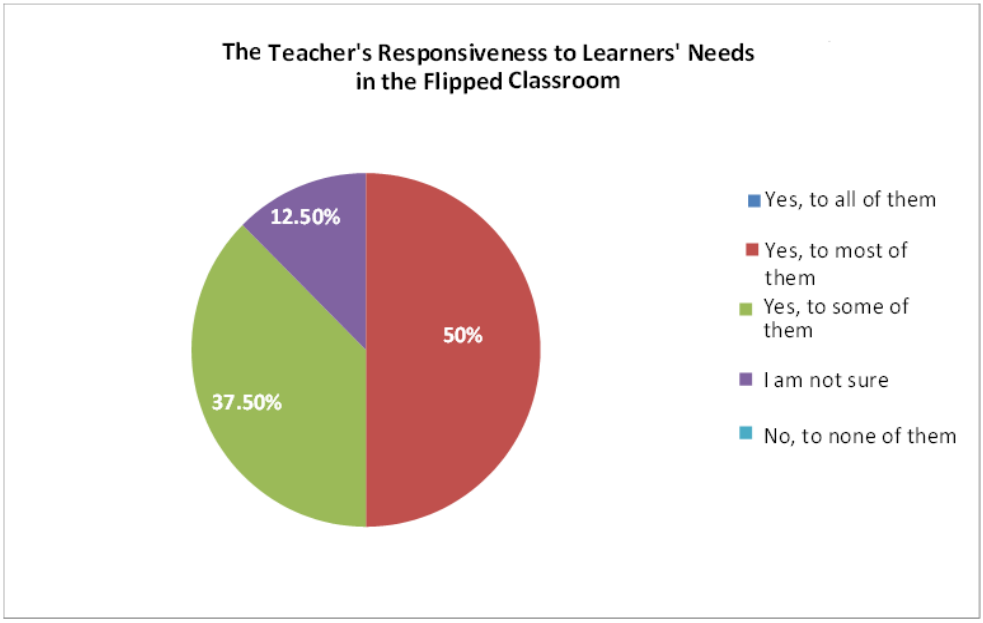


Figure 7: The Teacher's Responsiveness to Learners' Needs in the Flipped Classroom

According to this figure, the dominant percentage (50%) of the participants contend that the flipped classroom furnishes the necessary arrangement for differentiation endeavours to accomplish; 37.5% maintain that the teacher can only meet a limited number of their needs working with this model. Nevertheless, the recurrent percentage of 12.5% of the respondents has declared their skepticism regarding the position of differentiation in the flipped classroom paradigm.

4.2. Analysis of the During-experiment Observation

The angles of the during-experiment observation were in conjunction with the same three dimensions of investigation that we followed in the questionnaire. The purpose of analysing the remarks we made in the two sessions of our experiment is to add a qualitative value to the results presented above. Thus, we have put into explicit terms qualitative answers to our research questions of content understanding, engagement and differentiated instruction.

4.2.1. Session One

- *Content understanding*

An expected, though unfortunate, occurrence that the flipped classroom practitioners characterize as the most conspicuous challenge is students coming to class without having watched the video lecture. This was the case of our participants as a number of them did not attend the frontal instruction at home. Nonetheless, with the enriching contribution of those who did their "homework", we could successfully facilitate a discussion wherein all elements articulated their thoughts. Those who retained firm ideas of the components of the vodcast vocalised their restatements and comprehension of the content while the others reflected on their peers' words to somehow constitute ones of their own. The experimenter asked questions to elicit critical examinations of the content throughout this phase. We put their seeming knowledge construction and assimilation to the test in a group work activity. The end products, as well as one-on-one interactions with the learners, showed that the majority were able to reach the objective of absorbing the lesson and applying it.

