Perceptions of senior-year ELT students for flipped classroom: a materials development course

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ABSTRACT

This paper describes a structured attempt to integrate the flipped classroom model into a senior-level course at the higher education level. This study's purpose is to examine and compare the impact of flipped classrooms versus non-flipped as a means to contribute to the growing line of research on flipped teaching through an evaluation of both methods' academic outcomes, along with students' perceptions for their learning experience. Adopting action research principles, this study uses student grades, weekly e-journal entries, guided final journal entries, and focus group interviews as data collection tools. No significant difference were found to exist between mean scores for flipped and non-flipped groups regarding midterms and final e-portfolio, but flipped students received significantly higher essay scores compared to the non-flipped. Analysis of qualitative data led to 48 codes under five main categories: content delivery, instructor presence, learner presence, learning environment, and learning experience. Results indicate largely positive perceptions and satisfying learning experiences.

Introduction

Starting with two high-school chemistry teachers' concerns about students missing end-of-day classes (Bergmann & Sams, 2012), flipped classrooms have hit the spotlight as an alternative pedagogical method for better use of class time, increased interaction, student empowerment and engagement, opportunities for active learning, flexibility to review materials at one's own pace, more practice time, and flourishing group work, collaboration and social learning (Chen, Wang, Kinshuk, & Chen, 2014; Davies, Dean, & Ball, 2013; Ferreri & O'Connor, 2013; Jamaludin & Osman, 2014; McGivney-Burelle & Xue, 2013; McLaughlin et al., 2013; Strayer, 2012). Flipped classrooms or flipped learning refers to instructional practices whereby students learn course content through various technology-based materials (e.g. video recordings, narrated presentations, podcasts, and course notes) before attending class, instead of being delivered in the classroom within class hours as is the conventional practice. Hence, they have the opportunity to spend classroom time engaged in learning actively through various activities and applications, interacting with their peers and instructors, and receiving immediate, personal feedback. In other words, flipped learning is a:

> pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter. (Flipped Learning Network, 2014)

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Baker (2000) was among the first implementers of the flipped model, aiming to provide extracurricular materials to students and increase engagement for in-class activities. Lage, Platt, and Treglia (2000) applied the same method, providing maybe the most straightforward definition of flipped, or inverted, classrooms: "Inverting the classroom means that events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa" (p. 32). Flipped classrooms invert the traditional learning process, where learning is limited to school premises during school hours with instructors being the main resource for knowledge (LaFee, 2013). Flipping "moves the lectures outside the classrooms and uses learning activities to move practice with concepts inside the classroom" (Strayer, 2012, p. 171).

Although flipped learning is commonly associated with online videos, Bergmann and Sams (2012) repeatedly emphasise it is far more than videos/screencasts. While pre-class learning (a dimension of flipped learning largely benefitted from technological advancements in terms of varied materials) is crucial in terms of preparing students for in-class learning, the heart of the flipped classroom lies in peer and instructor engagement in an active learning experience in-class. In their scoping review about flipped classrooms in higher education, O'Flaherty and Phillips (2015) list technologies used to engage students in pre-class asynchronous and face-to-face synchronous activities as "pre-recorded lectures in the form of podcasts/vodcasts, screencasts, annotated notes and captured videos", as well as pre-readings, study guides from online repositories, case-based presentations and simulations followed by "team-based discussions, panel discussions, expert-led discussions, role-plays and student presentations, discussions and debates" in the classroom (p. 87). McLaughlin, White, Khanova, and Yuriev (2016) list three core elements of the flipped classroom as pre-class learning (e.g. video recordings, vodcasts, annotated notes, interactive online modules), in-class learning (e.g. discussions, group activities, individual feedback, scaffolding), and assessment (diverse approaches like embedded self-assessments, audio response systems, wikis, discussion forums, essays, and projects).

It is clear that considerable time, meticulous planning, and preparatory work are required to design, develop, and deliver course content, generating substantial workload for instructors. Scientifically validated resources and "how these resources are integrated into the overall approach is what matters" (Tucker, 2012, as cited in O'Flaherty & Phillips, 2015).

Mehring (2016) advocates the potential contribution of flipped learning in 'English as a foreign language' (EFL) classrooms creating a communicative and student-centred learning environment, and suggests varied tools for flipped EFL classrooms. Flipped classroom models provide opportunities for peer-assisted learning, cooperative learning, active learning, group work, and in-class discussions with students more active in the learning process, constructing their own knowledge and acquiring responsibility for their learning (Arnold-Garza, 2014; Butt, 2014; Hawks, 2014; Talbert, 2012). Benefits of the flipped classroom include flexibility and ability to progress at one's own pace, in-class collaborative tasks with/under the instructor's guidance, more efficient use of classroom time, continuous access to course materials, and improving self-discipline and self-regulation skills. Researchers also mention certain disadvantages to the flipped classroom, including a lack of engagement with pre-class materials and student readiness. Equally important is instructor engagement in providing a pedagogically sound and integrated learning environment. The following section provides findings from several research studies conducted on the flipped classroom model within various disciplines.

Flipped classrooms in practice

The flipped approach "opens up face-to-face class time" where the instructor actively interacts with learners through discussions, real-life examples, challenging scenarios, and continuous monitoring with an expected potential to improve the classroom experience (Mehring, 2016, p. 2). Research on the effectiveness of flipped classrooms in higher education is currently limited, though recent years have seen a rise. A number of studies across various disciplines indicate mixed but promising results,

which cannot directly be attributed to a single discipline specifically. Hence, this section includes findings from various disciplines grouped in terms of outcomes. Bishop and Verleger (2013) reported diverse, yet generally positive, student perceptions of the flipped classroom. In a study to determine the potential impact of the flipped classroom on student achievement and satisfaction in an introductory information systems course, Davies et al. (2013) found no difference in students' grades, but concluded that flipped classroom students spent more time on tasks and were more satisfied with the course. A similar finding by Zhao and Ho (2014), in an effort to 'flip' an undergraduate history course, revealed no evidence of significant impact on midterm exam scores, yet students' opinions about the flipped model varied. Likewise, Findlay-Thompson and Mombourquette (2014) used the flipped model for one section of an introduction to business course, and traditional lecture style for the other sections. Students were presented with identical course outlines, assignments, and exams. Academic performance evaluation indicated no significant differences, but students stated an appreciation of a higher quality of learning, despite lacking any quantifiable evidence.

