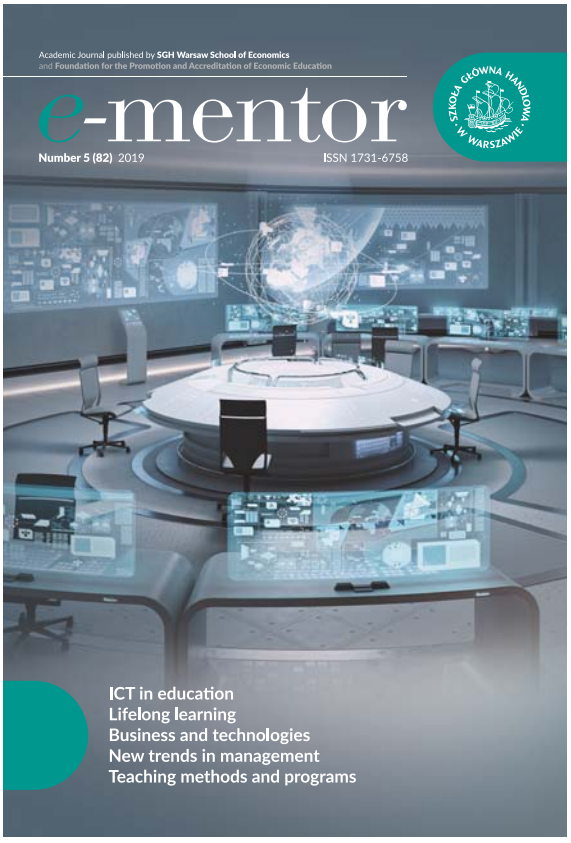
e-mentor

DWUMIESIĘCZNIK SZKOŁY GŁÓWNEJ HANDLOWEJ W WARSZAWIE

WSPÓŁWYDAWCA: FUNDACJA PROMOCJI I AKREDYTACJ KIERUNKÓW EKONOMICZNYCH



2019, nr 5 (82)

Bentkowska, K. (2019). Planner-Doer – Self-control and Regular Study. *e-mentor, 5*(82), 36–42. https://doi.org/10.15219/em82.1443

Planner–Doer – Self-control and Regular Study

Katarzyna Bentkowska[*]

Abstract

The systematic acquisition of knowledge is an important skill. Nevertheless, students seem to have problems with proper planning of their education and preparing their tasks on time. Referring to behavioral economics, this can be explained with the planner and doer model. This draws attention to the problems with self-control and describes the dilemma caused by internal tension between favorable long-term plans and short-term actions distracting attention from implementation of the former.

The aim of the article was to analyze student activity in e-learning classes. The analysis concerned a group of students regularly performing assigned tasks and the spread of their activities within the given period. It also allowed investigations into whether the time of submitting the task affected its quality and whether systematic work during the semester affected the exam result.

The analysis of student activity in the e-learning classes shows that:

- There was a large group of students regularly submitting tasks, but there was also a group who never prepared any of them.
- The spread of activity over particular days showed that most posts were published on the last two days of the given period.
- There was a relationship between the time of submitting the task and its evaluation – the posts from the final two days received a lower average number of points than those from previous days.
- There was a positive relationship between the ongoing performance of the tasks and the exam results.

The analysis presented here is a preliminary study but shows some trends among the students.

Keywords: behavioral economics, planner-doer model, self-control, bounded rationality, systematic learning

The process of teaching e-learning classes spurred the author to reflect upon how students commit to regular study and on-time assignment submission. When do students complete their assignments? Do they have sufficient self-control to submit them on time? Do they tend to complete them relatively quickly, when they have time available, to avoid problems which may render it more difficult later? Do they wait until the last minute, when it is no longer possible to postpone completing them? Perhaps they never hand in their assignments at all? Naturally, regular study is an important aspect of learning. However, students tend to find it difficult to properly plan their study time, regularly review the material and meet the assignment deadlines. Analyses of this phenomenon can draw upon the insights offered by behavioral economics, which, by combining economics with a psychological approach, attempts to provide a better explanation of how decisions are made. Richard Thaler and Hersh Shefrin's planner-doer model can be of utility in this regard.

