

Using email messages to improve learning. A behavioral economics perspective

Uso de emails para mejorar el aprendizaje. Una perspectiva desde la economía conductual

Miguel Angel Vallejo¹, Laura Vallejo-Slocker²

¹ Universidad Nacional de Educación a Distancia (UNED), Spain

² Universidad Complutense de Madrid, Spain

mvallejo@psi.uned.es , lavallej@ucm.es

ABSTRACT. Motivation is the main factor that increases success in education and has special importance in distance learning. The use of personalized email messages has been shown to be useful for increasing retention and engagement. The aim of this study was to evaluate the effect of motivational emails on exam scores: 922 psychology students were randomly assigned to message or no-message groups. The message group received weekly email messages based on behavioral economic principles. There were no differences between groups in exam scores. A decision-tree analysis showed that the message group with a history of academic success improved their exam scores when compared with the no-message group. Exam scores are related to having a history of academic success and to the perceived relationship between knowledge and the score obtained. Furthermore, the usefulness of this experience and the opinions of students are discussed.

RESUMEN. La motivación tiene una especial importancia en la educación a distancia. El uso de mensajes de correo electrónico personalizados es útil para favorecer la retención y el compromiso. El objetivo fue evaluar el efecto de correos electrónicos motivacionales en el resultado de los exámenes: 922 estudiantes de psicología fueron asignados aleatoriamente a un grupo con mensajes o sin mensajes. El grupo con mensajes, basados en principios de la economía conductual, los recibió semanalmente. No hubo diferencias entre los grupos. Un análisis de árbol de decisiones mostró que el grupo con mensajes con un historial de éxito académico mejoró sus resultados en los exámenes en comparación con el grupo sin mensajes. La calificación en los exámenes está relacionada con tener un historial de éxito académico y con la relación percibida entre el conocimiento y la nota obtenida. Se discuten, además, la utilidad de esta experiencia y las opiniones de los estudiantes.

KEYWORDS: Behavioral economics, Academic success, Higher education, Motivation, Distance learning.

PALABRAS CLAVE: Economía conductual, Éxito académico, Educación superior, Motivación, Enseñanza a distancia.

1. Introduction

Motivation is a main factor in education. Learning is a result of cognitive and motivational variables (Valle et al., 2003). Thus, increasing motivation is a good way to improve learning. Several studies have found that motivation is correlated with better results and learning performance, particularly when motivation is intrinsically oriented (Deci and Ryan, 1985; Pintrich and Schunk, 1966; Kauffman, 2004).

Distance education has a singular deficit in motivation. There is a substantial difference in graduation rates in distance education when compared with those of conventional higher education institutions. The term "distance education deficit" was coined to denote this characteristic (Simpson, 2013).

Emails have been used to improve motivation in education. Inkelaar and Simpson (2015) analyzed motivational emails and found a 2.3% increase in retention with the use of such emails. They suggest that despite the effect size of such an intervention, email is cost-effective and easy to use. This potential has also been noted by other authors (Case and Elliot, 1997; Huett et al., 2008; Motz, Mallon, and Quick, 2021; Smith et al., 2018). Additionally, from the behavioral economy perspective, the use of motivational text messages has been shown to be useful for improving engagement and attainment in math and English courses (Hume et al., 2018).

To improve motivation, understanding what variables are relevant to create a set of motivational text to send by email is important. Wlokowski and Ginsberg (1995) propose four dimensions: inclusion (connections between learners and teachers), positive attitudes, meaning (how learning is connected to a goal or purpose), and competence (feelings of efficacy and intrinsic motivation). These dimensions are related to the Attention, Relevance, Confidence, Satisfaction (ARCS) model of instruction (Keller, 1987) and self-theories and theory of action (Dweck, 1999, 2006; Snipes, Fancsali, and Stoker, 2012). These theories stress the importance of grit and growth, identity and community, and passion and purpose.

The aim of this study is to determine whether motivational text messages can improve academic results in a sample of students at UNED, a distance learning university in Spain. According to the literature, we hypothesized that students who receive motivational emails will obtain better results than students who do not receive them.

