

# Time Management: Procrastination Tendency in Individual and Collaborative Tasks

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## Abstract

Procrastination is the tendency to postpone an activity under one's control to the last possible minute, or even not to perform it at all. This study examines procrastination regarding completion of various parts of a task, each of which has a different deadline. Whereas from an attention economy perspective it may be better to complete all the parts at the earliest deadline, the human tendency to procrastinate results in a delay of the parts that have a later deadline. Data was collected at an online discussion board about the behavior of 120 MBA students. Their assignment included an individual part with a specific deadline for each student and a collaborative part that the students had to complete by the end of the semester. The findings suggest that usually students tended to perform their individual task on time, even when the assignment was voluntary. However, the collaborative part of the assignment was delayed to the last three weeks of the semester when the assignment was compulsory and was not completed at all when it was voluntary. The paper discusses the implications of the findings regarding effective time management of collaborative tasks in online environments.

**Keywords:** procrastination, time management, attention economy, online collaboration, online forum assignments.

## Introduction

Procrastination is the deferment of actions or tasks to a later time, or even to infinity. The word itself comes from the Latin word *procrastinatus*: *pro* (forward) and *crastinus* (of tomorrow). Procrastination is very common and takes place in everyday behaviors. A wide array of studies link procrastination to personal behavioral factors, such as lack of motivation, deficiencies in self-regulation, external locus of control, perfectionism, disorganization, and poor time management (Ackerman & Gross, 2005; Phillips, Jory, & Mogford, 2007).

Procrastination has been widely studied and there are many academic and practical guidelines on overcoming procrastination (Van Eerde, 2003). This study contributes to the research literature by examining the impact of online collaboration tools, which enable all the participants to see every-

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body's progress in completing their tasks, on procrastination of individual and collaborative tasks. Another aspect that distinguishes this study is that it is based on measurement of actual performance and not on subjective self-reported data. This research contributes to the informing science transdiscipline (Cohen, 1999, 2009; Gill & Cohen, 2009) by examining the impact of a collaborative information system on the

tendency to procrastinate individual and general tasks.

Davenport and Beck (2000, 2001) argue that the scarcest resource in modern organizations is attention. Individuals are overwhelmed by ever-growing incoming information and requests for their attention in their private as well as their work environment (Geri & Gefen, 2007). Since individuals have to decide on their priorities, and rationally decide to defer some tasks, procrastination is not necessarily a negative phenomenon. Chu and Choi (2005) distinguish between two sorts of procrastination behaviors. Passive procrastinators are paralyzed by their indecision and as a result fail to complete tasks on time, so this is certainly an unfavorable behavior. However, active procrastinators prefer to work under pressure and make deliberate decisions to procrastinate tasks, nevertheless, they usually complete their tasks on time.

Procrastination is wide spread in academic contexts, where students are required to meet deadlines for assignment completion in an environment full of events and activities which compete for the students' time and attention. Student syndrome refers to the phenomenon that many students will begin to engage themselves in a task just before a deadline (Ariely & Wertenbroch, 2002). Studies conducted in academic environments found that procrastination affects 46% to 95% of undergraduate students (Gallagher, Borg, Golin, & Kellehr, 1992; Janssen & Carton, 1999; Kachgal, Hansen, & Nutter, 2001; Özer, Demir, & Ferrari, 2009).

Nowadays, business environments, as well as many other organizational environments, enable collaboration of a group in writing all sorts of documents (Tapscott & Williams, 2006). For example, a manager sends an e-mail to five workers and asks them to complete a certain document by a predefined deadline. There may be specific requests from each individual with regard to certain parts of the documents, and usually everyone will be requested to read the document and comment or correct mistakes. The traditional option for such a task is that one person will be responsible for integrating the writing. A more current option is to use some sort of collaboration application. So, the document draft may be posted on a wiki, an online discussion board, a shared network server, or any other application that allows the group to work together. This study examines whether the use of online collaborative artifacts, such as online discussion boards, affects the tendency for procrastination.