The purpose of the paper is to analyze the activities of students participating in e-learning courses and to explain them within the context of behavioral economics. The analysis should demonstrate how many students regularly complete their assignments and present the distribution of student activity before deadlines. It should also render it possible to verify if deadlines have an impact on the quality of work and whether regular study over the course of an entire semester translates into better examination results.

Behavioral economics – problems with self-control

If the classical economics concept of *homo oeconomicus* were valid, regular studying would not be a problem. Perfectly rational human beings would have no difficulty optimizing their goals, and thus also planning their study sessions and completing their assignments on time.

[*] SGH Warsaw School of Economics, Poland

However, the *homo oeconomicus* concept has long been criticized (see: Horodecka, 2014; Lindenberg, 1990), with newer theories basing their analyses on subjects which more closely resemble reality. The rationality of real subjects is limited, and they are satisfied with a "good enough" level of achievement. Behavioral economics is an approach to studying the complexity of human actions. Proponents of this framework attempt to return to analyses of the psychological foundations of human behaviors, which featured in the work of the first economists but were then gradually abandoned by the discipline (Sołek, 2010, p. 25). Models which utilize behavioral psychology methods and quasi-rational subjects are more difficult to construct than traditional models based on rational subjects unaffected by emotions (Thaler, 2000, p. 140), but in return offer new ways of assessing their actions and designing socially beneficial institutional solutions.

The 2017 Nobel Prize laureate, Richard Thaler, one of the foremost proponents of behavioral economics, studied scenarios which demonstrate that, in practice, people act in other ways than traditional economics logic would suggest. Based on this research, he perfected his economic analysis by incorporating three psychological traits which impact decision-making: limited rationality, social preferences and lack of self-control (The Royal Swedish Academy of Sciences, 2017, p. 1). The lack of self-control is a key issue within the context of the problem analyzed in this paper.

Thaler notes that even if the subjects successfully utilize the information available to them and devise a proper plan, it is not guaranteed that they will follow it. This is because they always prioritize their current welfare over their welfare at any point in the future (O'Donoghue & Rabin, 1999, p. 126). Thus, they experience self-control problems. For example, while an individual may be aware that saving money is good for dealing with potential financial problems, in practice they never save because they are happier with what they consume now.

The self-control problem was of interest to Aristotle, Adam Smith and, outside of economics, to Sigmund Freud (Thaler & Shefrin, 1981, p. 394). In the 1960s, Walter Mischel conducted that famous marshmallow test, in which children could choose between eating one marshmallow now or waiting and receiving two pieces. This problem arises in various fields whenever a decision can be made which is beneficial to the subject at the time of making, but is detrimental to them in the long term.

Thaler (2018, p. 138) uses the story of Odysseus's return to Ithaca to explain the self-control problem. Despite all warnings, he wanted to hear the sirens' song which lured sailors to crash their boats against rocks. His solution was to order his crewmen to plug their ears with beeswax (to cut off all sounds which could distract them from the plan), and have himself tied to the mast, enabling him to listen to the sirens without any negative consequences (he thus chose an engagement strategy by restricting himself to avoid giving in to temptation). The Odysseus problem exemplifies the dilemmas we encounter in real life. We are constantly exposed to short-term temptations which can impact our long-term welfare.

Thaler notes that events which are closer in time receive more of our attention than those which are more remote. Thus, receiving PLN 1000 in a year is seen as less valuable than PLN 1000 today. Traditional economics uses the concept of discounting to describe this phenomenon. In practice, people "overvalue" current consumption (as noted in Strotz, 1956), and experiences which are closer in time seem more engaging. Thus, the events that occur between the present and the near future are discounted more than those that occur in the more remote future. This is referred to as hyperbolic discounting. Thaler (1981) was the first to conduct experiments to explicate this mechanism. These experiments confirmed that people are quicker to discount in shorter timeframes than in the more remote future. In addition, they demonstrated that profits are discounted more than losses, and low results are discounted to a greater degree than high results. This was later confirmed by numerous other studies (more on this topic in Frederick, Loewenstein, & O´Donoghue, 2002). Hyperbolic discounting and short-term temptations can explain many phenomena, such as why individuals want to quit smoking, but delay doing so. Within the context of learning, the prospect of having to take an examination and pass the course is frequently perceived as more remote than the student's current activities.