Similarly, McLaughlin et al. (2013) redesigned a basic pharmaceutics course delivered to 22 satellite students on two different campuses. Exam performances revealed no significant difference, yet the authors indicated increased class attendance, enhanced learning, and student empowerment. Turan and Göktaş (2015) conducted a 10-week study with 58 candidate pre-school teachers in Turkey for a flipped basic information technology course. Semi-structured interview findings and reflection surveys showed primarily negative student attitudes towards the flipped model, typically due to the habitual familiarity of traditional lectures. Researchers indicated an attitude change in perceptions, with students' final remarks on the model about increasing interaction and making them 'active learners'.

Not surprisingly, specific cases declared improved learning outcomes (e.g. Day & Foley, 2006; Schroeder, McGivney-Burelle, & Xue, 2015). Albert and Beatty (2014) applied the flipped model to an American university's introductory management course with 975 enrolled students. Results indicated increased student grades that were subsequently used to develop a set of design principles for a general flipped classroom model. Hung (2015) used an active learning strategy to organise learning materials in three different formats (flipped, semi-flipped, and control), and revealed an increased mean score on lesson assessments for flipped, in addition to increased learning engagement and satisfaction. Deslauries, Schelew, and Wieman (2011) also reported increased scores in physics in addition to higher levels of student engagement.

Another example is Pierce and Fox (2012), who redesigned a 71-student pharmacy course, reporting increased final exam scores compared to that of traditional instruction. However, when Ferreri and O'Connor (2013) redesigned a large pharmacy course, they reported that despite increased grades, students expressed significantly more negative comments about the flipped model. Strayer (2012) also found students had difficulties connecting pre-class and in-class components, and orienting themselves to classroom tasks. Wilson (2013) had similar experiences, where students disliked the increased responsibility, reflecting negatively particularly about not receiving lectures. There are other cases where students changed their initial negative attitude or frustration as they adapted themselves to the flipped process (e.g. Mason, Shuman, & Cook, 2013).

There are studies focusing on learners' opinions, impressions, or perceptions about the flipped classroom model from various disciplines. Mehring's (2015) study with Japanese university students studying in an EFL flipped classroom revealed increased active learning, engagement, and interaction among students. Another study from the language discipline conducted with 48 students by Hsieh, Wu, and Marek (2016) reported enhanced motivation as well as improved knowledge on topics, concluding that flipped instruction was an appropriate instructional design model for the teaching of English.

Filiz and Kurt (2015) mentioned certain misunderstandings about flipped learning, which may impede application across some disciplines and educational levels, including decreased instructor responsibility due to pre-recorded materials, decreased student-teacher interaction, lack of control over students' pre-class work, suitability for certain disciplines, mere video content, or flipped

implementation in only one model. Researchers underlined the importance of avoiding such misunderstandings particularly for potential or inexperienced implementers of flipped classrooms.

Recent interest in the incorporation of flipped learning has resulted in a growing body of research for various disciplines, as previously mentioned, yet there is still little research on the adoption of this approach for the teaching and learning of languages (Mehring, 2016). This current study's primary purpose is to contribute to the literature on flipped teaching by examining and comparing flipped versus non-flipped classrooms as a means to explore a teaching context using a self-reflective approach for further improvement, and by evaluating the academic outcomes of both methods along with students' perceptions on their learning experience. The research questions that guided this work are:

1. How does the flipped classroom method influence students' academic performance?
2. What are the students' perceptions of their learning experiences in the flipped classroom?
3. What are students' design suggestions for flipped classrooms?

Research context and procedure

The study was conducted on a Turkish public university's 'Materials Development and Evaluation in English Language Teaching' course, delivered as a 14-week compulsory senior-year 6-ECTS (European Credit Transfer System) course in the English Language Teaching (ELT) Department. The course aims to provide a solid basis for material design, development, and review in English language teaching, and to introduce new trends with strong emphasis on technology and media. It is designed to provide candidate teachers with theoretical and practical information and skills for designing, developing, reviewing, and evaluating instructional materials for language teaching as educators. The second half of the course comprises mainly hands-on activities with students designing, developing, and evaluating instructional materials as part of their e-portfolio, making it difficult for instructors to focus classroom time on lecturing and demonstration, whilst students create digital artefacts after class without moderation or expert supervision.

In the 2015–2016 fall semester, 70 students enrolled in two sections of the course, both taught by the same instructor (the researcher). Both sections were held on the same day, back-to-back (morning/afternoon sessions), with each totalling 150 minutes. The instructional model was randomly allocated for each section, with morning sessions taught as flipped and afternoons as non-flipped. Students were not informed of the instructional method allocation before enrolment.

The university's official learning management system (LMS) managed the course in two separate groups, with course pages constructed for each method. The same course content was used for both sections, although the material use and application differed based on the method. For instance, the same presentations were used for both sections, but in the form of narrated presentations or recorded videos for the flipped section, and as classroom lectures for the non-flipped. Similarly, comparable activities (e.g. puzzles, tasks) were used for both sections, but were applied collaboratively in-class with instructors and peers for the flipped, and as homework for the non-flipped.

Non-flipped classroom (traditional lectures)

The class was designed traditionally, where the instructor presented course materials for one or two class hours to 39 students, followed by class activities such as worksheets or hands-on material design and development using the appropriate tools. Students completed activities each week, submitting their material using an online assignment tool on the LMS. All course materials (e.g. presentations, additional reading, web links, or videos from academic seminars or other experts) were uploaded to the LMS for continuous access by the students. Non-flipped students were not given prior access to the instructor's pre-recorded lectures or other materials pertinent to the flipped section. Assessment involved one midterm exam, one take-home essay assignment, and the creation of an e-portfolio including digital artefacts created by students as homework. Table 1 outlines the general weekly course structure.

Table 1. Weekly course structure – non-flipped section.

