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Abstract

Online teaching and online learning have been studied for many years with focus on both the inputs and outputs, but seldom on outcomes such as the well-being of the students and/or teachers. Therefore, we already know that good outputs in forms of grades are strongly correlated with a clear and robust instructional design and planning, using a systematic model for design and development, but we still know very little about the well-being of the students and/or teachers. Our paper provides insights on the content and the functionalities of our sustainable educational approach (SEA) designed to both facilitate online learning and online collaboration and to motivate students to study and learn continuously, which proved to facilitate a smooth shift to online teaching and learning to stop the spreading of Coronavirus COVID-19 during Spring 2020. Using a sample of students registered for a course in elementary statistics during 2016-2020, we present empirical evidence for the positive short-term effects of using the SEA on the students' grades and their individual well-being.

Keywords: sustainable learning approach, student well-being, elementary statistics, Blackboard, COVID-19.

JEL Classification: A22, I20, I21

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1. Introduction

Enrollment rates into higher education have accelerated in all parts of the world since around the millennium, and educational investments are now almost at 5% of GDP globally (UNESCO 2015). However, while academic success has been fairly well-mapped to intellectual factors, the inability of humans to handle non-intellectual factors are likely to incur the simultaneous academic failure of many students in self-directed higher education (Credé and Kuncel 2008). Furthermore, the need of sufficient skills, attitudes, habits and motivation, all coincides with the multifaceted construct of procrastination, described as the "quintessence of self-regulatory failure" (Rebetez et al. 2016) or more formally as "to voluntarily delay an intended course of action despite expecting to be worse off for the delay" (Steel 2007). The increasing expectations about the negative effects of procrastination on both learning, performance and well-being of the individuals have spurred research in several areas in the last decades. In terms of the five factor personality traits model, procrastination is related to low conscientiousness, while the other four personality traits tend to determine the phenomenology of procrastination (Steel and Klingsieck 2016). Although procrastination might be viewed as a general personality trait that is not separable genetically from impulsivity (Gustavsson, 2014), it can also be triggered or mediated in specific domains, for instance via social affiliation, task aversiveness and body image (Klingsieck 2013).

Notably, the increasing use of social media and computer games has likely led to a sharp increase in procrastination in general and academic procrastination in particular (Steel, 2011). Essentially, every student is likely at some point to engage in academic procrastination, but the continuity (Day et al.2000) and the extent (Pychyl wt al. 2000) to which individual students are affected varies considerably and is associated with low levels of well-being (Sirois and Pychyl 2016). Even though there is a considerable amount of empirical studies on procrastination and learning, there are only a few interventional studies on procrastination and learning (Glick and Orsillo 2015) where teaching strategies to minimize procrastination are developed, tested and analyzed. Nevertheless, to our knowledge, the literature is still very limited about both the students' well-being when combining different types of teaching and learning models and how all these inputs affect the students' confidence about their knowledge accumulated during their university studies.

In this context, we provide new results from an analysis of the changes made to an introductory course to help the students to continuously study and verify that they accumulated relevant knowledge. The changes consist in combining the classical methods of teaching and working with students to find the correct answers to given questions with components of new educational formats such as MOOCs (Massive Open Online Courses) and SPOCs (Small Private Online Courses), aimed to help the students both to accumulate and to test their knowledge during the course. The logic of our new design of the course content is similar to Early Human Culture, paralleling the biological evolution of early humans with the development of cultural technologies that allowed them to become increasingly successful at acquiring food and surviving predators. The evidence for this evolution in culture can be seen especially in three innovations: 1) the creation and use of tools 2) new subsistence patterns; 3) the occupation of new environmental zones. In other words, human development always led to technical development, innovation and creation and this required changes in the way of accumulation knowledge. All these three innovations were implemented and developed since fall 2016 and were proven to be especially useful during the second half of the spring term 2020 when the Swedish government, due to Coronavirus, recommended that all higher-education activities related to teaching, learning and examination should be done remotely. Nonetheless, our teaching package for teaching and continuously learning during a course has several components that are in line OECD's suggestions for embracing digital learning and online collaboration in the context of necessary closures (Reimers and Schleicher 2020).

2. The need for digitally supporting learning

2.1 The need for digitally supported learning - in light of the coronavirus COVID-19

The digitalization has meant that students today are very accustomed to and presumably expect that the benefits outweigh the costs of adapting to new digital applications when moving from the traditional classroom to digital learning platforms. At the same time, the use of social media and computer games are assumed to be responsible for the sharp increase of students' voluntary delay in study-related activities, i.e., academic procrastination (Steel, 2011). Thus, it is important to create "how-when-why" incentives as to steer the students to learning strategies which make them reap of the digital benefits, especially if the cognitive load is high - such as during examinations.

