Journal of Qualitative Research in Education

Does E-learning Trigger Epistemic Curiosity?

Seda SARAC* Enisa MEDE** Ergun AKGUN***

To cite this article:
Sarac, S., Mede, E., & Akgun, E. (2022). Does e-learning trigger epistemic curiosity? *Journal of Qualitative Research in Education*, 30, 211-222. doi: 10.14689/enad.30.9

Abstract: This study aimed to explore the perceptions of tertiary level students about e-learning and determine whether it triggers their epistemic curiosity. Semi-structured interviews were conducted with 78 undergraduate students enrolled in a foundation (non-profit, private) university in Turkey. Key thematic categories including the perceptions of motivation to seek new information in e-learning, desire to cope with challenging information in e-learning, desire to discover new, uncertain, and unpredictable information in learning, and barriers to e-learning were deduced. Digital and traditional tools emerged as motivating resources promoting curiosity in e-learning. E-learning experiences also fostered the curiosity to predict novel, risky, and uncertain information. Situational factors such as timing and workload were perceived as barriers to epistemic curiosity in e-learning. The gathered findings offered suggestions and pedagogical implications for triggering epistemic curiosity through e-learning in higher education.

Keywords: E-learning, epistemic curiosity, higher education, qualitative research, interview

Article Info

Received:
23 Nov. 2021
Revised:
15 Feb. 2022
Accepted:
17 Feb. 2022

Article Type

Research

* *Corresponding Author:* Bahcesehir University, Turkey, seda.sarac@es.bau.edu.tr
** Bahcesehir University, Turkey, enisa.mede@es.bau.edu.tr
*** Bahcesehir University, Turkey, ergun.akgun@de.bau.edu.tr

Introduction

Both humans and non-humans are curious (Berlyne, 1954). Perceptual curiosity is the type of curiosity that motivates the organism to seek new stimuli. This curiosity is a type of curiosity seen in humans and non-humans. It is the driving force of exploratory behavior of both humans and non-humans. However, epistemic curiosity is a type of curiosity specific to humans. Epistemic curiosity is the desire for information and knowledge that motivates people's exploratory behaviors (Berlyne, 1960). In other words, it is the need for knowledge and the motivation to obtain this need through exploration (Grossnickle, 2016). Being curious is a feeling. This feeling motivates exploratory behavior that leads people to discover and grow (Izard, 1977; Panksepp, 1998).

Theoretically, epistemic curiosity is a complicated emotional-motivational state. This state can involve both positive feelings of interest for learning something new and relatively unpleasant feelings due to a lack of knowledge (Litman & Jimerson, 2004). Litman (2012) addressed epistemic curiosity as the desire to acquire new knowledge (I-type) or eliminate deprivation of information (D-type). Kashdan et al. (2004) and Kashdan et al. (2009), also, mention two dimensions of curiosity. The stretching dimension is about one's motivation to seek new knowledge and experiences, while the embracing dimension is about one's willingness to accept the uncertainty, unpredictability, and novelty of everyday life.

There are many debates about theoretical dimensions of epistemic curiosity. However, its place in learning that is appetizing for educational researchers, not what epistemic curiosity is or isn't or what dimensions it consists of. Piaget expressed the importance of epistemic curiosity in human learning in the 1900s. According to Piaget (1952), children discover new information and experiences in their environment that they do not know or contradict with what they know. This uncertainty arouses curiosity in the child and thus curiosity triggers exploration and thus, learning. Thus, triggering epistemic curiosity is important in educational environments. Loewenstein (1994) suggested that curiosity arises from recognizing lack of knowledge or uncertainty, and arousal of curiosity motivates the learner to explore the environment to fill this information gap. Epistemic curiosity motivates one to acquire knowledge and learn (Kidd & Hayden, 2015). According to Schmitt & Lahroodi (2008), even if we do not have a practical and epistemic motivation to acquire knowledge, it motivates us to learn and acquire knowledge. These views are also supported by brain research. For example, according to Kang et al. (2009), intrinsic motivation arising from curiosity and motivation emerging through extrinsic incentives activates the same neural circuits in the brain. Both novelty and stimulus complexity trigger curiosity. These views are also supported by studies conducted in educational settings. Studies conducted in the traditional classroom environment show that the uncertain and unpredictable forms of pedagogy and flexible academic contexts promote curiosity (Lamnina & Chase, 2019; see Peterson (2020) for review).