Planner-doer model

Thaler and Shefrin (1981) used the above observations to develop the planner-doer model. The model describes the dilemma which arises because of the tension between plans and actions. Every individual comprises a planner responsible for planning and a doer responsible for making decisions in the present. The approach used in this model refers to the agency relationship – the planner is the principal, and the doer is the agent. The planner makes decisions aimed at achieving long-term happiness, and the doer is responsible for current decision-making and is driven by short-term goals[1]. Internal tensions arise between them, which are difficult to balance. The planner, in attempting to increase the overall utility over the course

[1] A similar classification is used in modern psychology and is supported by neurological research.

of their life, may use willpower to force the doer to refrain from making decisions which are detrimental in the long term. However, this is not easy and incurs mental costs. The consequences of the tensions between the planner and the doer can be mitigated. To that end, it is possible to utilize methods which are analogous to those used to minimize conflicts of interest in agency relations in companies. The principal may use incentives such as motivational remuneration systems or implement certain rules, such as employee conduct rules or supervision procedures.

The two types of helpful tools – incentives and rules – can also be used in the conflict between the planner and the doer. First, the planner operates a system of rewards and punishments which help influence the final decision. Second, the planner may introduce rules which limit the choices available to the doer. The rules can be external (e.g. imposed during a weight-loss vacation) or internal (e.g. avoiding the purchase of confectionery).

Character traits determine how effectively the planner can control the doer, as levels of self-control vary between individuals (The Royal Swedish Academy of Sciences, 2017, p. 12). Thaler (2018, p. 151) notes that, even though the majority of people realize they have self-control issues, they underestimate the extent of these problems. Loewenstein (2005) also refers to this in his description of hot-cold empathy gaps. When not affectively aroused, people cannot reliably predict how they will behave and how their preferences will change in hot states, and the same is true in reverse.

Modern behavioral economics also uses other models which portray the tensions between short and long-term welfare, and which emphasize the self-control issue (e.g. Laibson, 1997; O'Donoghue & Rabin, 1999; Fudenberg & Levine, 2006). Knowledge of self-control problems may be of utility in various disciplines, including those related to solving important social issues such as saving money for retirement (see: Thaler & Sustein, 2009).

Self-control problems and regular studying

The models presented above can help explain why students rarely study regularly, and, in relation to the issue analyzed in this paper, why they so frequently wait so long to familiarize themselves with new e-learning content and complete the related assignments. Although the inner planner knows the advantages of regular study and is aware that it is more beneficial and effective to complete assignments early, the doer may act to postpone this.

O'Donoghue and Rabin (1999, p. 127), in their analysis of saving money for retirement, note that a rational subject would immediately transfer the saved funds to a savings account offering a better interest rate. However, a subject whose self-control is weak may postpone doing so as transferring funds is a burden to them in the present, and the benefits of transferring would be only available at a later time. Thus, the individual acts to incur the "costs" of the transfer in the future. If the individual is unaware of their self-control problems, they may postpone the transfer indefinitely, believing that they will surely fulfil the promise made to themselves the next day. Similarly, a student who has an assignment to complete may postpone bearing the "cost" of studying to the next day for as long as possible. This is because the cost is incurred immediately while the benefit is delayed.

Loewenstein's hot-cold empathy gap theory (2005) can also be applied to regular study. At the beginning of a semester, students, who are in a cold state, may easily promise themselves that they will study regularly or whenever they have time available. However, when the planned time for study finally comes, they are easily distracted by pleasure, something that they did not predict. What can also happen is that a student, stressed due to impending deadline, resolves to complete their assignment sooner next time, but ultimately forgets about this resolution and abandons the plan.