Week	Topic	Before-Class	In-Class	After-Class
1	Introduction to Course, Syllabus & Course Structure	–	Ungraded Quiz (Kahoot) on Syllabus	–
2	Introduction to Materials Design, Development, Adaptation & Evaluation in ELT	Reading Material	Lecture Writing Discussion Questions	Forum Discussion on LMS
3	Basic Principles of Materials Development for Language Learning/Teaching	–	Lecture Discussion	Take-Home Essay
4	Material Design in ELT: Practical Considerations	–	Lecture Discussion	Activity: Material Evaluation
5	Revisiting Instructional Design Principles	–	Lecture	Activity: Crossword Activity: Instructional Design Challenge
6	Visual Design Principles	Web Links	Lecture	Activity: Assessment of a Presentation
7	Power of Technology in ELT Classrooms	–	Guest Lecturer Discussion	Activity: Lesson Design
8	Midterm Week			
9	Developing Writing Skills: Blogging	Reading	Lecture Demonstration (Wordpress/Blogger)	e-Portfolio Artefact: Creating a Blog
10	Visual Literacy: Infographics & Still Visuals	–	Lecture Demonstration (PiktoChart)	e-Portfolio Artefact: Creating an Infographic
11	Digital Storytelling: Podcasts & Videos	–	Lecture Demonstration (Audacity/ MovieMaker)	e-Portfolio Artefact: Creating Audio/Video Podcasts
12	Digital Storytelling: Animations	–	Lecture Demonstration (Powtoon)	e-Portfolio Artefact: Creating an Animation
13	Gamification	–	Lecture Demonstration (Kahoot)	e-Portfolio Artefact: Creating a Quiz
14	Material Evaluation	–	Lecture Demonstration	Activity: Evaluation of Materials

Flipped classroom

This section was comprised of 31 students. Students were instructed to watch videos and cover course materials before attending class. The instructor used Microsoft Office Mix or Adobe Connect virtual classroom system to record videos (narrated slideshows with the instructor's 'talking head') serving as equivalent to lectures delivered to the non-flipped section. Some pre-class materials also included videos from academic seminars, training sessions, or from guest lecturers. Videos, written materials, and additional web links were uploaded to the LMS for continuous access by students (Figure 1). Several in-class activities were used to foster learning and engagement (e.g. quizzes, asynchronous forum discussions, games, student response systems or practical group work for writing discussion questions, and answering quiz questions) as well as to test whether or not students had watched/reviewed the course materials prior to attending class. A variety of formative and summative assessment techniques were employed including two graded quizzes, one essay assignment, and an e-portfolio including digital artefacts completed in-class throughout the semester. In-class activities also enabled students retaking quizzes and reviewing essays as a group activity to test and correct their own answers in a collaborative manner. Table 2 outlines the week-by-week general course structure.

Methodology

Research design

This qualitative study was conducted using an action research design. Action research, a common methodology used in educational research, is a systematic research conducted by instructors,

30 September
Before Class / Lecture: Materials Design, Development, Adaptation and Evaluation in ELT
Read: Materials Development for Language Learning and Teaching by Brian Tomlinson Lang. Teach. (2012), 45.2, 143-179

- READING: Materials development for language learning and teaching
- VIDEO - A focus on materials development with Rachael Roberts and Adam Kilgarriff
- ACTIVITY #1 - Forum Discussion

7 October
Before Class / Lecture: Materials Design, Development, Adaptation and Evaluation in ELT
Read: Materials Development for Language Learning and Teaching by Brian Tomlinson Lang. Teach. (2012), 45.2, 143-179
In Class / Essay: Individual

- PRE-CLASS LECTURE
  Materials Development for Language Learning & Teaching
- ASSIGNMENT #1 - 1st ESSAY
- DISCUSSION QUESTIONS

14 October
Before Class / Lecture: Materials Design, Development, Adaptation and Evaluation in ELT
In Class / Quiz: Individual & Team + Materials Evaluation

- PRE-CLASS LECTURE
  Principles of Materials Design and Adaptation
- In-Class Quiz (Individual)
- In-Class Quiz (Group)
- Activity #1 - Material Evaluation

21 October
Before Class / Lecture: Materials Design and Development: Revisiting Instructional Design Principles
In Class / ID Challenge

- PRE-CLASS LECTURE (PDF)
- PRE-CLASS LECTURE (VIDEO)
- VIDEO - ADDIE Model Instructional Strategies
- Activity #2 - Crossword
- Activity #3 - Instructional Design Challenge

28 October
Before Class / Lecture: Visual Design Principles
In Class / Activity: Evaluate Your Work

- POWER POINT İLE SUNUM HAZIRLAMA TEKNİKLERİ
- Principles of Graphic Design
- Elements and Principles of Design
- Visual Design Basics

4 November
Before Class / Lecture: Power of Technology in ELT Classrooms
In Class / Quiz: Individual & Team / Essay: Individual

- 21. Yüzyılda Eğitim, Teknoloji ve İnsan (1:11)
  - FORUM: 21. Yüzyılda Eğitim, Teknoloji ve İnsan
- Öğrenmenin Geleceği (1:06)
  - FORUM: Öğrenmenin Geleceği
- Dijital Dünya ve Öğrenme: Yakın Gelecekte Öğrenci, Öğretmen ve İçerik (0:22)
  - FORUM: Dijital Dünya ve Öğrenme: Yakın Gelecekte Öğrenci, Öğretmen ve İçerik
- In-Class Quiz #2 (Individual)
- In-Class Quiz #2 (Group)

Figure 1. Screenshot from course page on LMS.

educational administrators, or other stakeholders, either on their own or aided by researchers, to collect data on various issues including how schools operate, how teaching is conducted, or how and to what extent students learn. The main purpose of data collection is a deeper understanding in order to take action for improvement (Mills, 2003).

Action research takes a critical and self-reflective approach to exploring one's own teaching context (Burns, 2010). Researchers conduct action research to examine a specific phenomenon's current progress, and to improve it. While doing this, they not only observe what happens, but also take action (McNiff, Lomax, & Whitehead, 2004). Action research is becoming increasingly popular in the ELT context. Burns (2009) classifies the use of action research in language teacher education programmes under three main categories: (a) an integrated element of formal undergraduate or postgraduate courses; (b) collaborative teacher-researcher projects; and (c) individual projects by classroom teachers and teacher educators.

This mixed-methods action research study employs both qualitative and quantitative data to compare application of the flipped classroom model to one student group with another group under the traditional lecture-style model for a senior-year university course. Qualitative data was embedded through journals, an open-ended course assessment survey, and focus group interviews to gain a deep perspective about the learning experiences of both groups. Quantitative data was used to support qualitative data in the form of student grade achievements for midterm examinations, essay tasks, and final e-portfolios.