2. Method

2.1. Participants

UNED has as its mission the public service of higher education through the modality of distance education. At present, UNED has more than 205,000 students and is therefore the largest university in UNED. We chose a class in the final year (fourth) of undergraduate studies in psychology during the 2018-19 school year period. The subject was cognitive behavioral therapy. All students (1249) were invited to participate in the study. We chose the "opt-in" strategy. When they were informed of the study, if they did not express a desire not to participate, then they were included in the study. None of them opted out the study. The students were randomly assigned by an SQL software function to either the message group or the no-message control group.

To be considered a participant, a student must respond to a specific questionnaire one week after the exam. Only 922 of the initial 1249 students completed the questionnaire. All participants received an additional 0.3 points on their final exam score (ES) (scale 0-10).

2.2. Instruments

The dependent variable was the ESs of the students (scale 0-10). Several variables were obtained from the administrative and scholarly data on each student at UNED: age, sex, and success and evaluation rate. Success rate is the number of credits passed/number of credits evaluated, and the evaluation rate is the number of credits evaluated/number of credits enrolled.



A questionnaire was designed to evaluate some aspects related to the study of the student and her/his participation in this experience, including 10 questions on a 0-10 scale: satisfaction with the subject, appropriateness of the exam, relevance for their profession, usefulness of this experience and resources used to study.

2.3. Procedure

The email content was designed to increase self-efficacy and perceived importance of the subject to students' interests and professional matters. Emails sent closer to the final exam advised them of the importance of not losing their acquired knowledge.

Each message was personalized and gender-adjusted and started with a greeting and the name of the participant. The sender was the professor of the subject. The recipient was the official email address of the student participant. No messages were sent to private email addresses. The message topics were addressed in the following order:

- (1) Introductory text explaining the objective of the experience,
- (2) Looking for the importance of the subject in their real lives (purpose),
- (3) Prestige of the subject in relation to psychotherapy and psychiatry (identity and community),
- (4) Finding relations between the elements of the subject (grit),
- (5) Learning as a process to solve problems (growth mindset),
- (6) Each new knowledge or application being an opportunity to understand how the principles work (grit),
- (7) Self-evaluation and the need to contrast their point of view (identity and community),
- (8) Self-efficacy to understand and master the subject (growth mindset),
- (9) Motivation to establish a relationship between new and older knowledge (growth mindset),
- (10) The subject being practical and wonderful (purpose),
- (11) The importance of details: the way vs. the goal (growth mindset),
- (12) Striving to retain what has been learned as a necessity (loss aversion),
- (13) "Eight out of 10 students in February 2017 passed the subject..." (social reference and loss aversion), and
- (14) Not forgetting the main topics (grit and loss aversion).

The messages were sent on Sunday afternoons on a weekly basis, starting on October 28th, 2018, and ending on January 20th, 2019, a week before the exam.

2.4. Data analysis

The statistical analysis was conducted using SPSS version 24. A descriptive analysis was performed for all the variables studied. A t-test for independent groups was used to determine the efficacy of the intervention for ESs.

A decision-tree analysis was conducted to predict what variable measures before the study can add information about the utility of the motivational emails used. We used the Classification Tree module of SPSS 24 to identify an optimal algorithm for relating personal and scholarly variables to the exam results. Analysis with classification trees is a basic data-mining technique used in different disciplines (Vandamme, Meskens, and Superby, 2007; Onder and Uyar, 2017). The dependent variable (criterion) was the ES, and the independent variables were group, sex, age, evaluation and success rate. Moreover, we used the chi square automatic interaction detector (CHAID). Correction for multiple comparisons was controlled through the use of Bonferroni adjustments. The minimum parent and child nodes were set at 50 and 25, respectively (Onwuegbuzie and Collins, 2010). Model validation was performed to evaluate the predictive accuracy and generalizability of the model. A random division of the sample was conducted according to the following recommendations (Rokach and Maimon, 2015): a "training sample" of 70% of the full sample and a "validation

sample" (30%) used to test the classification accuracy of the decision tree generated.

To explore the relationship between ES and the other variables measured, a bivariate correlation analysis was performed.

