An explanatory sequential mixed-method research on the full-scale implementation of flipped learning in the first years of the world's first fully flipped university: Departmental differences

ABSTRACT

This study evaluates the first years of the full-scale flipped learning implementation process that began with an authority innovation-decision at the world's first fully flipped university in terms of departmental differences. The study employs an explanatory sequential mixed-method research. The primary respondents were 69 freshmen enrolled in the Faculty of Education at a private university in Istanbul, Turkey. In addition to student participants, five faculty members were recruited to the study. The primary data was collected through a Likert-type scale on flipped learning, including components on motivation, course structure, and interaction. Pre and post semi-structured interviews and a structured ranking form were also used to support the quantitative data. The findings of the study reveal that the students felt relatively unmotivated when instructed through flipped learning, although were satisfied with the course structure. In general, the students lacked student-student interaction. Due to the nature of the Guidance and Psychological Counseling department, the students faced some difficulties in engaging in all three types of interaction (student-student, student-educator, and student-content). Lengthy and poor-quality videos and students' lack of preparation for classes emerged as major problems in flipped learning. The faculty members complained about the amount of time required for pre-class preparation (i.e., recording flipped videos). This paper discusses how to foster motivation, collaboration, discussion, and interaction in flipped learning in higher education settings so as to guide prospective practitioners.

Key words: Distance education and online learning; Improving classroom teaching; Teaching/learning strategies; Pedagogical issues; Post-secondary education

1. Introduction

Recent developments and advances in instructional and educational technology have enabled educators to implement an active and innovative educational model called "Flipped Learning." It is sometimes called "Flipped Learning Approach" and was formerly referred to as "Flipped Classroom" (e.g., Bergmann & Sams, 2012, 2014; Lo et al., 2018). Since 2012, flipped learning, a sub-type of blended learning, has become a robust global movement with contributions from educators all around the world (Andujar et al., 2020; Lin et al., 2019; Lo & Hwang, 2018; Zou et al., 2020a). Flipped learning establishes a framework for the teaching/learning process in which students are provided with personalized learning (Bergmann & Sams, 2012). In this sense, it is widely used together with adaptive learning systems (e.g., Author(s), XXXX; Chi et al., 2018; Louhab et al., 2020; Reidsema et al., 2017; Yuping et al., 2015). Flipped learning is defined as 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 Global Initiative (FLGI), 2019, p. 2).

Flipped learning was founded on Bloom's taxonomy of educational objectives (Şahin & Kurban, 2016) (see Bloom, 1956; Bloom et al., 1956 for details of the taxonomy). In flipped learning, faculty members prepare instructional course videos and materials that students watch and study in preparation for classes (de Grazia et al., 2012). A low level of knowledge and cognitive processes (Anderson & Krathwohl, 2001; Bloom et al., 1956) is constructed by students watching the videos. In addition, other supporting materials are made available through a Learning Management System (LMS) digital platform. Rather than direct instruction, the physical classroom is transformed into a dynamic and interactive group learning space (Lo, 2018). In this way, faculty members are able to implement various instructional methods in their classes, enabling them to be facilitators who guide students and allow them to apply the concepts, engage in subject matter, and internalize and develop their knowledge in the classroom. This allows them to co-generate high-level knowledge and cognitive processes (Zou et al., 2020b) (see Anderson & Krathwohl, 2001 and Bloom et al., 1956 for high-level cognition) through collaboration and discussion with peers (Bergmann & Sams, 2012; Şahin & Kurban, 2016).

A body of research on flipped learning shows a wide variety of positive outcomes (Author(s), XXXX; Andujar et al., 2020; Gianoni- Capenakas et al., 2019; Lee & Wallace, 2018; Lo et al., 2017; Presti, 2016; Şahin & Kurban, 2019b; Zou et al., 2020a). These studies

suggest that flipped learning is effective in increasing instructional flexibility (Gündüz & Akkoyunlu, 2019), students' self-efficacy and critical thinking (Lin et al., 2019; Zou et al., 2020a), and their satisfaction (Andujar et al., 2020), engagement (Lee & Wallace, 2018), motivation (Chen-Hsieh et al., 2017; Debbağ & Yıldız, 2021; Zou et al., 2020a), and performance (Hibbard et al., 2016; Strelan et al., 2020; Zou et al., 2020a). In general, flipped learning is felt to free up class time, allowing for more individual and small group instruction in the classroom (Yarbro et al., 2014). Furthermore, it enables students to put their theoretical knowledge into practice by ensuring active participation (Debbağ & Yıldız, 2021). For students to actively participate in the learning process, motivation and interaction are of vital importance.

1.1. Pillars of flipped learning: Motivation, course structure, and interaction

Since motivation, course structure, and interaction play an important role in student engagement in flipped learning courses, they were specifically selected for the study in order to gain insights into students' perceptions. Motivation is the process that originates, guides, and controls goal-oriented behaviors (Cofer & Appley, 1964). It is an affective construct that is considered a pivotal factor in flipped education (Lo et al., 2021). Central to students' successful participation in flipped learning is their motivation to complete the tasks in online courses (Kim & Frick, 2011; Şahin & Shelley, 2008) because their motivation, positive emotions toward flipped courses, and self-regulative behaviors/skills such as academic volitional strategies (Author(s), xxxx) are related to their academic achievement. Motivation triggers students' desire to learn course content and to be involved in classroom activities (online or face-to-face). With adequate motivation, students can feel stimulated to achieve their personal and academic goals. Consequently, they gain the confidence and ability to succeed in course learning outcomes. Indeed, a number of studies claim that students who are motivated to learn attain better academic results (e.g., Bond, 2020; Kiplinger & Linn, 1995; Lavrijsen et al., 2021).

Course structure in relation to flipped learning appears vital for improved engagement in the topic and for higher learning performance as this can affect students' satisfaction and skills (Eom et al., 2006; Moore, 1991). Course structure involves the organization of topics and sequencing of course content (Matich-Maroney & Moore, 2016). Course structure includes faculty members' weekly instructional objectives, the teaching strategies they prefer, and the course evaluation methods. It is related to the extent of knowledge and skills that students gain from courses. How instructional videos in flipped learning are set up determines students' perceptions toward the material, the course, and flipped learning in general. The quality of the course structure and instructional design can determine how much students feel connected to

the course and to each other while learning. It can also connect students with the technological tools used in the course. If students' technological skills do not meet course requirements, their level of motivation can influence their focus and the amount of effort they invest (Abeysekera & Dawson, 2015). What is more, students can efficiently utilize various course materials after each individual and group space in flipped learning. So, rather than looking at course content, the factors that need to be investigated are how the course is designed and how it aligns with the principles of flipped learning. Öztürk and Çakıroğlu (2021) warn that problems may arise in flipped learning studies, for example lack of instant feedback, course structure, and time issues. Hence, course structure should be simple, adaptable, contemporary, and have measurable outputs of knowledge, skills, and dispositions at various points in the learning process in order to support the instructional objectives.

The final factor affecting students' flipped learning experience is interaction. Interaction is reciprocal action that involves direct involvement with someone or something and relies on argumentation and participation (Krummheuer, 2015). Interaction can be student-student, student-educator, or student-content (Lee et al., 2013; Lo, 2018; Moore, 1991). Student-student interaction includes any kind of communication, discussion, collaboration, helping each other etc. among students, whereas student-educator interaction includes interactive synchronous or asynchronous lessons, assignments, feedback, questions posed by both parties, etc. As for student-content interaction, this involves reading course books, watching course videos, etc. Interaction can entail experiences in which students engage in meaningful, subject-specific, and goal-oriented dialogue and can enrich the time on task during in-class teaching. In particular, student-student and student-content interaction can decrease students' dependency on their educator when learning new information (Landry et al., 2006). Students can help each other engage in instructional activities while collectively learning by doing. Studies such as those by Landry et al. (2006) and Lee et al. (2013) show that students prefer discussion boards, journals, content management tools (i.e., Perusall), and collaboration tools (i.e., Google collaboration tools) to paper-based quizzes, lectures, and announcements, elements that are less interactive in flipped learning. In relation to student-educator interaction, Xiao et al. (2018) highlight that student progress in a flipped learning environment relies on student-educator interaction. Supporting this, Li and Yang (2021) determined that online interaction between teacher and student may help students get feedback and reduce students' cognitive load.