It is worth analyzing the influence of the planner's tools described by Thaler on motivating the doer to adopt good habits. The planner may inspire a sense of guilt in the doer and thus motivate them to work regularly. However, using willpower requires effort (Thaler, 2018, p. 147). The planner can therefore use punishments and rewards. An example of this is resolving to do something pleasurable after spending a certain amount of time studying. However, the effectiveness of the punishments and rewards tends to be low as they do not eliminate the influence of the doer, who can abandon studying and instead focus on pleasure. The planner may also impose rules which force regular learning, although as long as the rules are internal, they can be abandoned. Only external rules – such as a deadline – cannot be changed. The student is thus ultimately forced to complete their assignments at a certain point due to deadlines – obligation is one of the most important methods of mitigating self-control issues (Laibson, 1997, p. 443).

In practice, in order for students to plan their work properly, it is helpful to divide e-learning lecture materials into several segments, uploaded at regular intervals and setting deadlines for turning in the related assignments. In this way, students are aware of the class schedule at the beginning of the semester and know when they are expected to familiarize themselves with it. However, even in this situation, problems with regular assignment completion can be observed, especially last-minute completion.

Student activity study results

The data analyzed in this paper relates to the activities of students during two e-learning courses which form part of full-time (SM) and part-time, weekend (NM) programs taught at the Warsaw School of Economics (SGH), both lasting a single semester. All course participants participated in the study. For both courses, the number of full-time students (N) was 47, and for the part-time program, N was 22. Results which require taking into account different numbers of lectures are presented separately for both types

of program. In the remaining cases, the results have been added together. A total of 449 messages were posted by students on the forums during the semester. The participants were aged between 20 and 25 years, with 29 of them being women (including 23 for SM and 6 for NM) and 40 being men (including 24 for SM and 16 for NM).

The student group was not selected randomly, was not representative and the results therefore cannot be extrapolated to the entire student population. The analysis only demonstrates certain patterns occurring in a non-randomly selected group.

During the course, the students were given access to one or two new lectures every two weeks. The full-time program entailed ten lectures, while the part-time program entailed seven. At the end of every lecture, a homework assignment was given in the form of a problem question, which the students were required to answer on the forums. The deadline was 15 days, after which the forums were locked, with each answer being awarded between one and four points. A written examination was administered at the end of the semester. Marks for answers given on the forums constituted up to 40% of the final grade, with the examination constituting the remaining 60%.

The analysis is based on the following premises:

1. A student who posts their answer earlier is better at planning their work – from the perspective of the planner-doer model, their self-control is stronger. Analogously, a student who posts closer to the deadline has weaker self-control.
2. The grades received by students depend on their involvement in writing the answer.

The following matters are analyzed:

1. The number of responses given by students in both lectures during the semester (depending on the type of program) is indicative of how many were able to meet their deadlines, i.e. possessed the necessary self-control.
2. The number of responses given by students on subsequent days during which the forums are open is indicative of the distribution of student activity over time and provide insight into their levels of self-control.
3. The distribution of grades awarded for answers according to their time of submission is indicative of whether the time at which an answer was posted impacts its quality. The grade average for four time periods is analyzed.
4. Verification of the existence of a relation between the number of points obtained for answers during the semester and the number of points scored in the final examination. The Pearson correlation coefficient is used to assess the association. Students who take the examination in the first sitting (56 students) are to be taken into account.

The answers to the final two questions should be indicative of whether better self-control enables the respondents to achieve higher academic results.