A regression analysis was performed to identify the variables measured by the postquestionnaire related to ESs. This analysis was independent of the intervention but useful for understanding students' opinions about the experience.

3. Results

3.1. Sample characteristics

Table 1 shows the main characteristics of the participants. Participants were mainly women, and their mean age was 35 years. The evaluation rate was 0.81, and the success rate was 0.79. There were no statistically significant differences between these variables and the two experimental groups.

	Total	Message	Control
N	922	459	463
Age (y)			
Mean (SD)	34.98 (10.88)	35.27 (10.99)	34.71 (10.79)
Sex (n)			
Female	677 (73.4%)	316 (70.7%)	361 (76%)
Male	245 (36.6%)	131 (29.3%)	114 (24%)
Evaluation rate (0-1)			
Mean (SD)	0.81 (0.27)	0.82 (0.27)	0.81 (0.27)
Success rate (0-1)			
Mean (SD)	0.79 (0.29)	0.79 (0.29)	0.79 (0.29)

n: number of cases; y: years, SD: standard deviation, and %: percentage.

Table 1. Characteristics of participants. Source: Own elaboration.

3.2. Intervention effects

Using ES as a dependent or criterion variable, the decision-tree analysis showed a first node with group as a predictor ($F(1, 6350) = 9.394, p < 0.001$). A second-level node, under the presence of the message group, showed an additional predictor: success rate ($F(3, 3120) = 260.981, p < 0.001$). The model was able to correctly classify 86.8% of the sample. Model validation showed an 89.3% correct classification for the "training sample" and an 82.6% correct classification for the "validation sample" (Figure 1). There were five final groups covering 100% of the sample (51.5, 15.0, 9.4, 9.4, and 14.7%).

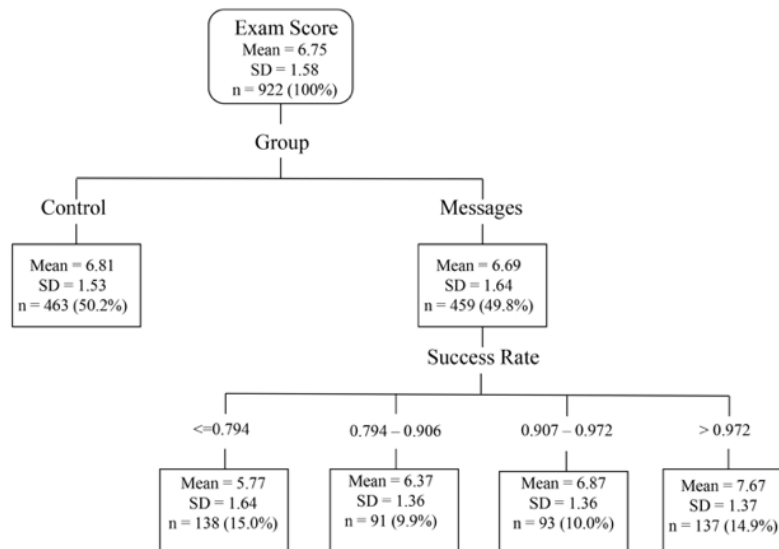


Figure 1. Decision-tree model for ES as a dependent or criterion variable. Source: Own elaboration.

3.3. Correlation and regression analysis

Table 2 shows the correlation coefficients of the variables studied. There are high coefficients between ES and the relationship perceived between ES and knowledge of the subject ($r=0.56$, $p<0.001$) and between ES and the effort made by the student in studying the subject ($r=0.55$, $p<0.001$). Satisfaction with the subject is related to the adjustment of the exam to the subject content (good exam) ($r=0.57$, $p<0.001$), the contribution of the subject to the student's training as a psychologist (purpose) ($r=0.66$, $p<0.001$), the utility of the activity ($r=0.52$, $p<0.001$), and the use of the e-learning platform (Alf) ($r=0.39$, $p<0.001$).