## Methodology

Data of actual performance of 120 students enrolled in an advanced elective MBA course at the Open University of Israel was used to examine procrastination in submitting assignments to an online discussion board. Most studies on procrastination (e.g., Ackerman & Gross, 2005; Ariely & Wertenbroch, 2002; Lavoie & Pychyl, 2001; Özer, Demir & Ferrari, 2009; Phillips, Jory, & Mogford, 2007; Van Eerde, 2003) are based on questionnaires that are filled in by the participants. This study is based on actual data extracted from the discussion forum, including dates of submission.

MBA students were chosen as the research population because they usually work, and, therefore, there may be similar traits in their procrastination behavior in work and learning situations. Thus, the findings of this study may be generalized to business and other work environments, although one should keep in mind that people behave differently in different contexts. A punctual manager may be at the same time an MBA student who never submits an assignment on time.

One of the course assignments required the students to find an up-to-date article in a newspaper, either electronic or printed, that is related to the course themes. Each student was assigned a personal due date, in a different week during the semester. The list of students and due dates was published on the discussion board. The students were asked to analyze the article, according to the models and concepts learned in the course, and to upload the analysis to the course online forum. In addition, each student had to write at least two comments to other students' analyses. This

part of the assignment had to be completed by the end of the semester. Repetitions, in either part of the assignment, analysis, or comments, were forbidden, so the students had to read prior posts before fulfilling any part of the assignment. Although the students had to write the comments to their peers' work individually, the second part of the assignment is considered collaborative because the students had to rely on their peers' work and refer to it. In that sense, the task was not trivial, because on the one hand, they had to demonstrate their own contribution, but on the other hand, it might seem uncollegial to elaborate the discussion in a way that undermines their peers' analyses. Furthermore, the purpose of the second part of the assignment was to engage the students in a voluntary discussion that presumably would promote collaborative learning.

This assignment was conducted during the years 2005-2009 in seven semesters. In the first two semesters, the assignment was voluntary; however, in the following semesters it was compulsory. A one-way analysis of variance (ANOVA) test of the students' final exam mean grade showed that the levels of the students in the two first semesters ( $F=.081$ ,  $p=.777$ ) and in the following five semesters ( $F=1.700$ ,  $p=.161$ ) that were included in this study were homogenous. Therefore, the students were assigned to two groups: voluntary and compulsory.

This research examines the difference in procrastination when the assignment is voluntary or compulsory, and the distinction when the individuals have a personal due date (in the analysis part of the assignment) or a general due date (in the comments part of the assignment).

Procrastination was measured by counting the days between the submission day and the due-date. If the assignment was posted on the due date the delay value was zero; if posted before the due-date, the delay value was assigned a relevant negative number, according to the number of days remaining till the due date; and if the submission was late, the delay value was a positive number of days, according to the delay.

The second part of the assignment was to post two comments to other student's analysis, in which they could illuminate some other thoughts or expand the analysis in different ways. For this assignment a general deadline was set, at the end of the semester. An interesting fact is that in the voluntary group, none of the students posted a comment, excluding one. So they took procrastination to its extreme – they didn't perform the second part of the assignment at all. Because of this fact, the examination of procrastination in the second part of the assignment was done only for the compulsory group.

## Results

Table 1 presents the students' demographics and descriptive data regarding the delay in submissions of the analysis assignment and comments assignments and the gap between posting the first and second comment. The average age of graduate students at the Open University of Israel in 2008 was 34.5 (SD 7.9) and the median was 32. The graduates average age was 37.0 (SD 8.8) and the median was 34 (Open University President's report, 2008). Of the 120 participants, there were 73 men (60.8%) and 47 women (39.2%). The general graduate gender proportion at the Open University of Israel is approximately 50% men and 50% women. No gender differences were found.

