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Original Paper

How Should Higher Education Institutions Provide Lectures Under the COVID-19 Crisis

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Abstract

As the COVID-19 crisis prevails, many universities and colleges all over the world were not able to conduct face-to-face classes and instead conduct online learning. Online learning has merits and is evaluated by learners and university faculties. However, whether or not the learning quality of online learning improves or maintains should be evaluated. Furthermore, online learning without being face-to-face is different from flipped classroom. This paper examines how the quality of online learning changes empirically. The empirical results show that most of the results are not different from face-to-face class, and online quiz type test scores are quite high; however, the quality of reports (writing) has declined significantly. There is some possibility that surface knowledge improved by online learning of undergraduates, but in-depth learning by thinking or discussing with other learners and faculty are not realized.

Keywords

active learning, COVID-19 crisis, face-to-face, flipped classroom, online learning, university

1. Introduction

Recently, researchers who not only major in higher education but also major in other fields have raised doubts about the effectiveness of traditional lecture-type teaching. One-direction teaching method from teachers to students has been criticized repeatedly. Instead, in-depth study methods by thinking for themselves such as “active learning”, have been highly regarded. On the other hand, such methods like active learning have also been criticized because of the effectiveness of promoting learnings. In spite of the fact that evolutions in ICT (information, communication, and technology) enable new ICT-based methods meaningful for pedagogy, traditional teaching is still the core teaching patterns regardless of conducting online learning. Of course, the introduction of ICT in classes needs knowledge about such

fields and time; however, some teachers do not agree that introducing ICT would have a positive effect. Some people say that educators are not familiar with the ICT; however, the reason is not so simple as such.

These situations have changed suddenly and greatly because of the spreading COVID-19 in 2020 all over the world. Many schools, universities, and other educational institutions that have not introduced such ICT systems largely have to introduce online learning inevitably. In Japan, as well, most university and college classes are performing online learning. By now, a lot of studies and questionnaires have been presented for university education. Most studies show that not only learners but also faculty are satisfied with the online-based method. However, the evaluation of such learning method has not been examined in depth.

Flipped classroom was introduced not only to junior and high schools but also to universities, and it has spread gradually. Most of the flipped classrooms use online materials and learners have to do pre-study before attending the class. Therefore, almost all the flipped classrooms are strongly related with online learning. In my class, the flipped classroom was introduced about fifteen to twenty years ago. Active learning such as teaching others, discussion, and presentations has been used for increasing the quality of learning. However, most flipped classrooms perform as a blended class, namely, online learning and face-to-face class. My class is no exception. Flipped classrooms may have to be changed without face-to-face classes under the COVID-19 crisis. Chats and forums are used for communicating among learners and between learners and faculty; however, different types of flipped classrooms would be necessary.

This study examines the effects of online learning for student education. More concretely, the effect of online learning without face-to-face classroom education is examined. There would be a high possibility that most universities will have to continue online learning at least for the time being. It is necessary for universities to examine the effectiveness of the online learning without feelings or intuition, and sometimes make up for the shortcomings when able to. Too much dependence on feelings or intuition is dangerous, regardless of the satisfaction of educators and learners.

This study is structured as follows. Section 2 reviews existing studies which focus on online learning. Moreover, some studies which examine flipped classroom and active learning are reviewed. Section 3 provides a preliminary one for empirical analyses. Section 4 examines the effectiveness of online examinations for my class's data and the statistical results are analyzed. Finally, this study ends with a brief summary.

2. Existing Studies for Online Learning

The pros and cons of online learning have been discussed much in many ways. Online learning reduces time and place barriers in general, and a lot of studies insist on large merits. Studies which focus on these merits have been presented, and advanced research have also been examined. Milman (2012),