	1	2	3	4	5	6	7	8	9	10	11	12
1 Exam Score (ES)	–											
2 Evaluation Rate	0.16**	–										
3 Success Rate	0.27**	0.15*	–									
4 Subject Satisfaction	0.22**	0.02	-0.00	–								
5 Good Exam	0.37**	0.07*	0.04	0.57**	–							
6 ES Knowledge	0.56**	0.09*	0.10*	0.35**	0.61**	–						
7 ES Effort	0.55**	0.09*	0.13*	0.33**	0.56**	0.82**	–					
8 Purpose	0.13**	-0.04	-0.04	0.66**	0.43**	0.28*	0.22*	–				
9 Utility Activity	0.05	-0.04	-0.05	0.52**	0.36**	0.22**	0.21*	0.48**	–			
10 Recommended	0.14	-0.04	-0.04	0.47**	0.31**	0.17**	0.16*	0.47**	0.79**	–		
11 Utility for Other Subjects	0.03	0.00	-0.04	0.41**	0.29**	0.17**	0.15*	0.36**	0.62**	0.65**	–	
12 Alf Use	0.04	-0.05	-0.04	0.39**	0.24**	0.13**	0.10*	0.35**	0.46**	0.40**	0.38**	–
13 Social Network Use	-0.01	0.00	-0.03	0.10*	0.07*	0.07*	0.07*	0.14**	0.18**	0.24**	0.14**	0.19**

* $P < 0.05$

** $P < 0.01$

Variables 4 to 13 correspond to the ten-item questionnaire completed after the exam

Table 2. Correlations among variables and questionnaire items ($n=922$). Source: Own elaboration.

A multiple regression analysis was used, with the variables measured in the study as independent variables and the ES, the outcome of the learning, as the dependent variable. The results of the regression analysis are presented in Table 3. There is a significant predictor effect of ES ($F(4, 921) = 131.17, p < 0.000$).

Model	SS	Df	Ms	F	Sig.
Regression	813.56	4	203.39	131.17	0.001
Residual	1325.72	917	1.55		
Total	2139.28	921			

IV = variables measured, and DV = ES.

Table 3. Results of multiple regression analysis on ESs (N=922). Source: Own elaboration.

The model obtained is shown in Table 4 and explains 38% of ESs ($R^2 = 0.38$), which is a large effect based on Cohen's (1988) guidelines of effect sizes. The relationship perceived between ES and knowledge of the subject has a high beta value ($\beta = 0.32, p < 0.000$). The next three predictors are as follows: the relationship perceived between ES and knowledge of the subject ($\beta = 0.26, p < 0.000$), the success rate having a high beta value ($\beta = 0.19, p < 0.000$), and the evaluation rate ($\beta = 0.07, p = 0.012$).

Model	Unstandardized Coefficients		Standardized Coefficients		
	β	SE β	β	t	Sig.
Constant	3.191	0.197		16.236	0.000
ES Knowledge	0.223	0.032	0.318	6.875	0.000
Success Rate	1.040	0.149	0.192	6.982	0.000
ES Effort	0.165	0.030	0.258	5.547	0.000
Evaluation Rate	0.404	0.161	0.069	2.508	0.012

IV = variables measured, and DV = ES.

Note. $R = 0.617$. $R^2 = 0.380$. $\Delta R^2 = 0.377$ Std. error of estimate = 1.245

Table 4. Results of multiple regression analysis on ESs (N=922). Source: Own elaboration.

4. Discussion

The model obtained is shown in Table 4 and explains 38% of ESs ($R^2 = 0.38$), which is a large effect based on Cohen's (1988) guidelines of effect sizes. The relationship perceived between ES and knowledge of the subject has the high beta value ($\beta = 0.32, p < 0.000$). The next three predictors are as follows: the relationship perceived between ES and knowledge of the subject ($\beta = 0.26, p < 0.000$), the success rate having a high beta value ($\beta = 0.19, p < 0.000$), and the evaluation rate ($\beta = 0.07, p = 0.012$).

We did not obtain a significant difference in ESs from the use of motivational messages. To our knowledge, there are no similar studies to perform a comparison. Nevertheless, other studies have shown a small effect of such messages on student retention, at approximately 10% ($p = 0.1$) (Inkelaar and Simpson, 2015), or an 8.7% increase in ESs ($p < 0.05$) (Hume et al., 2018) in adult education. Contrary to expectations, these motivational messages did not show a group effect in our study. One reason to explain this lack of effect is the possible communication among participants. They had an alternative way to communicate through social networks. It is possible that they exchanged information about the motivational emails. However, we do not have measures to evaluate this possible artifact, which may have negatively affected group independence.