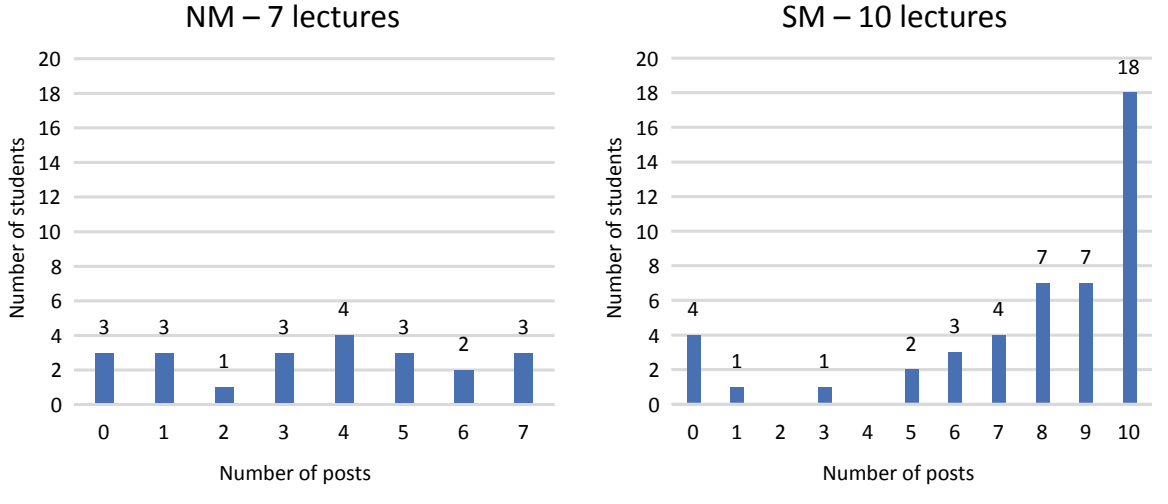
Regularity of assignment completion

Figure 1 demonstrates the regularity with which the students completed their assignments during the semester.

One group of students completed all of their assignments during the semester. On the other hand, another group never posted any answers on the forums.

The distribution of student activity for the part-time program was relatively even. However, in the full-time group, the largest group (18 students) completed all assignments. Relatively numerous groups (7 students each) completed 8 or 9 assignments. On the other hand, very few students posted between 1 and 4 answers, and as many as four failed to post a single one. This implies a certain kind of consistency in action and that the groups were polarized – divided into those who completed their assignments and those

Figure 1. Number of students according to the number of answers posted (N for NM = 22; N for SM = 47)



Source: author's own work.

who completely abandoned them. The study results provide no insight into the matter, but it is possible that those who did not post their answers online had weak self-control, failed to plan their work properly and were unable to complete their assignments in a timely fashion.

The data do not demonstrate that the willingness of students to post their answers changed over the course of the semester, regardless of whether it was the first or tenth lecture, but a similar number of students posted their responses every time.

Time available for completing assignments

As has already been mentioned, the students had 15 days to post their responses on the forums after a lecture had been uploaded. Figure 2 demonstrates the distribution of answers over that time period.

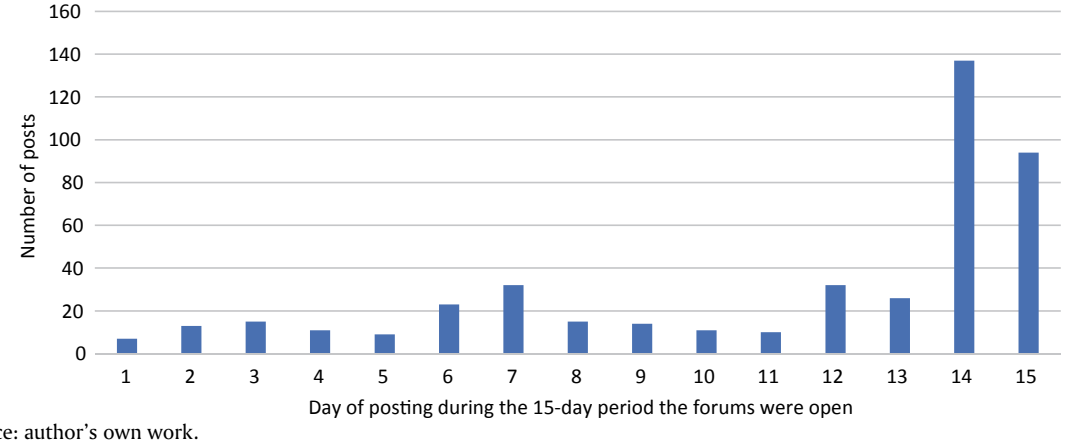
A certain pattern can be observed when analyzing the forum activity of students on individual days after a new lecture was uploaded. When we sum the answers for all lectures, no more than 15 answers per day were given in the first five days. A total of 23 answers were posted on day six, and 32 on day seven (for all lectures). The lectures were always uploaded on a Monday, i.e. days six and seven were always weekends, when more students had time to complete their assignments. Student activity then declined at the beginning of the second week. The majority of answers were posted on the forums on the second Sunday (a total of 137) and on Monday, the last day of forum availability (94 answers).