**Table 1: Students' demographics and delay data**

	<b>Voluntary assignment</b>	<b>Compulsory assignment</b>
<b>Semesters</b>	2005B, 2006A	2007A, 2007B, 2008B, 2008C, 2009A
<b>Total number of students</b>	53	67
<b>Gender</b>	31 Men (58.5%) 22 Women (41.5%)	42 Men (62.7%) 25 Women (37.3%)
<b>Number of valid analysis submissions</b>	49	67
<b>Delay* of analysis submission (days)</b>		
Mean	2.61	-1.81
Standard deviation	13.731	3.322
Percentile 25	-5	-4
Median	-3	-1
Percentile 75	6.5	0
<b>Number of valid comment submissions</b>	1	130
<b>Delay* of comments submission (days)</b>		
Mean	–	-20.96
Standard deviation	–	21.456
Percentile 25	–	-33.25
Median	–	-18
Percentile 75	–	-5
<b>Gap between comments submission (days)</b>		
Mean	–	10.29
Standard deviation	–	14.989
Percentile 35	–	0
Percentile 45	–	1
Median	–	5
Percentile 75	–	15

\* A negative value indicates that the assignment was submitted before the deadline.

As explained, the assignment consisted of two parts. The first part included searching an appropriate article, analyzing it, and posting the analysis on the course discussion forum during a specific week, so each student had a predefined personal deadline. This part was actually performed by almost all of the students, excluding four students in the voluntary group who did not perform this part at all. However, the nature of the procrastination was different for each group. Table 2 presents the frequency of submission delay of the students in the voluntary and compulsory groups. Figure 1 shows a histogram of delays in submission of the analysis assignment in the voluntary classes, and Figure 2 describes the compulsory classes. In the voluntary group, the delay in submission was longer than in the compulsory one. In the voluntary group 71% of the submis-

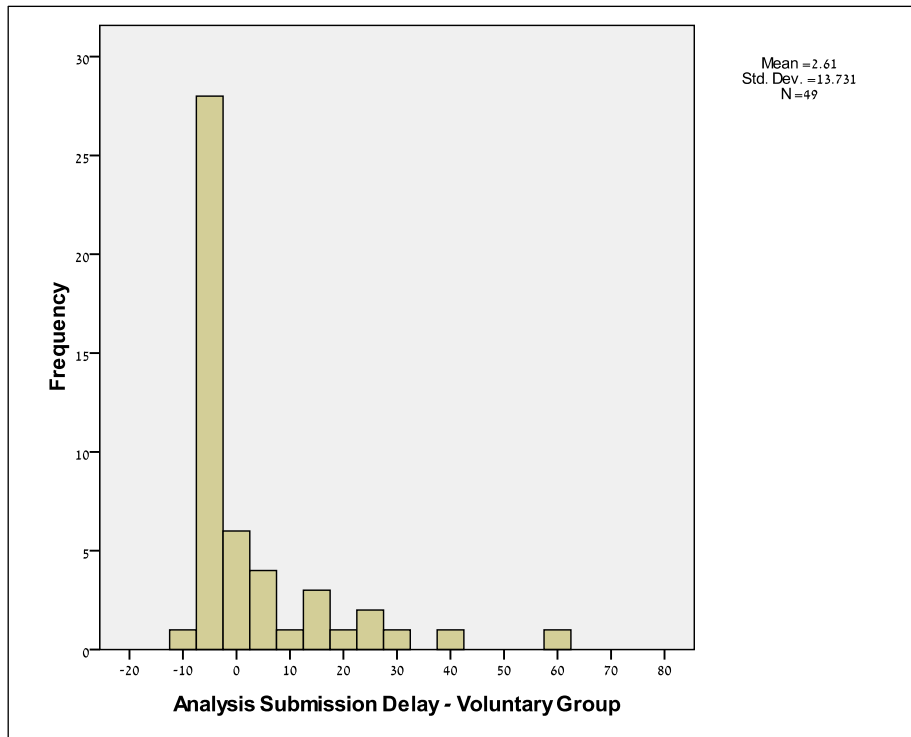
sions were made by the due date, whereas in the compulsory group 92.5% of the assignments were submitted by the due date, or the consequent day. Those in the voluntary group who were late postponed their submission for longer periods, even more than two months behind the deadline. However, the late students in the compulsory group completed their assignment within ten days.

