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Effects of forced distance learning on student engagement in the case of International Economics (in English)

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Abstract

The Covid-19 pandemic and resulting shift to online learning in April of 2020 in Japan offered a unique opportunity to study many types of differences of online and in-class learning environments. One such opportunity was to compare levels of student preparation and engagement in a Content (International Economics) and language (English) integrated learning (CLIL) class.

The scores of two groups of students in two separate years, taking identical quizzes, one in a traditional in-class environment, one in the Covid-19-caused forced at-home environment, were compared. The students forced to attend online classes showed markedly higher average quiz scores related to the assigned readings each week: the online class, on average, scored 12 points higher (out of 100) each week. Further, in each of the two years the scores at the beginning of the term were higher and then gradually decreased over the length of the term. This improvement in scores was not affected by any diminishing returns and remained relatively steady throughout the term. This indicates that there was something about the situation in 2020 that caused students to make a greater effort to prepare for class and that this effect was prolonged.

This increased engagement is a welcome finding for educators in Japanese Universities, who have long battled student effort levels. It is also important, given that the course is taught in English, which is a focus of Japanese higher education and a particular source of frustration regarding student engagement (King, 2013). This research does not attempt to identify the exact cause of this increased engagement but concludes that something about studying from home may increase student comfort levels studying content (International Economics) in a foreign language.

Keywords: CLIL, student engagement, economics education, remote learning

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Introduction

The sudden need to teach online at the beginning of the first term in April, 2020 brought about many challenges for teachers and students alike. It also provided opportunity for research comparing online and in-person classes and study environments. Inspired by innovative social science methods such as trying to make consumer behavior observations in a fast-changing context (Pierce, 2009), it was decided to observe the students who were thrust into this unexpected learning situation and attempt to document useful conclusions.

A CLIL course entitled “Learning International Management in English” (The Course) is taught to second year undergraduate students at Fukuyama University in Hiroshima, Japan. The Course uses a textbook made available at no cost to students via the Saylor Foundation titled “Fundamentals of Global Strategy” (De Kluyver, 2010). The text is used to introduce students to vocabulary and concepts that they are already roughly familiar with in their native language (Japanese) in order to facilitate the ability to participate in class discussion and understand lectures taught entirely in a foreign language (English). While teaching the course in previous years it became clear that a weekly quiz would provide needed motivation for students to do the readings (one chapter per week). The quiz until this year has been conducted at the beginning of each class using the Kahoot! App (Kahoot!, 2013). (Students view the questions on a screen and enter answers via their smartphone).

In early April, 2020, it was officially announced that first-term classes would not be starting as normal (Fukuyama University, 2020). Faculty members were instructed to “pre-teach” material via the internet while waiting for classes to begin (it was hoped that classes could begin in May). During this time of interaction with students, the author observed a heightened feeling of engagement from the students. Tasks were completed more quickly than expected, questions would be asked where they had not been in the past. Anecdotal conversations with colleagues echoed these observations. A common theory was that in such a time of isolation and uncertainty, any kind of normal interaction was welcome. When it was announced that classes would indeed be starting in May, but that they would be entirely on-line, it was decided to attempt to quantify this increased engagement by replicating the quiz from the previous year in as identical a way as possible for the purpose of comparing online and in-person classes.

The theoretical background for the study comes from the literature on the productivity benefits of working at home (Bloom, 2014), though not all the research shows entirely positive outcomes (Farrell, 2014). There is also study on the positive and negative effects of online and hybrid courses at post-secondary educational institutions (Mupinga, 2007). Also, it should be noted that there is research that suggests that test scores are improved in general if the learning environment is virtual (Goldberg &

McKhann, 2000). It is expected that the literature in this field of remote study/work productivity will rapidly expand as the effects of Covid-19-caused work/study situations is examined.

Background

Fukuyama University is a private university in Hiroshima Prefecture, Japan, with approximately 5,000 students, mostly undergraduates. The Department of International Economics instituted a new course several years ago entitled “International Economics in English”, which was later split into two separate courses, “International Management in English” in first term and “International Trade in English” in second term. The purpose of the courses is to teach a second-year, university-level of Economics, using only English – all lectures are entirely in English, all readings are in English, and all assignments are to be done in English following the theory of Content and Language Integrated Learning (Dalton-Puffer, 2007). The students are mostly 2nd year Economics undergraduates whose English level is approximately high-beginner.