When the answers are grouped, we can see that, over the course of the semester, the number of answers posted during the first week was always lower than the sum of answers posted on the penultimate day, and only slightly higher than on the final day before the deadline (Figure 3).

The lower levels of activity in the initial days after the uploads can be explained by the fact that students require time to familiarize themselves with the material before attempting to answer the question. At first, the lack of other answers on the forums may be disincentivizing – some individuals do not like to be the first to respond. It is sometimes easier to post when others have already done so, their answers serving as guidance. On the other hand, the more people who participate in the discussion, the more difficult it is to provide a unique answer worth a higher amount of points. Postponing until the deadline bears the risk of having to complete an assignment at an inconvenient time for the student. For example, they may be forced not to participate in an interesting, unforeseen activity, or assignment completion may be rendered more difficult by random events, e.g. illness.

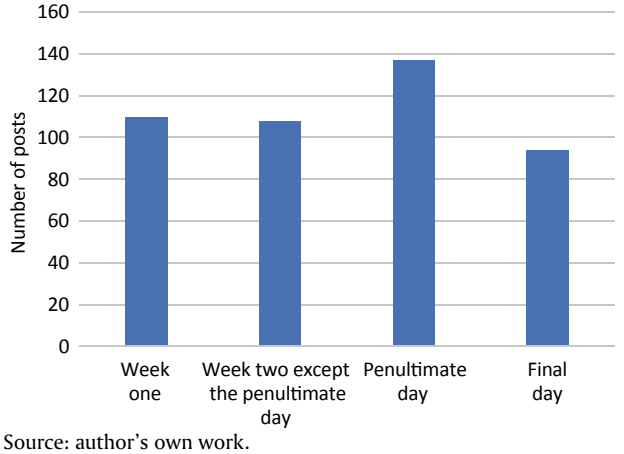
It can thus be estimated that, if the students made an effort to regularly complete their assignments motivated by their best interest, the majority of the answers would be posted in the middle of the period. By then, the majority of the students should have had enough time to complete their assignment, without experiencing the stress of doing so directly before the deadline. However, the above data demonstrate that the distribution of student activity does not match this reasoning.

Figure 2. Sum of student answers on different days of forum availability (data for the entire semester) for N = 449



Source: author's own work.

Figure 3. Grouped sums of forum answers posted on various days in the semester, for N = 449



Source: author's own work.

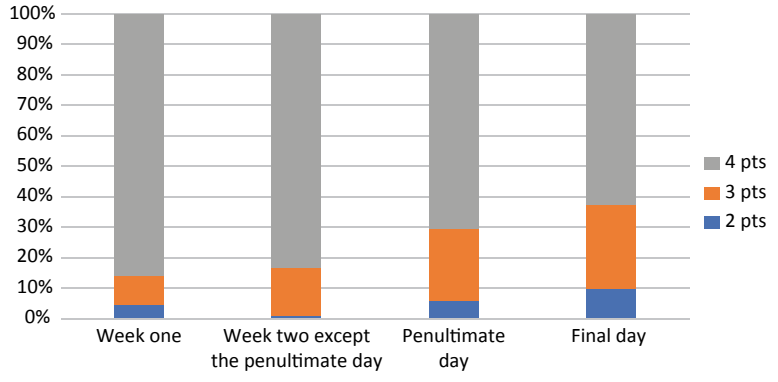
Quality of answers

Further analysis can demonstrate that the time available for completing an assignment translates into its quality, measured by the number of points scored (Figure 4).

The answers were divided into four groups: those posted in the first week, in the second week except the penultimate day, on the penultimate day and on the final day. Fewer answers posted on the penultimate and final day received the maximum amount of 4 points compared to the other two groups. The average number of points scored by each group are as follows: 3.81; 3.82; 3.64 and 3.52, respectively. An ANOVA test was conducted to verify the significance of the differences. For $p = 0.05$, the calculated test statistic value was within the critical range of $[2.29; \infty]$. It follows that the scores achieved vary significantly according to the date of posting. It should also be noted that, even though it is not reflected in the points scored, the author believes that exceptional answers that were significantly better than the others were never posted on the last two days. This may be a result of having less time to answer a question or the lower engagement of those students who delayed posting their solution.