All investment in learning lost due to inefficient learning strategies and tools, student's procrastination and/or school closure due to a shock (such as the Coronavirus outbreak in 2020), is expected to lead to worse outcomes, both in form of failing exams but also in a superficial accumulation of knowledge needed in most cases in other courses – accompanied with worse health outcomes in the long run. Therefore, it is of critical importance for both students, and the teaching and examination staff, to identify all inputs that facilitate the accumulation of sustainable knowledge in a given period of time. This type of knowledge was proven to be useful for all universities around the world in the first half of the year 2020 when governments implemented emergency plans to slow down and limit the spread of the Coronavirus in many countries, including changing access to or pausing education for several weeks.

In this chapter, we analyze data from Sweden covering the period where the concept "Swedish exceptionalism" was once again popularized when the seemingly non-authoritative wait-and-see strategy relying on the individual's own responsibility given governmental voluntary recommendations got huge international attention. In this setting, recommendations were that all teaching, learning and examinations at the higher-education organizations were to be done remotely. Nevertheless, compared to other countries, Sweden was an exception, locally allowing for larger flexibility within all educational units at all educational levels, implying that the educational system was never locked down. While (compulsory) elementary schools and daycare units continued teaching on site, most of the (voluntary) educational activities in both high school and university were done remotely since the middle of March. This shift in teaching activities were facilitated by Sweden's high degree of digitalization due to previous investments in infrastructure and the intensive use of digital learning platforms which prevented a long-term disruption of teaching, learning and examination activities.

2.2 The development and the implementation of our approach

Our framework of teaching and learning aims to get the students to work continuously and not postpone their studies (i.e., academic procrastination) through weekly self-reliant digital tests, from here on called weekly quizzes. We constructed our teaching and learning platform on the basis that robust statistical reasoning and thinking is a prerequisite for understanding, learning and accumulating sustainable knowledge, but not

only to strengthen the students' statistical abilities but also their well-being. In order to develop the abilities, it is crucial to find out efficient combinations of both the teaching platform, teaching tools and teaching pedagogy used by the teachers and the learning methods and tools used by students.

Basic concepts are important for early success in learning new material, by helping the learner to form the foundation for understanding and accumulate new knowledge. While many teachers of statistics are likely to focus on transmitting basic concepts, many students are likely to have trouble with statistics due to non-cognitive factors, such as negative attitudes or beliefs towards statistics (Gal and Ginsburg 2017).

The occurrence of negative "statistics anxiety" in statistics and methodology courses is high (Onwuegbuzie 2004). Negative attitudes or beliefs towards statistics can impede learning of statistics and/or hinder the extent to which students develop statistical intuition. Therefore, higher involvement of students in learning during the entire course period is expected not only to lead to better study results (Steel and Klingsieck 2016) and sustainable knowledge, but also to a lower stress level (Tice and Baumeister 1997) and an increase in students' well-being and health (Sirois and Pychyl 2016).

Modern teaching and learning methods and tools offer digital enhancement including elements such as "gamification" and "flipped classroom". These two elements where used in the design of our teaching and using our SEA. The course is a 10 weeks full-time introductory course with about 120 students each (spring and fall) term focusing on statistical and methodological elements and is a prerequisite for courses in both statistics and economics.

A great challenge in our approach is to construct an incentive structure helping students to work continuously and not to postpone their studies. Without sufficient and spaced repetition, basic concepts and skills are not consolidated, and surface learning is prioritized at the expense of deeper learning.

The initiation of learning start with the students reading and self-study of the assigned literature for the upcoming week (a kind of "flipped classroom"), where the learning is deepened through learning activities such as lectures, exercises, labs, and final Q&A summary sessions.

An important component of our approach is the weekly quizzes (Figure 1), which are "gamification" influenced self-correcting digital tests intended to help the students to start learning basic concepts and skills.

The weekly quizzes are digital (as suggested by Larwin and Larwin 2011), distributed within and between weeks (as suggested by Vaessen et al 2017), embedded (as suggested by Sosa et al. 2011) and with self-competition against a balanced achievable level (monitored via Blackboard course evaluations). Our approach facilitates the participating students to check their pre-test status in preparation for the upcoming week, and in the end for the upcoming final exam (as mentioned by Brown and Tallon 2015). Although the tests are individualized, students are allowed to discuss how to solve the questions, which facilitates their accumulation of knowledge in a social context (as suggested by Deci and Ryan, 1985).