1.2. Significance of the study from the point of flipped learning adoption

Flipped learning has been gaining popularity, particularly since the release of Bergmann and Sams' *Flip Your Classroom: Reach Every Student in Every Class Every in 2012* (Author(s), xxxx). Since then, flipped learning has not only begun to be adopted as an active pedagogy but has become a hot topic of academic research (Li et al., 2021). The adoption process of flipped learning can be conceptualized within the framework of diffusion of innovation (Rogers, 1995). Linking the theory and current study, according to Rogers' adopter categories in the theory of diffusion of innovation, XXXX University corresponds to "innovators" in adopting flipped learning. Rogers underlines that innovators face serious challenges. In the current study, flipped learning as an innovation impacted the routines of students and faculty members who were used to the former pedagogical approach as they were products of it. In this regard, the innovation in the current study is a pedagogical shift from face-to-face learning or non-flipped e-learning to flipped learning at the university.

Unfortunately, literature on educational change has provided us with little guidance in the integration of change efforts in specific contexts (Huber, 2021). However, the success of a change highly relies on the nature of it and the context in which it takes place (Ellsworth, 2000; Rogers, 1995). Among other factors, the type of innovation-decision appears to stand out. It signifies whether the change occurs due to a decision by an authority (termed authority innovation-decision) or is volunteered by some stakeholders (termed optional innovation-decision) or by all stakeholders (termed collective innovation-decision), all of which profoundly affect the outcomes (Rogers, 1995). In flipped learning literature, a great deal of effort has been devoted to scrutinizing optional innovation-decision, where the decision was made solely by educators or scholars (e.g., Bergmann & Sams, 2012, 2014; Gündüz & Akkoyunlu, 2019; Miller et al., 2018; Nuhoğlu-Kibar et al., 2020). However, the type of innovation-decision might result in resistance to change (Rogers, 1995). Considering all the issues mentioned above, there seems to be no scholarly work in the flipped learning literature empirically setting out the challenges that institutions may face in the first years of undertaking a university-wide flipped learning journey initiated by an authority innovation-decision in the higher education context. In an attempt to fill in this gap, this study reports on the first years of a relatively successful flipped learning implementation process embarked on by the world's first fully flipped university as seen through the eyes of both students and faculty members. This piece of research is expected to provide some insights for preparing prospective practitioners of flipped learning to the challenges awaiting them.

1.3. Comparing different trees to see the forest of flipped learning

The knowledge structure, objectives, vision, culture, and nature of disciplines profoundly differ (Bennett & Maton, 2010). To better conceptualize this difference, Kolb (1981) classifies academic disciplines into four broad categories in the cognitive dimension. These categories are hard pure (e.g., Physics, Biology, Mathematics), hard applied (e.g., Computer science, Engineering, Pharmacy), soft pure (e.g., History, English, Philosophy), and soft applied (e.g., Teaching, Law, Social work). However, this categorization has recently been criticized for disregarding interdisciplines, whose categories are not so clear-cut (Trowler, 2014). Regarding the categorization of education, although all disciplines in the faculty of education are soft applied in essence, they appear to slightly cross the border of other discipline categories owing to the discipline-specific courses their curricula include. Hence, arguably, all disciplines in the faculty of education might be partly considered interdisciplinary. In this sense, the department of Mathematics Education (ME) is hard pure in part, while those of English Learning Teaching (ELT) and Guidance and Psychological Counselling (GPC) are soft pure in part. In brief, hard pure disciplines generalize findings and reach universal laws, whereas soft pure disciplines have unclear boundaries and loosely defined problems (Kolb, 1981). This difference between disciplines dictates the action of academics and creates differences in attitudes, skills, and practices (Becher & Trowler, 2001). Pedagogies of disciplines are also affected by this difference. In essence, disciplines fuse pedagogical knowledge into content knowledge (Shulman, 1986, 1987). Hinging on this, Shulman (2005) adds the notion of "Signature Pedagogy" to the education literature. Signature pedagogy reflects "the characteristic forms of teaching and learning" of disciplines (Shulman, 2005, p. 52). In short, Shulman (1993, 2005) contends that teaching cannot be operationalized devoid of discipline.

Since flipped learning is beneficial regardless of discipline at undergraduate level (Author(s), XXXX; Strelan et al., 2020), many scholarly works have been undertaken in various departments in a scattered manner. Despite the fact that these studies seem to have been carried out in line with the notion of signature pedagogy (Shulman, 2005), the need for multidisciplinary studies to give a view of the big picture is gradually increasing. Yet, in the Web of Science (WoS) Core Collection Database, no scholarly research, to date, involving a rigorous systematic analysis that compares departments in the faculties of education has as yet been undertaken. That is, recent flipped learning studies seem to have addressed the problems of singular disciplines (e.g., Aghaei et al., 2020; Basal, 2015; Hwang & Chang, 2011; Lai, 2021; Lai & Hwang, 2016; Zou, 2020). Moreover, a considerable number of academic efforts have

been limited to only one or very few courses (e.g., Lai & Hwang, 2016; Lo et al., 2021; Matich-Maroney & Moore, 2016; Miller et al., 2018; Nuhoğlu-Kibar et al., 2020; Xiao & Kim, 2018), which narrows down the scope of these studies further. In these studies, flipped learning is seldom if ever implemented before or after the term in which the data is collected, which signifies that they were conducted in "a temporary educational laboratory setting" substantially lowering their ecological generalization (Fraenkel et al., 2018). Of course, these endeavors are valuable in exploring discipline-specific and course-specific issues. Yet, the authors are concerned that one may not see the forest just by looking at different trees over a small moment in time. Thus, it is necessary to determine the similar and different problems students and faculty members face in flipped learning from a broad perspective across departments at universities. To fill in this gap, this study focuses on the departmental differences in an authentic flipped learning implementation process in order to offer tailored tips to departments and other institutions contemplating the implementation or already implementing flipped learning. Operationalizing this aim, the research questions below guided this scholarly work.

Research Questions

During the first years of full-scale flipped learning implementation initiated by an authority innovation-decision at the world's first fully flipped university:

1) What were freshman students' a) motivation, b) course structure, c) student-educator interaction, d) student-content interaction, and e) student-student interaction?
2) Was there a statistically significant difference between the departments of the Faculty of Education in terms of a) motivation, b) course structure, c) student-educator interaction, d) student-content interaction, and e) student-student interaction?
3) What did faculty members prioritize regarding the needs?
    a) What were the difficulties that faculty members experienced?
    b) What areas needed improvement?
4) What were faculty members' perceptions of freshmen students' needs?

2. Material and methods

This section is organized as research design, sampling and population, setting, data collection tools, procedure, and, lastly, data analysis.

2.1. *Research design*

Bond (2020) suggests that using only quantitative studies limits the depth of findings as a result of a hardening interpretation of them. Consequently, mixed-methods research designs are preferred in most flipped learning studies with the purpose of complementing qualitative studies

for easier inference of meaning (Author(s), XXXX). In line with this, this study fuses both the quantitative and the qualitative research paradigms, featuring methodological pluralism. More specifically, the current study adopts an explanatory sequential mixed-method research design. In sequential research designs, the qualitative data collection process follows the quantitative one in order to be able to further explain the novel results obtained through analysis of the quantitative data or vice versa (Creswell & Plano-Clark, 2017). In the current study, qualitative data collected from the faculty members followed quantitative data collected from students. This means that this study is an explanatory one (Fraenkel et al., 2018). The reason behind this preference was to satisfy data richness by means of interpreting student data through the eyes of faculty members. The quantitative part of the study involved the application of a Likert-type scale to freshman students and ranking possible areas of need identified by the faculty members. The qualitative part of the study involved administering a Structured Ranking Form (SRF) to and conducting Semi-Structured Interviews (SSIs) with faculty members.

The research paradigm, information source, sampling method, data collection tools, data collection time, and data analysis method in relation to the research questions are presented in Table 1 in order to aid understanding of the research design.