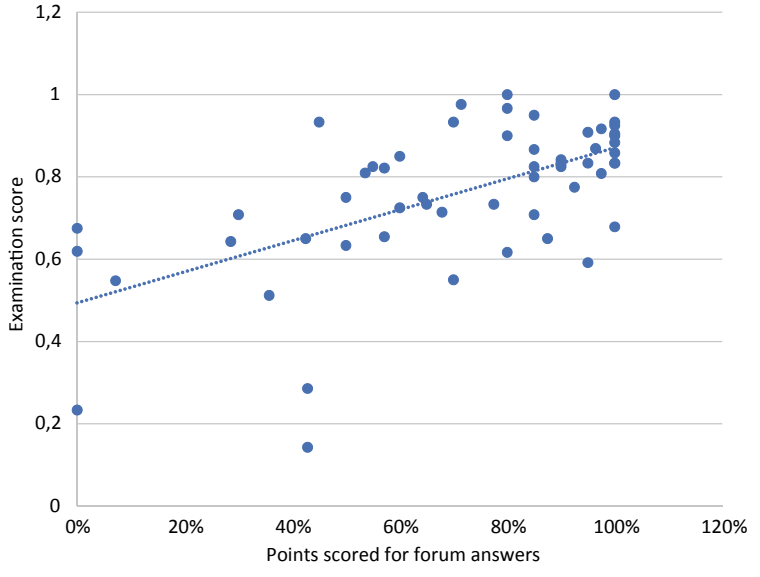
The data from the study are insufficient to assess whether students fail to familiarize themselves with the material well enough when completing assignments near the end of the deadline. However, it is valid to assume that the likelihood of doing so only cursorily and ineffectively is higher compared to situations where more time is available before the deadline.

Figure 4. Distribution of points scored for answers according to date of posting for N = 449



Source: author's own work.

Figure 5. Number of points scored for answers and the number of points scored in the examination (percentage value) for N = 56



Source: author's own work.

Involvement in providing answers on the forums and examination results

The purpose of the final part of the analysis is to verify if there is any correlation between the level of involvement in posting on the forums and the knowledge acquired by participating in the course. This is illustrated by verifying the relation between the total number of points acquired by students for forum answers and the number of points scored in the examination (Figure 5). Both variables are given as percentage values. A total of 56 students took the examination at the first sitting.

The Pearson correlation coefficient ($N=56$, $p=0.001$) is 0.60. The value is higher than the table value (0.51), which means that there is a statistically significant relationship between the variables. Students who acquired a high amount of points for posting frequently also received a high amount of points in the examination. Among the students who received the maximum amount of points for their forum posts, only one scored lower than 80% in the examination. On the other hand, among those who received less than 50% of the maximum amount of points for their forum posts, only one person scored higher than 80% in the exam.

Thus, regular study, which means better self-control, helps achieve higher scores, though this may also be related to the fact that students who study regularly also spend more time preparing for exams.

Summary

Behavioral economics form an interesting basis for analyzing matters related to regular study. The planner-doer model used in this paper renders it possible to explicate problems with regular study and timely assignment completion by linking them to self-control and a greater focus on short-term pleasures than on long-term welfare.

The analysis of the activity of students participating in e-learning courses demonstrated that the highest number of students who completed every assignment (18 students) were enrolled in the full-time program. Two groups of 7 students each completed 8 and 9 assignments, i.e. nearly all assignments required by the syllabus. From the perspective of the planner-doer model, it can be assumed that a large number of students acted under the influence of the planner and pursued their long-term interests, i.e. completed tasks which influenced their final grade. The distribution of student activity on individual days shows that slightly more answers were posted at the weekends, when students most likely had more time, but the overwhelming majority of answers were posted on the penultimate and final day before the deadline. This can be explained by the inner doer delaying task completion as much as possible, motivating the student to complete the task only when postponing is no longer an option. The high number of answers posted on the forums very close to the deadline demonstrates that the most effective solution to resolve Thaler's planner-doer conflict is an external rule – in this case, an answer submission deadline. This offers an important insight for teachers – students can be motivated to study and complete assignments by setting deadlines.