All learning environments, online or not, require learners to attend class, learn the material, submit homework, and do group work. However, e-learning environments,

unlike face-to-face learning environments, are more learner-centered and require autonomy as they present many choices for the learners (Andrade & Bunker, 2011). Thus, in e-learning, the control of the process is mostly with the learner and requires the learner to manage his learning and to choose among different options to manage the process. Unlike classroom learning, e-learning requires more self-discipline more engagement on part of the learner (Panigrahi et al., 2018).

As of March 2020, face-to-face education is suspended in most countries due to the COVID-19 pandemic. To disrupt students' learning, distance education launched at all education levels all over the world (UNESCO, 2020). The Spring semester of the 2019-2020 academic year and the entire 2020-201 academic year were completed with distance education. The majority of educational institutions have shifted to online education, incorporating e-learning platforms in their teaching to accommodate various needs in learning. Neuwirth et al. (2020) stated that the pandemic has particularly required higher education to respond to an unprecedented challenge. All higher education institutions shifted to distance learning through virtual classrooms at mid-semester. This sudden shift included many challenges for both learners and teachers. Although e-learning has become increasingly popular in recent years, it was a brand-new experience for many students and teachers.

E-learning, offering online (both synchronous and asynchronous) courses, has increased the workload of students who had to adapt quickly to different forms of e-learning models. This sudden shift was a novel experience for students accustomed to traditional face-to-face teaching. This situation, which is new and challenging for many students, and the complexity of the interaction between the learning interface and the learner, offers students a more novel and complex learning experience full of uncertainties.

A search for curiosity research that includes technology in the learning process returned minimal results generally based on empirical research (Collin et al., 2012). Researchers either simply looked at students' natural curiosity about technology use (Ching, 2009), examined curiosity by only measuring the number of questions students can generate (Rule & Barrera, 2008), or measured student engagement (Wang & Reeves, 2006). Specifically, more qualitative research studies are needed to understand the multifaceted nature of epistemic curiosity and e-learning from students' perspectives and generate in-depth conceptualizations about how these concepts can be integrated for more effective learning and teaching processes. Therefore, the present research attempts to find out the students' perceptions about their experiences during e-learning and explore whether e-learning with its complicated nature can trigger epistemic curiosity in learners who are experiencing e-learning in tertiary education for the first time during COVID 19. In this regard, the research questions were as follows:

"How do undergraduate students experience e-learning?"

"Does e-learning trigger epistemic curiosity among students?"

Method

Research Design

This study employed a qualitative research design. As the study looked into the lived experiences described by the participants, a phenomenological study was adopted by the researchers. In this phenomenological research, the respondents were interviewed and asked to share their perceptions about e-learning and describe whether it triggers their epistemic curiosity.

Participants

The participants comprised 78 undergraduate students enrolled in Turkey's foundation (non-profit, private) university. The age of the participants ranged from 20 to 23 years; 44 were female (%56) and 35 were male. As qualitative research relies on non-random sampling techniques, purposeful sampling was used to select the participants to provide in-depth and deeper understandings of the phenomenon (Patton, 2002). Due to the COVID 19 pandemic, there was a sudden shift to distance education. All courses were offered online via a learning management system. Courses were either synchronous or asynchronous. Participants voluntarily completed the online questionnaire. They all indicated that they were taking online courses for the first time.

Data Collection Tools

In this phenomenological study, data were gathered from semi-structured interviews. Specifically, to explore the students' perceptions about e-learning and find out whether it affects their epistemic curiosity, four open-ended questions were addressed to each participant. The Turkish version of the Curiosity and Exploration Inventory-II (Acun, Kapıkıran & Kabasakal, 2013) developed by Kashdan et al. (2009) was used as the major guideline to form questions to explore whether e-learning triggers the epistemic curiosity of the participants. The questions particularly attempted to find out their motivation for seeking new information and experiences during e-learning, reflecting the "stretching" dimension of epistemic curiosity and their desire to discover new, uncertain, and unpredictable information in e-learning which reflected the "embracing" dimension of epistemic curiosity. Additionally, the questions tried to find out the participants' perceptions about their desire to cope with uncertainty during e-courses and lastly, identify the barriers experienced during e-learning.