Participants

Study participants ($N_{flip} = 31$, $N_{nonflip} = 39$) were senior ELT students undertaking a Materials Development and Evaluation in ELT course at a Turkish state university. The students met weekly for three 50-

Table 2. Weekly course structure – flipped section

Week	Topic	Before-Class	In-Class
1	Introduction to Course, Syllabus & Course Structure	–	Ungraded Quiz (Kahoot) on Syllabus
2	Introduction to Materials Design, Development, Adaptation & Evaluation in ELT	Reading Material Video (Seminar)	Writing Discussion Questions Discussion
3	Basic Principles of Materials Development for Language Learning/Teaching	Reading Material Video Lecture	Discussion Essay Writing
4	Material Design in ELT: Practical Considerations	Reading Material Video Lecture	Quiz (Individual) Quiz (Group) Activity: Material Evaluation
5	Revisiting Instructional Design Principles	Reading Material Video Lecture	Activity: Crossword Activity: Instructional Design Challenge
6	Visual Design Principles	Web Links Video Lecture	Activity: Assessment of a Presentation
7	Power of Technology in ELT Classrooms	Guest Lecturer Videos	Quiz (Individual) Quiz (Group) Discussion
8	Midterm Week		
9	Developing Writing Skills: Blogging	Reading Lecture Demonstration (Wordpress/Blogger)	Group Work: Creating a Blog on Educational Use of Blogs e-Portfolio Artefact: Creating a Blog
10	Visual Literacy: Infographics & Still Visuals	Lecture Demonstration (PiktoChart)	Group Work: Creating an Infographic on Educational Use of Visuals e-Portfolio Artefact: Creating an Infographic
11	Digital Storytelling: Podcasts & Videos	Lecture Demonstration (Audacity/ MovieMaker)	Group Work: Creating a Video on Educational Use of Podcasts e-Portfolio Artefact: Creating Audio/ Video Podcasts
12	Digital Storytelling: Animations	Lecture Demonstration (Powtoon)	Group Work: Creating an Animation on Educational Use of Animations e-Portfolio Artefact: Creating an Animation
13	Gamification	Lecture Demonstration (Kahoot)	Group Work: Creating a Quiz on Educational Use of Gamification e-Portfolio Artefact: Creating a Quiz
14	Material Evaluation	Lecture	Group Work: Evaluating Materials

minute classes in a computer laboratory, where each student had access to an Internet-connected computer. Each student undertook two technology literacy courses in their first year, yet none had any prior flipped classroom experience. Table 3 provides a demographic overview of the participants.

Data collection

Data collection included academic performance data, weekly electronic journal entries, a final journal entry guided by open-ended questions, and focus group interviews.

Academic performance

Midterm/quiz, essay scores, and final portfolio scores were used to measure academic performance, with care to construct an equivalent assessment structure for both classes. The non-flipped class was

Table 3. Participant demographics.

		Flipped	Non-flipped	Total
Gender	Male	12	13	25
	Female	19	26	45
	Total	31	39	70
Age	Average	22.8	23.4	23.2

graded based on midterm score (30%), take-home essay score (10%), attendance (5%), journals (5%), and e-Portfolio (50%), whilst the flipped class was based on quiz grades (30%), in-class essay score (10%), attendance (5%), journals (5%), and e-Portfolio (50%).

Midterm and quizzes included multiple choice, fill-in-the-blanks, matching types, and two open-ended questions. Both were administered electronically in the computer lab within classroom hours. Questions were drawn from a question bank created by the researcher, with the same number and similar difficulty levels for the same subjects. Open-ended questions were manually evaluated by the researcher, and other questions were evaluated automatically based on a key previously entered by the researcher.

The essay task was administered to both sections with students asked to answer one of three questions. The flipped students were given questions at the beginning of the week, with the opportunity to undertake some research, and wrote their essay in-class with the instructor's presence. They were free to ask questions, use the Internet to access information, and had three class hours to submit their work. For the non-flipped students, it was a take-home task where they were free to use any digital or printed resources or ask questions to the instructor. They then had to write their essay on their own with no real-time instructor assistance. All essays, in-class or take-home, were assessed and marked based on the same evaluation grid.

Final assessment was based on students' e-portfolio of digital artefacts, created on a theme selected from a compilation given by the instructor. Each e-portfolio artefact was peer-assessed, self-assessed, and assessed by the instructor using an extensive rubric.

Journals

Students were advised to keep weekly journals to reflect and elaborate on their experience. No guide was provided, except for instruction given at the semester start, and repeated several times throughout regarding what was expected. Although journal keeping was part of the course assessment, only 41 students (59%) complied, albeit irregularly, resulting in 149 journal entries.

Open-ended course assessment

At the semester end, prior to final portfolio submission and assessment, a six-item open-ended questionnaire was administered online to all students to reveal reflections of their course experience, to which 46 students (66%) responded.

(1) Overall, are you satisfied with this learning experience?
(2) What do you think are the most satisfying aspect(s) of this learning experience?
(3) What do you think are the least satisfying aspect(s) of this learning experience?
(4) What was your typical approach to studying and average effort you put into each lesson (e.g. preparation before class, approximate hours per week for study, watching course videos or doing assignments)?
(5) Did you observe any changes in your attitude toward this learning experience? How and why?
(6) What improvements would you suggest to improve learning for this course?

Focus group interviews

Focus group interviews were conducted to elicit students' perceptions of classroom experiences. Students were invited to participate in focus groups based on their open-ended course assessment responses. Fourteen students responded positively, and two focus group interviews were held (flipped, non-flipped). According to Bloor and Wood (2006), focus groups are mostly characterised by several individuals discussing a subject instead of merely answering questions. Each interview lasted 90 minutes.

Table 4 shows response rates for journals, open-ended course assessment, and focus group interviews.

Table 4. Data collection methods and response rates.

		Flipped	Non-flipped	Total
Journals	Male	5	7	12
	Female	10	19	29
	None declared	–	–	–
	Total	*15*	*26*	*41*
Open-Ended Course Assessment	Male	5	11	16
	Female	9	14	23
	None declared	1	6	7
	Total	*15*	*31*	*46*
Focus Group	Male	3	5	8
	Female	1	5	6
	None declared	–	–	–
	Total	*4*	*10*	*14*

Data analysis

Student performance from flipped/non-flipped classes (score data for midterm exams/quizzes, essays, final e-portfolios) were retrieved from the Student Affairs System, and transferred to SPSS v.20.0 statistical software for analysis. Independent samples *t*-test examined the significant difference between students' performances on midterms, essays, and e-portfolios.