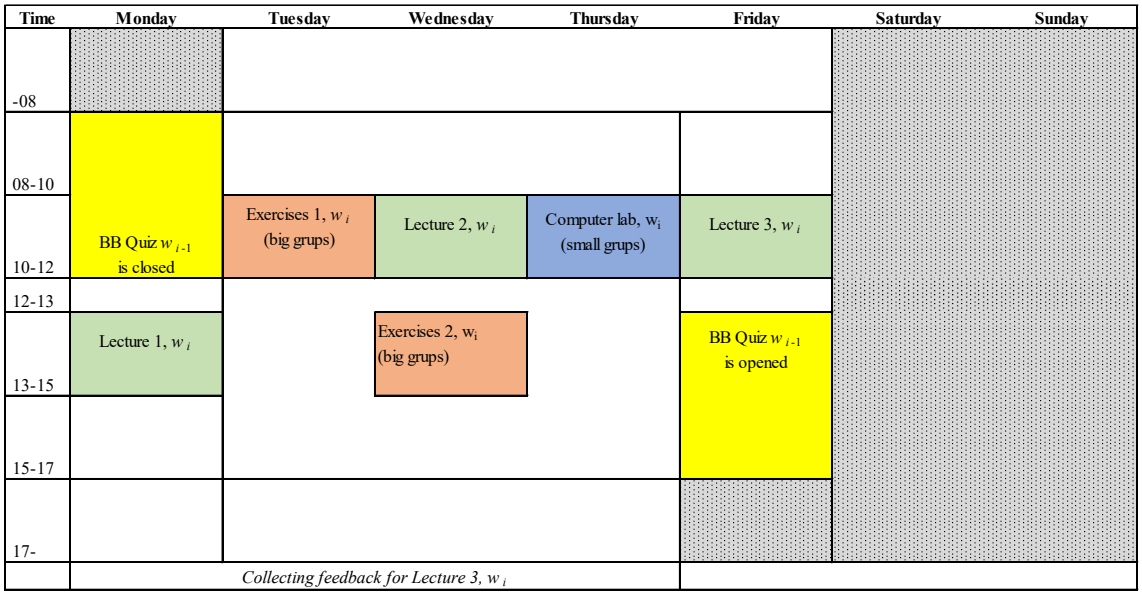

Figure 1 Schedule of weekly learning activities

The quizzes count for up to 10% of the final exam score, so there is a fairly strong incentive why students would attend them. Each weekly quiz is open from Friday noon to Monday noon. A quiz consists of five questions randomly selected from a test bank containing questions on basic skills and concepts that are included in the course literature assigned for a prior reading. Each week, there is a maximum of 20 attempts. The students

receive direct feedback on their answers and their score after submitting each attempt. The best score is considered. Table 1 shows that less than half of the total quiz score does not award any bonus points for the written exam, a bar which should stimulate the students to devote at least a certain amount of time for studies each week. In addition, all points are required in order to receive all bonus points, thus serving as a reward for hard work. Therefore, the mapping of bonus points from the total quiz score gives the students incentives to prepare themselves well for the quiz, which impact positively in their preparation for the upcoming exam studies.

Table 1 Bonus score on the written exam mapped from the total quiz score

Bonus score	0	1	2	3	4	5
Quiz score (%)	<50	50-64.9	65-79.9	80-94.9	95-99.9	100

Since fall term 2016 the weekly quizzes have replaced the single exam-like mid-term quiz, with a few minor adjustments over time. On important adjustment was in fall term 2018, when the written final exam was partly replaced by two examinations (20% each), a survey project (10%) and an individualized audit report (10%) bearing similarities to the quizzes. Consequently, the number of weekly quizzes was reduced from ten to eight.

Figure 2 shows that the bonus earned from quizzes had a positive impact on both the participation rate in the ordinary examination and the percentage of the students who pass the examination in general and pass with distinction, in particular.