Table 1

Summary of the research design

Res. Que.	Research Paradigm	Information Source	Sampling Method	Data Collection Tool	Data Collection Time	Data Analysis Method
1	Quantitative	Freshman university students	Convenient	FLA-S	While experiencing FL	Descriptive analysis
2	Quantitative	Freshman university students	Convenient	PIF, FLA-S	While experiencing FL	Kruskal-Wallis
3	Mixed	Faculty members	Convenient, Maximum variation	SRF & Pre-SSIF	While implementing FL	Descriptive (frequency of ranking) & Qualitative content analysis
4	Qualitative	Faculty members	Maximum variation	Post-SSIF	After the course	Qualitative content analysis

Note: FL = Flipped learning, SRF = Structured ranking form, SSIF = Semi-structured interview form, FLA-S = Flipped learning approach scale, PIF = Personal information form

2.2. Sampling and population

This study uses a convenient sampling method since the population, all students and educators who experienced flipped learning in university, was quite small and the researchers intended to involve a high proportion of the population. A total of 69 volunteer freshmen at a private university in Turkey (3.69% of the undergraduate population at the university and 44.8% of those in the Faculty of Education) participated in this study. Only freshmen participated in the study since there were no other levels at that time. 81.2% of the participants were female (n = 56) and 18.8% were male (n = 13). 24.6% of the students (n = 17) were from the department of Mathematics Education (ME), 31.9% (n = 22) were from the department of English Language Teaching (ELT), 33.3% (n = 23) were from the department of Guidance and Psychological Counselling (GPC), and 10.1% (n = 7) were missing. Most of the participants had experienced flipped learning in their English preparatory program.

Five faculty members were recruited to the study using the maximum variation sampling method, which was 50% of serving faculty members. Based on observation, the faculty members who did not participate in the study did not differ systematically from the study participants in terms of any important variables in flipped learning such as gender, experience, knowledge, and skills. Of the five faculty member participants, all answered the pre-SSI form and SRF, while four answered a post-SSI form; this was because one faculty member resigned from the university. Three of the faculty member participants obtained their PhD degrees from a higher education institution in the USA, while the other two obtained theirs in Turkey. All of them offered at least three flipped learning courses, which they were obliged to provide in one semester

2.3. Setting

The university in which this study was carried out was established in the fall of 2012. In the 2014-2015 academic year, the first students were enrolled at the university. When the data of this study was collected, the university had a total of 1,871 undergraduate students, while only 154 were in the Faculty of Education. The university employed 103 faculty members in total, 10 of which were in the Faculty of Education. The university is unique in Turkey as it pioneered flipped learning in all departments and is recognized as “the first fully flipped university” in the world (FLGI, 2019; Prnewswire, 2018; Smith, 2018; Şahin & Kurban, 2016; Şahin & Kurban, 2019a). The implementation decision was given by the university administration in order to enhance the quality of education. In harmony with flipped learning, teacher education is offered through the *University within School Model* (Özcan, 2011, 2013) based on wide-ranging subject-specific knowledge and two-years’ practical experience in the Faculty of Education. The

university's vision is "to educate innovative and entrepreneurial global leaders who will shape the future". As a non-profit, foundation university, it was established with the mission to "graduate internationally competitive, forward-thinking students and to bring together research-oriented, leading scholars who will make globally significant contributions to their professional fields, science and technology" (Şahin & Kurban, 2016, p. 69). The university uses the Blackboard Learning Management System to implement flipped learning at all departments.

When appointed to non-tenure or tenure-track full-time or part-time positions, academic staff are trained by the Center for Research and Best Practices in Learning and Teaching (CELT). In order to enhance teaching/learning effectiveness in flipped learning, CELT personnel help them design, develop, deliver, and assess instruction. The university arranges training sessions and conducts workshops for new academic staff in flipped learning techniques before the beginning of each academic term. Throughout the year, academic staff can use CELT as a drop-in center to ask questions regarding flipped learning and get academic support for LMS usage. The center also helps them with quality assurance parameters for flipped learning course design and delivery. It shares the results from mid-course evaluations and provides follow up support to the university's faculties and schools in preparing for external accreditation. For example, depending on the needs of academic staff in a one-to-one session, CELT members are available for tutoring and to provide suggestions about the syllabus, lesson planning, pre-class and in-class practices, Blackboard course design, contemporary instructional technologies and tools, and, in particular, online assessment. Furthermore, if academic staff are unsure whether their course design and delivery is in line with flipped learning principles, they can ask for a course observation. This is carried out by a CELT member as a peer-observation and includes reflection and discussion regarding the teaching/learning process. In addition, they can request to observe a CELT member's flipped learning in action.

Since the university was founded, the CELT has run a flipped learning video studio. Faculty members can book studio time to record their lesson content, generally teaching the course content in front of a camera. If needed, they then can get help from the content editor to add interactivity to the video. In the studio, the video records of the course content prepared by the faculty members for the pre-class are put into final form three days before the course. Then, the studio staff submit the edited content to the faculty members when it is uploaded onto Blackboard and made available to students. A camera operative and content editor work in the

studio with a wide range of equipment: green screen background, Tricaster live stream device, Wacom graphic tablet, Blackmagic 4k camera, prompter, and Adobe creative cloud software (XXXX University, 2021). The aim is to use the video production software and hardware to produce quality videos that students can interact with more effectively.

In Turkey, the curriculum development process is centralized (i.e., determination of curriculum goals and course contents). Teacher education undergraduate curricula are mainly determined by the Turkish Republic Council of Higher Education (CoHE). In line with CoHE regulations, teacher education undergraduate curricula must include approximately 50% content knowledge and skills, 30% pedagogical knowledge and skills, and 20% general culture courses. However, these rates and course hours vary across departments in the faculty of education. Indeed, faculties of education are given flexibility to determine courses up to 25% of the total ECTS (European Credit Transfer and Accumulation System) credit (CoHE, 2018). Utilizing this flexibility, the general objectives of each undergraduate program in the Faculty of Education at XXXX University are re-structured within the framework of flipped learning and the *University within School Model* (Özcan, 2013), adhering to the CoHE regulations. Together with this eclectic approach, the course content of the Faculty of Education is organized in line with “constructivism" and "learning by doing." All these have a profound influence on the differences in the first-year curricula of departments (see Table 2). (The researchers focus only on first-year curricula in that only freshmen were recruited to the study.)

Table 2
The distribution of the first-year courses across departments by course category

Department	Content Knowledge		Pedagogical Knowledge		[c]General Culture	
	n	%	N	%	n	%
ME	5	33.3%	3	20%	7	46.67%
GPC[a, b]	2	12.5%	3	18.75%	10	62.50%
ELT	7	50%	2	14.29%	5	35.71%

[a]This department has one additional elective course.
[b]In contrast to countries such as the USA, Canada and Australia where a graduate degree is generally awarded so as to be eligible for working at schools as GPC, a 4-year undergraduate degree in Turkey is awarded.
[c]English for Academic Purposes I, Turkish Language and Literature I, Principles of Atatürk and History of the Turkish Republic I and other courses

As shown in Table 2, the GPC department has considerably fewer content knowledge courses (n = 2, 12.5%) than that of ME (n = 5, 33.3%) and ELT (n = 7, 50%). The GPC department has more general culture courses (n = 10, 62.50%) compared to those of ME (n = 7, 46.67%) and ELT (n = 5, 35.71%).

2.4. Data collection tools

The study utilizes four data collection tools: a Personal Information Form (PIF) (Items 1 and 2 in Appendix A), the Flipped Learning Approach Scale (FLA-S), a Structured Ranking Form (Appendix A), and Pre and Post Semi-Structured Interview Forms (Appendices B and C). These instruments are described below.

2.4.1. Personal information forms:

First, a personal information form developed by the researchers including variables such gender, age, department, and grade was distributed to the students. This form also asked whether they have experienced flipped learning. If yes, they were asked when, where, and how they experienced flipped learning. In addition, a similar PIF was distributed to the faculty members.

2.4.2. Flipped learning approach scale (for university students):

A 24-item flipped learning approach scale was adapted from Lee et al.'s (2013) study with their permission. The instrument included five factors: motivation (7 items), course structure (6 items), student-educator interaction (5 items), student-student interaction (3 items), and student-content interaction (3 items), employing a 5-point Likert-type scale (1 = "strongly disagree", 5 = "strongly agree"). Since these factors were also highlighted by the XXXX University's guidelines and academic staff handbook (see XXXX University, 2015 and Appendix E for a newer version), the flipped learning approach scale was preferred. The Cronbach's alpha coefficients for these factors are .67, .75, .78, .77, .80, respectively. The Cronbach alpha value for the original scale is .84, whereas the current study recalculates the Cronbach's alpha coefficient to .87 for the whole scale. Since all the Cronbach's alpha values of these factors are close to or higher than .70, the instrument can be judged as reliable (Nunnally, 1978). The maximum possible score is 120, while the minimum possible score is 24. The higher the students' scale score, the lower the students' need for flipped learning.