Qualitative data (149 journal entries, 46 responses to six-question final journal, and two focus group interview transcripts) was analysed through content analysis. A matrix-like structure to organize data is considered useful to facilitate pattern matching of qualitative data (Yin, 1994). Journal data and interviews entered into Excel spreadsheets enabled the identification of patterns, coding, and emerging themes, with codes and themes rearranged and classification revealing pertinent concepts and relations to explain and describe the data. Employing an open coding approach, data was analytically split into discrete parts for closer examination, and comparison for similarities and differences. Collected through journals, an open-ended course assessment survey and two focus group interviews, student perception analysis led to 48 codes grouped under five main categories (Figure 2). Findings were enriched with significant excerpt statements from participants (prefixed 'F' for flipped students and 'NF' for non-flipped).

Findings

Findings encompass student performance from exam scores and students' perceptions based on journal reflections, open-ended course assessment, and focus group interviews. Quantitative analysis results primarily emphasises significant group differences, highlighting student participation. Qualitative analysis provides the bigger picture about students' reflections; adding connotation through excerpts. Since the language of instruction was English, all data is in English, except for focus group interviews where students preferred their native Turkish.

Academic performance

The first research question sought to determine whether or not the flipped method impacted on the students' academic performance. Independent samples *t*-test was conducted to isolate significant differences between students' performances based on their scores from midterm/quizzes, essays, and final e-portfolios. Table 5 shows mean values for the flipped and non-flipped groups, ranging from 46.74 to 68.07.

Table 6 shows testing for significant difference between the groups' mean scores. Firstly, homogeneity of variance between groups was examined, and then Levene's test was used to assess equal variances between groups. For midterms and final e-portfolio scores, Sig. value of greater than .05
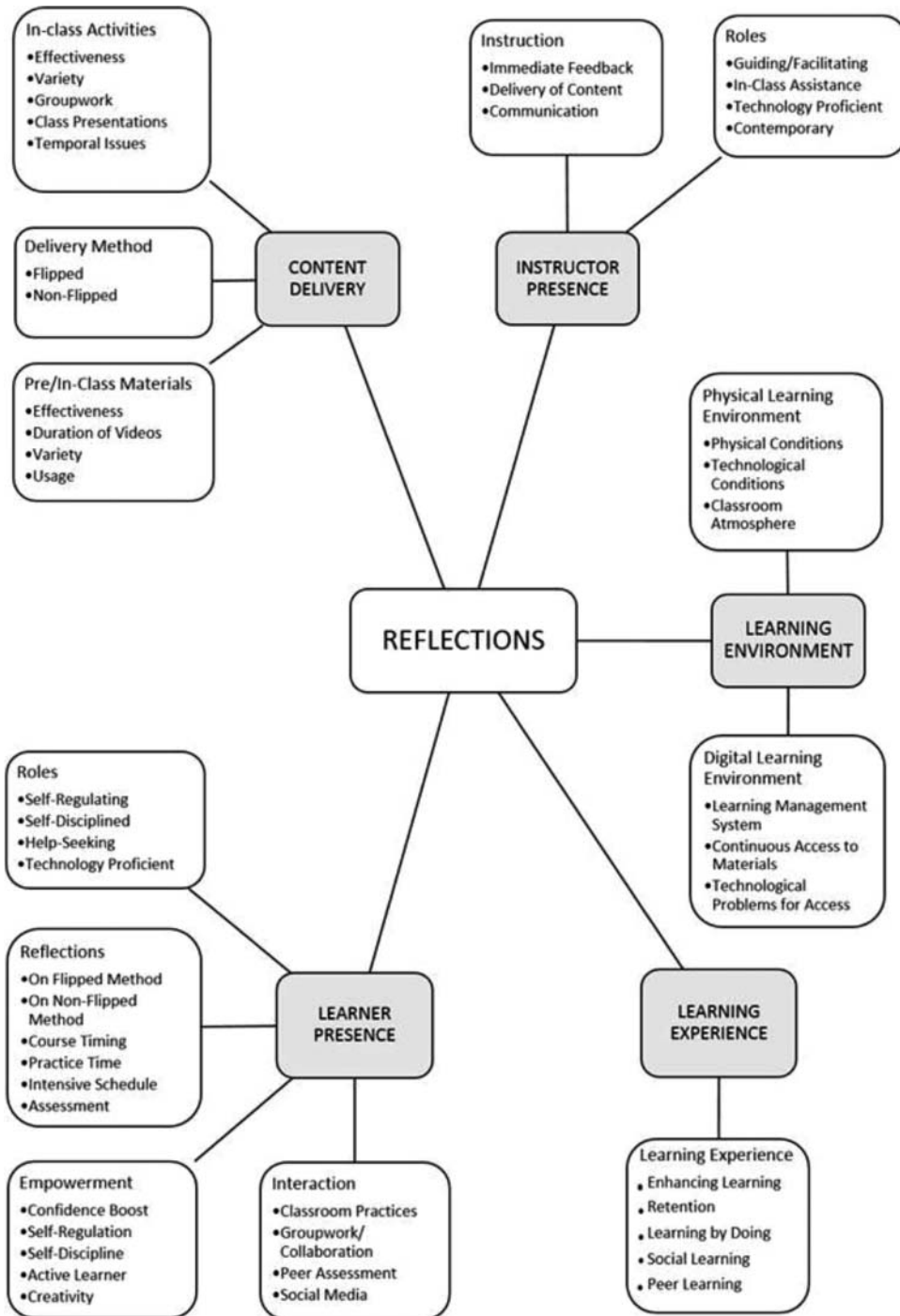
In-class Activities
- Effectiveness
- Variety
- Groupwork
- Class Presentations
- Temporal Issues

Instruction
- Immediate Feedback
- Delivery of Content
- Communication

Roles
- Guiding/Facilitating
- In-Class Assistance
- Technology Proficient
- Contemporary

Delivery Method
- Flipped
- Non-Flipped

CONTENT DELIVERY

INSTRUCTOR PRESENCE

Pre/In-Class Materials
- Effectiveness
- Duration of Videos
- Variety
- Usage

Physical Learning Environment
- Physical Conditions
- Technological Conditions
- Classroom Atmosphere

REFLECTIONS

LEARNING ENVIRONMENT

Roles
- Self-Regulating
- Self-Disciplined
- Help-Seeking
- Technology Proficient

Digital Learning Environment
- Learning Management System
- Continuous Access to Materials
- Technological Problems for Access

Reflections
- On Flipped Method
- On Non-Flipped Method
- Course Timing
- Practice Time
- Intensive Schedule
- Assessment

LEARNER PRESENCE

LEARNING EXPERIENCE

Empowerment
- Confidence Boost
- Self-Regulation
- Self-Discipline
- Active Learner
- Creativity

Interaction
- Classroom Practices
- Groupwork/ Collaboration
- Peer Assessment
- Social Media

Learning Experience
- Enhancing Learning
- Retention
- Learning by Doing
- Social Learning
- Peer Learning

Figure 2. Categories, sub-categories, and codes.