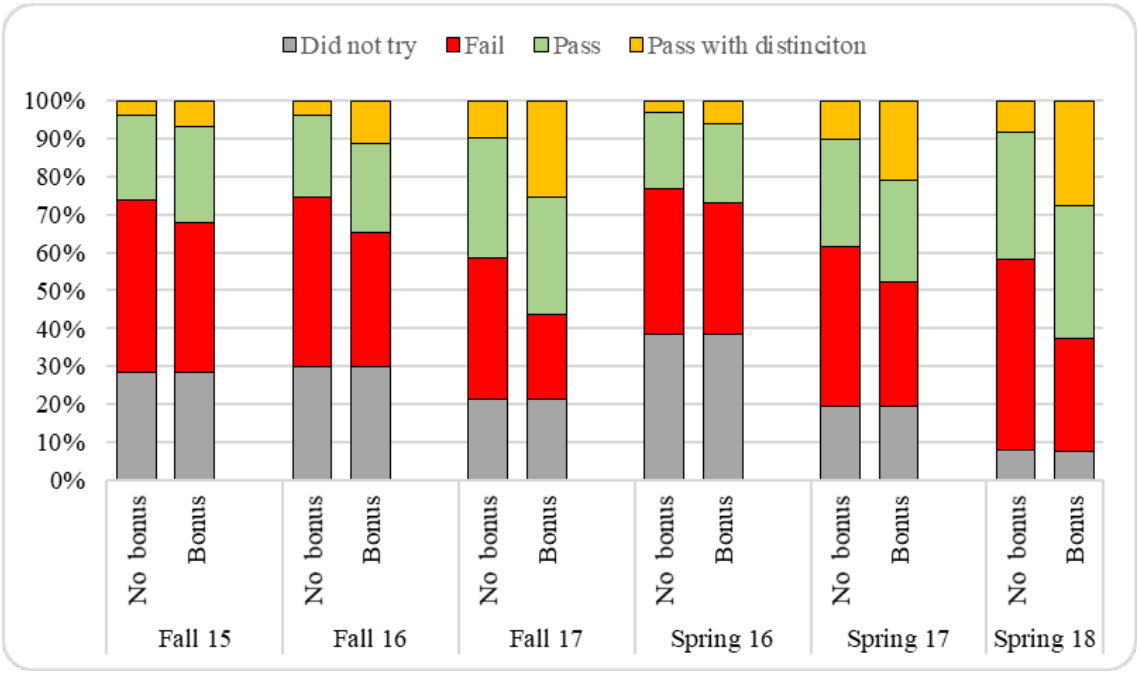

Figure 2 Participation and grade at the ordinary written examination fall 2015 – Spring 2018, by term and bonus

The course is given in the beginning of the term, starting at the end of January, and therefore none of the course's educational activities were affected by the regulations implemented since March 17. Thus, the weekly quizzes were not altered, although all lectures, exercises, and examination were digitalized. One exception was the ordinary exam which was held on campus on March 13 as was originally scheduled. Given that exam registrations and the mean absence rate of students during previous terms, we estimate that (only) about 11% of the students registered but never turned up on the campus-held ordinary exam (Figure 3). Rather than the corona outbreak, students seemed more worried and anxious about the forms of the teaching, and the re-examination in particular. Since the structure of the course (Figure 1) was intact and the re-examination was undertaken as an adaption of the quizzes and the audit report, these familiarities ought to have relieved the students and the adaptions were also praised in the course evaluations.