Two researchers who were experts in qualitative research and educational studies developed four open-ended questions parallel to the questionnaire items to fit respondents and tap into their experiences. The first question attempted to determine the students' perceptions of how motivated they feel to seek new information and experiences in their e-courses. The second question tried to identify how they cope with challenging information during e-learning. As for the third question, the students were

requested to share their perspectives about their willingness to deal with new, uncertain, and unpredictable information to complete their online assignments. Finally, for the last question, the students were asked them to share the barriers they face during e-learning.

Data Analysis

For this study, thematic analysis was used to identify, analyze, and report the gathered data. The six-phase approach of Clarke and Braun (2012) was followed in the study for thematic analysis. First, the individual questionnaires were transcribed by two coders (one of the researchers and a doctoral student) who read and re-read the textual data for familiarization. Second, the initial codes as the building blocks of the analysis were generated. Six descriptive codes, namely motivation, new information, challenging experience, being unpredictable, Desire, and barrier. These codes were combined and grouped into four main themes: Motivation to seek new information in e-learning, desire to deal with challenging information in e-learning, desire to discover new, uncertain, and unpredictable information in e-learning, and finally Barriers to e-learning. Finally, the coders reviewed, defined, and named the main themes to ensure that they provided in-depth information about the research subject.

Trustworthiness and Ethics

Before the data collection procedure, approval was obtained from the university's Ethics Committee. Then, a consent form was sent to each participant, explicitly stating the questionnaires were anonymous and that they could withdraw at any time during the study. The Informed consent was received with yes / no screen questions from all participants before filling the online questionnaires.

Findings

This part presents the responses of the participants regarding their perceptions about e-learning and its possible influences on their epistemic curiosity. The responses were categorized under four themes deduced from thematic analysis.

Motivation to seek new information in e-learning. When the respondents were asked to describe "how motivated they feel to seek new information during their e-courses", they emphasized using online search engines such as "Google and Google Scholar" as effective search engines to increase their motivation while completing their online tasks. Considering this finding, some of the respondents shared the following excerpts:

> When I come across new information in my e-courses, I directly google it. It is so effective and motivating to seek information online. (Student #16)

> The Internet resources help me reach new information easily. I rely on Google, Google Scholar, or any helpful and motivating websites to reach the information I need. (Student #34)

Additionally, some respondents preferred to talk to their friends and family members and get their opinion while searching for new information related to their e-courses. This finding shows that "interacting with others" is motivating for students to reach new information as illustrated in these comments:

> The support of my family helps me a lot when I try to reach new information on a particular subject that my instructor asks me in the e-courses. (Student #49)

> I am very motivated to talk with my friends when I try to reach new information. We learn a lot from each other, which helps me with my online tasks. (Student #11)

Apart from talking with others, the respondents relied on traditional resources such as "reading books, articles and journals" which motivated them to find new information as displayed below:

> When I want to look for new information, I prefer to look at the books in my library. I feel motivated when I look at the books or articles needed. (Student #76)

> I prefer searching for articles and journals to find new information. Reading them motivates me to complete my online tasks. (Student #58)

Desire to cope with challenging information. Another theme that emerged from the interviews was relevant to the Desire of the participants to cope with challenging information. Considering this finding, the respondents highlighted the importance of "planning, sequencing, and outlining" strategies while trying to understand the given assignments. Some of them expressed their viewpoints as follows:

> The first thing I do to understand complicated information is to make a plan and sequence the relevant points. This helps me complete the given task (Student #39).