Nevertheless, even if the motivational emails did not improve the ESs, some participants still may have benefitted from this intervention. The decision-tree analysis shows that these messages may favour better

students. Above the 0.907 score for success rate, the presence of messages improved the ESs more than did the absence of these messages. This outcome is interesting, as it shows that the decision to use such messages can depend on the previous academic history of the student; for example, messages can be sent to only the students who can benefit from them.

We expect to improve the achievement of students with difficulties, but we have not done so yet. Exploring other interventions to motivate these students is necessary. In our study, we identified students (24%) who benefitted from this intervention. Possibly, the content of motivational messages is helpful for students with medium to high past academic success but is not helpful for, or can even have a negative effect on, students with low past academic success. Reading about the utility of the subject in professional training may have an adverse effect on those who have problems achieving this goal.

We did not find any studies with a college sample related to scholarly achievement. However, there are some related insights in the extant research. However, these findings do not apply to all individuals. Karlan and Wood (2017) studied the content of email messages provided to donors to increase fundraising, finding that the information provided improved donor response among experienced prior donors. These people are motivated by the benefits provided by their donations. In the case of less experienced prior donors, the email did not work because the motivation was occasional and emotional. In our study, students with a history of high success were more ready to accept messages congruent with the relationship between effort and academic and professional outcomes. This content did not work for people without these previous experiences, and such information may have even been counterproductive.

The lack of experience in a specific subject cannot be substituted by generic information about the subject. Niederdeppe, Avery, Kellog and Mathios (2016) found that media information about statin drugs had a paradoxical and counterproductive effect on people who were not taking a prescription statin drug. Thus, previous experience with such a drug may be needed to motivate such individuals toward the drug. A similar effect may be present in our study in people without significant experience with academic success.

When email motivation is successful, the effect is small, which may be due to the ceiling effect because 24.1% of the people who improved had a success rate higher than 0.907. Nevertheless, the effects of text messages seem to be a beneficial for self-efficacy, which might facilitate behavioral change in the long term. We do not measure self-efficacy in our study, but other authors (Schwerdtfeger, Schmitz, and Warken, 2012) have studied this effect.

The responses to the questionnaire after the study are useful for understanding some study aspects, but it is influenced by the ESs obtained. The students know their ESs before answering the questionnaire.

ES is related to four variables. Two of these variables are taken before the study: success rate and evaluation rate, confirming the importance of academic history. A history of academic success may be associated with an increased feeling of study value and motivation (Schaap, Schmidt, and Verkoeijen, 2012). The other two variables are the perceived relationships between knowledge and effort and between effort and the score obtained. These relationships identify the adequacy of the score exam to the student's effort and are also motivational factors (Lizzio and Wilson, 2013; Jurgens, 2016). Both groups of variables—academic history and the adequacy of the exam—are poorly related ($r = .09, .1$), which is probably an indication that they are two relatively independent processes. The information related to the adequacy of the exam and the purpose and utility of the subject can be influenced by motivational messages and by exam construction. It is not possible to differentiate the variables responsible for these scores, but the general effect is an increase in motivation.

Limitations

There are several limitations in this study. The main limitation is the lack of control over the communication

between the experimental and control groups. Although all communication was personal, it was impossible to prevent communication between the groups. The students have their own network to communicate, and they are likely to consider this study an interesting matter to share. This break in the independence of these groups is a serious threat to a comparison of the groups' results. To understand this possible effect, we considered a small group of 60 students who were not in the initial database of the study for administrative reasons. They did not receive any communications about the study. In other words, these students were treated as if they were not part of the study at all. The comparison showed a significant difference between groups in ESs ($M_{\text{message}} = 6.686$, $M_{\text{out of study}} = 5.992$, $t = 2.935$, $p < 0.003$). This finding confirms the possible communication between study groups and shows a positive effect of the motivational emails used.