Steed (2012), and Louhab et al. (2018) showed that learners can study at their own pace and convenient time. Under this COVID-19 crisis, some students feel better when they do not need to ride crowed trains or buses to go to universities or colleges. Moreover, with on-demand-type lectures, students are able to view the video lectures repeatedly, if necessary. Learners can listen to lectures not only on a PC/tablet but also faculty can provide mobile devices whenever it is convenient to use. Goodwin and Miller (2013) revealed that educators who use this for online lessons feel this usefulness because they can give some students more advanced contents. Learner levels are not the same in almost any of the cases. Some learners sometimes feel bored because they have to spend much time on subjects they already know or understand without any difficulty. For such learners, educators provide materials that are more advanced levels. Of course, educators can give students easier, clearer, more concrete explanations. Online learning is easy to fit with learners' levels. Schneider, Wallace, Blikstein, and Pea (2013) suggested that learners who enter into open-ended studies can attain better achievements than other learners who used traditional textbooks. By using chat or other functions, learners are able to participate in open-ended discussion or sometimes learners, themselves, can teach. Teaching others is sometimes a useful way, not only for learners who do not understand, but also for learners who are not perfect but understand well. Explaining to others can sometimes promote learners' understandings. Wu, Hsieh, and Yang (2017) found that the online learning group not only promotes meaningful collaboration, but also achieved the participants' oral proficiency, and it leads to more active learning in highly interactive learning activities, such as class discussion and presentations by groups. In most meeting software, such as Zoom, Slack, and Teams, such functions are equipped and learners and educators can use without difficulties. Amasha et al. (2018) suggested that the usage of online learning and assessment in synchronization becomes a motivation and can enhance students' performance. Surely, some reports indicate that the drop rate of students during the semester decreased. Chats and forums can free learners from loneliness.

On the other hand, some educators have negative opinions on online learning and feel face-to-face classes instead of online learning are more appropriate (see, for example, Willet, Brown, & Danzy-Bussell, 2019). Whitney (2019) indicated that online learning appears to have negative effects on student learning compared to in-person teaching. There are some studies which found no difference between online learning and face-to-face learning. Yen et al. (2018) revealed that students achieve equally well across all (three) teaching modalities.

One important key point for the success of online learning seems to depend on learners' readiness. Bovermann, Weidich, and Bastiaens (2018) showed that students who indicated low readiness for online learning have non-autonomous motivation. On the other hand, learners who have strong incentives to study are sometimes not eager to study online learnings.

Flipped or reversed classrooms have recently been paid much attention in education. The relationship between online learning and flipped learning is, of course, strong. The flipped classroom is a reversed

method of traditional teaching in which learners study using materials outside of class (school), such as at home, usually videos (on demand) or textbooks, and then do their additional work, such as problem-solving, discussion, or debates, in the classroom. Caviglia-Harris (2016) showed that students in the flipped classroom scored higher points. Kurihara (2018) found that a flipped classroom facilitates the effectiveness of learning, but it is difficult to increase active learning such as spontaneous incentives for study. Sometimes there seems to be a lot of cases where lecture-based classrooms achieve more active study. If the goal of teaching is usually to engender understanding, educators must move from memorization of knowledge and facts, known as surface learning, for example, to deep learning in which understanding is promoted from active and constructive processes (Kurihara, 2016).

It seems difficult to decide which is better, online learning or face-to-face learning. They are inconclusive at this point. There is one small possibility of blend classes, which constitute of online learning and face-to-face class; however, it is too intrinsic. There is less evidence about models that blend elements of online and in-person instruction.

In most countries, most universities or colleges had to perform classes by online learning from April (most Japanese universities usually start from April). There is little study that copes with the pros and cons of online learning as the spreading of COVID-19 has been too sudden. However, researchers have to cope with COVID-19 and at least after COVID-19. It would be necessary to report the results of my class. Improving the quality of higher education is necessary.

3. Preliminary Analysis for Evaluating Online Learning

It should be examined much more from now on whether online learning promotes learners' learning or not. More information is necessary to examine the examples of whether online learning will be or should be continued. There would be possibility that blend classes of online and face-to-face should be conducted after the COVID-19 crisis if the effectiveness of such style would be large.

Table 1 is the questionnaire results for learners. The number of the sample is 42. It is interesting to note that "on-demand" type is the most popular among online learning. Of course, some points should be noted. One is that the results depend too much on the situation of COVID-19. For example, it is expected that face-to-face would be unpopular when the situation is too serious or rapidly worsening. Furthermore, as freshman have not been to universities almost at all, some of them would like to go to universities to make friends or for some incentives such as finding extracurricular activities. Most Japanese education institutions start from April. Moreover, if learners have many classes live, they sometimes feel tired. Watching screens for a long time impairs eyes and health. However, it is clear that on-demand type is popular and live type is unpopular.

The number of the sample is small and the results are too dependent on many kinds of situations; however, hybrid type, namely, on-demand and face-to-face would be reasonable. One reason is that flipped classroom would be preferable if conducted face-to-face. However, as the COVID-19 situation

becomes too serious, face-to-face class would be impossible for many education institutions all over the world.

