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Motivational Fluctuations in Virtual Learning Environments: A Time-Interval Perspective

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Abstract: Once perceived as a static entity, motivation is now regarded as an ever-changing dynamic construct which is constantly in a state of flux. Though recent years have witnessed an outgrowth of research on the nature of motivational fluctuations in language classes and different factors underlying such changes, it seems that scant research has tried to address the issue in online classes. Thus, informed by this gap, the researchers in the current study sought to find out how Iranian EFL learners' motivation might fluctuate during different time intervals through the experience of online learning. In so doing, three different contexts of learning were explored, namely institute, high school and university settings. A total of thirty-four learners were selected from these three learning contexts. To gather data, the researchers made use of Motometers and retrospective thinking procedure. As the results indicated, different patterns of motivational fluctuations were identified for institute, high school and university students throughout different time intervals within a single session. Also, as the findings helped reveal, the mean motivational levels for university students were the highest, followed by institute learners and then high school students. The study findings offer fruitful implications for school and institute teachers and learners, as well as university professors and students, particularly as regards paying increased attention towards the oscillating nature of learners' motivation.

Keywords: Learning Context Differences, Motivational Fluctuations, Motometer, Time-interval, Virtual Learning

Introduction

Motivation is doubtlessly an important factor in language learning, a driving force that augments learners' willingness to accomplish more (e.g., Dörnyei & Ryan, 2015; Lumsden, 1994). A cursory glimpse through the literature addressing motivation reveals that in its early days, motivation was regarded as a static, unchangeable entity, and as a trait that could be classified into different types. This view of motivation as a static construct is evident in the work of researchers such as Deci and Ryan (2013). Later, Gardner and Lambert (1999) sought to set forth some taxonomies of motivation, and hence dichotomous terms such as intrinsic/extrinsic and integrative/instrumental became commonplace. Later on, the static nature of motivation was questioned with the advent of new models of second language motivation, including process models and second language motivational self-system (e.g., Csizér & Dörnyei, 2005; Dörnyei, 2009). Inspired by these recent changes in the field of motivation, and also informed by the findings of current research in the field, nowadays we give more credit to the contention that motivation is not static and stable, and is rather fluctuating all the time

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(e.g., Csizér & Dörnyei, 2005; Dörnyei, 2009; Dörnyei & Ottó, 1998; Kruk, 2016; Lambert, 2017; Larsen-Freeman, 2015; Mohammadzadeh & Alavinia, 2021; Sosin et al. 2024; Widlund et al. 2024; Yu & Liu, 2024)

Now, we are at the stage of endorsing complex dynamic systems theory (Larsen-Freeman, 2015), according to which changes in learners' motivational states happen by the elapse of time depending on the context of learning, the focus of the lesson, the type of tasks they are doing, the kind of feedback they are receiving, and a host of other factors. There is a multitude of studies which confirm the dynamicity of motivation, among which reference can be made to Pawlak (2012), Pawlak et al. (2014), Waninge et al. (2014), and Yanguas (2011), among others. Waninge et al. (2014), for instance, reported that learners' motivation went through fluctuations both within a single session, and across different sessions of teaching.

Though motivational fluctuations in real, on-site classes have been studied by different researchers, it appears that very scant research has been appropriated to investigate the status and pattern of motivational changes in virtual learning environments. As Busse and Walter (2013) maintain, a number of studies on students' motivation in online learning have revealed that the high attrition rate is attributable to decreased motivation in online classes. Moreover, Kyewski and Kramer (2018) call for further research to be done on motivational status in online courses to pinpoint the reasons underlying learners' lower levels of propensity for learning. Inspired by this dearth of research on motivational fluctuations occurring in online learning environments, the researchers in the current study strove to investigate the motivational fluctuations in Iranian EFL learners in the virtual learning context. In this vein, the major variable postulated to affect motivational fluctuations was different time intervals the learners went thought during the entire instructional session. It's also worth noting that in implementing the current research, comparisons were made between different learning environments, i.e. institute, school and university contexts.

Literature Review

Motivation has long been regarded by researchers and practitioners alike as a crucial component of teaching foreign or second languages and has therefore been targeted as an enthralling issue by numerous educational researchers (e.g. Rahimi & Karkami, 2015; Vahtrick & de Bot, 2013). As Dörnyei (2005, p. 65) notes, "motivation is of great importance in SLA: It provides the primary impetus to initiate L2 learning and later the driving force to sustain the long and often tedious learning process."

An elusive term and a fuzzy concept, motivation has been approached quite disparately by different researchers. The conceptualizations of the term range from the early behavioristic view which regarded it as being at the mercy of external forces, to more cognitive views which gave more heed to the element of choice and decision making, the constructivist models that highlighted the individualistic and unique nature of motivation, the social constructivist view which placed more emphasis on the social and contextual factors in motivating the individuals, and finally more current perspectives that underscore the dynamic nature of motivation considering it as a construct which is always in the state of flux (Dörnyei, 2001, 2005; Mohammadi & Alavinia, 2021; Mohammadzadeh & Alavinia, 2021; Ortega, 2009; Pawlak, 2012; Pawlak et al. 2014; Sosin et al. 2024; Waninge et al. 2014; Widlund et al. 2024; Yu & Liu, 2024). In what follows, some pertinent samples from the literature are presented in regard to motivational fluctuations.