Another limitation of this study is that the students are in their final year of undergraduate studies in psychology. However, the need to motivate students might be greater in the earlier years of undergraduate studies. To prevent the failure of motivation, it is necessary to know the effectiveness of motivational emails in these early years of undergraduate studies.

5. Conclusions

Motivational email is a simple and lower-cost procedure that is useful when students have a history of academic success. Thus, the message content can be improved such that it has a positive effect on students with little or no history of academic success. Nevertheless, the paradoxical effect due to reactivity and counterproductive responses must be taken into account.

Students' history of academic success must be known before sending such emails. In this way, our study provides a specific indication for similar samples in exploring the utility of this procedure.

The students in our study responded positively about the experience and remarked about the importance of a strong relationship between the results of the exam (ESs), the knowledge acquired, and the effort made during learning. These aspects are consistent with the content of the emails sent.

The usefulness of motivational email is congruent with the use of nudges, mainly when these could be prepared in the student context (Brown et al., 2024).

Acknowledgments

The authors thank Enrique Moreno, the director of the information processing office of UNED, for facilitating the academic history data of the students enrolled in this research.

Funding

This research did not receive external funding.

Cómo citar este artículo / How to cite this paper

Vallejo, M. A., & Vallejo-Slocker, L. (2026). Using email messages to improve learning. A behavioral economics perspective. *Campus Virtuales*, 15(2), 9-17. <https://doi.org/10.54988/cv.2026.2.1689>

References

- Case, P., & Elliot, B. (1997). Attrition and retention in distance learning programs, problems strategies, problems and solutions. *Open Praxis*, 1, 30-33.
- Deci, E., & Ryan, R. (1985). *Intrinsic motivation and self-determination in human behavior*. Plenum Press.
- Dweck, C.S. (1999). *Self-theories: Their role in motivation, personality and development*. Psychology Press.
- Dweck, C.S. (2006). *Mindset*. Random House.

Vallejo, M. A., & Vallejo-Slocker, L. (2026). Using email messages to improve learning. A behavioral economics perspective. *Campus Virtuales*, 15(2), 9-17. <https://doi.org/10.54988/cv.2026.2.1689>