**Table 2: Frequency of submission delay**

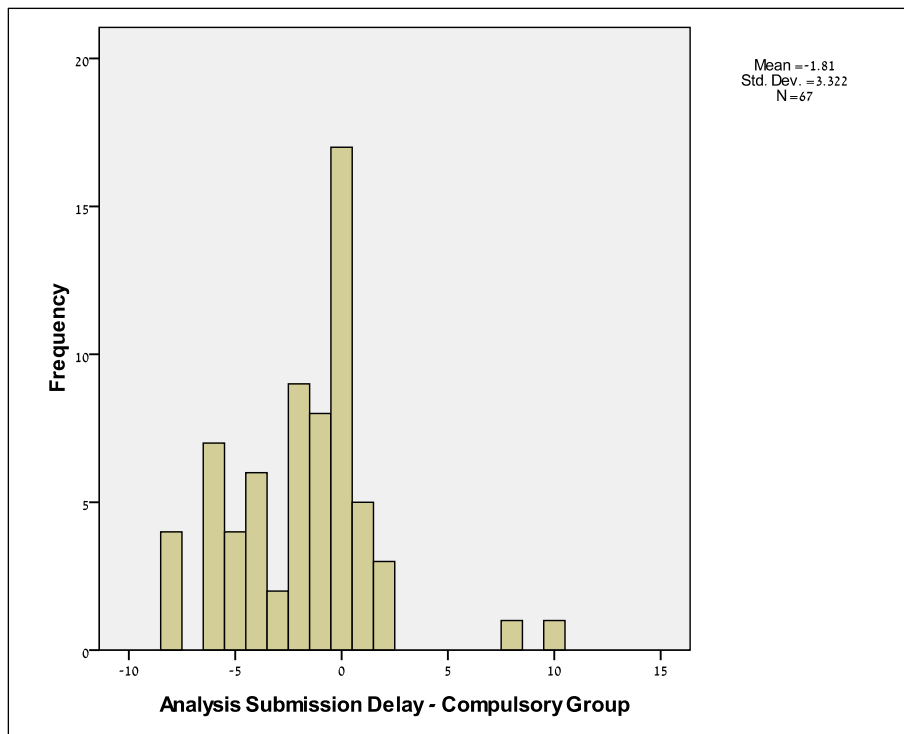
Delay* (days)	Voluntary Group			Compulsory Group		
	Frequency	Valid Percent	Cumulative Percent	Frequency	Valid Percent	Cumulative Percent
-10	1	2.0	2.0			
-8	0	0	2.0	4	6.0	6.0
-6	6	12.2	14.3	7	10.4	16.4
-5	12	24.5	38.8	4	6.0	22.4
-4	3	6.1	44.9	6	9.0	31.3
-3	7	14.3	59.2	2	3.0	34.3
-2	3	6.1	65.3	9	13.4	47.8
-1	2	4.1	69.4	8	11.9	59.7
<b>0</b>	<b>1</b>	<b>2.0</b>	<b>71.4</b>	<b>17</b>	<b>25.4</b>	<b>85.1</b>
1	0	0	71.4	5	7.5	92.5
2	0	0	71.4	3	4.5	97.0
3	1	2.0	73.5			
6	1	2.0	75.5			
7	2	4.1	79.6			
8	0	0	79.6	1	1.5	98.5
10	1	2.0	81.6	1	1.5	100.0
15	2	4.1	85.7			
16	1	2.0	87.8			
18	1	2.0	89.8			
23	1	2.0	91.8			
24	1	2.0	93.9			
30	1	2.0	95.9			
39	1	2.0	98.0			
62	1	2.0	100.0			
Total	49	100.0		67	100.0	

\* A negative value indicates that the assignment was submitted before the deadline.