In an early study, Campbell and Storch (2011) investigated the motivational changes in students studying Chinese as a foreign language over one semester at an Australian university. To gather the required data, they made use of semi-structured interviews. In line with the findings, they claimed that the most crucial elements influencing motivation in both positive and negative ways were those related to the learning environment. Additionally, the results showed that using tactics to support learners' L2 selves may help them overcome challenging situations and continue their L2 learning.

In a similar vein, Kruk (2013) probed how the individuals' motivation changed over three weeks and how online resources and a browser-based virtual environment affected it. The study included 13 Polish senior high school students in the third grade. The information was gathered using various instruments, including background questionnaires, interest grids, questionnaires on how well the classes were taught overall, evaluation sheets, and learner logs. The findings revealed that motivational intensity tends to shift over time (i.e., both during single lessons and from one lesson to the next). It is worth noting, however, that students showed greater interest and involvement when participating in online activities and that variations in motivation were less prominent. When asked to complete course book tasks (i.e., paper-based activities), their level of motivation was shown to be more vulnerable to change. According to Kruk, the observed changes in motivational intensity might be a direct outcome of the treatment used and the tasks assigned to the individuals.

In a later study, Pawlak et al. (2014) sought to examine the motivational development of 38 senior high school English language learners. The study looked at the individuals' longer-term engagement in four classes spread over two weeks and their motivations for learning English. The research was conducted through implementing detailed lesson plans, interviews with randomly selected students, motivation grids filled out by participants every five minutes during each English lesson, and teachers and students' evaluations of the conducted classes. Based on the results, in the long run, the changes in motivation were connected to instrumentality (i.e., pursuing pragmatic objectives and avoiding negative consequences). Furthermore, factors like the focus of the lesson, the type of activities the students were required to complete, their duration, the transition from one phase of the class to the next, student cooperation, the significance of the topics covered, and their relationship to the final exams were all found to have an impact on the short-term changes in motivational intensity (i.e., the changes that occurred during individual lessons as well as from one class to the next).

Azarnoosh et al. (2015), on the other hand, embarked on an investigation into the longer-term fluctuations in high school and university students' motivational levels. They also considered how other elements, such as learner age groups, the learning environment, and the sociocultural setting, might result in various motivational patterns. Utilizing the questionnaire developed and validated by Taguchi et al. (2009), they discovered that although students at all levels exhibited favorable motivational dispositions, high school students had a lower degree of motivation than university students.

In a longitudinal probe into the motivational fluctuations over a long period of time, Pawlak and Mystkowska-Wiertelak (2018) examined the evolution of motivational processes in the learning histories of two individuals from kindergarten to university. One of the participants in their study was male and the other female, both studying English as a foreign language. Investigating the two participants' motivational changes over this long time span, the researchers analyzed the fluctuations in their L2 motivational systems through a retrodictive modeling technique. The findings revealed some interesting patterns for the two learners' motivational changes in different time periods.

In another investigation, Mohammadzadeh and Alavinia (2021) explored motivational fluctuations during task-supported language instruction. The study also aimed to distinguish the possible discrepancies between the learners and teachers' assessments of classroom motivation. To this aim, thirteen language school students were recruited to take part in the study. The instruments employed were lesson plans, Motometers, teacher observation sheets, and semi-structured focus group interviews, following the lead of Waninge et al. (2014). The results showed that motivation is changeable depending on a variety of context-dependent variables, including instructional emphasis, learner dispositions on a given day, group dynamics, instructor motivation, and a number of contextual variables, including the day of the week and class schedule. Additionally, the data revealed discrepancies in the assessments of the students' motivation for each lesson from the teachers.

Likewise, Mohammadi and Alavinia (2021) strove to examine task type effect on learners' motivational fluctuations. Their participants were some forty Iranian high school EFL learners, and the main tools utilized for gathering data were Motometers and interviews. As their findings

indicated, task type played a significant role in shaping and directing motivational changes in students. It was also found that problem-solving task was the most captivating one, with the second most absorbing task being the one based on picture prompts. However, as regards the second focus of their study, no gender-related differences were identified apropos motivational fluctuations.

Finally, in a more recent probe, Kruk (2022) aimed at pinpointing the factors influencing motivational dynamics and causing shifts in the degree of motivation. To conduct the study, he chose two advanced English language learners as the participants. In the research process, the two learners who took part in the study were instructed to improve their English by using the virtual environment. The analysis of the data through quantitative and qualitative methods disclosed a number of varied factors underlying the motivational changes contributing to variations in motivational intensity.

Even though research on motivation as a dynamic entity has been ongoing for more than 20 years now, there is still a dire need for more thorough research into different unknown perspectives of motivational fluctuations (e.g., Pawlak et al., 2014). The body of literature available in this domain, part of which was reviewed in the foregoing section, has mostly focused on issues such as nature of motivational fluctuations in a single session, and across multiple sessions of instruction, as well as the factors influencing these changes in motivational states. Long-term fluctuations and motivational intensity have been among the other commonly investigated topics. However, it seems that moment-by-moment changes in learners' motivational states in the context of virtual learning, as an important facet of research on motivational fluctuations have received meagre attention, and hence more scrutiny is required to uncover the enigmatic nature of motivational changes in online language instruction. Another major lacuna that was identified in the literature, and hence addressed in the present study was the need for conducting comparative studies on learners' motivational changes with a focus on different levels of proficiency and diverse educational contexts. Informed by this dearth of research in this domain, the researchers in the present study intended to bridge the gap by formulating the following research questions:

Research Question One: How does Iranian institute EFL learners' motivation fluctuate during different time intervals through a single session of online learning?