> I prefer to outline complex information and then put the pieces together to clarify the meaning of the given assignment. (Student #28)

> During my e-courses, I am also asked to understand challenging information. I believe that outlining and making a plan of important information is effective for finishing my assignments. (Student #63)

Desire to discover new, uncertain, and unpredictable information. Apart from the Desire to use strategies to deal with challenging information, the respondents focused on personality characteristics such as "patience and calmness". They stated that these characteristics increased their desire to reach new, uncertain, and unpredictable information as displayed in the following comments:

> When I need to discover new and uncertain information, I try to be patient and calm. (Student #17)

> I try to stay calm when dealing with unpredictable information in my e-courses. (Student #29)

Similarly, the respondents described their e-learning experiences as "motivating and trustworthy" when they encountered uncertain and unpredictable online tasks. They tried to motivate and trusted themselves during such experiences as illustrated below:

> Sometimes the tasks are not clear and certain. In such situations, I trust myself and I know that there is always a solution. (Student #39)

> It is sometimes difficult to predict what I am supposed to do in the online tasks. I know that I need to be motivated and find a solution. (Student #9)

Barriers to e-learning. The last theme that emerged from the interviews was relevant to the challenges and difficulties experienced during e-learning. The respondents particularly stated that "timing and workload of tasks" were the major difficulties they experienced in e-courses. Considering this finding, they made the following comments:

> It is very difficult to complete the online tasks on time. We have so many assignments and timing are the two problems for me. (Student #31)

> In e-courses, we have so many tasks to finish. I have a hard time completing the due date. (Student #47)

Conclusion and Discussion

The present study aimed to explore the perceptions of tertiary level students about their experiences during e-learning and find out whether e-learning triggers their EC during the process of e-learning. The key themes that emerged from the study comprised: motivation to seek new information in e-learning, Desire to cope with challenging information in e-learning, willingness to discover new, uncertain, and unpredictable information in learning, and finally, barriers to e-learning. This study's findings might add a deeper understanding of Kashdan's model of curiosity with two dimensions and shed new light on the nature of EC related to e-learning.

Considering the first theme, the respondents highlighted the importance of using online search engines such as Google and Google Scholar as motivating tools to search for new information during their e-courses. Others preferred to interact with their friends and family members and get their opinion about new information they needed. Finally, the rest of the respondents described the use of traditional resources like books, articles, and journals to seek new information. Interestingly, these descriptions predicted the "stretching" dimension as one of the interlocking elements of EC (e.g., Berlyne, 1978; Day, 1971; Deci,1975; Spielberger & Starr, 1994; Kashdan et al.; 2009). The first dimension, stretch, includes items with positive, growth-oriented meanings (e.g., "I view challenging situations as opportunities to grow and learn"), and stretch is closely associated with various indicators of well-being (e.g., happiness, stress, psychological well-being) (Kashdan et al., 2009). Respondents felt motivated to seek out new information, reflecting positive, growth-oriented emotional and motivational systems that trigger their curiosity about e-learning. Furthermore, the respondents shared their perspectives about the willingness to deal with challenging information in e-learning. They particularly focused on the use of planning, sequencing, and outlining challenging information. Similarly, they emphasized the personal factors such as patience and calmness as the triggering sources for their desire to discover new, uncertain, and unpredictable information. Therefore, the collected findings showed that e-learning experiences provide a context for a particular state of curiosity, allowing students to more easily grasp the wider field for their curiosity and interests (Arnone et al., 1994). The

respondents also described their online experiences as motivating and trustworthy when facing such uncertainties. They highlighted that their e-learning experiences fostered their curiosity to predict novel, risky and uncertain information. This finding might provide an in-depth understanding of the "embracing" dimension of epistemic curiosity which consists of items that are much more ambiguous, reflecting readiness to embrace novel and unpredictable experiences (e.g., "I like to do things that is uncertain").

Finally, workload and timing of tasks were the two major barriers that the participating students shared for their e-learning experiences. This finding is related to situational factors. These factors include ''in the moment'' happenings as well as personal traits, predispositions, and maturation within a context that help explain the direction of behavior (Arnone, et al., 2011, p.185). The fact that students stated the major barrier to e-learning as completing tasks on time may indicate problems of self-regulation in general and, time and environmental management in particular. This result is in line with the findings by Lee et al. (2021) reporting students' challenges associated with independent studying and time management. Several researchers underline the importance of time and environment management as factors affecting success in e-learning (Barnard et al., 2009; Calamlam et al., 2021; Voils et al., 2019). In their review study, Sharpe and Benfield (2005) also stated that time management is the most problematic area in students' e-learning experiences. Students must engage in various self-regulation processes such as planning, time, and environment management (Ramdass & Zimmerman, 2011). Students should be aware of deadlines, have realistic estimates of the time required to complete the task, and act by prioritizing tasks in line with these estimates (Zimmerman & Risemberg, 1997). The fact that e-learning provides time and pace flexibility requires students to use more effective time management strategies. Although e-learning triggers students' curiosity and motivates them to learn, it may not be possible to achieve success in e-learning without the necessary time and environment management skills. Therefore, the assignments and deadlines should be organized by the other courses in e-learning.