- *Engagement*

In this session, we dealt with lesson planning which is a topic not at all foreign to the student's academic ear, at least not on a surface level. We reiterate that although not every learner saw the video lecture, the whole classroom could participate and engage in the follow-up task. Students exhibited eagerness to actively share and debate with their peers. The suggested reasoning for this is their existing familiarity with the subject of interaction. It means that they had solid ideas they could use to open zones for involvement in the acts of

communication. Hence, we conclude that structured pre-class preparation which is converted into immediate prior knowledge and sufficient familiarity is conductive to learners' engagement.

- *Differentiated instruction*

The experimenter sought to differentiate the three areas of instruction: content, process and product in no specific order. The versatility and proliferation of videos extant on multiple websites afford the teacher with a plethora of means to customise the presentation of a given content as well as the input itself. We could find vodcasts in which the recorder(s) present in textual, audio and visual forms to meet the requirements of as many learning styles as we were allowed. Videos also were diversified in terms of complexity, intelligibility, simplicity of input; hence, we could find means of information transition that suited the overall readiness of our participants. This particular area was also effectively attended to when needed through mini-lectures during the in-class stage. We interacted personally with each individual to assess their "proximity" and help them achieve it. As for the product, students were permitted to decide whether to work alone in isolation or with groups of their own choice. We circulated constantly to provide feedback on each member's progress and final products. On these bases, we infer that differentiation is, to variable extents, possible to carry out in the flipped classroom.

4.2.2. Session Two

- *Content understanding*

As opposed to the practice of planning a lesson, the Revised Bloom's taxonomy was a completely new topic. Before the exposure to it, learners were on an identical level of readiness in the sense that they had no pre-existing knowledge about Bloom or his concepts. In this situation, we could not improvise to include those who had not accessed the video lecture in advance of the session. As a consequence, the discussion was mostly within the intellectual grips of those who had realised their pre-class preparation. A few of the others started making occasional attempts at participation as the phase matured, and they were slowly clued into the content. Notwithstanding, we have chosen to support or disprove the hypothesis that concerns content understanding specifically on the grounds of what the former group demonstrated. When asked to summarize the content of the material, we observed that they had sufficient rudimentary grasp through which they can build knowledge. We answered their questions for clarifications and rectified misconceptions. We also kept evoking original thoughts related to all the facets of Bloom's prepositions. After that, we went along the same procedures of assigning an activity and circulating around the place for individual interactions to gain concrete insight into their level of comprehension. In a short period, most of them were able to successfully complete their assignment.

- *Engagement*

Except those who watched the video, the majority of the others were more or less absent from the interaction. Logically, they could not possibly join a discussion revolving around concepts without minimal acquaintance. By contrast, those who had viewed the lecture were invigorated to take part in arguing, commenting and explaining their opinions on the scholar's perspectives of the learning process.

- *Differentiated instruction*

The strategies that we incorporated to customise the three educational areas of content, process and product to address the disparate needs of the students were not different from those of the past session. However, doing so under the highlighted circumstances of this session was immensely challenging, if not impossible. The lack of commitment or interest in the experiment on the part of some students created a cleavage between them and those who had watched the video. Consequently, the classroom in this situation consisted of two groups of learners who were on strikingly contrasting ends of proximity. Bridging this vast gap signified that we had to teach them the topic from the very outset. Given the unattainability of this implication, we are led to conclude that differentiation in the flipped classroom can only occur if the students do commit to the imperative of attending the virtual lesson.

5. Discussion

The findings reveal in confirmatory terms that this model is, to a large extent, beneficial in promoting content understanding, learners' engagement as well as facilitating differentiation. Through moving didactic teaching to their personal space, students are handed the "remote control" to manipulate the procedure of information reception. In this way, they can control the pace of learning an inverted lesson in a manner that proved satisfactory for a number of our participants. Class time is redesigned for students to enquire for clarifications, profoundly discuss the concepts they retained from the lecture, connect the ideas they built with others and arrive at full understanding. The optimal quality of students' palpable involvement in the course of the in-class stage is a direct outcome of the pre-class phase. When students have prior knowledge they perceive to be valid enough, they are encouraged to take part in the intellectual interaction. The reality of this was visibly evident in the first session of the experiment.