Research Question Two: How does Iranian high school EFL learners' motivation fluctuate during different time intervals through a single session of online learning?

Research Question Three: How does Iranian university EFL learners' motivation fluctuate during different time intervals through a single session of online learning?

Research Question Four: Is there a significant difference among the patterns of motivational fluctuations occurring for institute, high school and university students during different time intervals through a single session of online learning?

Methodology

Design of the Study

This study employed a mixed-methods research design. Mixed methods research combines quantitative and qualitative strands in a single or multi-phased study (Creswell & Clark, 2011). In the present study, successive to quantitative data collection via Motometers, qualitative data were garnered in a retrospective manner based on the students' comments regarding their experienced motivational fluctuations. In fact, the qualitative data were used to clarify and explain the findings obtained from the quantitative phase.

Participants

The participants in this study were three groups of EFL learners studying at three different educational contexts, i.e. language school (institute), high school and university. The learners were selected based

on convenience sampling and availability. Due to the limitations prevailing through the time when the study was performed, mainly caused by Coronavirus Pandemic and the lockdown condition, and also owing to the inaccessibility of cooperating participants, only a total of thirty-four learners were selected from the three study contexts: ten from language institutes, ten from universities, and 14 from schools. As no control was exercised for gender, both males and females participated in the study. The participants attended English language classes once a week at the school and university contexts, but twice a week in the institute context, with each class session lasting for 90 minutes in all three contexts. However, it's worth noting that the session from the university class considered for the current research lasted for only 50 minutes due to the instructor's discretion.

Instruments

To gather data, following the lead of most similar studies in the realm of motivational fluctuations, the researchers opted for Motometers as the main means of data collection. However, to delve more deeply into the issue, the researchers also held a brief retrospective thinking session with the participants to help explicate some of the patterns of motivational changes that were revealed based on the findings. A brief account of these two means of data collection is provided in what follows.

Motometer

The first and the main research instrument used in the study was a Motometer, a device utilized in the previous studies on motivational changes, and particularly in the investigation performed by Waninge et al. (2014), to elicit the learners' self-ratings of their motivation on a scale ranging from 0 (the lowest motivation) to 100 (the highest motivation). The learners were required to determine the level of their motivation during the whole instructional session at five-minute intervals. The instrument used was similar to Pawlak's (2012) motivational grid, which measured motivational levels on a scale ranging from 1 to 7; however, the researchers in the present study found Waninge et al.'s (2014) Motometer more practical in gathering the intended data. To ensure the collection of more reliable data, and to minimize the interruptions in the process of performing research, the participants were briefed in advance regarding the research procedure, and were asked to specify the degree of their motivation at 5-minute time intervals upon receiving the instructors' reminder for doing so.

Retrospective Thinking

Another major phase of the study, which acted as the qualitative follow-up for the initial stage that relied on quantitative data collection via Motometers, was the retrospective thinking phase. This was mainly done by the researchers for a number of reasons, including the consolidation of the findings obtained through the use of Motometers, disambiguation of the vague points observed in the patterns of motivational changes, and augmentation of the dependability of the findings. In this process, the learners were demanded to think back on their self-ratings at different time intervals during the lesson, and recall what made them mark the motivational degrees and fluctuations in the way they did on the Motometer.

Procedure

As stated earlier, the researchers in the current study embarked on pinpointing the pattern of learners' motivational fluctuations across different time intervals in a single instructional session, and in so doing, a total of 34 Iranian high school, institute and university EFL learners were used as the participants. To conduct the study, initially the participants were briefed on the research objectives, and informed consent was obtained from all the learners. They were further reassured that the findings would merely be used for the research purposes, and that they would not be revealed to any third parties outside the research context. After ensuring the confidentiality and anonymity conditions, the learners were sent the Motometers in an online fashion (as the participants were going through the virtual learning experience).

To cater for the collection of more dependable and valid data, clear instructions were provided for the learners as to the correct way of filling the Motometers and reporting their self-ratings of their motivation at 5-minute intervals. Then, a sample Motometer was filled for them, and after ensuring that they had grasped all the points, they were required to specify their level of motivation, upon the teacher's signal, by putting a mark on the Motometer from 0 to 100. These concerns were attended to in an attempt to safeguard the implementation of data collection in an unobtrusive manner, to let the learners proceed with the normal process of instruction and task completion. At the end of the instructional session, the participants were required to send the filled Motometers to the first two researchers in the study, who were in charge of data collection in the classes they were instructing. After screening the gathered Motometers and controlling for the accuracy of the procedure, the first two researchers arranged with the participants for a retrospective thinking session, during which the said researchers tried to tap into the reasons inspiring the learners to fill the Motometers in the way they did, and in so doing the learners' completed Motometers were used as a sort of prompt helping them remember what they had reported.