In my classes, some classes that the number of students is relatively small, live type was employed; however, a few students could not join because the network was not working fully. At the earlier stage, microphone and camera were sold out. Some students may feel so stressful when they appear on the screen. Thus, on-demand type was basically used. Other classes that the number of the students is large, only on-demand type was conducted.

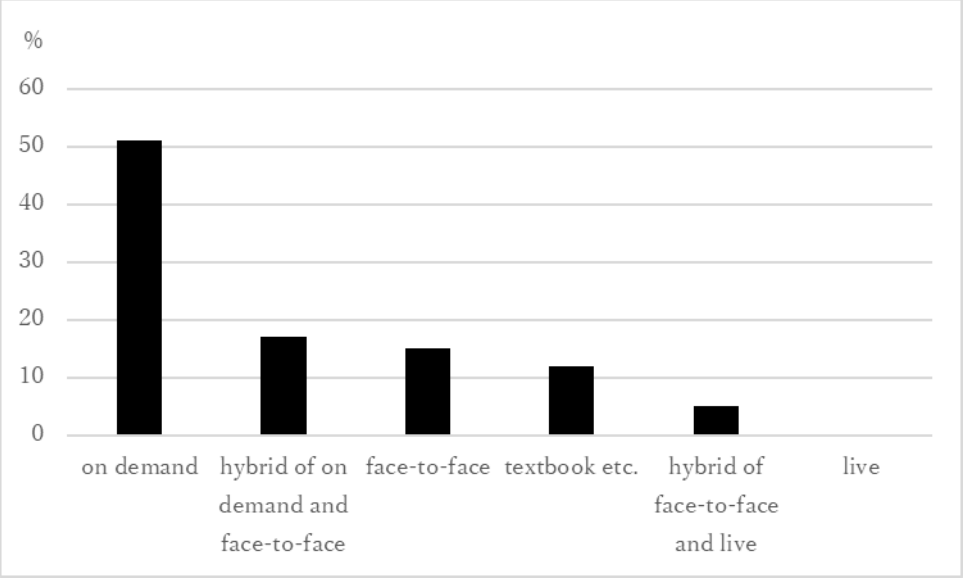

Figure 1. Preference for Students

This study focuses on the quality of learners' learning. A lot of the results of questionnaire including the large number of samples have been presented about online learning; however, quality of learners' learning has not been analyzed much. Quality assessment is urgently necessary.

Table 1 is the results of evaluation of one class. This class is finally evaluated by report, small test, and final test. Present times and times of seeing the video were not included for final evaluation. The parentheses of the table are "mean" and are compared with face-to-face class (last year). Additionally, the weight of each point for final evaluation is different between this year and past ones (including last year).

Table 1. Statistical Description and Comparison of Online Class and Face-to-face Class

	Final result (0-100)	Present (0-15)	Times of seeing the video (0-)	Report (0-10)	Small test (0-15)	Exams of the end of the semester (0-65)
Mean	76.1404 (-4.6096)	14.7544 (0.8244)	105.5439 (67.3639)	3.7543 (-5.0557)	13.7421 (4.6211)	53.7532 (-0.6518)
Median	75.0000	15.0000	107.0000	4.0000	14.4000	57.5001
Maximum	95.0000	15.0000	215.0000	10.0000	15.0000	64.0000
Minimum	40.0000	8.0000	43.0000	0.0000	0.0000	25.0000
Std. Dev	12.1479	1.0737	33.0843	2.5587	2.3095	14.9214
Skewness	-1.0992	-5.0878	0.6531	0.6120	-4.2977	-0.6911
Kurtosis	4.9710	30.0437	3.6653	2.6386	24.0924	2.4030
Jarque-Bera	20.7047	1982.900	1231.995	3.8689	1231.996	1.5009
Probability	0.0000	0.0000	0.0000	0.1445	0.0000	0.4736

Note. Parentheses are “mean” and compared with face-to-face class (last year).

It should be noted that the number of learners seeing the video is large and it increased compared to the past face-to-face class; about a 1.5 times increase. Also, the score of small test (some of them are multiple choice) increased, but the score of reports decreased largely. Rublic was used because evaluation criteria should be much more clarified under this situation; however, it did not function well. There are not in the table, but for small tests, the scores of multiple-choice-type small tests scores are quite high but the scores of writing-type small test are quite low.