2.4.3. Structured ranking form (for faculty members):

In addition to quantitative measurement tools, the researchers employed a qualitative measurement tool, the structured ranking form. The ranking form was used to collect perceptions of faculty members using self-report measures. This form was developed by the

researchers after taking into account students' answers to FLA-S and a rigorous literature review. SRF included two personal and three ranking questions (Appendix A). Alternatives of the three ranking questions were ranked by the faculty members from 1 to 5 or 7. Alternative 1 applies to the item that is the area least needed by the respondents, whereas alternative 5 or 7 applies to the area most needed. The researchers obtained feedback regarding the SRF from two experts in the field of curriculum and instruction and ME. The faculty members were not required to rank all items if inapplicable; here, they replied "I did not experience it."

2.4.4. Semi-structured interview form (Pre-SSI, for faculty members):

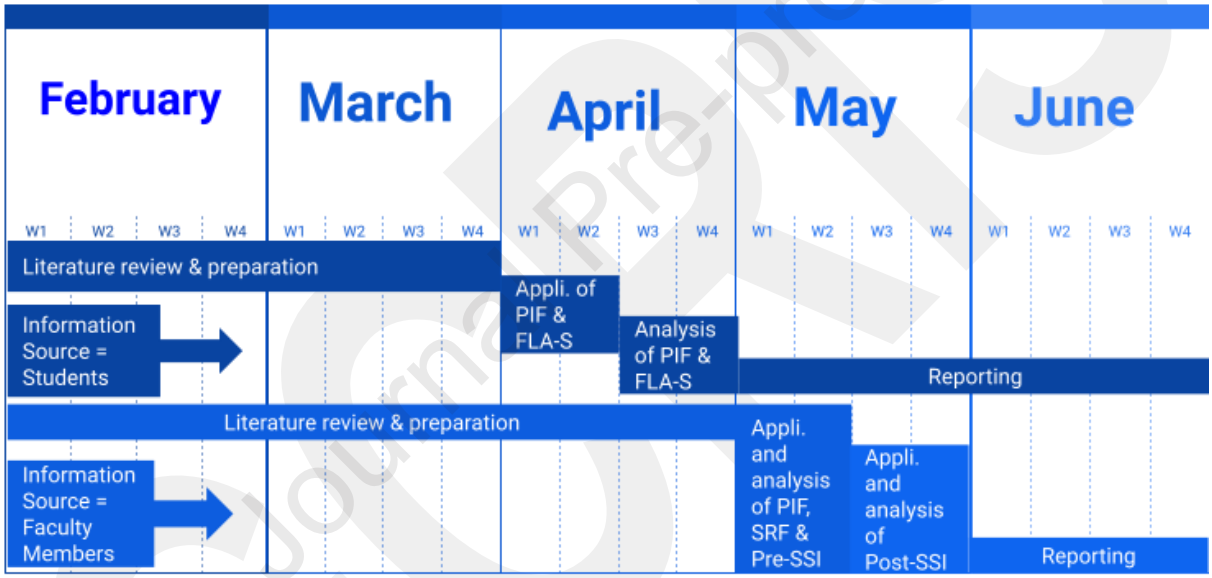
The pre-SSI form containing five questions was developed by the researchers. The faculty members were asked to talk about their courses and their experience with LMS. Then, they were asked to share their first-hand experiences revealed by the students' FLA-S findings and then we reviewed the literature regarding those difficulties, their students' expectations, and areas for improvement of flipping. The form was also subjected to expert opinion for reliability and validity.

2.4.5. Semi-structured interview form (post-SSI, for faculty members):

Faculty members were asked post-SSI questions in a post-SSI form in order to gather views and inferences on the findings of the students' FLA-S. SSI form questions, consisting of six main items, were developed by the researchers. The researchers discussed in-depth the evaluation of the results and how they would ensure fulfilment of needs. For content validation of the interview questions, the researchers asked the opinion of a professor from the department of educational sciences. Finally, it should be noted that the aim of the pre-interview was to go through SRF, and the aim of the post-interview was to elaborate and comment on the entire study data.

2.5. Procedure

This study collected participants' opinions, ideas, and experiences using communication processes recommended by Witkin and Altschuld (1995). A personal information form for students and the FLA-S were conducted through face-to-face application during class hours at the university. The process lasted one week in total, each taking an average of nearly 10 minutes. Following analysis, the PIF and SRF were distributed to the faculty members in their offices. They were asked to rank possible areas of need, determined by the literature review, for flipped learning. After administering the SRF, the faculty members were interviewed regarding their reasons for their most or least rankings in order that the researchers could suggest more valid data (Pre-SSI). After analysis of this data, faculty members were interviewed again (Post-SSI). A summary of the process of the study is presented in Figure 1.



FLA-S = Flipped learning approach scale, PIF = Personal information form, SSI = Semi-structured interview, SRF = Structured ranking form

Fig. 1

The process of the study

The interview process began by informing faculty members that they would be audio-recorded and that this record would not be shared with third parties. The interviews were conducted in the faculty members' offices. The SSI questions were not limited to SSI form questions. The researchers adapted the questions to faculty members during the interviews according to the flow of the conversation between the interviewer (first researcher) and the interviewee. One specific reason for this was that the results from the FLA-S differed between departments.

2.6. Data analysis

First of all, factor scores were calculated by averaging the related items. Frequency, percentile, median, mean, standard deviation, and mean ranks were used for describing the data. As the data set was small, Kruskal-Wallis tests were performed to check whether the departments differed or not. In order to identify the direction of difference, post-hoc Mann-Whitney U tests were performed for each department pair. If the results were statistically significant, eta squared effect sizes were calculated to weight the practical meaning. The magnitude of effect sizes were interpreted according to Cohen's (1988) suggestions. The alpha level was set to .05.

The four faculty members gave alternatives to the first question of 1 to 5 points for least to highest area of need. Where no ranking was provided by the faculty member, NA (Not Applicable) was noted and no point was assigned. For each item, the average total points were calculated and two alternatives with the highest score were selected. For instance, item 1 gained 4.8, while item 5 gained 4.3 points. In addition, the four faculty members gave alternatives to the second question of 1 to 7 points from least to highest area of need. Finally, they gave alternatives to the third question of 1 to 5 points from least to highest area of need. This process was analyzed by both researchers.

With respect to qualitative data analysis, firstly, the audio-recorded pre and post-SSIs conducted with faculty members were transcribed into a Word document. A total of 48,195 characters for the pre-SSI form and 67,515 characters for the post-SSI form were obtained. Quantitative content analysis was separately conducted on these transcriptions. Widely used in social sciences, this method was used to scan transcriptions and to determine the patterns behind words and concepts (Krippendorff, 2004). The pre and post-SSI data transcriptions were read, reviewed, and coded. Then, in order to ensure reliability of the codings (Krippendorff, 2011a, 2011b), the authors discussed agreements and disagreements. Revisions were made to address areas of inconsistency and to maximize mutual exclusivity, as suggested by Strauss and Corbin (2008). Finally, the authors agreed on every code. Minor categories were not reported or discussed in this paper for reasons of limited space. The names of the participants were hidden for confidentiality.

3. Findings

The findings of this study are presented in order of research question.

3.1. Freshman students' a) motivation, b) course structure, c) student-educator interaction, d) student-content interaction, and e) student-student interaction (Research question 1)

The results with respect to research question 1 (a, b, c, d, e) are presented in Table 3 and Figure 2.

Table 3
Description of the flipped learning approach scale by factor

Factor	n[a]	Flipped Learning Approach Scale	
		M[b]	SD
Motivation	65	3.47	.63
Course Structure	64	3.83	.60
Student-Educator Interaction	65	3.86	.68
Student-Content Interaction	69	3.77	.77
Student-Student Interaction	66	3.46	.99

[a] $n^{total} = 69$.
[b] The scale is 5-likert type.
Note: The reason for the different number of observations for each sub-variable was the loss of data due to incomplete filling out of the scale.