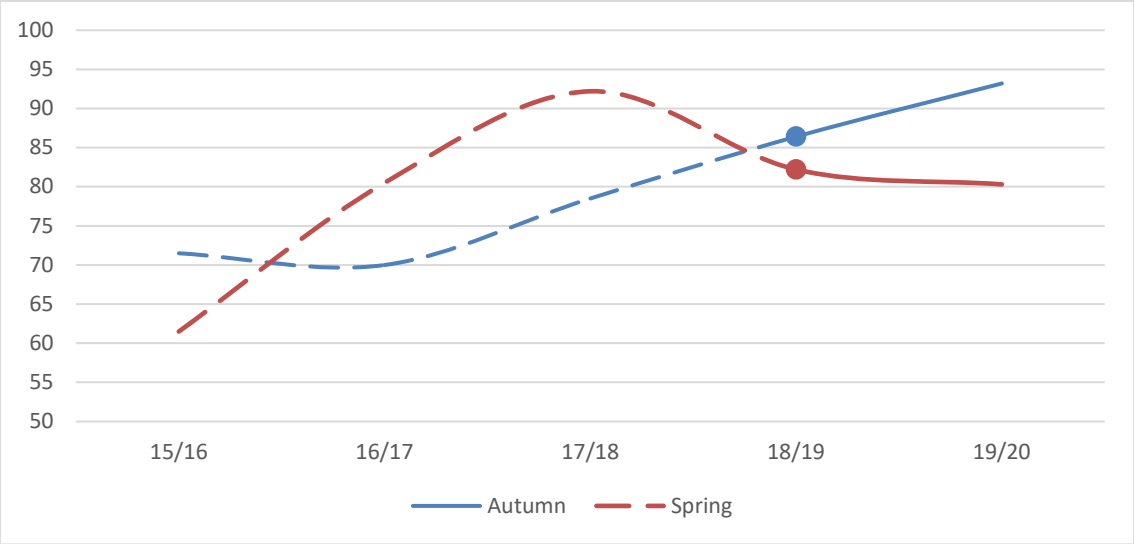

Figure 3 Participation rate at the ordinary written examination 2015-2020, by term, before (dashed line) and after SEA changes

Participation rate in weekly quizzes increased from 83% (fall 2016) to 95% (spring 2017) and was stable thereafter. The lower participation rate during the implementation the first term might be due to teething problems with insufficient communication of the purpos and a few ambiguities in wording of some questions. However, the engagement varies between students – although most students either stop making more attempts when they have reached the maximum score each week (the median is 7), or when they run out of attempts. Some students switch to more fruitful study strategies, procrastinating more on the first quiz but start the quiz earlier in later weeks.

Figure 3 shows that the participation rate in the ordinary exam resembles that of the quizzes, being relatively stable until the fall term 2016 and sharply increasing in the succeeding terms. We hypothesize that the participation rate would not have fallen as much in the last term had it not been for the coronavirus-outbreak.

The quizzes seem to motivate the students to take responsibility for their own learning by constituting a challenging learning environment. They seem to understand and use the incentives "to focus on the right things at the right time" when they consider the basic concepts and skills at the beginning of the week. Both Blackboard data and the course evaluations supports that, starting in the fall term 2018 when the weekly quizzes were introduced, more students spent a reasonable amount of time and was better prepared for the weekly learning activities. The result is a higher goal fulfillment in both

the current (Figure 4) and in subsequent courses. The proportion of students passing the written examination increased on average by 3 % both before (with a single mid-term quiz) and after the new system of quizzes was introduced, but the proportion passing with distinction increased much less before (3 %) than after (11 %). Generally, the total passing rate, see figure 3, increased in a similar way as the participation rate after redesigning our approach in the way presented in Figure 1.

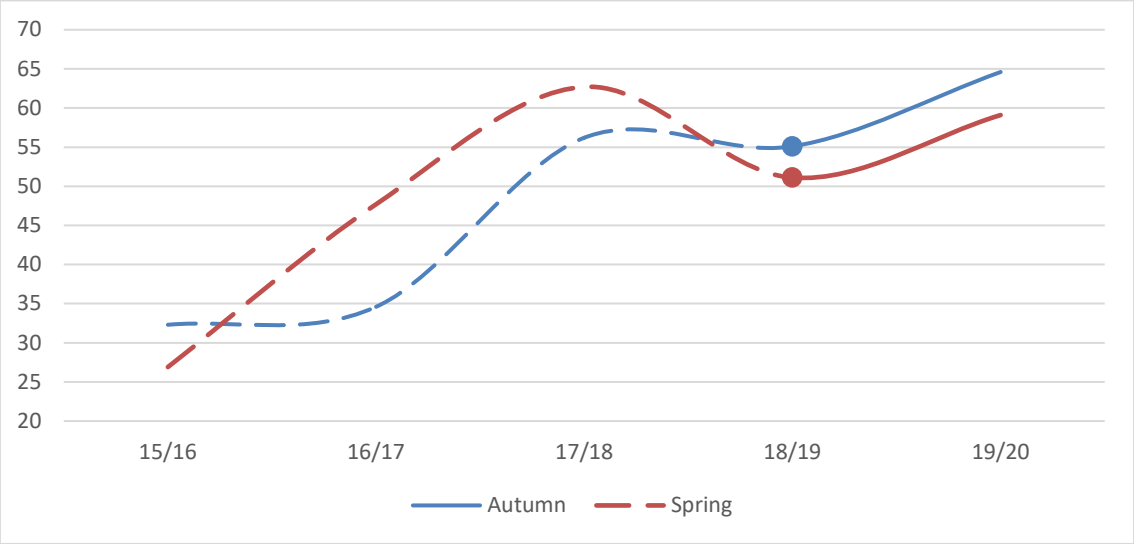

Figure 4 Passing the ordinary written examination 2015-2020, by term, before (dashed line) and after SEA changes