## Time Management



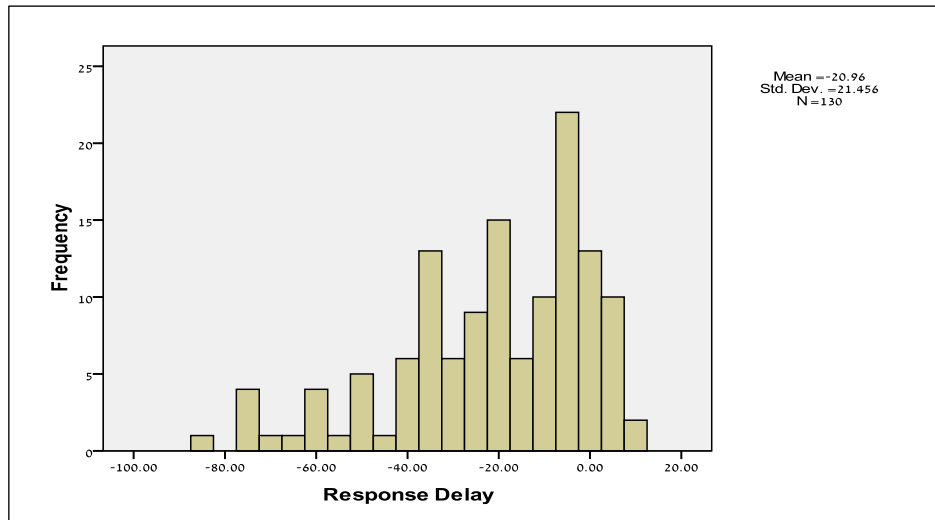
**Figure 1: Analysis submission delay in the voluntary group**



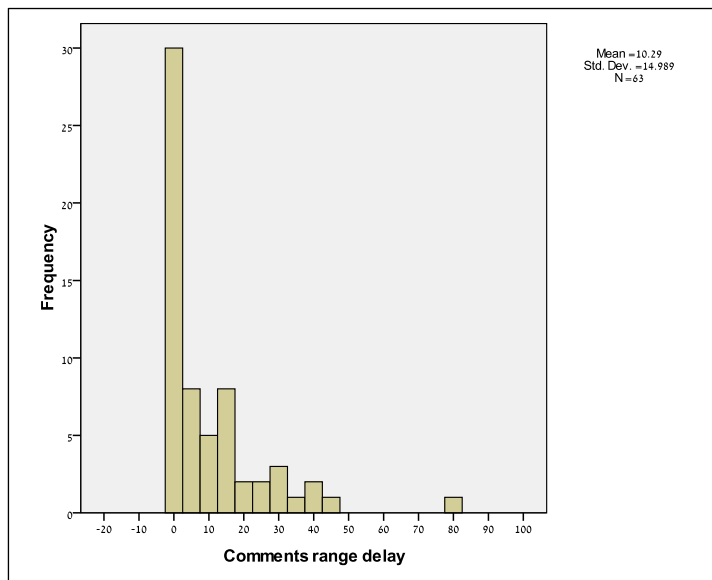
**Figure 2: Analysis submission delay in the compulsory group**

There were no findings regarding gender differences in procrastination. Other factors, which have been analyzed without significant findings were length and grade of analysis. It must be clarified that no penalty was intentionally given to procrastinators, even if the assignment was posted long after the due date.

As can be seen in Figure 3, the submission of 45% of the comments was done in the last two weeks of the semester, and 16% even after the end of the semester, most of them a week later. Even students who posted their first part assignment at the beginning or middle of the semester postponed the submission of the second part. Another interesting fact is that 35% of the students posted the two comments on the same day, and, if the definition of “same day” includes also the following day (because the students often post at night, when the date changes), the percent of students posting the two comments on the same day rises to 48%. This can be seen in Figure 4.