- Huett, J. B., Kalinowski, K. E., Moller, L., & Huett, K. C. (2008). Improving the Motivation and Retention of Online Students through the Use of ARCS-Based E-Mails. *American Journal of Distance Education*, 22(3), 159–176. <https://doi.org/10.1080/08923640802224451>
- Hume, S., O'Reilly, F., Groot, B., Chande, R., Sanders, M., Hollingsworth, A., Meer, J.T., Barnes, J., Booth, S., Kozman, E., & Soon, X-Z. (2018). Improving engagement and attainment in maths and English courses: insights from behavioural research. Department for Education. UK Government. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/738028/Improving_engagement_and_attainment_in_maths_and_English-courses.pdf
- Inkelaar, T., & Simpson, O. (2015). Challenging the 'distance education deficit' through 'motivational emails.' *Open Learning: The Journal of Open and Distance Learning*, 30(2), 152–163. <https://doi.org/10.1080/02680513.2015.1055718>
- Juergens, C. M. (2016). Study habits as predictors of exam scores. *Psychology and Education: An Interdisciplinary Journal*, 53(3–4), 36–47.
- Karlan, D., & Wood, D. H. (2017). The effect of effectiveness: Donor response to aid effectiveness in a direct mail fundraising experiment. *Journal of Behavioral and Experimental Economics*, 66, 1–8. <https://doi.org/10.1016/j.socec.2016.05.005>
- Kauffman, D. E., & Husman, J. (2004). Effects of Time Perspective on Student Motivation: Introduction to a Special Issue. *Educational Psychology Review*, 16(1), 1–7. <https://doi.org/10.1023/B:EDPR.0000012342.37854.58>
- Keller, J. M. (1987). Development and Use of the ARCS Model of Motivational Design. *Journal of Instructional Development*, 10(3), 2–10. <https://www.jstor.org/stable/30221294>
- Lizzio, A., & Wilson, K. (2013). First-year students' appraisal of assessment tasks: Implications for efficacy, engagement and performance. *Assessment & Evaluation in Higher Education*, 38(4), 389–406. <https://doi.org/10.1080/02602938.2011.637156>
- Motz, B. A., Mallon, M. G., & Quick, J. D. (2021). Automated Educative Nudges to Reduce Missed Assignments in College. *IEEE Transactions on Learning Technologies*, 14(2), 189–200. <https://doi.org/10.1109/TLT.2021.3064613>
- Niederdeppe, J., Avery, R. J., Kellogg, M. D., & Mathios, A. (2017). Mixed messages, mixed outcomes: Exposure to direct-to-consumer advertising for statin drugs is associated with more frequent visits to fast food restaurants and exercise. *Health Communication*, 32(7), 845–856. <https://doi.org/10.1080/10410236.2016.1177903>
- Önder, E., & Uyar, S. (2017). CHAID Analysis to Determine Socioeconomic Variables That Explain Students' Academic Success. *Universal Journal of Educational Research*, 5(4), 608–619. <https://doi.org/10.13189/ujer.2017.050410>
- Onwuegbuzie, A. J., & Collins, K. M. (2010). An innovative method for stress and coping researchers for analyzing themes in mixed research: Introducing chi-square automatic interaction detection (CHAID). In K. M. Collins, A. J. Onwuegbuzie, & Q. G. Jio (Eds.), *Toward a broader understanding of stress and coping: Mixed methods approaches* (pp. 287–301). Information Age.
- Pintrich, P., & Schunk, D. (1996). *Motivation in education: Theory, research, and applications*. Prentice-Hall.
- Rau, P.-L. P., Gao, Q., & Wu, L.-M. (2008). Using Mobile Communication Technology in High School Education: Motivation, Pressure, and Learning Performance. *Computers & Education*, 50(1), 1–22. <https://doi.org/10.1016/j.compedu.2006.03.008>
- Rokach, L., & Maimon, O. (2015). *Data mining with decision trees: Theory and applications*. 2nd ed. World Scientific Publishing.
- Schaap, L., Schmidt, H. G., & Verkoeijen, P. P. J. L. (2012). Assessing Knowledge Growth in a Psychology Curriculum: Which Students Improve Most? *Assessment & Evaluation in Higher Education*, 37(7), 875–887. <https://doi.org/10.1080/02602938.2011.581747>
- Schwerdtfeger, A. R., Schmitz, C., & Warken, M. (2012). Using text messages to bridge the intention-behavior gap? A pilot study on the use of text message reminders to increase objectively assessed physical activity in daily life. *Frontiers in Psychology*, 3. <https://doi.org/10.3389/fpsyg.2012.00270>
- Simpson, O. (2013). *Supporting students for success in online and distance education*. Routledge.
- Smith, B. O., White, D. R., Kuzyk, P. C., & Tierney, J. E. (2018). Improved Grade Outcomes with an E-Mailed "Grade Nudge." *Journal of Economic Education*, 49(1), 1–7. <https://doi.org/10.1080/00220485.2017.1397570>
- Snipes, J., Fancsal, C., & Stoker, G. (2012). Student academic mindset intervention: A review of the current landscape. Report released by the Stuoski Fonudation. https://www.impaqint.com/sites/default/files/project-reports/impag%20student%20academic%20mindset%20interventions%20report%20august%202012_0.pdf Accessed 15 November 2019.
- Valle, A., Cabanach, R. G., Nunez, J. C., Gonzalez-Pienda, J., Rodriguez, S., & Pineiro, I. (2003). Cognitive, Motivational, and Volitional Dimensions of Learning: An Empirical Test of a Hypothetical Model. *Research in Higher Education*, 44(5), 557–580. <https://www.jstor.org/stable/40197322>
- Vandamme, J.-P., Meskens, N., & Superby, J.-F. (2007). Predicting academic performance by data mining methods. *Education Economics*, 15(4), 405–419. <https://doi.org/10.1080/09645290701409939>
- Włodkowski, R.J., & Ginsberg, M.B. (1995). *Diversity and motivation: Culturally responsive teaching*. Jossey-Bass.