(.146, .107, respectively) indicates equal variances can be assumed, whereas for essay scores, Sig. value of less than .05 (.000) indicates non-equal variances between groups.

No significant difference exists between the mean scores for flipped and non-flipped groups regarding midterms and final e-portfolio scores. Yet, there is significant difference for essay scores

Table 5. Academic performance of groups.

	Group	N	Mean	Std. deviation	Std. error mean
Midterm	Flipped	30	57.33	15.448	2.820
	Non-flipped	38	56.00	11.571	1.877
Essay	Flipped	30	68.07	28.528	5.209
	Non-flipped	38	46.74	37.978	6.161
e-Portfolio (Final)	Flipped	30	63.33	21.275	3.884
	Non-flipped	38	64.75	14.587	2.366

Table 6. Independent samples test.

		Levene's test for equality of variances		t-Test for equality of means					95% confidence interval of diff.	
		F	Sig.	t	df	Sig. (two-tailed)	Mean diff.	Std. error diff.	Lower	Upper
Midterm	Equal variances assumed	2.163	.146	.407	66	.685	1.333	3.276	−5.207	7.874
	Equal variances not assumed			.394	52.333	.696	1.333	3.388	−5.464	8.131
Essay	Equal variances assumed	13.525	**.000**	2.557	66	.013	21.330	8.340	4.678	37.982
	Equal variances not assumed			2.644	65.864	**.010**	21.330	8.067	5.222	37.438
e-Portfolio (Final)	Equal variances assumed	2.671	.107	−.325	66	.747	−1.414	4.356	−10.112	7.284
	Equal variances not assumed			−.311	49.207	.757	−1.414	4.548	−10.553	7.725

at $p < .05$ ($p = .010 < .05$), concluding that flipped students received significantly higher essay scores compared to non-flipped. Further investigation showed that (Figure 3) 12 of 38 non-flipped students (32%) scored zero, from non-submitted assignments, whereas others scored low marks due to plagiarism. Removing these 'undelivered' essays from the data revealed a p-value of .056.

Student perceptions

Collected through journals, an open-ended course assessment survey, and two focus group interviews, student perception analysis led to 48 codes grouped under five main categories.
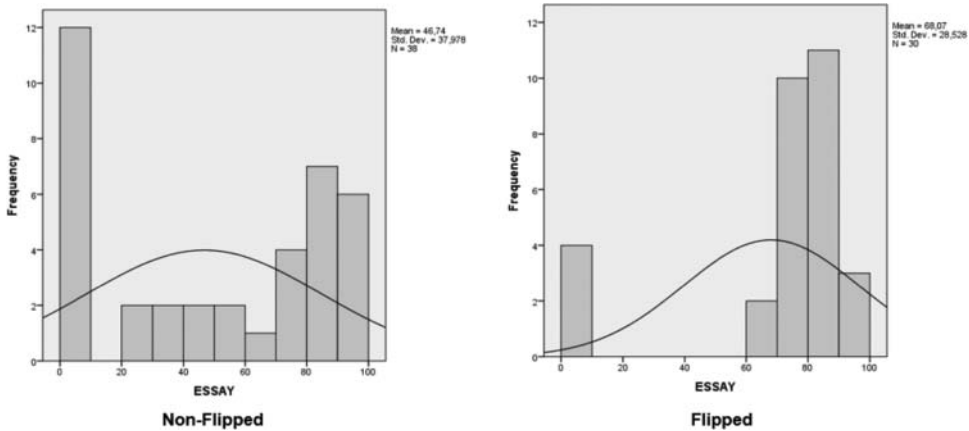

Figure 3. Histograms of essay scores.

Content delivery

Content was delivered as flipped and non-flipped, receiving both positive and negative student evaluation. Considered 'ground-breaking', flipped classes attracted numerous comments from both groups, presenting new experiences for students, and most facing it with 'doubt' and anxiety.

> F18: In the beginning, when you explained the schedule and format of the lesson, I didn't like the idea of preparing before the class. But by the end, I saw how useful it was. We had time for practice instead of reading or watching videos, articles in the lesson.

Most were curious; however, many wrote positively about the flipped classrooms in their weekly journals:

> F26: I'm not used to this kind of learning, so it was interesting. I liked this style, but will take time to get used to it.

> F10: Watching videos at home or reading presentations before coming to lessons and then doing assignments in class is so nice, and I think it is more permanent.

Some defined it an "amazing experience" (F18), and having heard from friends, some non-flipped students compared their traditional experience findings; "the flipped (morning) lessons are more beneficial...students can handle data gathering part themselves, getting help from the instructor when they need (activity part)" (NF16). Before classes, instructors provided wide-ranging materials, with videos and narrated presentations with 'talking heads' mentioned predominantly. Many students considered narrated presentations a "brilliant idea", where they could follow content, whilst feeling the instructors' presence.

> F13: Most satisfying was the 'before class' section. I believe learning is something different than just information given in class. This style provides students with an opportunity to learn as much as they want before they come to class – if they are willing.

Students considered course materials convenient, effective and engaging; yet video duration was a major concern. Narrated presentations and instructor-prepared course videos were <20 minutes, yet some subject matter experts' or seminar videos lasted >50 minutes. Students 'confessed' skipping some videos as 'too long', or lost their attention.

> F13: ...I loved this style. Maybe the only criticism would be the amount or rather duration of the tasks. For instance, some weeks we had more than three videos, which was too much. Maybe they could be shortened.

> F23: This week's pre-lecture section was more effective than the previous. It was shorter and more memorable.

> NF29: Since the semester start, I really appreciated how the instructor prepared her presentations. They are so clear and include key words. As a visual learner, this was really beneficial.

In-class activities such as puzzles, quizzes, or challenging games checked students had studied pre-class materials. Used as graded assessments, quizzes were the most mentioned activity. After each quiz, graded or not, students retook the same quiz as collaborative group work, discussing possible responses with group members/research resources to confirm or correct their answers.

> F1: We solved quiz questions, which was a good method. We discussed them with our group and class, so we learnt permanently...

> F8: Actually, doing the quiz in groups was good. Because we shared our ideas, we talked about the questions and learned better. It was a good method.

One main benefit of the flipped classrooms was stated as having the chance to use class time for making learning more permanent with continuous interaction with peers and the instructor.