Data Analysis

As mentioned before, the study was done in two phases, with the first phase being purely quantitative and the second one following a qualitative procedure. To analyze the data, for research questions one to three, the descriptive statistics were reported using SPSS (version 22). Nevertheless, for analyzing research question four, both quantitative and qualitative analyses were carried out, with the qualitative analysis being used as a step for corroborating the quantitative findings. More specifically, the quantitative analysis for research question four which explored the possible effect of time interval on Iranian EFL learners' motivational fluctuations across different learning contexts, i.e. institute, school and university, entailed the use of one-way ANOVA and posthoc Tukey HSD test. As regards the quantitative analysis, some patterns of motivational fluctuations for different time intervals during the session are illustrated and a number of extracts from the learners' responses in the retrospective thinking phase are listed.

Results

Findings Obtained for Research Question One

The first research question of the study was after finding how Iranian institute EFL learners' motivation fluctuates during different time intervals through a single session. Table 1 illustrates the mean scores for their motivational fluctuations during the entire 90-minute session, as well as the relevant standard deviations.

Table 1

The Mean Scores Obtained for Motivational Fluctuations among Institute EFL Learners during a Single Session

	N	Minimum	Maximum	Mean	Std. Deviation
InsWhole1	9	70.00	100.00	89.66	10.39
InsWhole2	9	75.00	100.00	91.33	8.47
InsWhole3	9	75.00	100.00	91.44	9.54
InsWhole4	9	80.00	98.00	90.88	6.19
InsWhole5	9	85.00	95.00	89.66	4.44
InsWhole6	9	70.00	96.00	89.33	8.18
InsWhole7	9	73.00	99.00	89.44	9.39
InsWhole8	9	74.00	100.00	92.00	9.31
InsWhole9	9	71.00	98.00	88.55	8.30
InsWhole10	9	73.00	100.00	88.66	9.66
InsWhole11	9	50.00	100.00	85.44	15.62
InsWhole12	9	45.00	100.00	84.55	16.34
InsWhole13	9	50.00	99.00	85.77	14.99
InsWhole14	9	60.00	98.00	84.00	12.41

InsWhole15	9	60.00	98.00	84.00	12.95
InsWhole16	9	50.00	95.00	80.33	15.61
InsWhole17	9	40.00	99.00	78.22	19.70
InsWhole18	9	40.00	90.00	73.88	17.63
Valid N (listwise)	9				

As the data in the table above helps reveal, the highest mean score belongs to the 40th minute of instruction, and the lowest mean is the one for the end of the class time. It can be inferred that the learners have reached a state of flow in the middle of class time, and this motivation has come to the lowest point at the end of the class time, possibly showing the students' high levels of enjoyment and satisfaction in the midst point, and its decline perhaps shows their feeling of despair that the class has come to an end. Support for this claim can be gathered from the satisfaction a number of the participants revealed in the retrospective thinking session for the interesting flow of the class, and their sorrow for the termination of the session. One of the participants, for instance, expressed her feelings in the following manner:

Extract 1

This session for me really went well, and I felt the greatest amount of motivation in the middle of the session, but I didn't feel so well when the class came into its end.

Findings Obtained for Research Question Two

The second research question of the study sought to find how Iranian high school EFL learners' motivation fluctuates during different time intervals through a single session. Table 2 displays the mean scores and standard deviations for learners' motivational fluctuations during an entire 90-minute session.

Table 2

The Mean Scores Obtained for Motivational Fluctuations among High School EFL Learners during a Single Session

	N	Minimum	Maximum	Mean	Std. Deviation
SchWhole1	14	80.00	100.00	97.35	5.75
SchWhole2	14	80.00	100.00	92.14	6.99
SchWhole3	14	25.00	100.00	91.64	20.09
SchWhole4	14	30.00	100.00	78.92	21.85
SchWhole5	14	60.00	100.00	84.64	12.92
SchWhole6	14	50.00	100.00	83.57	18.02
SchWhole7	14	50.00	100.00	84.21	16.31
SchWhole8	14	30.00	100.00	83.57	22.73
SchWhole9	14	50.00	100.00	87.50	15.03
SchWhole10	14	50.00	100.00	87.14	18.26
SchWhole11	14	30.00	100.00	85.57	18.89
SchWhole12	14	50.00	100.00	83.00	17.24
SchWhole13	14	40.00	100.00	83.78	21.87
SchWhole14	14	50.00	100.00	80.00	18.29
SchWhole15	14	50.00	100.00	82.42	20.08
SchWhole16	14	60.00	100.00	82.14	14.50
SchWhole17	14	40.00	100.00	82.50	23.10
SchWhole18	14	70.00	100.00	92.00	11.79
Valid N (listwise)	14				

As depicted in the table, the highest mean belongs to the beginning of the session, when the learners' energy has been at the topmost level. Compared to the previous table which showed the motivational fluctuations at the institute session, here there are more ups and downs in the students' motivational levels, and the condition is more unstable. Around minute 20, there is a sudden decline in the average motivation. Though the mean motivation gradually increases during the following minutes of class time, around minute 70 there is another decrease in the mean motivation. Finally, at the end of the

class time, the motivation returns to a high level which possibly shows the learners' happiness that the class came to its end. This finding was corroborated by the impressions and reflections the learners revealed during the retrospective thinking session, when some of the students admitted they didn't experience a high level of motivation during the class partly because of the limitations in virtual learning experience. Evidence for this claim is provided in the following typical extract from one of the students.

Extract 2

I'm not interested in online classes. I want to return to real classes.