It is interesting to note that there would be some possibility that the quality of the class did not improve. In the next section, some statistical analyzes are employed for further analyses.

4. Empirical Analyses

This paper focuses on the achievement of my class. Numerous studies have begun to be presented; however, the evaluation of quality has not been fully examined and discussed.

The correlations of each variable are in Table 2.

Table 2. Correlations among Variables

	Present	Times	Small test
Present	1	0.1970	0.8064
Times	0.1970	1	0.2650
Small test	0.8064	0.2650	1

Leaners could not attend face-to-face classes at all, so seeing the video at least one time counts as "present" in the class. As expected, some learners repeatedly viewed the video. However, have they accomplished this subject's goal successfully? Other important points including this one are analyzed next.

Regression analyses are performed for the final scores. Least Squares and Robust estimations are empirical methods. Robust estimation is unlike maximum likelihood estimation and is used because the number of the samples is not so large. OLS estimates for regression are sensitive to observations that do not follow the pattern of other observations. This is not a problem if the outlier is simply an extreme observation from the tail of a normal distribution; however, if the outlier is from non-normal measurement error or some other violation of standard OLS, it compromises the validity of the regression results if a non-robust regression method is employed. In the panel analyses, fixed effects model and random effects model are employed. The results of the regressions are in Table 3.

Table 3. Regression Analyses for Final Score

Method	Ordinary Least Squares	Robust Least Squares	Ordinary Least Squares	Robust Least Squares
C	-69.5333***	-70.2128***	-40.2426**	-39.9641**
	(-4.5128)	(-4.3871)	(-2.3701)	(-2.2284)
Present	8.8867***+	8.9969***	4.7584***	4.8286***
	(8.3701)	(8.1582)	(2.9204)	(2.8057)
Times	0.0730**-	0.0662*	0.0542	0.0534
	(2.1189)	(1.8491)	(1.6697)	(1.5587)
Small test			2.4460***	2.3518***
			(3.1757)	(2.8908)
Adjusted R-squared	0.5966		0.6547	
Adjusted Rw-squared		0.6944		0.7015
F-statistic	42.4145		36.3951	
Prob(F-statistic)	0.0000		0.0000	
Rn-squared statistic		78.9857		95.2412
Prob(Rn-squared statistic)		0.0000		0.0000

Note. Parentheses are t statistics. ***, **, and * denote significant at 1, 5, and 10%, respectively.

It should be noted that learners could get final good scores by multiple choice small tests. As Table 2 shows, however, the score of reports declined largely. Wring ability seems not to be increased. Moreover, the times of viewing the videos are related positively with the final score; however, the relationship is not so conclusive. There would be a possibility that the method of learning has damaged some aspects. Spontaneous and progressive learning may be hindered. On the other hand, learners asked many questions compare with the last year (face-to-face). Finally, the number of questions increased. It cannot conclude that the willingness to study has not seemed to be damaged; however, there would be some possibility that learners who are not good at face-to-face class may have asked questions while learners who are good at face-to-face class may not have asked questions.

Finally, three questionnaires are conducted:

Q1: Did it (video material) help your understanding?

Q2: Did it make you challenge spontaneous study?

Q3: Did you feel growth as a learner?

The results are in Table 4.

Table 4. Questionnaires

	Q1	Q2	Q3
Mean	4.0833	3.4583	3.9166
	(-0.4287)	(-0.8227)	(-0.2184)
Median	4.0000	3.5000	4.0000
Maximum	5.0000	5.0000	5.0000
Minimum	2.0000	1.0000	1.0000
Std. Dev	0.7389	0.9443	1.0883
Skewness	0.4499	-0.2618	-0.9350
Kurtosis	2.8957	2.7279	3.3302
Jarque-Bera	1.6411	0.6965	7.2130
Probability	0.4401	0.7058	0.0271

Note. Parentheses are “mean” and compared with face-to-face class (last year).

Faculty must change themselves and move from “memorization” of knowledge and facts, generally known as surface learning, to deep learning which learners understanding is facilitated from meaningful and constructive processes (Kurihara, 2016).