The first eight chapters of “Fundamentals of Global Strategy” are covered in weeks two through nine of the course. In week one, the students are told that beginning in the following week, there will be a quiz at the start of each class covering that week’s text chapter. Each chapter is approximately twenty pages of English text, at quite an advanced level of English. In the first class of the term, students are given a guide as to how to approach each chapter and instructed to focus on three key goals: first, understand the titles and subtitles completely as these include the economic concepts for the chapter; second, understand the general concepts discussed in the chapter; and third, be familiar with the chapter summary. The goal is not to have the students attempt to understand everything, but rather to arm the students with some knowledge of key terms ahead of the class to aid class participation and comprehension. As such, the weekly quizzes are intended to be quite general and not difficult. The class is recommended, but not compulsory, and is populated by mostly second year students of the Department of International Economics. Prerequisites are first year Micro and Macro Economics and first year English. In 2019 there were 25 students in the class, in 2020 there were 48 students.

The study

The study aimed to compare the results of identical quiz questions on two groups of students, a 2019 group who attended class normally, and a 2020 group who were forced to attend class online only because of the Covid-19 pandemic. The weekly quizzes were based entirely on assigned reading, that is, no classroom activity had bearing on success in answering questions correctly, all preparation was done independently by students. As such it is hypothesized that this study will indicate general levels of student engagement in their studies, and effort regarding learning in a foreign language. The quizzes involved assigned reading only, immunizing the effects of in class learning. The study attempts to measure the students' preparation and engagement in their studies, specifically related to foreign language-based content (International Economics) rather than the learning outcomes from the different styles of classes.

While exact duplication of quiz questions and overall time allowed was possible, format was not. In 2019 students viewed questions one by one on the screen in class and entered their answers via smartphone, while in 2020 the students were given the questions all at once in an online quiz. In the 2019 versions, students would be asked to log in to Kahoot! at the beginning of the class and the quiz would follow. Each quiz had between 8 and 20 questions, all multiple choice. To attempt to match the environment in 2019 as much as possible, in 2020 the students would get access to the quiz for exactly the same amount of time as the elapsed quiz time in 2019 (Kahoot! allows the quiz giver to set time for each question.) In both cases, the quizzes were stated to be open book. In 2019, in addition to being open book, some collaboration in class was permitted (quietly chatting with people seated nearby, ideally in English). It is assumed that some groups of students would have collaborated online via messaging apps etc in 2020, but given that collaboration was allowed in 2019, this is not judged to be of significant advantage. All of the questions were multiple choice, and all except for week six were sentence based (ie no pictures or video).

For example:

A company opens a factory in Vietnam to take advantage of lower labor costs. This is an example of

- A) Adaptation**
- B) Aggregation**
- C) Arbitrage**
- D) None of the above**

While conducting the quizzes, two exceptions should be noted. First, the questions in week six were of a slightly different format in that students were asked to view a video and then answer a question about that video. This will be discussed more in the results section because the scores in this week were somewhat of a slight outlier. Second, each week's quizzes were tabulated and then compared to the previous year's quizzes, but in one case in 2019 (week 5) there was a power outage so only the scores of the first eight questions were counted. As a result, to attempt to preserve the study's integrity, in 2020, week 5, only the first 8 questions were counted.

It is important to emphasize again that this study is not attempting to assess learning outcomes in class, but rather the motivation and engagement that students bring to each class. The quizzes were chosen for their out-of-class effort isolation: all material on the quizzes is from the assigned reading. Thus none of the result of the quiz can be attributed to the difference in lesson styles, but rather the student engagement in their own studies in their own time. The intention was to try and quantify the generally observed sense of heightened engagement observed in the student body by the author and faculty colleagues in April, 2020, a month of "pre-teaching" where there was much uncertainty of when lessons would begin and anxiety about the situation of the COVID-19 pandemic. It should also be noted that during this "pre-teaching" of some material in the month of April, 2020, in the interim before actual classes began, none of the material covered in the readings was introduced to preserve the efficacy of the study.

Hypothesis

According to the observations from the "pre-teaching" period in April, 2020, it is expected that the situation of online lessons will increase student engagement and effort. This will result in higher scores on the quizzes and higher attendance (as reflected by the proportion of each class that sits each quiz.) Further it is expected that given the laws of diminishing returns (and the related research on worker performance), both the scores and the year-on-year increases will decrease over time. The scores decreasing over time hypothesis is based on anecdotal evidence the author has observed in four years of teaching the course: students tend to arrive in April full of energy and motivation and this wanes over time.