> F18: I think preparation before class is logical...we did not waste class time. Preparing before classes gave us chance to work with group members in practicals.

F15: We did activities in-class, giving us chance to work in groups. We could ask our friends/instructors about any problems.

NF30: In my opinion, in-class practicals was the most effective part. I also learned about instructors' presentations I missed from my group friends.

Time was a major concern for students completing in-class activities and course assignments. Context-specific reasons ranged from intensive senior-year course schedule due to teaching practicum, to habits of completing homework at home.

F18: Time for activities was limited. More time would be more useful for such brilliant materials.

F22: I was…ashamed, that's why I didn't [complete] these [tasks] in the computer lab lessons with your [instructor] assistance…then I felt too lazy to do them at home.

As expected, non-flipped students complained about time shortages for classroom activities. Many thought it would be "better, if more time was given" to complete activities (NF30).

NF1: The lesson process isn't tiring, but after-class activities are stressful, because of limited time to complete tasks.

NF30: I suggest more opportunity be given to students to practice in-class.

Learning environment

Due to student numbers, groups took courses in different IT labs. The non-flipped students experienced serious problems with physical conditions and technological infrastructure during weeks 1–2. The location was changed; yet, class size was high, and students complained of heat/overcrowding, particularly during lectures, negatively affecting classroom management. For practicals, class atmosphere was more relaxed and flexible, with students mobile and more comfortable. The flipped classroom students repeatedly emphasized the "stress-free learning experience" overall with their "flexible learning environment" (F3).

Flexibility was mentioned in terms of time and space in accessing course materials; both the flipped and non-flipped students had continuous access to course notes, supplementary materials, videos, and web links on LMS.

F19: To do lessons in a digital setting is the best thing for people like me who love technology.

NF29: Even though I could not participate in this lesson, I easily reached the materials online and I also read the article and wrote an essay…

NF24: I like the format of the lesson because we can follow information on LMS. It was a good idea…to create a [Facebook] group.

Instructor presence

Students' reflections on instructor presence were examined under two sub-categories. Instructor's classroom role was emphasised by both the flipped and non-flipped groups. The flipped students were satisfied with instructor's active presence; not merely lecturing, but interacting, answering questions and providing help. "Reviewing" class materials "together with the instructor" was considered an "engaging" activity (F10).

F26: It was good not to learn [the] subject in class. Normally, group works are problematic, but this was good because everybody was there. Also, we could ask questions.

NF20: Especially our mentors…were very friendly and we were always free to ask questions.

Instructor's guiding role was also underlined by both student groups, particularly the non-flipped, along with instructor-student communication and content delivery.

NF21: Yes, she lectured, but mostly she guided us to access information and to gain experience. She helped us to be autonomous learners.

NF19: Answers to students' questions were very detailed and interesting. She used real-life experiences while explaining the presentation.

Students underlined the importance of instructors being technologically proficient and contemporary educators to implement such classroom "innovations". Both groups mentioned 'innovativeness' of the course, being the first "proper" course where they were asked to use technology actively and could access course materials digitally.

F13: …flexible learning plans or programmes are something which all teachers mention, however this is the first I'd experienced.

Student presence

This course was demanding and hands-on compared to other curriculum courses, with students expected to plan and implement a micro-instructional design process, completed through developing a varied material digital e-portfolio. Regardless of method, almost all students mentioned their adaptation to new roles/competencies for this course. Nonetheless, self-regulation and self-discipline were two concepts predominantly and recurrently underlined by the flipped classroom students.

F3: When there's a lecture video before the lesson, it's a huge challenge. Idea is great: drink coffee and smoke while listening to lectures, but impossible in reality. I cannot find any motivation for 30-minute lessons at home, unfortunately.

NF?: It was a pleasure to read more than instructed. I watched and read materials before class and wrote my journal regularly. These activities helped my self-regulation skills. (no name)

F?: I became more responsible for my own learning. (no name)

F11: I'm committed. I have targets. I worked at least an hour after watching videos, making notes and practicing before class. This required self-discipline.

On such courses, students are expected to actively use digital tools – for many students it is a gift, but a curse for others. Instructors observed technology-proficient students managed both methods relatively easier. The less technology proficient were less confident; believing their battle lost from the beginning.

F28: As I'm technologically illiterate, I know I'd have difficulties.

NF?: It takes too much time if not good with technology. (no name)

F29: I am not a successful technology user, but have learnt. The atmosphere made me relaxed.

Not every student searched the Internet for concepts not understood, or an activity he/she wanted to learn about; some even did not ask the instructor or classmates about problems. Focus group participants said many were not used to seeking help or searching for information not provided. Nevertheless, several students from both groups stated the course boosted their confidence, empowering them with self-discipline, creativeness, and becoming more active learners.

NF16: At first I didn't expect to have fun while blogging and creating my own materials, but when I saw my final work, I was really proud. Now I know I can do this…

NF23: It improved my way of thinking and my creativity.

F3: We learnt about teamwork, and it's better day-by-day.

Students considered "working with a classmate" contributed to learning, making it more "effective". One said, "Group work is good for learning" (F23). Classroom practices improved student interaction, and learning to work collaboratively. One stated group work helped them see mistakes or gaps, with peers helping them correct mistakes and overcome the gaps together (F2).

F23: To me, group work is perfect as we share our ideas, and this helps to reduce the anxiety I think.

NF10: Group work…helps us to better understand some points about the topic and other activities…

F26: It was fun coming to school, because I knew that nothing would be lectured; we would just study in groups, create something.

Student–instructor and student–student interaction was also strengthened by social media. Students were members of a Facebook group the instructor created, which not only served for announcements, but as a medium for sharing knowledge, skills, and course-related anxieties, concerns or achievements.

Students complained about busy senior-year schedules with teaching practicum and private courses; most recommended moving this course to another semester, regardless of teaching method. Some flipped students thought a non-flipped classroom might be more advantageous, with content delivered by instructors.

F4: As a flipped student, I think non-flipped members were lucky because we watched the videos by ourselves, but they listened to instructors.

F3: I wonder if the non-flipped group learned better than us, especially the theory. But for practicals, flipped method is king.

Time was another concern, with both groups wanting more classroom practicals time. Focus group flipped students appreciated the method, defining it as "modern" and "extraordinary", emphasising the formative assessment, particularly in flipped, monitoring student learning to provide continuous feedback for improvement.