3. Well-being and student well-being

This section presents shortly the concept of well-being and motivates our choice of the concept and the related questions we used in our surveys that were distributed each term to our students. Individual well-being, the determinants of well-being and its development over time are increasingly important policy issues as evidenced by reports such as Stiglitz et al. (2009) and OECD (2011, 2013). The concepts of individual well-being in general and student well-being in particular have presented in different ways in the literature. Although the concept of well-being is widely used, there is no commonly agreed definition of just what it is. Moreover, the terms well-being, quality of life, happiness and life satisfaction are often used interchangeably (OECD 2011).

Even though the theoretical and empirical literature on well-being is huge, the theoretical foundations suggest that policies aimed at improving well-being might have only short-term effects (Diener and Lucas 1999), which might suggest that the focus should be more on the individual's happiness than on their well-being. Subjective well-being (SWB) research is concerned with individuals' subjective experience of their own lives, where SWB usually consists of three interrelated components: life satisfaction, pleasant affect, and unpleasant affect. Affect refers to pleasant and unpleasant moods and emotions, whereas life satisfaction refers to a cognitive sense of satisfaction with life. Unlike traditional clinical models of mental health, SWB does not simply refer to an absence of negative experiences (Diener et al. 1999).

Regardless of the theoretical and/or the empirical framework used to analyse the individual well-being, the concept of SWB came in use much more in the school environment. In many countries, there has been a gradual transition from using the concept of student welfare towards the concept of student well-being, which is consistent with a positive psychology approach (e.g., Ryff and Singer 1996) and the positive education approach (e.g., Noble and McGrath 2008) that both focus on pupil well-being and its determinants. Earlier studies reported that overall, high levels of well-being of pupils is on average positively correlated with higher grades, forgiveness and generosity, more positive and meaningful social relationships, and better physical and mental health (Frisch 2000; Veenhoven1989). Notably, the few definitions of "student wellbeing" (Huebner 1991a; 1991b; 1994) mainly refers to the well-being of children and/or young pupils.

Earlier literature has several times reported concerns that the developed countries seem to nurture ontological individualism (Taylor 1989) and high rates of loneliness and unhappiness (Cacioppo et al. 2016). In a world of digitalization and globalization, human interaction becomes more characterized by interplay rather than by competition. It is therefore important to understand not only the relatively temporary feeling of happiness and unhappiness of the "independent" individual, but also the more stable values driving their state of satisfaction with their life in general, and their domain satisfaction such as studying, learning and being a student, in particular. Therefore, in our survey we use both OECD general life questions and domain satisfaction questions.

4 Methodology

4.1 Survey design

We used web-surveys that were designed to gather information about the students' well-being and how they responded to the move to digitally supported learning and assessment. The students were informed about the purpose of our research and their anonymity, voluntary participation and right to withdraw without giving any explanation and without any consequences. The questions gathered information regarding their confidence about their own knowledge in statistics, techniques and strategies of learning, time spent online, their well-being and demographics (age, gender, housing arrangements). The survey was distributed via "ORU-survey", a web platform integrated in the University environment during each term starting from fall term 2018, with only minor variation of the questions. A public link to the survey was distributed via an email sent to all students through Blackboard's course message facility. While designed to be based on students' freedom of participating, the survey aimed to gain insight into key perspectives of our students. There are about 120 students registered for the ES each term, and the composition of the students' academic orientation differs somewhat between spring and fall. The student group is more homogenous in the spring compared to the fall since ES is then a compulsory course for more students as part of their curriculum for a bachelor's degree in economics and/or business administration.

The first wave of our survey data was collected from three groups of about 100 students each, all of them studying an introductory course in statistics (ES), economics (EE) and business administration (EBA) at our university. The response rate varies a lot, from about 15% for students studying EBA to 78% for students studying EE. The response rate of students studying ES was 39%, which varied a little bit (i.e., 25-48%) during the following waves of our survey.

The first survey was only launched in the beginning of the course and remained open for two weeks. Afterwards, the survey was launched the first day of the first and the last week of the course and remained open for about 10 days. All waves, students answered to the following well-being question: "All things considered, how satisfied are you with your life as a whole these days?" on a scale from 0 (or Completely Dissatisfied) to 10 (or Completely Satisfied).