Moreover, another reason mentioned by the students regarding their higher motivation at the outset of the class was the interest generated by the dialog topic at the beginning of the class which was related to 'personality'. In this regard, one of the students said:

Extract 3

I liked the dialog topic because I thought it is essential for us to know more about ourselves.

Findings Obtained for Research Question Three

The third research question of the study intended to pinpoint how Iranian university EFL learners' motivation fluctuates during different time intervals through a single session. Table 3 shows the mean values for motivational fluctuations for the entire session at the university. Unlike the previous two instances, here the class which was held for general English course had a shorter duration, and lasted for only 50 minutes.

Table 3

The Mean Scores Obtained for Motivational Fluctuations among University EFL Learners during a Single Session

	N	Minimum	Maximum	Mean	Std. Deviation
UniWhole1	12	90.00	100.00	99.16	2.88
UniWhole2	12	90.00	100.00	99.16	2.88
UniWhole3	12	95.00	100.00	99.25	1.48
UniWhole4	12	60.00	100.00	92.91	12.23
UniWhole5	12	87.00	100.00	93.75	5.37
UniWhole6	12	60.00	100.00	93.83	11.48
UniWhole7	12	40.00	100.00	87.58	18.53
UniWhole8	12	30.00	100.00	81.41	22.74
UniWhole9	12	30.00	100.00	87.50	22.51
UniWhole10	12	75.00	100.00	92.50	9.88
Valid N (listwise)	12				

As is evident from the table, at the outset of the session, the learners enjoy a very high level of motivation, which persists for the first fifteen minutes of the class time. Around minute 40, there is a sharp decline in the learners' level of motivation, which then returns to a high level at the end of the class time. The fluctuations in this class are a bit odd, and hence harder to interpret. The only thing that can be said is that the learners come to class with a high level of motivation, and then their motivation gradually declines perhaps due to the low task engagement, and then it reaches the lowest level 10 minutes to the end of the class, probably due to their boredom. However, their motivation returns to a high level as the class reaches its end. The pattern observed here resembles the pattern of motivational fluctuations experienced by the high school learners presented earlier. The high level of motivation experienced by the students at the outset can be justified on a number of accounts, based on the comments given by the participants in the retrospective thinking session. As the learners commented, the beginning of the class time was more appealing as they were more energetic. Also, as the comments disclosed, the friendly behavior of the teacher helped them feel more at ease and motivated during the initial part of the class time. Furthermore, the discussion topic was fascinating

enough to keep them motivated for the first part of class period. For instance, one of the participants explained the reason for the high motivation at the beginning of the class in the following manner:

Extract 4

I usually feel highly motivated at the beginning of the class because I'm full of energy. Also, the teacher's kind behavior makes me more interested in the class.

However, regarding the ups and downs in their motivational levels, especially the initial high level and lowered levels as the class progressed, the students mentioned the boring nature of online classes which were not so interactive and were mostly influenced by problems like poor internet connection and the interruptions during the session. Two of the students in the retrospective thinking session put this problem the following way:

Extract 5

I don't like being in online classes. There are frequent interruptions and disconnections, and we can't have enough interaction and communication like face-to-face classes.

Extract 6

Online classes limit our communication. Personally, I don't like online classes and prefer the face-to-face classes.

Findings Obtained for Research Question Four

The fourth research question of the study sought to find the difference among the patterns of motivational fluctuations occurring for institute, high school and university students during different time intervals through a single session. To compare the mean motivational levels, use was made of one-way ANOVA and Tukey HSD test. However, prior to this, the test of normality was run on the three sets of values, the results of which are indicated in Table 4.

Table 4

Test of Normality for the Mean Scores of Students in Three Contexts

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
InsMean	.214	18	.059	.880	18	.057
SchMean	.196	18	.066	.905	18	.069
UniMean	.186	10	.200*	.906	10	.257

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

As is seen in the table above, the results of Kolmogorov-Smirnov and Shapiro-Wilk tests both indicate the normality of distribution of the data ($p > .05$). Table 5 illustrates the descriptive statistics for the mean motivational levels of students in the three contexts.

Table 5

Descriptive Statistics for the Mean Motivational Levels of Students in Three Contexts

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Institute	18	86.5078	5.00886	1.18060	84.0169	88.9986	73.88	92.00
School	18	85.6717	4.80814	1.13329	83.2806	88.0627	78.92	97.35
University	10	92.7050	5.86465	1.85457	88.5097	96.9003	81.41	99.25
Total	46	87.5278	5.73070	.84495	85.8260	89.2296	73.88	99.25

As is evident from the table above, the mean motivational level for the university students is the highest, the one for institute learners in the second highest, and the one for high school students is the lowest. Table 6 makes a comparison among the three sets of values using one-way ANOVA.

Table 6

One-way ANOVA for the Mean Scores of Students in Three Contexts

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	348.776	2	174.388	6.641	.003
Within Groups	1129.066	43	26.257		
Total	1477.842	45			

In line with the data reported in the table above, there is a significant difference (p = .003 < .05) among the patterns of motivational fluctuations occurring for institute, high school and university students during different time intervals through a single session, and hence the null hypothesis of the study is rejected. To get a clearer picture of the differences among the three sets of values, a glance can be taken at the results of Tukey test in Table 7.