As can be seen in Table 3, the findings from the analysis of factors of students' FLA-S indicate that the mean of items related to student-student interaction (M = 3.46, SD = .99) is the lowest of all the factors. In addition, the findings reveal that student-educator interaction (M = 3.86, SD = .68) in flipped learning obtains the highest mean score. In short, factor scores of the scale are close to 4, which corresponds to "agree" in the scale, indicating that students' experiences regarding flipped learning were quite positive. For improved visualization of the results, those regarding research question 1 are also given in Figure 2.

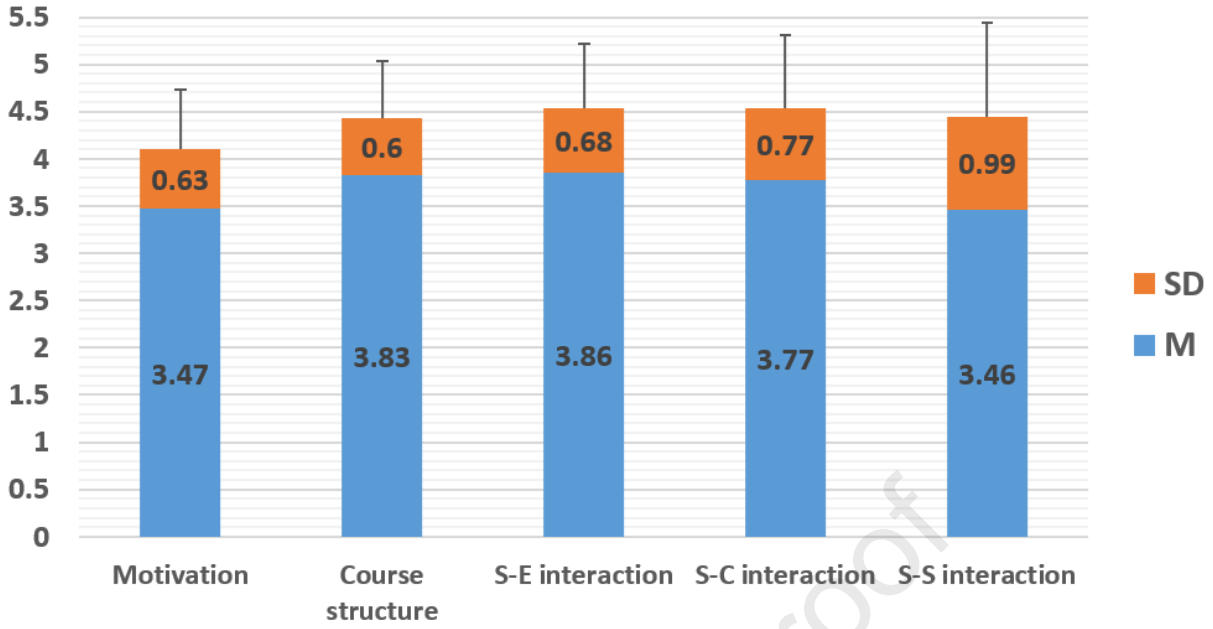


Fig. 2

Descriptives of flipped learning approach scale by factor

3.2. The difference between the departments of the Faculty of Education in terms of a) motivation, b) course structure, c) student-educator interaction, d) student-content interaction, and e) student-student interaction (Research question 2)

To answer research question 2 (a, b, c, d, e), the Kruskal-Wallis analysis results are presented in Table 4.

Table 4

The results of Kruskal-Wallis T tests by the factors of flipped learning approach scale across departments

Sub-variable	Department[a,b]	n[c]	Mdn	M[d]	SD	Mean Rank	χ^2	p	Post-hoc tests[e]
Motivation	1) ME	16	3.71	3.51	.64	33.84	3.292	.193	N/A
	2) GPC	22	3.29	3.35	.43	24.50			
	3) ELT	20	3.57	3.53	.71	31.53			
Course Structure	1) ME	15	3.67	3.76	.64	31.07	2.877	.237	N/A
	2) GPC	22	3.67	3.72	.51	24.84			
	3) ELT	21	3.75	3.88	.58	33.26			
Student-Educator Interaction	1) ME	15	3.80	3.78	.56	29.47	8.137	.017*	3>2
	2) GPC	22	3.60	3.64	.48	22.86			
	3) ELT	22	4.00	4.18	.62	37.50			
Student-Content Interaction	1) ME	17	4.00	3.92	.65	36.50	7.275	.026*	1,3>2
	2) GPC	23	3.33	3.56	.65	23.54			
	3) ELT	22	4.00	3.76	.96	35.95			
Student-Student Interaction	1) ME	16	3.67	3.49	1.01	32.72	8.368	.015*	3>2
	2) GPC	22	3.00	3.11	.91	21.89			
	3) ELT	21	4.00	3.76	1.03	36.43			

*$p < .05$.

[a] ME = Mathematics Education, GPC = Guidance and Psychological Counseling, ELT = English Language Teaching.

[b] Seven observations were discarded from the analysis since they indicated that their departments were "other".

[c] $n_{\text{total for motivation}} = 58$, $n_{\text{total for course structure}} = 58$, $n_{\text{total for student-educator interaction}} = 59$, $n_{\text{total for student-content interaction}} = 62$, $n_{\text{total for student-student interaction}} = 59$.

[d] The scale is 5-likert type.

[e] Post-hoc Mann-Whitney U Tests were performed for each department pair if there was statistically significant difference as a result of Kruskal-Wallis test.

Note 1: Degree of freedom was 2 for all sub-variables.

Note 2: The reason for the different number of observations for each sub-variable was the loss of data due to incomplete filling out of the scale.

As can be seen in Table 4, the departments show no statistically significant difference in terms of motivation ($\chi^2 = 3.292$, $p = .193$) and course structure ($\chi^2 = 2.877$, $p = .237$).

However, some statistically significant differences between the departments are revealed when it comes to student-educator (χ^2 = 8.137, p = .017), student-content (χ^2 = 7.275, p = .026), and student-student (χ^2 = 8.368, p = .015) interaction. Students from the ELT department show more student-educator interaction than students in the GPC department (U = 126.000, p = .006, η^2 = .168). The effect size is large according to Cohen (1988). The students from the ELT (U = 152.500, p = .021, η^2 = .116) and the ME (U = 113.000, p = .023, η^2 = .127) department demonstrate more student-content interaction than students in the GPC department. These two effect sizes are intermediate. The students from ELT show more student-student interaction than students in GPC (U = 117.000, p = .005, η^2 = .178). This effect size is large.

3.3. The difficulties that faculty members experienced (Research Question 3a):

The qualitative content analysis results concerning research question 3a are given below. Due to limitations of space, only the highest two factors are listed.

1) The difficulties they experienced using LMS in flipped learning:
- Some students came to class without having watched the videos (highest 1)
- Students might resist flipped learning or lack the motivation to do the pre-class work (highest 2)

2) Faculty members' perception regarding the students' expectations about flipped learning:
- The need to engage in critical thinking and problem-solving activities (highest 1)
- The need to pay attention to students' interests, strengths, and weaknesses (highest 2)

3) What might be done to improve flipped learning in terms of objectives, organization, and materials?
- Produce better quality videos (highest 1)
- Increase students' self-motivation to learn (highest 2)

3.4. The areas in need of improvement (Research Question 3b):

In this study, four main themes were identified. These are 1) students coming to class without preparation, 2) lengthy instructional videos, 3) low quality of instructional videos, and 4) the amount of time required for educators to prepare for flipped learning.

The majority of the faculty members indicated that the main difficulties when applying flipped learning are the fact that students come to class without having watched the instructional videos. All of the faculty members mentioned that if students come to the class without having done the necessary preparation (i.e., reading the chapters, watching flipped videos, learning

basic terms), they tend to face challenges during the in-class part of flipping. For instance, faculty member B from the ME department said:

> "...In high school, they knew this by heart, for example some theorems. Here is a simple example, but let's say I was explaining in the [flipped] video that the angles of the triangle add up to 180 degrees, but even those who did not watch the [flipped] video know [from high school] the factual knowledge. However, they were solving problems themselves in the lesson. Those who did not watch the video were having more difficulty [to find a solution]... (An example for Category 1: Students coming to class without preparation).