Learning experience

Besides empowerment, many students believed flipped classes enhanced learning through in-class engagement, providing time/opportunity for real-life applications, and encouraging social classroom learning. Flipped method "enhanced learning" (F19); "we learned from each other in the classroom…benefitting from many perspectives: self-discipline, responsibility of learning, creativity and imagination."

F11: The Facebook group was useful. It improved motivation; gave a sense of communal belonging.

F17: We had to learn…to prepare our e-portfolio, we had to learn. We learned in collaboration with friends, and learnt by doing, so we retained it.

Discussion and conclusion

This study's purpose was to compare the academic performance of students under two methodologies, namely the flipped and non-flipped classroom models, alongside investigating perceptions of students' learning experiences. Results indicate largely positive perceptions and satisfying learning experiences among students. Unsurprisingly, students of the demanding senior-year course are mainly concerned about heavy workloads and temporal constraints.

One central finding was no significant difference in academic performance from midterm/quiz and final e-portfolio scores. Despite many studies resulting in significant difference on the flipped side (e.g. Day & Foley, 2006; Hung, 2015; Schroeder et al., 2015), this finding is congruent with research from various disciplines indicating no significant student performance difference (e.g. Findlay-Thompson, & Mombourquette, 2014; Hotle & Garrow, 2016). Many students believed the flipped classroom enhanced learning through classroom engagement, providing more time/opportunity for real-life applications, encouraging in-class social learning. However, no quantifiable evidence supports their claims, other than their perceptions, which is comparable to Findlay-Thompson and Mombourquette's (2014) findings of no grade differential despite students'

assurances of better performance. Also parallel are Frydenberg (2013), Hsieh et al. (2016)), Hung (2015), and McGivney-Burelle and Xue (2013) in suggesting higher satisfaction levels from flipped students as opposed to non-flipped.

Zhao and Ho (2014) cited Marcey and Brint (2012), Mason et al. (2013), and Stone (2012), indicating mixed results on learning outcomes. Likewise, despite no significant difference on scores achieved from midterm/quizzes and final e-portfolios, this study showed flipped classroom students significantly outperformed non-flipped students in essay scores. This may be due to in-class performance of essay writing in the flipped classroom as a classroom activity, while as a take-home 'task' some non-flipped students were not 'bothered' since it constituted only 10% of the total available achievement score. This may also align with Herreid and Schiller (2013), who emphasised instructors' struggle to engage students in self-study along with the importance of students' active engagement with content and instructor's guidance in the classroom. Both Hsieh et al. (2016) and Hung (2015) also found flipped students more engaged with out-of-class study, spending relatively more time/effort than in traditional classrooms.

Qualitative results were also mixed, with encouraging and adverse opinions on the flipped classroom method. This parallels with results from Bishop and Verleger (2013) where perceptions of flipped students were mostly positive, with a substantial minority of negative views. Considered 'ground-breaking', flipped classroom was a novel experience for all students although initially greeted by doubt, anxiety, excitement, and curiosity. Students were particularly satisfied with the design, format and structure of instructional materials, together with technology usage and multimedia resources. Flexible access to course materials to watch/read at their own volition/pace was regularly mentioned. Flexibility was also underlined by several others (e.g. Mason et al., 2013; Roach, 2014; Wanner & Palmer, 2015; Zhao & Ho, 2014). Students thought course materials were effective and engaging; yet video duration was a major concern. Similarly, several researchers' students preferred shorter videos (e.g. Zappe, Lieicht, Messner, Litzinger, & Lee, 2009; Zhao & Ho, 2014). Students indicated heavier workloads required more time to complete course tasks and activities. Although this is a concern shared by other studies (e.g. Wanner & Palmer, 2015), it might not hold significance for this study as the course was equally demanding for both flipped and non-flipped groups.

Students' reflections on instructor presence dominated. Active presence of supportive, technologically proficient, and contemporary instructors was underlined significantly by both groups. Ever-changing technologies and their reflection on learning environments change instructors' roles and competencies. This new role of instructors guiding, facilitating and engaging students in learning environments is particularly important for flipped classrooms, ensuring students are not left behind (Galway, Berry, & Takaro, 2015; Kim, Kim, Khera, & Getman, 2014).

Student empowerment was a major theme deduced from journals and focus group interviews. Students believed that the flipped classroom method boosted their confidence, empowering them to become more disciplined, creative, and more active learners. This is consistent with similar findings in the literature (e.g. Turan & Göktaş, 2015; Ziegelmeier & Topaz, 2015). Qualitative findings from McLaughlin et al. (2013) also suggested that the flipped model promoted student empowerment, development, and engagement, whilst Sahin, Cavlazoglu, and Zeytuncu (2015) emphasised "changes in preparation habits before attending class" and "improved levels of understanding" as additional benefits of the flipped model (p. 148). Another contributing factor was considered opportunities for in-class collaborative work with peers. Classroom practices improved interaction among students in learning to work together. Strayer's (2012) study with an inverted statistics class also indicated that even if less satisfied with the flipped method, students were more positive about cooperative learning and innovative teaching. New generation students seem to find flipped classrooms enjoyable, flexible, fun, and useful, and the body of evidence is growing that such endeavours support them in their learning.

Implications for practice

This study confines itself to a pre-service ELT teacher training programme at a Turkish state university, and relies on exam scores obtained through assessment tools prepared and measured by the researcher and on self-reported participant data collected in an inverted learning environment created by the researcher. Circumstances within other disciplines or context may differ significantly from this study's context. These differences may be explored further within alternative educational settings in order to obtain a more in-depth understanding of the approach. Within its limitations, this current study concludes with the following implications for practice and further research:

The flipped classroom does not decrease the instructor's classroom role. Along with revolutionising technologies, instructors evolve from mere information providers to guides, mentors, and facilitators. Institutions are responsible for assisting instructor adaptation, raising their awareness, and training them on new pedagogical approaches. Instructors' engagement and proficiency is crucial in flipped learning, and they should be supported through sound professional development, not only on technology, but also on how to integrate technology into specific learning processes.

Preparation is key to flipping the classroom successfully. Students should be clearly informed to understand the flipped classroom model – which is vital for their engagement. Instructors may create incentives and encouragement for improving student participation in class; yet, lack of engagement with pre-class materials should also be addressed, possibly through different activities or methods (e.g. adding motivating elements to pre-recorded lectures, gamification activities). Duration of podcasts, vodcasts, screencasts, or any pre-recorded videos should be kept short to avoid distraction, and well planned to make content readily digestible.

Future research should further examine how flipping impacts additional dimensions of academic performance or learning outcomes in various disciplines.

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Disclosure statement

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