Table 7

Tukey HSD Test for the Mean Scores of Students in Three Contexts

		Mean Difference			95% Confidence Interval	
(I) Group	(J) Group	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Institute	School	.83611	1.70806	.877	-3.3101	4.9823
	University	-6.19722*	2.02101	.010	-11.1031	-1.2913
School	Institute	-.83611	1.70806	.877	-4.9823	3.3101
	University	-7.03333*	2.02101	.003	-11.9392	-2.1275
University	Institute	6.19722*	2.02101	.010	1.2913	11.1031
	School	7.03333*	2.02101	.003	2.1275	11.9392

*. The mean difference is significant at the 0.05 level.

As the data in the table above help reveal, the main differences are ascribed to different motivational levels between the institute learners and university students, as well as between the high school and university students. That is to say, university students have revealed comparatively higher levels of motivation in relation to institute learners and high school students. To help form a clearer picture of the motivational fluctuations in the three studied contexts, the researchers present the patterns of fluctuations in the following three figures. Figure 1 portrays the changes occurring in institute learners' motivational levels throughout a single session. As is seen, the fluctuations reveal a downward pattern showing that the learners' motivation has gone through an incessant decline throughout the entire session; however, as mentioned earlier, the highest increase in the learners' motivation can be observed around minute 40, but the motivation is still high during the following minutes of class time, and the sharpest decline belongs to the last 10 to 15 minutes of the session.

Figure 1

The Pattern of Motivational Fluctuations among Institute EFL Learners during Different Time Intervals through a Single Session

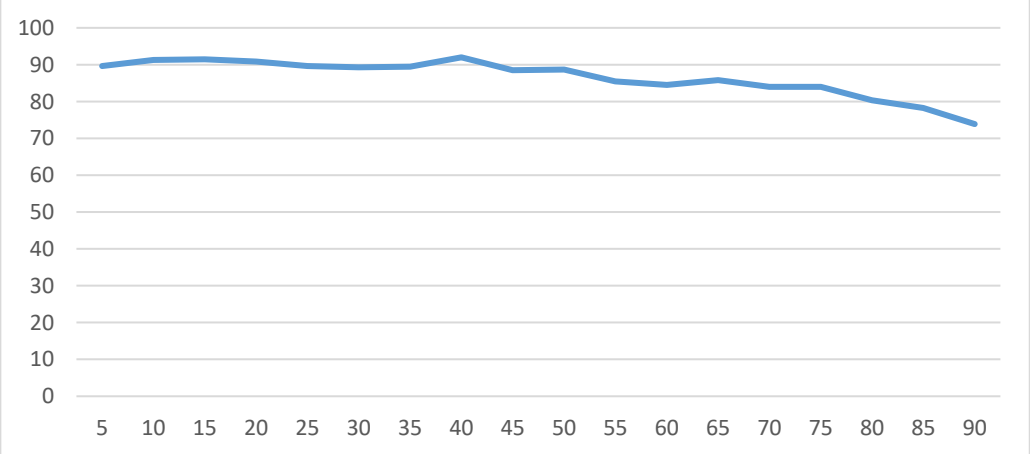
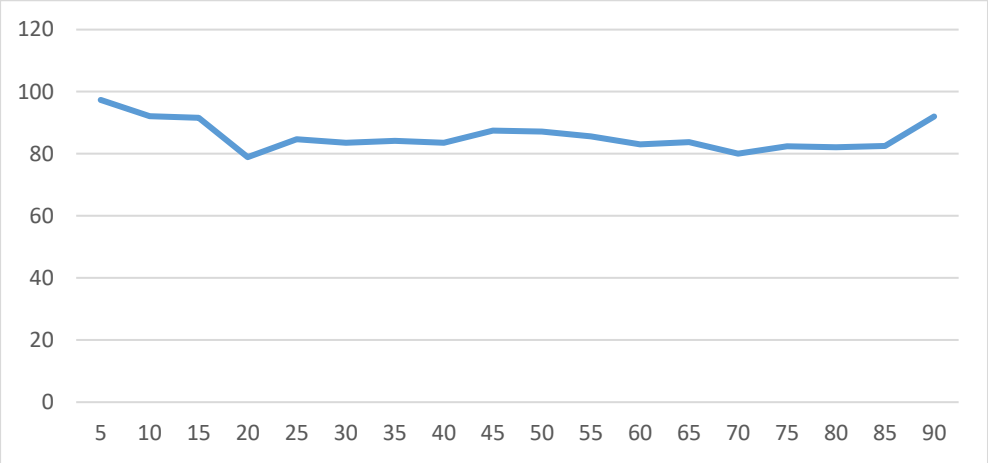


Figure 2, on the other hand, displays the motivational fluctuations occurring for high school students during a single session. As is obvious in the figure, the motivational levels of learners reveal a strange pattern of changes, having many ups and downs throughout the entire session. The sharpest decrease has occurred from minute 15 to 20, while after minute 20 another increase is observable in the figure. Although in the rest of class time slight motivational changes are visible, the fluctuations are not so eye-catching, and finally around minute 85 another escalation is witnessed in the mean level of motivation.