The second theme revealed by the interviews is that the instructional videos are too long. They pointed out that "the longer the videos, the more frequently or longer students watch" did not apply. Thus, there was no positive correlation between the length of an instructional video and the amount of time students spent watching. In this regard, faculty member E from the ME department added:

> "I was aiming to give [proof] in a video, and sometimes I asked them to [prove] by themselves in the lesson. Students had difficulty even in this skill. I think [this] might work better in some lessons, but it may not work much in every lesson because videos have to be very long. Students [need to] watch quite a lot, how will [can] we give all the details in videos?" (An example for Category 2: Too long instructional videos).

Another theme the faculty members stressed is the quality of instructional videos because the quality of instructional videos allows students to watch and help in gaining lower-order thinking skills and basic learning objectives before in-class flipped activities. To illustrate, faculty member D from the ELT department remarked:

> "… I would like to add my own comments [to the content], but I don't have that much time. In the same vein, I think technically different things can be conducted, because it goes like this: I stand on the edge [within the video], when I watch the video again, it becomes a very static image. For example, [I want] conversations that flow, or the slides in the background, etc. Maybe I have to do [this], but at this

> stage, while I compromise the quality of the content due to time limitations, and if I also start thinking about such technical things, I will steal from the content. Hence, I'm not doing such a thing." (An example for Category 3: The lack of instructional video quality).

Finally, regarding the theme of time restrictions for recording instructional videos, faculty member C from the GPC department said:

> "In the groups I have come across… There are not many [students] who watch a lot of videos or come prepared for the lesson. Then, it seems to me that time is wasted. Well, the lesson has 3 hours per week, [and] you [teachers] have to spend 1-2 more hours beforehand to record a flipped video for this [lesson]… "(An example for Category 4: The amount of time required for educators to prepare for flipped learning).

3.5. Faculty members' perceptions of student needs (Research question 4):

The qualitative content analysis results with respect to research question 4 are presented below. Three main categories emerged: 1) the quality of instructional videos, 2) interactions, and 3) motivation for flipped learning.

All of the faculty members agree that the quality of instructional videos delivered in a flipped course is highly important for its effectiveness. They also emphasize that instructional videos should provide various students with a variety of interactions. Providing a tricky question, for example, is helpful to spark online discussion among students after they watch flipped videos.

Faculty member C from the GPC department remarked on the relationship between the quality and length of instructional videos.

> "It is not easy to explain things [some factual knowledge] within a video, after all, a 5-10 minutes video is not so enough in that sense, only the concepts in that lesson can be given to students. We can ask a few questions, trigger their curiosity, but it is limited to this..." (An example for Category 1: The quality of instructional video).

Moreover, all of the faculty members said that interactions between students-educators-content are another area for building effectiveness and efficiency of flipped learning. Faculty member B from the ME department referred to student-student interaction in online discussion:

> "...in some courses, for example, I didn't do it [online discussion] [because] I was thinking that it is something that consumes time and should be well-designed**,** but, on the other hand, I am aware of the fact that multiple-choice is not very beneficial, anyway, but a tricky situation related to [the flipped] video can be given, after which opinions [of students] can be taken, just like an online discussion." (An example for Category 2: Interaction).

The length of flipped videos is one of the key elements of quality and motivating videos. For instance, faculty member E from the ME department pointed out that instructional videos recorded by educators should have a time restriction; otherwise, students do not feel motivated to watch them or do the assignments. Faculty member E from the ME department also said:

> "...for instance, a student takes 6 courses and all of them apply flipped learning, so this necessitates at least 5 minutes [for every course] per week - I don't think most teachers limit it to 5 minutes - that is, I think that they [the faculty members] have [flipped] videos lasting around 10 minutes or even longer. [Flipped videos should last] between 3 to 5 minutes, maximum 7 minutes because I know [they will not watch it]." (An example for Category 3: Motivation towards flipped learning).

Half of them stressed that the more interaction a flipped video had, the more motivated students feel to focus on the video, follow the instructions, and do the assignments in the individual space. So, interactive, short and qualified flipped videos may trigger students' motivation in order to engage more in pre-class learning.

4. Discussion

This section discusses motivation, course structure, three interaction types, departmental differences, and, lastly, flipped videos. Motivation is one of the key facets in education (Bond et al., 2020). This study identifies motivation as relatively low. Despite flipped learning being argued to increase student motivation by providing opportunities for more personalized and student-centered learning (Basal, 2015; Bond, 2020), the results of this study show that,

regardless of department, students still need to be self-motivated in order to get ready for class. Similarly, Alsancak-Sırakaya (2015) report even lower motivation in flipped learning, although it was found not to differ from the classical hybrid learning method. As for the possible underlying reasons for this low level of motivation, Zou (2020) emphasize students' low self-regulation level and its effect on increasing perceived workload, which, in turn, makes pre-class assignments look more daunting. Concurring with this, Kim and Frick (2011) postulate the relationship between excessive workload and low student motivation for online courses. However, the fact that the data of this study was collected in the first iteration of flipped learning implementation at the university might have played a determining role. As a matter of fact, the high initial effort required to prepare instructional materials such as recording instructional videos in flipped learning (Betihavas et al., 2016) seems to have lowered their quality. Supporting this, the qualitative data of the current study points to lengthy, low quality, and non-interactive instructional videos. As a result, low levels of motivation toward flipped learning might have an adverse effect on students' attending the lessons prepared (having watched the instructional videos and submitted assignments, etc.). However, it is recognized that flipped learning requires students to prepare in advance to get the most out of the lessons (Basal, 2015; Fisher et al., 2020; Reidsema et al., 2017). The study also reveals that the level of motivation did not differ by department. In fact, motivation for the foundation of each department in the Faculty of Education was different. Nevertheless, motivation toward teaching as well as guidance and psychological counseling methods used in this process was the same. After all, the departments in the Faculty of Education teach drawing on the constructivist educational paradigm. From this perspective, we can understand motivation between departments to be equivalent. In short, it may be argued that motivation is more influenced by flipped learning itself rather than the unique impact of individual departments. Nonetheless, since there are as yet no studies discussing the differences in motivation between departments, this study may be the first to research inter-departmental differences regarding flipped learning in the higher education context. Consequently, we expect that this study will pave the way for further research on this issue.

Course structure is one of the pillars that boost the effectiveness of flipped learning (Arner, 2020; Lee et al., 2013). In this study, course structure achieved the second highest of all variables. The sole data regarding course structure comes from students and does not feature in the interviews with faculty members. This is most likely because they could not evaluate the course content in an unbiased way as it could be argued that negatively referring to the course structure would be criticizing one's own lesson. Due to this, they may have refrained from

commenting on this factor. Regarding course structure between departments, this study ascertained no difference. A possible reason for this may be the fact that each faculty member received the same flipped training (Appendix D for the CELT's academic staff training) from CELT, which might have made flipped learning experiences of students similar to each other regarding course structure. As Arner (2020) points out, faculty members need to focus on the teaching style suitable for the subject matter rather than merely adopt a flipped or traditional model while delivering course content because this might be the prime source of differences in learning outputs.

It is claimed that interaction is one of the crucial factors in flipped learning (Bishop & Verleger, 2013). As such, flipped learning is supposed to be student-centered, giving student-student interaction is of paramount importance (Gündüz & Akkoyunlu, 2019; Lo & Hew, 2021; Touchton, 2015; Xiao et al., 2018). However, this study found freshmen's student-student interaction to be the lowest of all factors. There appear to be several likely reasons causing this. First, students may not be able to arrange a common out-of-class meeting time for synchronous interaction (Moran & Milsom, 2015). Also, Lo et al. (2017), Lo (2020), and Law et al. (2020) highlight that freshmen's unfamiliarity with and lack of training in flipped learning before enrolling in the faculty of education may repress the emergence of interaction. Indeed, although they received English language education via flipped learning in the preparatory English program to a certain extent, this experience seems to have been insufficient in terms of the amount of time they were exposed and it was not suitable for the specific flipped learning experience in the department. This result could also be explained by the fact that they were freshmen and did not yet know each other well. This unfamiliarity might have lessened the freshmen's interaction with their peers. On the other hand, this study found student-educator interaction to be the highest factor. In other words, students tended to be better in touch with educators than with their peers or course content. This high level can be explained by the low level of student-student interaction and the high level availability of faculty members. Another reason may be that most of the instructional videos of the university were not interactive, let alone the static reading materials, substantially limiting quality student-content interaction opportunities.