The rest of this section presents only a few of the results of our explorative analysis of the students' well-being; i.e., Students' life-satisfaction by subject (Table 2), by their confidence for their knowledge in the most basic concepts in statistics at the beginning (Table 3) and the end (Table 4) of the ES course and by their time-use in most popular social networking platform (Table 5).

The students' average life satisfaction is 7.3 which is higher than the average score of 6.5 reported by OECD in 2017 for the 35 OECD countries, as well as Brazil, Colombia, Costa Rica, Lithuania, the Russian Federation and South Africa. The average life satisfaction of students living in India, who answer the same question almost at the same time, was 6.4 (Andrén 2019). More than 75% of the students answered with a score of 7 or higher and no students answered with a score lower than 3. There are small differences across groups of students by the course there are attending. Students attending business administration have an average life satisfaction of 8, while students who are studying two courses (Economics and Business Administration or Statistics) have an average life satisfaction of 6.29. Except the group of students who studied Economics, the other two groups are very small. Therefore, all our results are explorative and should be interpreted with caution. However, there is a statistically significant negative relationship between studying more than one course and the students' wellbeing.

Table 2 Students' life satisfaction;[#] all and by subject, in percent, means and pairwise correlations. Fall term 2018

	All	Economics	Statistics	Business Administration	Two courses (Economics +1)
0 = Completely Dissatisfied					
1					
2					
3	1.68	1.22	4.17		
4	3.36	3.66	4.17		
5	9.24	9.76	4.17	16.67	28.57
6	6.72	7.32	4.17	8.33	28.57
7	31.93	31.71	41.67	16.67	28.57
8	26.05	25.61	20.83	33.33	14.29
9	15.13	15.85	12.50	16.67	
10 = Completely Satisfied	5.88	4.88	8.33	8.33	
Mean Life Satisfaction	7.31	7.29	7.45	8.00	6.29
Pairwise correlation		-0.10	-0.01	0.04	-0.1703*
n	121	83	21	10	7

n=121. [#] The students answer to the question "All things considered, how satisfied are you with your life as a whole these days?" on a scale from 0 = Completely Dissatisfied to 10 = Completely Satisfied.

Table 3 Students' life satisfaction by their confidence in their ability of successfully complete statistical tasks at the *beginning* of ES

	(0)	(1)	(2)	(3)	(4)	**(5)**	(6)	Pw corr
Identify the scale of measurement for a variable.	7.1	6.4	6.8	7.5	7.8	**9.4**	8.8	0.33*
Interpret the probability value (p-value) from a statistical procedure.	7.3	7.1	6.9	6.4	8.2	**9.3**	8.5	0.25*
Select the correct statistical procedure to be used to answer a research question.	7.2	7.3	7.0	7.8	8.0	**10.0**		0.20
Explain what the value of the standard deviation means in terms of the variable being measured.	6.3	6.0	7.7	7.8	7.9	**8.1**	7.0	0.17
Distinguish between a Type I error and a Type II error in hypothesis testing.	7.6	7.3	7.3	8.8	6.3	**9.5**	5.5	-0.04
Explain what the numeric value of the standard error is measuring.	7.3	7.9	7.1	6.9	7.8	**9.3**	5.0	0.04
Distinguish between the objectives of descriptive versus inferential statistical procedures.	7.7	6.7	7.6	7.6	7.7	**8.3**		0.05
Distinguish between a population parameter and a sample statistic.	6.3	7.4	8.4	7.8	5.4	**8.0**	8.5	0.15
Identify when the mean. median and mode should be used as a measure of central tendency.	7.0	4.3	7.3	7.6	7.0	**7.7**	9.3	0.30*
Distinguish between a parameter and a variable.	6.9	6.7	8.3	7.2	7.0	**8.2**	8.3	0.15

Note: students' confidence in their ability to successfully complete the given statistical task on a scale from (0) = No Confidence At All to (6) = Complete Confidence; pwcorr is the pairwise correlation between the students' well-being and their confidence in their ability to successfully complete the given statistical task. * means that the correlation is statistically significant at the 5% level. **n = 63**.