Figure 2

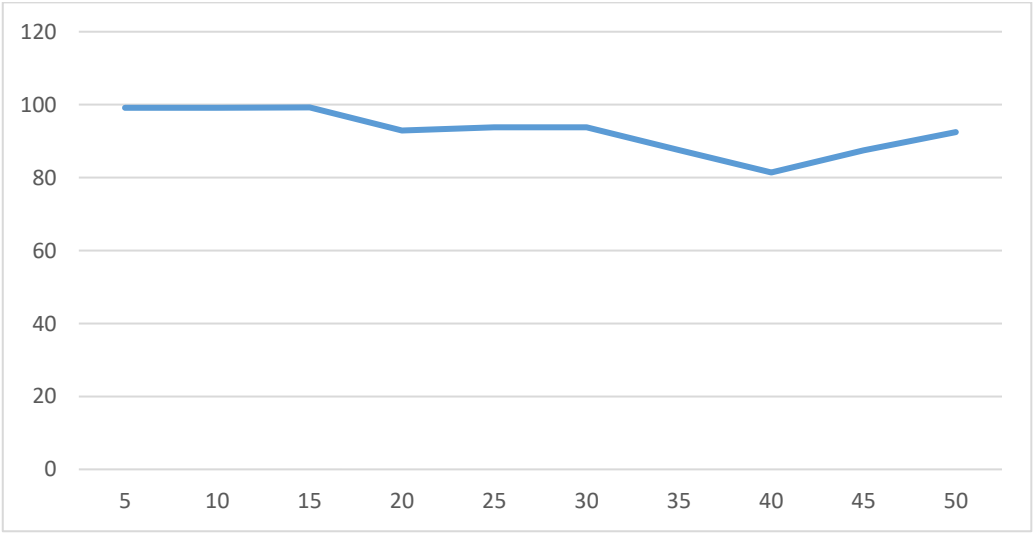
The Pattern of Motivational Fluctuations among High School EFL Learners during Different Time Intervals through a Single Session



Finally, Figure 3 illustrates the motivational fluctuations occurring to university students during the entire class time, the difference being that unlike the previous two classes, the present one lasted for only 50 minutes. As is seen in the figure, from the beginning of the class up to minute 15, the motivational levels are smooth. However, from minute 15 to 20 a drop in the students' motivational level is observable. Minutes 20 to 30 also reveal a smooth pattern, while from minute 30 to 40 a sharp decrease is witnessed which is immediately followed by an increase during the remaining 10 minutes of the class time.

Figure 3

The Pattern of Motivational Fluctuations among University EFL Learners during Different Time Intervals through a Single Session



Discussion

The first research question of the study was after finding how Iranian institute EFL learners' motivation fluctuates during different time intervals through a single session. Regarding variations in motivation, the examination of motivational self-ratings revealed that learners' stated levels of motivation fluctuated at different time-points during the session. Based on the finding obtained for this research question, it was pointed out that the learners reached a state of flow in the middle of the class time, and this motivation fell to the lowest degree at the end of the class time. The finding for this research question which confirms the fluctuations occurring in learners' self-perceived motivation is consistent with earlier studies on the issue (e.g., Kruk, 2016; Pawlak's, 2012; Pawlak et al., 2014; Waninge et al, 2014).

The finding is specifically in more compliance with that of Waninge et al (2014), as both studies made use of Motometers as the data collection tool, while Pawlak (2012), whose results also resonate with the current finding, used a variety of data-gathering methods, including interviews, questionnaires, motivational grids, and assessment sheets. The finding also aligns with MacIntyre and Serrol (2014), who argued that L2 classroom motivation is prone to change from one moment to another. It is consistent with the results of the retrodictive study by Pawlak and Mystowska-Wiertelak (2018) in that they also found changes in the motivational systems of L2 learners.

The second research question sought to find how Iranian high school EFL learners' motivation fluctuates during different time intervals through a single session. As the findings helped reveal, the highest mean belonged to the beginning of the session, when the learners' energy was quite high. Furthermore, as some of the students commented, at the beginning of the class, when they studied a dialog about 'personality', was in their view very prominent for them, because it helped them know themselves better. Thus, students showed more enthusiasm and a more positive emotional reaction while speaking about personally important topics, a finding which is similar to the one obtained by Phung (2016). This finding is also in accordance with the one reported by Pawllak (2012), whose study provided evidence regarding the claim that magnitude and nature of motivation are subject to change over time.

The third research question of the study intended to pinpoint how Iranian university EFL learners' motivation fluctuates during different time intervals through a single session. As stated previously, the learners enjoyed a very high level of motivation at the outset, which persisted for the first fifteen minutes of the class time. As the learners commented, the beginning of the class time is usually more appealing as they are more energetic. Also, as the comments divulged, the friendly personality of the teacher helped them feel more motivated during the initial part of the class time. Furthermore, the discussion topic, as they uttered, was fascinating enough to keep them motivated for the first part of class period. Also, as mentioned before, toward the end of the class time there was a sharp decline in the learners' level of motivation, which then returned to a high level as the class was terminated. It might be stated that the learners come to class with a high level of motivation, and then their motivation gradually declines perhaps due to the low task engagement and internet problems. This line of argumentation is in keeping with Mohammadi and Alavinia's (2021) finding, where some of the students commented that their low motivation was partly because of task difficulty. The finding is overall consistent with that of Kruk (2022) since as he also pointed out, many elements contributed to variations of motivational intensity.