It would be quite difficult to achieve significant and positive effects in my class by introducing a flipped classroom and active learning at the same time; however, it would not be impossible. A blended class that combines the flipped classroom and face-to-face class may be one key issue or solution with or after the COVID-19 crisis. However, flipped classroom and online class are not goal. For flipped

class, the method was almost the same with the last year (face-to-face). However, it seems that learners could not improve important abilities in reality. Spontaneous study may drop and this problem is serious.

Face-to-face could have solved this issue, although it is difficult to judge. However, at least over dependence on online learning could cause serious problems. Pursing too much clarity on the grounds that we are not face-to-face or reducing the level of the class for clarity would hinder learners' learning, especially spontaneous learning. Comparing last year's class, the key points are the results of reports and multiple choice tasks. Learners would like to learn under this sever condition. However, communicating with other learners, much more feedback from faculty to students, and tasks which are related with real world would be solutions. Face-to-face classrooms give selectable choices. Moreover, learners are under too much stress and worry about tasks, so some faculty, including myself, did not give students many tasks. Faculty may have to adjust the amount and number of tasks with other faculty. While considering such things, the contents of the tasks should be also considered.

5. Conclusions

As the COVID-19 crisis occurs, many education institutions all over the world have to quit face-to-face classes and instead conduct online learning. Online learning has merits and are highly welcomed by learners and faculty. However, whether the learning quality of online learning improves or not should be evaluated adequately. Online learning without face-to-face is different from flipped classrooms. The empirical results show that most of the results are not different from face-to-face class and quiz-type test scores are quite high; however, the quality of reports declined significantly. There is some possibility that surface knowledge improved, but in-depth learning by thinking or discussing with other students are not realized.

There is room for further studies. Ramirez (2018) showed no differences in attitudes toward Twitter for educational purposes based on the number of online courses the students and faculty completed. As such, new technologies will be invented and teachers should follow them if the introduction will improve the classes.

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References

Amasha, M. A., Abougalala, R. A., Reeves, A., & Alkhalaf, S. (2018). Combining online learning & assessment in synchronization form. *Education Information Technologies, 23*, 2517-2529. https://doi.org/10.1007/s10639-018-9728-0

Bovermann, K., Weidich, J., & Bastiaens, T. (2018). Online learning readiness and attitudes towards gaming in gamified online learning—a mixed methods case study. *International Journal of Educational technology in Higher Education, 15*, 27. https://doi.org/10.1186/s41239-018-0107-0

Caviglia-Harris, J. (2016). Flipping the undergraduate economics classroom: Using online videos to enhance teaching and learning. *Southern Economic Journal, 83*(1), 321-331.

Kurihara, Y. (2016). Flipped Classroom: Effects on Education for the Case of Economics. *Journal of Education and e-Learning Research, 3*(2), 65-71.

Kurihara, Y. (2018). Is Flipped Classroom Effective in Higher Education for the Case of Economics. *Journal of Business Economics and Information Technology, 5*(5), 1-7.

Louhab, F. E., Ayoub, B., & Talea, M. (2018). Considering mobile device constraints and context—awareness in adaptive mobile learning for flipped classroom. *Education and Information Technology, New York* (May 2018), 1-26. http://dx.doi.org/10.1007/s10639-018-9733-3

Milman, N. B. (2012). The flipped classroom strategy: What is it and how can it best be used? *Distant Learning, 9*(3), 85-87.

Ramirez, D. M. (2018). Computer technology and Twitter for online learning and student engagement. *Journal of Multidisciplinary Research, 10*(1-2), 137-153. https://doi.org/10.1016/j.jhlste.2019.100206

Westermann, E. B. (2014). A half-flipped classroom or an alternative approach? Primary sources and blended learning. *Educational Research Quarterly, 38*(2), 43-57.

Whitney, K. (2019). Moving the classroom to the computer lab: Can online learning with in-person support improve outcomes in community colleges? *Economics of Education Review, 70*, 159-172.

Wu, W.-C. V., Hsieh, J. S. C., & Yang, J. C. (2017). Creating an online learning community in a flipped classroom to enhance EFL learners' oral proficiency. *Educational Technology & Society, 20*(2), 142-157.

Yen, S.-C., Lu, Y., Lee, A., & Enriquez, J. (2018). Learning online, office, and in-between: Comparing student academic outcomes and course satisfaction in face-to-face, online, and blended teaching modalities. *Education Information Technologies, 23*, 2141-2153. https://doi.org/10.1007/s10639-018-9707-5