Table 4 Students' life satisfaction by their confidence in their ability of successfully complete statistical tasks at *the end* of ES

	(0)	(1)	(2)	(3)	(4)	(5)	(6)	Pw corr
Identify the scale of measurement for a variable.	4.7	9.2	8.0	8.2	4.3	8.0	10.0	0.10
Interpret the probability value (p-value) from a statistical procedure.	7.0	9.8	8.5	5.6	6.1	9.0	6.3	-0.21
Select the correct statistical procedure to be used to answer a research question.	9.3		7.7	6.9	7.3		8.0	-0.05
Explain what the value of the standard deviation means in terms of the variable being measured.		7.0	9.3	6.6	5.5	6.1	9.0	-0.14
Distinguish between a Type I error and a Type II error in hypothesis testing.	9.0	5.3	10.0	10.0	7.0	5.4	7.9	0.03
Explain what the numeric value of the standard error is measuring.	6.7	8.1	6.4	5.4	8.4			0.00
Distinguish between the objectives of descriptive versus inferential statistical procedures.	6.3	7.6	7.4	7.6		9.0		0.14
Distinguish between a population parameter and a sample statistic.	8.8	8.3	6.0	3.5	6.0	9.5	7.3	-0.14
Identify when the mean. median and mode should be used as a measure of central tendency.	10.0	6.7	4.7	6.8	7.8	4.0	9.2	0.14
Distinguish between a parameter and a variable.	9.0	5.0	6.2	7.6	8.0	9.5	5.7	-0.03

Note: students confidence in their ability to successfully complete the given statistical task on a scale from (0) = No Confidence At All to (6) = Complete Confidence; pwcorr is the pairwise correlation between the students' well-being and their confidence in their ability to successfully complete the given statistical task. None of the correlation coefficients is statistically significant at the 5% level. **n = 30.**

Table 5 Students' life satisfaction by their time use in different SNPs. Fall term 2018

	Instagram	WhatsApp	Snapchat	Pinterest	Tumblr	Quora	Facebook	YouTube	Twitter	LinkedIn
Rarely (once every 3 months)	7.0	7.5	7.0	7.5	6.8	**9.0**		**9.0**	**7.2**	**6.7**
Sometimes (once per month)		7.2	**8.3**	6.8	7.3	**9.0**	7.0	**7.6**	**7.5**	7.5
Often (a few times each week)	**8.0**	7.3	7.4	6.8		**8.0**	6.8	6.8	**8.3**	7.0
Each day; < 15 minutes	7.2	6.8	6.9	6.5	8.0		7.2	**8.0**	**7.7**	**8.0**
Each day; 15-59 minutes	7.3	6.9	6.7	6.5			7.5	6.9	7.3	**8.0**
Each day; 1-2 hours	7.2	**8.0**	**7.7**	**7.5**			**8.0**	**7.7**	6.4	**8.0**
Each day; 2-3 hours	**7.9**	4.0	**8.4**	**8.0**			**7.3**	**7.7**	**8.0**	
Each day; more than 3 hours	**7.0**	**7.8**	7.2				**7.0**	**7.2**		
Do not have an account	7.0	7.4	7.3	7.3	7.3	7.2	**6.5**	7.5	7.4	7.4
pwcorr (WB. t_{SNP})	-0.14	0.04	0.05	0.01	-0.01	-0.14	-0.02	0.05	0.03	**0.11**

Note: pwcorr is the pairwise correlation between the students' well-being and their time spent in SNPs. No coefficient is statistically significant at the 5% level. n=121

Students who study statistics have a relatively good confidence in their ability to successfully complete ten basic statistical tasks, and their confidence is correlated with their well-being. Students answered using a scale with 6 possible responses, from 0 (no confidence at all) to 6 (complete confidence), marking for each task, both at the beginning (Table 3) and the end of the ES course (Table 4) during the spring term 2019. Again, having in mind the small number of observations, there is a smaller group that answer at the end of the course who seem to be less confident about their ability to successfully completed the ten different statistical tasks, which also show lower average satisfaction.

Students and younger people seem to spend more and more time using Internet or interacting with others in social networking platforms (SNP). Therefore, we asked the students each term how much time they spent in ten SNPs (Table 5). The correlation between individual well-being and time spent in LinkedIn is positive, and in Instagram, Facebook, Tumblr and Quora it is negative.

5 Summary and conclusions

Our paper adds to the literature of the online teaching and online learning and the students' academic success by providing some empirical evidence for a positive relationship between studying continuously during an university course and well-being. We presented the content and some functionalities of our SEA, developed and implemented with focus on sustainable learning of basic concepts in statistics, which later are supported by empirical evidence for the positive association between the students' grades and their individual well-being. We also highlighted a few of our experiences during spring term 2020, when under only a few days, we shifted to remote teaching and learning to stop the spreading of Coronavirus COVID-19. Our SEA has several components that efficiently facilitated digital learning and online collaboration in the context of necessary closures.

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