**Figure 3: Comments submission delay**



**Figure 4: Gap of submission dates of comments**

## Discussion

The students' choice to separate the personal analysis and the comments posting demonstrates that they referred to each part of the assignment as a different task. These students had to read the analyses of the prior postings before submitting their own analysis because no duplications were allowed. In these cases, it can be reasonable to perform the second part of the assignment immediately and post comments to those analyses read, but they have not. On the other hand, in each week of the semester more analyses were posted to the discussion board, so the student had more choices of subjects to which to respond, as well as more knowledge of relevant theories and frameworks. This may be viewed as a justifiable reason for procrastination.

It is important to emphasize that the posted comments needed to be unique and meaningful, and since the initial analyses were generally very good, the students were required to elaborate and find less obvious aspects. This leads to a deduction that when using a discussion forum to post the assignments, the procrastination occurs in the preparation stage of the task and not in the posting activity. It means that when the student prepares the appropriate comment, it is posted immediately, due to the fear that another student will prepare a similar comment to the same analysis. This conclusion is strengthened by the fact that in the first part of the assignment there were some cases where students posted an article with a note that the analysis will be posted later, and they asked the other students not to choose the article's subject as their own analysis subject. Nevertheless, in the first part, each student had a different week to prepare the assignment, so there was less risk that another student would choose the same article; therefore, they could procrastinate the submission until the end of their assigned week.

There were no findings regarding differences of behavior depending on gender. This correlates with some studies (Kachgal et al., 2001), but not with others (Özer et al., 2009), maybe the differences can be attributed to culture or age differences of the participants in these studies. It also correlates to the observation that there were no social interactions between the students, because gender differences tend to emerge in online discussion boards that involve social interaction (Gefen, Geri, & Paravastu, 2008). The students' attitude toward the assignments was forthright, as a task that must be done. There were neither discussions nor debates, although the instructor of the course tried to stimulate students and encourage them to interact by posting focused questions. Just one case of student interaction happened, when one student posted an article one week before he had to. This raised the anger of the other students, who were concerned whether there would be enough articles for everyone in that particular week.

Student task-oriented attitude was also found in prior research, e.g., Chan and Waugh (2007) who studied student participation in online activities at the Open University of Hong Kong. American Graduate Management Information Systems students valued reading their peers postings but assigned lesser value to replying to other students' messages (Levy, 2006). Beaudoin, Kurtz, and Eden (2009) found in their cross-cultural study that Western students attributed less importance to online relationships with peers.

The finding that in the voluntary group the students did not perform the second part of the assignment can be attributed to procrastination (Ariely & Wertenbroch, 2002). It can also be explained from the attention economy perspective (Davenport & Beck, 2000, 2001). MBA students are usually very busy and do not have time to engage in voluntary learning activities (Geri & Gefen, 2007), so they adopt a satisficing approach (Simon, 1957, 1971), and complete only compulsory tasks. Even instructor encouragement may not influence their behavior (Yang, Yan, Tan, & Teo, 2007). Moreover, this demonstrates that the behavior of the students determines norms of conduct. When students saw that others in their group did not post, they followed track and did not post their own comments.



The participants of this study were MBA students toward the completion of their studies, so their behavior and performance may be different from those of other populations. There are some preliminary findings that require further research. It seems that the behavior of the first students of each group when posting their assignments defined norms for the whole class. For example, if a critical masse of students posted their comments early (about 10 comments or more) it encouraged the other students in the group to abstain from procrastination. The sample size of the current study did not allow such an analysis, so the issue of social influence on procrastination tendency in collaborative forum assignments is suggested as a future research direction.