For those who are inhibited by several factors, pushed to fall back in the collective learning process, and are permanently overshadowed by their higher-achieving peers, the reversal of a class put them in the appropriate arrangement in which their teacher can attend to them. In the likely case when certain students are still struggling to grasp some conceptual points or acquire competencies that hinder their process of attaining mastery, the tutor can redirect his or her attention to them for harmonious customisation. The core of differentiation, rendered less challenging through this temporal allotment, is to bring the teacher closer to his or her students on an individual level in order to eliminate all ambiguities that cloud their areas of strengths and weaknesses. By filling the abstract columns of each learner's profile, the intuitive professional will be able to figure out how to devise inclusive paths for coveted progression within a given course. A significant effect to this intensive one-on-one personalisation that should not be overlooked is the highly humanised essence of the teacher- student rapport. Learning and studying become more than a pragmatist task of amassing information and passing exams to gain semestrial hooks to the next grade; learning and studying become a deeper sort of immersion in which students are weekly attempting to exhibit signs of valuable advancement and intellectual maturity for their source of inspiration, i.e. the mentor.

Despite this favourable picture of inverting a classroom, objective reasoning of the low fluctuations in the results lead us to concede that the model is not the answer to not even most of the academic deficiencies. Some informants have pointed out well-founded disadvantageous aspects that might lessen its appeal to varying extents. It is, nevertheless, the majority's positive attitudes that do tint it with the green light of sufficient validation. The flipped classroom represents a welcome change for which the necessity cannot be stressed enough. It can indeed be the solution that dispels a few of the negatives for which outdated teaching is denigrated. Didactic teaching and direct focus on dissemination objectives consumes teachers' awareness and vitiate it from addressing every element that constitutes his or her classroom. To this end, many students barely wade their way through the curriculum, yet

still manage to advance to the next academic grade with alarming gaps in their knowledge and defects in their skills.

The flipped classroom is an innovation away from the deeply rooted clutches of traditional education. Its feasibility exists in the fact that it is not so far away a trend so as to suggest a dramatic overhauling of our Algerian academic contexts for which many teachers are not ready. Across many other parts of the developed world, educators are experimenting with technologized practices that realises all theoretically established teaching ideals. In an instructional system wherein digitalised pedagogy has yet to be made a reality, the flipped classroom as a widely legitimized model, can be our step towards the new culture of learning that leverages humanity's greatest achievement: the internet. In addition to this, what makes it easily attainable is the fact it does not nullify the lecture as a method of instruction to which our system is still tightly wedded; it merely relegates it to a subordinate position in favour of active learning practices and more productive use of time -the currency of education.

6. Conclusion

This research investigated the potential of the flipped classroom in the Algerian context. The research concentration was centred on three main areas. The first one was content understanding without which one cannot be said to have progressed in a given course. This was followed by the element of active engagement in the course of this progress in the classroom. We have ended up with the considerably broader scope of differentiation. The aim herein was as to put forward solutions for learner-inclusive environments and study their incorporation within the scrutinized model.

In a nutshell, we disclosed the model's effectiveness in deepening learners' understanding of their courses that is ideally transferable to authentic situations of knowledge application. We also unveiled how active engagement is induced through the strategy of preparing students before the classroom session and equipping them with ideas to facilitate learners' involvement. This research revealed the existence of sufficient coherence between the structure of the flipped classroom and strategies of customisation in the time granted from the reversal gives way to more teacher-to-student interactions. The latter allows the teacher to build deep insights into the learning styles of a large number of students compared to traditional lecture-based learning. As they progress through the teaching process, these ideas encourage the teacher to interact proactively and productively with learners to get incrementally constructive feedback.

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