It should be noted that in 2019 there were 25 students registered in the class, and in 2020, there were 48 students. As it is "recommended", most students take the course, but the proportion of students who took it in 2020 was higher than in 2019. As this course is taught in English, there may be some degree of self-selection in that students who are weaker in English are more likely to avoid this class. However, as it is assumed that the average English ability of the students is not significantly different from year to year,

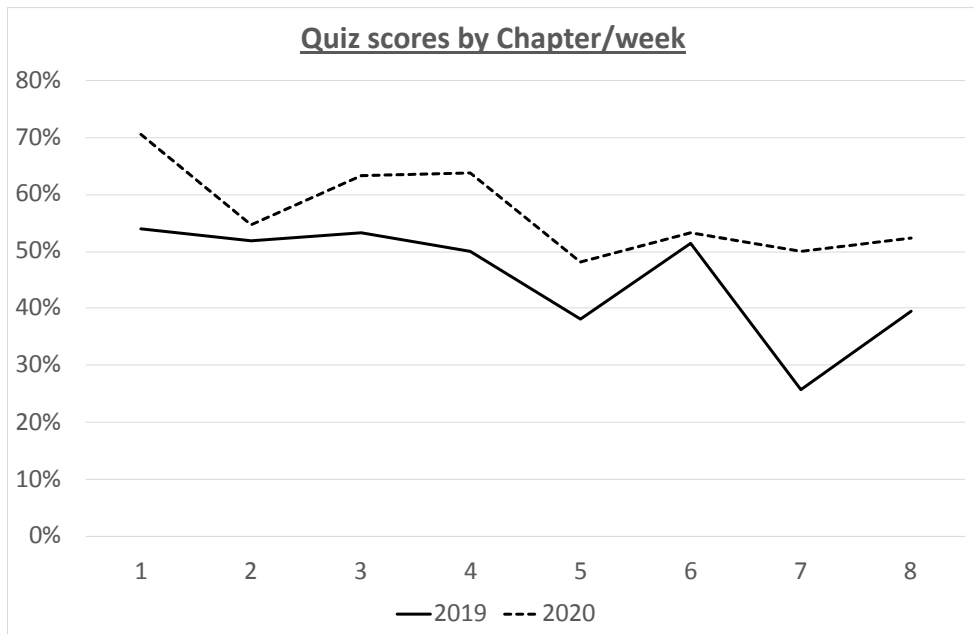
the higher proportion of students taking the course in 2020 would be expected to lower the average English ability and thus affect the quiz scores negatively. And as the study expects the scores to increase because of the Covid-19 situation, self-selection is not viewed as a confounding factor in the study.

Results

Quiz scores

Figure 1 shows the weekly results of the two years of eight quizzes. The students in 2020 scored, on average, 12 points (out of 100) higher on each of the quizzes. Both the 2020 and the 2019 students' scores trended downwards as time passed but there is no discernable decrease in the gap between the two groups of students. That the 2020 students scored higher, on average, is in line with expectations, as is both sets of students' scores decreasing over time. But that the gap remained fairly consistent throughout the eight weeks is contrary to expectations.

Figure 1: Quiz Scores by Chapter/week



Week six results are somewhat of an outlier. While 2020 scores were still higher than 2019 scores, the difference was only 2 points (compared with the average of 12). The week 6 quiz was slightly different as students were asked to watch a short video (of an advertisement) and then answer a question. It is possible that the big-screen environment in class was more conducive to student understanding than

watching on their personal screens at home. In addition, the format of the test may have had more of an effect in this case. The 2019 quiz version of the week 6 quiz had the students all collectively watch a short video (roughly 30 seconds) and only then would the question appear. Therefore the students were forced to watch the entire video, uninterrupted. In 2020, however, the students were given all questions at once, with the videos included as embedded links. Students could watch as they chose. Worried about time pressure, some students may have not watched the videos completely. The difference in week 6 is noted here for posterity, but it does not materially change the outcome of the study in the view of the author.