The quality of answers varied according to the date of posting. The average score for answers posted on the penultimate and final day before the deadline was lower than in the case of answers posted earlier.

Using the Pearson correlation coefficient, a statistically significant relation was identified between the number of points scored for forum posts and the number of points scored in the examination. Students who were more involved achieved higher scores in the exam, their stronger self-control allowing them to achieve better grades.

The analysis presented in this paper constitutes a preliminary study. Due to the limited research material and non-random sampling, the group studied cannot be considered representative, and the results cannot be extrapolated to the entire student population. However, certain trends can be observed among students, and it is worth repeating the analysis on a larger sample. Further research can focus on providing a more detailed explanation of the causes of the observed phenomena, which could help determine a more effective method of facilitating regular study.

References

Frederick, S., Loewenstein, G., & O´Donoghue, T. (2002). Time Discounting and Time Preference: A Critical Review. *Journal of Economic Literature, 40*(2), 351–401. DOI: 10.1257/002205102320161311

Fudenberg, D., & Levine D. K. (2006). A Dual-Self Model of Impulse Control. *American Economic Review, 96*(5), 1449–1476. DOI: 10.1257/aer.96.5.1449

Horodecka, A. (2014). Homo oeconomicus jako podstawa ekonomii – krytyka i alternatywy. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *347*, 166–183. DOI: 10.15611/pn.2014.347.16

Laibson, D. (1997). Golden eggs and hyperbolic discounting. *Quarterly Journal of Economics, 112*(2), 443–477. DOI: 10.1162/003355397555253

Lindenberg, S. (1990). Homo Socio-oeconomicus: The Emergence of a General Model of Man in the Social Sciences. *Journal of Institutional and Theoretical Economics*, *146*(4), 727–748. Retrieved from https://www.jstor.org/stable/40751361

Loewenstein, G. (2005). Hot-cold empathy gaps and medical decision making. *Health Psychology, 24*(4), 49–56. DOI: 10.1037/0278-6133.24.4.S49

O'Donoghue, T., & Rabin, M. (1999). Procrastination in Preparing for Retirement, In H. Aaron (Ed.), *Behavioral Dimensions of Retirement Economics* (pp. 125–156). Washington: The Brookings Institution.

Sołek, A. (2010). Ekonomia behawioralna a ekonomia neoklasyczna. *Zeszyty Naukowe /Polskie Towarzystwo Ekonomiczne, 8,* 21–34.

Strotz, R. H. (1956). Myopia and Inconsistency in Dynamic Utility Maximization. *The Review of Economic Studies, 23*(3), 165–180. DOI: 10.2307/2295722

Thaler, R. H. (1981). Some Empirical Evidence on Dynamic Inconsistency. *Economics Letters, 8*(3), 201–207. DOI: 10.1016/0165-1765(81)90067-7

Thaler, R. H. (2000). From Homo Economicus to Homo Sapiens. *Journal of Economic Perspectives, 14*(1), 133–141. DOI: 10.1257/jep.14.1.133

Thaler, R. H. (2018). *Zachowania niepoprawne, Tworzenie ekonomii behawioralnej*. Poznań: Media Rodzina.

Thaler, R. H., & Shefrin, H. M. (1981). An Economic Theory of Self-Control. *Journal of Political Economy*, 89(2), 392–406. http://dx.doi.org/10.1086/260971

Thaler, R. H., & Sunstein, C. R. (2009). *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New York: Penguin Books.

The Royal Swedish Academy of Sciences. (2017). *Richard H. Thaler: Integrating economics with psychology*. Retrieved from https://www.nobelprize.org/uploads/2018/06/advanced-economicsciences2017-1.pdf

Katarzyna Bentkowska is a Doctor of Economics and Adjunct at the Institute of Markets and Competition of the Warsaw School of Economics. Her research interests focus on the influence of institutions on the actions of individuals, behavioral economics and individual behaviors which deviate from ideal rationality. ORCID: 0000-0002-2063-2529