This study reveals that the ELT department students experienced higher levels of student-student, student-educator, and student-content interaction compared to GPC department students. This high level of interaction seems to make sense as interaction with students, educators, and content is necessary for language learning because of its highly communicative and collaborative nature (Canale & Swain, 1980; Jiang et al., 2020). Indeed,

the pedagogy of language learning is based on social-constructivist theories such that they facilitate and encourage in-class and out-of-class collaboration (e.g., discussion, group work) as much as possible. As a result, language students are often engaged in every sort of interaction as it is the essential portion of learning/teaching methods and instructional objectives of the department and the only way to become fluent in language use (Chai et al., 2010; Jiang et al., 2020). For instance, instructional objectives such as learning how to use communicative skills (e.g., reading, writing, listening, speaking) are interactive in essence. Students in non-language departments, however, do not have to interact with others as much as language learners do. According to Shulman (2005), since what counts as knowledge and skill varies across disciplines, using communicative skills is regarded as "knowledge" in the ELT department while it is not so in others. After all, communication and interaction with students and educators are the inherent goal of the ELT department. In this study, on the other hand, GPC faculty members indicate in their interviews that the design of instruction in the GPC department appears to be less interactive than other departments owing to its psychological nature. In fact, one of the main purposes in GPC is to aid students' personal development, self-examination, and self-evaluation. For instance, Şahin et al. (2020) highlight that for GPC departments, "...shared memories and stories during a psychological case-based instruction are not enough for students to be sufficiently active in the course." Supporting the distinction between the two departments, Authors (XXXX) classify the ELT department as "ready" for e-learning, whereas the GPC department as "less ready." They report online communication self-efficacy level as the primary source of this difference. In addition to the nature of the departments, the differences in curricula probably affect interaction patterns. In the first-year, ELT students mostly took content knowledge courses, while GPC students did general culture courses (see Table 2). This might have adversely affected GPC students because general culture courses are much more crowded than content knowledge course, which seriously restricts student-educator interaction opportunities. In addition, the fact that faculty members teaching these courses are mostly part-timers appears to have exacerbated this effect. This is because a substantial amount of faculty member support and a relatively small class size are needed for collaborative pedagogical approaches (i.e., flipped learning) in hybrid higher education settings to give satisfactory results (Lee, 2017). On the other hand, ELT students took more than one content knowledge course from the same faculty members, which leverages student-educator interaction by cementing the ties between the two. These two situations might have widened the student-educator interaction gap between departments. As for the student-content interaction difference, being part-time faculty members and, consequently, not feeling a high

level of commitment to the university and its principles, they seemed not to grasp the essence of flipped learning. This is likely to have detrimentally impacted student-content interaction. Lastly, when it comes to the student-student interaction, the fact that students taking general culture courses, saw each other only in one course and they were from different departments may have slowed down the familiarization process, unfavorably hampering interaction.

Faculty members frequently commented on the length of flipped videos and their relationship with motivation, effectiveness, quality, pre-watching, etc. In the current study, faculty members stressed that instructional videos should be shorter in order that students can feel motivated to watch them. They pointed out that students were able to focus on instructional videos better when they were shorter (5-7 minutes) rather than longer (10-20 minutes). These comments from faculty members are in line with the literature. Harrison (2015) reports that students demanded instructional videos be shorter than 20 minutes. This finding also coincides with Slemmons et al.'s (2018) finding. Additionally, Lo and Hew (2017) propose 6-minute instructional videos in flipped learning. Afify (2020) concludes that short videos (<6 minutes) are effective in terms of increasing student achievement and retention and in reducing cognitive load. On the other hand, the current study also reveals that students came to class without having watched instructional videos. Gaughan (2014) and Slemmons et al. (2018) point out that lengthy instructional videos may hinder watching. In the present study, faculty members emphasized the low quality of instructional videos. "Avoiding misdesign of digital video-based learning resources" is recommended with the purpose of alleviating cognitive burden on the part of students (Afify, 2020). This lack of quality is also related to the length and workload associated with producing them. Lo et al. (2017) list the significant start-up effort on the part of educators as one of the two most frequently reported flipped learning challenges. Concurring with this, Campbell et al. (2014) estimate that it takes approximately eight hours to produce a quality 10-minute flipped video. Where faculty members do not have much time (Kebritchi et al., 2017; Koh et al., 2020), the quality of videos goes down. However, quality short flipped videos do not necessarily take less time to produce than longer ones. As French mathematician Blaise Pascal remarked in a letter written in 1657, "I was going to write shorter, but I did not have enough time", suggesting that writing more concisely is harder and more time-consuming.

5. Concluding Remarks

Flipped learning has gained substantial popularity over the last decade (Bond, 2020; Organization for Economic Co-operation and Development **(**OECD), 2018). Flipped learning is a hybrid teaching/learning process in which a group learning process results in a dynamic,

interactive learning environment. The primary purpose of this study is to lead the way for those institutions planning to implement flipped learning. To this end, the researchers present the first years of the university-wide flipped learning implementation process that was initiated by an authority innovation-decision in the Faculty of Education of the world's first fully flipped university. The data for this research study, designed with an explanatory sequential mixed-method, came from an analysis of students' "flipped learning approach scale" and analysis of faculty members' ranking form and then interviews. This study reveals a few areas of practical need in flipped learning. First, flipped learning, in general, entails more student-student interaction. In particular, the GPC department needs more interaction opportunities. Moreover, students are required to be more enthusiastic in flipped learning. Faculty members expect them to watch and study instructional videos before classes. This expectation dictates short and high-quality videos. Unfortunately, faculty members, overwhelmed by the excessive workload of academia, barely managed to record average-level quality videos. All in all, flipped learning seems to bring about increasing pre-class workload for both parties, as also echoed by Aghaei et al. (2020), Al-Samarraie et al., (2020), and Arslan (2020). As underlined with the concept of "effort expectancy" in the UTAUT model by Venkatesh et al. (2003), this substantial workload increase might lead to a decrease in its quality and a slowdown in its adoption rate. As a matter of fact, students dealt with this workload by not fulfilling pre-class duties, whereas the faculty members did so by recording long, non-interactive, and lecture-based videos. These outcomes of the increasing pre-class workload caused serious restrictions to the very foundation of flipped learning in that some part of the class-time had to be allocated for video-watching, narrowing down the time needed for constructing higher-level knowledge. What could be done to alleviate these issues is detailed in the next chapter.

6. Implications and limitations

This section is organized as follows: Practical implications, limitations, and, finally, avenues for future research.

6.1. Practical implications for educators and institutions

Given the pivotal role instructional videos play and the frequency they are used in flipped learning (Şahin et al., 2020), the suggestions related to them constitute a noteworthy output of this study. Faculty members should prepare better-quality instructional videos that attract the attention of students by considering their interests, strengths, and weaknesses to increase their motivation. These videos can be prepared via Web tools such as Edpuzzle, H5P, Nearpod, ThingLink (Bond, 2020; Zou, 2020) to foster motivation and interaction. In line with Venkatesh

et al.'s (2003) concept of "facilitating conditions", faculty members can be trained regarding how to produce quality and interactive videos. To achieve this, they can also get help from any technology-support unit, as in the flipped learning video studio at the university. If one does not exist, one should be founded. However, this study also observes that because of the intensity of their workload, educators did not use the studio as much as necessary. Lesson hours need to be adjusted according to workload. An alternative is that since the study reveals that faculty members do not have sufficient time to produce videos, they could use ready-prepared or even professional videos. Online platforms of Open Educational Resources (OER) such as Youtube, TED, Khan Academy, Teaching Channel might be used for short online instructional videos. However, instructional videos not created by the class teacher are more likely to give rise to disengagement (Bond, 2020). For this reason, the use of online platforms that contain ready-prepared, quality instructional videos should be occasional rather than frequent. This would also help prevent a fear of standardization and deprofessionalization (Tucker, 2012). Our hope is that faculty members will be able to produce their own authentic and attractive course videos without being dependent on such platforms and without increasing their workload.