Attendance

Figure 2: Attendance by Chapter/Week

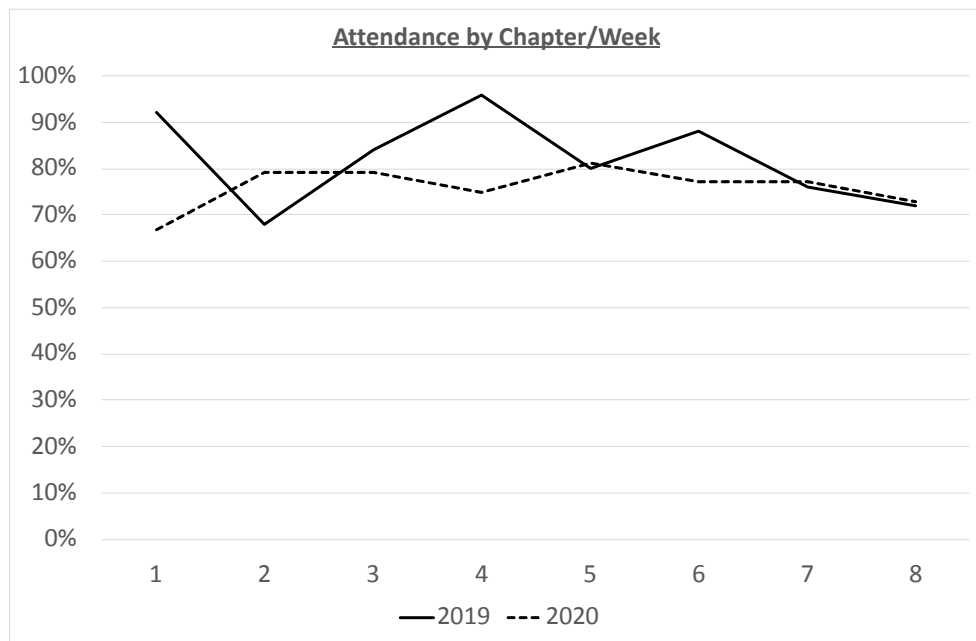


Figure 2 shows attendance by Chapter/week for the two years. The expectation was that attendance would be higher in the 2020 (Covid-19) year but it appears that attendance was slightly better in the 2019 (regular) year.

It should be noted that the reason previous years' results (2017 or 2018) were not included is that the quizzes have changed slightly over the years to attempt to improve them. 2019 and 2020 are the only two years with identical quizzes but anecdotally speaking the results from 2017 and 2018 were not significantly different from 2019.

Conclusions

Observations of their results lead to the conclusion that students prepared more for the quizzes in 2020 than they did in 2019. This is consistent with expectations and gives evidence to support the observations that students were more engaged in the Covid-19 environment. Scores were 12 points higher, which while the sample size is not large, suggest a meaningful year-on-year increase. That the score improvements did not decrease over time leads to two theories, CLIL-unique effects of learning online, or learning online in general. As noted above, there does appear to be evidence that test scores can be higher in an online learning environment, but this study specifically attempted to assess effort and preparation. So it seems reasonable to conclude that there are some CLIL-related effects here. Further evidence to this are the increased registration rates (which will be discussed below). It seems reasonable to conclude that Japanese University students may feel more comfortable in a foreign language from the comfort of their own space rather than in a classroom environment.

Two other conclusions, one expected, the other not. That the overall scores for both years decreased over time is entirely consistent with anecdotal observations of student (and indeed human) motivation. Slightly puzzling though is the rate of attendance being, if anything, lower in the at-home environment. The convenience of attending from home was assumed to be a positive factor for attendance, but clearly it was not. Perhaps the increased registration rates (again, discussed below) are of some explanation as a higher proportion of eligible students in the class leads to a higher proportion of lower-achieving students (who may be more prone to being absent). Important to note that students in both years are subject to the rule that they attend at least two-thirds of the classes.

Other findings and further research

One thing to consider is if the change in environment caused a permanent and replicable improvement in student engagement or if general principals of diminishing marginal utility (Marshall, 1890). Surveys of the 48 students in the test group may be useful as they move through their upper class years. A repeat of the study in April of 2021 would be useful as well either for another remote study if the Covid-19 situation has not improved, or another in-class study if it has.

Noted above is that the proportion of students in each of the two years that were eligible to take the course increased in the 2020 Covid-19 year. This was rejected as a confounding factor in the study because more students taking the course would almost certainly lower the overall English ability in the class because of self selection (students with lower levels of English are more likely to avoid the class). In

2020 almost all of the eligible students took the class, thus it is assumed that more lower level English students are included and yet the average scores still increased. This then leads to the theory that comfort had something to do with both the increased quiz scores and in the willingness to accept the challenge of taking a course in a foreign language.

There is some evidence of this as 48 students registered for the first term course (which was taught entirely online), but only 38 for the second term course (which was taught in-person). This is both good and bad news, however, because although it is a welcome finding that more students are willing to challenge taking a course taught in a foreign language if they can do it online, taking the course online defeats the purpose of students being able to acquire abilities to listen to, and make use of, English in their field. A possible confounding factor in this line of postulation is that both the first and second term versions of the course are taught in first period. Students tend to not like first period because they need to wake up quite early (many students have long commutes to get to school). So, it's possible that the increased registration noted in the first term of the 2020 year was impacted by students being able to take the course but only wake up a few minutes before each class started.

For further study then, the students of the first and second terms of 2020 should be surveyed to attempt to determine why they did or did not take the course. If it is determined that students are more comfortable using English to discuss Economics in the at-home environment, perhaps the course could be modified to include some, but not all, material for at-home tasks.

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