No significant correlation was found between the grade of the post and the time it was posted, as well as between the post length and the time it was posted. As indicated, there was no penalty for procrastination, even if the assignment was posted after the due date. Most of the response postings occurred within the last 21 days of the semester, so it would have been hard to find qualitative or quantitative differences with regard to the submission timing. Furthermore, since the postings were graded according to their quality (as opposed to points earned just for the posting), students would be expected to contribute meaningful content. Although it seems that there is no correlation between the quality and the timing of the submission, further research is required to substantiate such assertion or to identify factors that may have influence on the connection between procrastination and quality.

## Conclusion

This study examined procrastination in the context of completion of various parts of a task, each of which has a different deadline. In the conflict between attention economy efficiency and the human tendency to procrastinate, the findings indicate that procrastination tendency has a stronger effect on human behavior than attention efficiency considerations. The findings also demonstrate that people will be usually more punctual in their individual assignments than in general collaborative assignments. Besides assigning specific individual deadlines, effective time management of collaborative tasks may require division of these tasks to a few interim tasks with several interim deadlines.

This research contributes several notions to the informing science transdiscipline (Cohen, 1999, 2009; Gill & Cohen, 2009), and their theoretical implications should be further studied. It introduces the potential application of collaborative information systems to reduce the tendency to procrastinate individual and general tasks. The empirical findings demonstrate that the ability of all the participants to see everybody's progress in completing their tasks encourages them to adhere to the schedule. Thus, even if people do not collaborate in the actual performance of a task, they help each other by observing the task completion.

Another issue that should be further studied within informing science contexts is the time value of information. The purpose of the comments part of the assignment was to encourage collaborative learning. The students deferred their fulfillment of the task until the end of the semester, so no real collaborative discussion occurred. Such collaboration might have been developed if the task was not procrastinated, and therefore the information might have been more valuable.

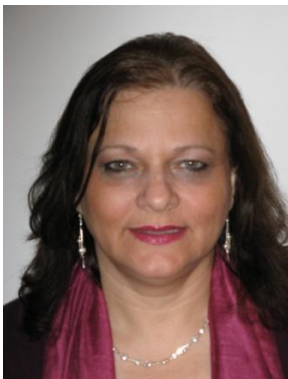
## References

- Ackerman, D., & Gross, B. L. (2005). My instructor made me do it: Task characteristics of procrastination. *Journal of Marketing Education, 27*(5), 5-13.
- Ariely, D., & Wertenbroch, K. (2002). Procrastination, deadlines, and performance: Self-control by pre-commitment. *Psychological Science, 13*(3), 219-224.
- Beaudoin, M. F., Kurtz, G., & Eden, S. (2009). Experiences and opinions of e-learners: What works, what are the challenges, and what competencies ensure successful online learning. *Interdisciplinary Journal*