Students should be highly active and motivated in flipped learning so as to gain the maximum benefit from it. To make this happen, educators need to provide students with student-centered learning experiences. As De Kleijn et al. (2013) indicate, formative assessment with positive feedback during pre-class preparation could increase student confidence, which is a component of intrinsic motivation according to self-determination theory (Deci & Ryan, 2000). As a more active pedagogy, peer assessment techniques in LMS might be also enriched. Initially, they may resist their classmates correcting their class activities. However, providing a detailed rubric and using additional "educator" assessment might mitigate this resistance. Aside from assessment activities, student-student interaction tools in the LMS such as discussion forums should be used more frequently. In addition, Lo and Hew (2017) recommend using LMS with gamification features so as to gamify pre-class activities. This might help enhance student motivation through "perceived enjoyment" (Punnoose, 2012; van der Heijden, 2004), which, in turn, is likely to lead to an increase in engagement and adoption of flipped learning. Despite all this, educators should still not assume that students always watch flipped videos before class. If educators find that students still do not watch the videos, they should avoid too much lecturing in class time. Instead, they could allow "flextime" at the beginning of every session, where students who have not previously watched the flipped video can do so.

Students from the GPC department were found to engage in less interaction compared to other departments. Educators in this department had already been utilizing various methods to increase their interaction such as student pools and other specific applications (i.e., mentimeter). They had also been utilizing break-out groups, integrating real-life examples from movies to their classes, including students with tangible subject-matter experience to the lectures (i.e., giving responsibilities in the data collection process in a psychological testing course), and inviting professionals from the field to lectures. However, these attempts were clearly not enough to increase interaction in GPC classes. Consequently, to remedy this problem, more effort should be exerted to increase interaction in the teaching/learning environment. GPC department faculty members should use asynchronous collaborative tools/methods such as online discussion boards, forums, and group work more often. In addition, they might make students record their own flipped video and use reflection assignments in order to increase student-content interaction.

6.2. The limitations of the study

This study is not without limitations. To begin with, the data was collected from first grade undergraduate students, representing the adaptation process of freshmen. Senior students, for example, could experience a different process. Additionally, the participants in this study were students and the faculty members of a private university, thus coming from a middle or high socio-economic level (i.e. all received scholarships since the foundation), not representing the situation in public universities. These two limitations weaken the external validity of the study. Last but not least, this paper discusses motivation, course structure, and interactions based mainly on instructional videos, as these videos have a pivotal role in flipped learning. However, there is a common misconception that flipped learning is instructional videos. On the contrary, flipped learning should include other significant elements such as LMSs, MOOCs, Learning Labs or Adaptive Digital Platforms (Author(s), xxxx; Şahin & Kurban, 2019b; Wang, 2021).

6.3. Avenues for future research

The limitations of this study could lead the way for future academic endeavors. First of all, further studies with sophomore, junior, and senior year students can be carried out so as to ascertain whether or not these findings hold true for higher grades. Future studies might target larger populations and use random selection to satisfy external validity. In order to satisfy external validity, participants from public universities may also be recruited. Further studies could also expand the data sources used by taking administrators' and technology support office (CELT at the university) staff's point of view into account. In addition, more scholarly work on flipped learning is warranted on seeking ways of promoting motivation and interaction

especially in the GPC department due to the current scarce number of studies. It is worth pointing out here that special academic attention needs to be devoted to the role of "perceived workload" on motivation. This is because the authors could not clearly establish causation between some variables due to the design of the study. For example, "is students' motivation toward flipped learning low due to too long instructional videos or the videos' low quality?" and "do students come to class without preparation (i.e., not having watched the instructional videos in their individual space) because the flipped videos lack interaction?" Such questions are still open to investigation by future researchers.

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Appendix A: Structured Ranking Form

- How many courses do you teach in a semester on average under flipped learning environments?

- How long (semesters) have you been using Blackboard for your instructional method?
- What are the difficulties you experienced using Blackboard in flipped learning as Blackboard? Please rank the followings from 1 (lowest) to 5 (highest).

( ) Some students came to class without watching the videos.

( ) Students complained about the late delivery of videos.

( ) Students complained about the length of the videos.

( ) Extra workload / don't have time or expertise.

( ) Students might resist the approach or lack the motivation to do the pre-class work.

- What are your students' expectations about flipped learning? Please rank the followings from 1 (lowest) to 7 (highest).

( ) Have more constant and positive interactions.

( ) Have greater opportunities to work at your own pace.

( ) Have greater access to course material and instruction.

( ) Have more choice in how they demonstrate their learning.

( ) More likely to engage in collaborative decision-making.

( ) More likely to engage in critical thinking and problem solving.

( ) As an educator, more likely to take into account students' interests, strengths, and weaknesses.

- What might be done to improve flipped learning in terms of objectives, organization, and materials? Please rank the followings from 1 (lowest) to 5 (highest)

( ) More usage in class learning activities.

( ) Changes to the assessment process.

( ) Taking better-qualified videos.

( ) Increase the peer instruction / Peer-to-peer-centered learning.

( ) Increase students' self-motivated learning.

Appendix B: Pre Semi-Structured Interview Form

1) What are the difficulties you experienced using Blackboard in flipped learning? You selected [selected alternative]. Why? (Pre-form)

2) Why did you select [selected alternative]? Do you think the students see this as an advantage? (Pre-form)

3) What might be done to improve flipped learning implementation in terms of objectives, organization, and materials? You talked about [selected alternative], why? (Pre-form)

4) You indicated the last ranking as [selected alternative]. This is the last alternative, which needs to be improved. (Pre-form)

Appendix C: Post Semi-Structured Interview Form

1) Why do you think that most of the students marked “agree” or “strongly agree” for their flipped learning average satisfaction & motivation? (Post-form)

2) What are the main needs of your department regarding flipped learning? (Post-form)

3) What can be employed to increase interaction? (Post-form)

4) How would you develop yourself and your courses in order to implement a better flipped learning? (Post-form)

6) Why do you think that critical thinking of students is of limited use? What might be the reasons? (Post-form)

Appendix D: Instructional Objectives of CELT's Academic Staff Training

The aim of the training is to train instructors who can keep student interaction at a high level in distance education by using flipped learning. The training is given via flipped learning and consists of two parts. The first part of the training is carried out asynchronously over the Blackboard LMS. In this section, instructors watch content related to flipped learning, solve tests, and participate in discussion boards. The objectives of this part of the training are as follows:

- Instructors can define what flipped learning is,
- Instructors can explain the relationship of flipped learning with active learning,
- Instructors can outline the stages of a flipped learning lesson plan,
- Instructors can identify best practices for the individual space of flipped learning,
- Instructors can identify the best practices of flipped learning for the online group space,
- Instructors can explain how different types of assessment can be used in flipped learning.

The second part of the training is carried out synchronously, through *Blackboard Collaborate* (a virtual classroom program add-on) and *Zoom*, which the instructors also use in their own lessons. In this part of the training, instructors write lesson goals, develop appropriate and original evaluations for online training to measure the learning goals, prepare classroom activities to attain those goals, and choose technologies that are suitable for delivering their activities to students virtually and using flipped learning. The objectives of this part of the training are as follows:

- Instructors can prepare a lesson plan for active classroom learning,
- Instructors can create a flipped learning lesson plan,
- Instructors can create activities for the individual space of a flipped learning course,
- Instructors can create activities for the online group space of a flipped learning course,
- Instructors can develop an assessment for a flipped learning course.

In the asynchronous part (theoretical) there are 4 hours of content in total, whereas the synchronous workshop (implementation) lasts 3 hours.

Appendix E: New Flipped Learning Handbook Preparation

Outline of the University

I. Teaching Resources
    A. Academic calendar
    B. Flipped learning
    C. Syllabus preparation
    D. Course materials
    E. Paid software
    F. Free learning tools
    G. Copyright
II. Technologies
    A. University email
    B. Student information system
    C. Blackboard LMS
    D. Virtual classrooms
    E. Technological equipment support
III. Examinations
    A. University's attitude toward midterms and finals
    B. Student attendance
    C. Defining an exam date
    D. Meaning of letter grades

Highlights

- The FL implementation in the world's first fully flipped university was evaluated
- An explanatory sequential mixed method research was conducted
- The students particularly lack motivation and student-student interaction
- The GPC department needs more interaction compared to other departments
- Long, unqualified videos and unprepared participation emerge as major problems in FL