Finally, the fourth research question strove to find the difference among the patterns of motivational fluctuations occurring for institute, high school, and university students during different time intervals through a single session. In line with the findings, the mean motivational levels for university students were the highest, followed by institute learners and high school students. The findings also pointed toward a significant difference among the patterns of motivational fluctuations experienced by three groups of participants. This finding is acquiescent with that of Yaghoubinejad, et al. (2016) who found that motivation fluctuates over time among Iranian EFL learners, under the influence of a myriad of motivational factors. The finding is also along the lines of Kruk's (2019)

contention holding that the overall motivational patterns are likely to change variably in different learning contexts. The context-specific fluctuations in motivational intensity found in the current study might gain further approval and support from the findings obtained by Azarnoosh et al. (2015), who averred that different learning environments and sociocultural contexts are likely to generate distinct motivational patterns. In a manner akin to what was found in the current study, they also concluded that high school students sampled in their study revealed a lower motivational level than university students. This finding can be justified on account of the fact that university learners are usually more determined to gain achievement and success, because they have a better, more well-formed vision of their future. However, another plausible justification for the higher level of learners' mean motivation in the university class investigated might be attributable to the shorter duration of this class compared to institute and school classes lasting for 90 minutes. This might be in partial keeping with Mohammadzadeh and Alavinia's (2021) claim holding that class schedule can play a role in motivating the learners.

Conclusion and Implications

The study reported in this paper investigated the dynamic nature of motivation in foreign language learning, and due to its unique focus, it might be regarded as one of the first attempts to explore the changes in motivational intensity in three different learning contexts, i.e. institute, high school, and university. The findings mainly revealed significant differences among the patterns of motivational fluctuations occurring for university, institute, and high school students during different time intervals through a single session of online learning.

At the same time, students' comments voiced in the retrospective thinking session helped unveil some of the factors affecting changes in students' motivational levels in the aforesaid contexts. Some of the factors influencing motivational fluctuations in a positive way included the degree of task involvement, teacher's personality, and the interesting nature of discussion topics. On the other hand, among the factors negatively impacting learners' motivational states mention can be made of the internet connection problems, and the low interactivity of the classes.

The findings of the current study are thought to offer some fruitful implications for university professors, as well as school and institute teachers. Among the most conspicuous implications, mention can be made of raising teachers' awareness regarding the efficacy of the selected tasks and the variable degrees of involvement and hence motivation they might spark, and the implementation of needs analysis projects to inform the instructors of the learners' most preferred topics and themes. Hence, it is thought, informed by the findings of the current research, the instructors will hopefully act more responsibly in planning the course and preparing the tasks and activities which are more absorbing for the students at different levels of proficiency and in different learning contexts. In other words, to provide for the best level of motivation possible, educationally speaking, relevant themes and intriguing tasks from the students' personal experiences and preferences might be included in the classes. Ellis (2003) states that themes with a 'here-and-now' focus may generate a more favorable reaction from pupils. Instructors must also be aware of how the nature of the work may impact students' motivation and feelings. Furthermore, students feel extremely motivated and confident when they have the language and topic knowledge necessary to complete the task.

Although the study provided some useful insights into the patterns of motivational fluctuations in the three studied contexts, like all other investigations it was not void of weaknesses and limitations. First, though attempts were made on the part of researchers to include three contexts of English language learning to pinpoint their motivational fluctuations and their self-ratings of motivation through Motometers, the data for university students could only be gathered through a 50-minute session, which is likely to have influenced the obtained findings. Second, even though the comments were collected at precise five-minute intervals in an unobtrusive manner and without undue interruption, the fact that they were required to provide self-ratings of their motivation while focusing on the lesson could have possibly made it challenging for the students to give their undivided attention to both the materials being learned and the provision of self-reported motivational changes.

Third, even though the students had been taught how to complete the Motometers to reveal motivational fluctuations, the mere application of Motometers might not have been sufficient in gathering the reliable data, and the use of other instruments could have helped come up with more robust and reliable data. Fourth, because two of the current researchers (the first and the second one) were the instructors of two of the classes, the researchers' presence in the class environment may have led to Hawthorn effect, and hence adversely impacted the obtained results. Fifth, as the study was done during the pandemic and in the virtual learning environment, face-to-face contact with the participants was not possible, a point which might have exerted a negative influence on the obtained findings. Lastly, interpretations had to rely mostly on the researchers' conjectures about the direction of the motivational changes in the absence of more rigorous evidence from the literature, and hence the conclusions made were rather based on the learners' self-ratings of their motivation, and their comments.

Similar research in other contexts is needed to delve deeper into the elements influencing learners' motivation to solidify the findings. Future researchers, for instance, are advised to make use of a variety of data collection tools in addition to the ones employed in the current study to come up with more reliable findings. Also, the current study might be replicated by the future researchers in the on-site, physical classes in an attempt to corroborate or complement the findings. In conducting future research in this realm, the researchers are also recommended to investigate the possible effect of other factors like proficiency level, gender, age group, personality traits, and the like, as regards the learners' ensuing motivational changes. Moreover, the use of research assistants can be a good measure to lessen the potential effect of researcher presence and what is known as 'double-blind' (e.g., Mackey & Gass, 2005). After all, it must be noted that though probe into motivational fluctuations has been around for more than two decades now, doing research in this domain still resembles traveling within uncharted waters, and there are so many perspectives of the issue that are in need of further scrutiny and disambiguation.

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Declaration of Conflicting Interests

The authors of the current paper hereby declare that they have no conflict of interest.

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