- of *E-Learning and Learning Objects*, 5, 275-289. Retrieved October 16, 2009 from <http://www.ijello.org/Volume5/IJELLOv5p275-289Beaudoin665.pdf>
- Chan, M., & Waugh, R. (2007). Factors affecting student participation in the online learning environment at the Open University of Hong Kong. *The Journal of Distance Education / Revue de l'Éducation à Distance* [Online], 21(3), 23-38. Retrieved October 16, 2009 from <http://www.jofde.ca/index.php/jde/article/view/31>
- Chu, A. H., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of "active" procrastination on attitudes and performance. *Journal of Social Psychology*, 145(3), 245-264.
- Cohen, E. (1999). Reconceptualizing information systems as a field of the transdiscipline informing science: From ugly duckling to swan. *Journal of Computing and Information Technology*, 7(3), 213-219.
- Cohen, E. (2009). A philosophy of informing science. *Informing Science: the International Journal of an Emerging Transdiscipline*, 12, 1-15. Retrieved October 16, 2009 from <http://inform.nu/Articles/Vol12/ISJv12p001-015Cohen399.pdf>
- Davenport, T. H., & Beck, J. C. (2000). Getting the attention you need. *Harvard Business Review*, 78(5), 118-126.
- Davenport, T. H., & Beck, J. C. (2001). *The attention economy: Understanding the new currency of business*. Boston, MA: Harvard Business School Press.
- Gallagher, R.P., Borg, S., Golin, A., & Kelleher, K. (1992). The personal, career, and learning skills needs of college students. *Journal of College Student Development*, 33(4), 301-10.
- Gefen, D., Geri, N., & Paravastu, N. (2008). Vive la différence: Communicating across cultural boundaries in cross-gender online collaborative discussions. In N. Kock (Ed.), *Virtual team leadership and collaborative engineering advancements: Contemporary issues and implications, Advances in e-collaboration series: Volume 3*. Hershey, PA: IGI Publishing. 1-12. Retrieved October 16, 2009 from <http://www.igi-global.com/downloads/excerpts/33013.pdf>
- Geri, N., & Gefen, D. (2007). Is there a value paradox of e-learning in MBA programs? *Issues in Informing Science and Information Technology*, 4(1), 163-174. Retrieved October 16, 2009 from <http://proceedings.informingscience.org/InSITE2007/IISITv4p163-174Geri322.pdf>
- Gill, T. G., & Cohen, E. (Eds.). (2009). *Foundations of informing science, 1999-2008*. Santa Rosa, CA: Informing Sciences Press.
- Janssen, T., & Carton, J. S. (1999). The effects of locus of control and task difficulty on procrastination. *Journal of Genetic Psychology*, 160(4), 436-442.
- Kachgal, M., Hansen, L. S., & Nutter, K. J.(2001). Academic procrastination prevention/intervention strategies and recommendations. *Journal of Developmental Education*, 25(Fall), 14-24.
- Lavoie, J., & Pychyl, T. (2001). Cyberslacking and the procrastination superhighway: A web-based survey of online procrastination, attitudes, and emotion. *Social Science Computer Review*, 19(4), 431-444.
- Levy, Y. (2006). The top 10 most valuable online learning activities for graduate MIS students. *International Journal of Information and Communication Technology Education*, 2(3), 27-44.
- Open University President's report (2008). *The President's report 2007-2008*. The Open University of Israel. Retrieved October 16, 2009 from <http://www-e.openu.ac.il/presidents-office/report2008E/report2008E.html>
- Özer, B. U., Demir, A., & Ferrari, J. R. (2009). Exploring academic procrastination among Turkish students: Possible gender differences in prevalence and reasons. *The Journal of Social Psychology*, 149(2), 241-257.
- Phillips, J. G., Jory, M., & Mogford, M. (2007). Decisional Style and eParticipation, *Proceedings of the 19th Australasian conference on Computer-Human Interaction: Entertaining User Interfaces, Adelaide, Australia*, November 28-30, 2007, 139-141.

- Simon, H. A. (1957). *Models of man: Social and rational*. New York: John Wiley and Sons.
- Simon, H. A. (1971). Designing organizations for an information-rich world. In M. Greenberger (Ed.), *Computers, communications and the public interest* (pp.40-41). Baltimore, MD: Johns Hopkins Press.
- Tapscott, D., & Williams, A. D. (2006). *Wikinomics: How mass collaboration changes everything*. New-York: Portfolio.
- Van Eerde, W. (2003). Procrastination at work and time management training. *Journal of Psychology*, 137, 421-434.
- Yang, X., Yan, L., Tan, C. H., & Teo, H. H. (2007). Students' participation intention in an online discussion forum: Why is computer-mediated interaction attractive? *Information & Management*, 44, 456-466.

## Biographies



**Dr. Ruti Gafni** holds a PhD from Bar-Ilan University, Israel in the Business Administration School, focusing in Information Systems. She holds an M.Sc. from Tel Aviv University and a BA (Cum Laude) in Economics and Computer Science from Bar-Ilan. She has more than 30 years of practical experience as project manager and analyst of information systems. She teaches in the Management and Economics MBA program, both at the Open University of Israel and at Netanya Academic College.



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