Summary/Conclusion

The COVID-19 situation has abruptly forced students and faculty to experience a new form of learning, that is, e-learning through virtual classrooms. This rapid transition from face-to-face learning to distance learning has brought considerations that should be addressed to achieve mutual and meaningful learning and teaching environment. The present study's findings highlight the importance of e-learning as an instructional tool to promote epistemic curiosity among university students. Based on the gathered findings, we offer several pedagogical implications. First, instructors can model curiosity themselves and become co-learners in virtual classes. They can show interest and excitement about learning something new as well as motivate students to learn how to find out things for themselves.

Additionally, the students can be engaged in challenging tasks that lead them to discover new, uncertain, and unpredictable information while learning. While addressing these issues, the number of assignments and timing should be thoroughly addressed to balance the student workload. We argue that future research on epistemic curiosity and e-learning should deal with questions that ask which online practices might lead to different types of curiosity for students with different dispositions. Future research should include interpersonal variables that could moderate the relationship between e-learning and curiosity. For example, self-variables such as self-efficacy, self-regulation, and social factors such as peer interaction might influence whether high curiosity would have beneficial or detrimental effects. In addition, it is important to note and reinforce that e-learning needs to address and foster epistemic curiosity as well to lead to more meaningful and life-long learning. For many students, there are various psychological, economic, and pragmatic burdens and constraints stemming from the pandemic that might prevent them from fulfilling the course requirements. Therefore, the pedagogical innovations should meet the changing expectations and needs of the students and prepare them for physically distant, but meaningful learning experiences that will help them learn and trigger their curiosity and lead to lifelong learning.

Ethics Committee Approval: The ethics committee approval was obtained from the Scientific Research and Publication Ethics Committee of Bahcesehir University (Date:10.02.2021, No: 2021/02/16)

Informed Consent: An informed consent was obtained from each participant prior to the study.

Peer-review: Externally peer-reviewed.

Authors' Contributions: Concept- S.S., E. M., E.A; Design-S.S, E. M., E. A.; Data collection and processing- E. A., Data analysis-E.M,Interpretation -S.S, E.M.; Literature reviewı-S. S., E. M., E. A., Writing- S. S., E. M., E. A., Critical evaluation-All authors

Conflict of Interests: There was no conflict of interest between the authors.

Financial Disclosure: No financial support was received for this study.

References

Acun, N., Kapikiran, S., & Kabasakal, Z. (2013). Trait curiosity and exploration Inventory-II: Exploratory and confirmatory factor analysis and its reliability. Turkish Psychological Articles, 16(31), 86-90.

Andrade, M. S., & Bunker, E. L. (2011). The role of SRL and TELEs in distance education: Narrowing the gap. *Fostering Self-Regulated Learning Through ICT* (pp. 105-121). IGI Global https://doi.org/10.4018/978-1-61692-901-5.ch007

Arnone, M. P., Grabowski, B. L., & Rynd, C. P. (1994). Curiosity as a personality variable influencing learning in a learner-controlled lesson with and without advisement. *Educational Technology Research and Development, 42*(1), 5–20. https://doi.org/10.1007/BF02298167

Arnone, M.P., Small, R.V., & Chauncey, S.A. (2011). Curiosity, interest, and engagement in technology-pervasive learning environments: a new research agenda. Education Technology Research and Development, 59, 181–198. https://doi.org/10.1007/s11423-011-9190-9

Barnard, L., Lan, W. Y., To, Y. M., Paton, V. O., & Lai, S. L. (2009). Measuring self-regulation in online and blended learning environments. *The Internet and Higher Education, 12*(1), 1-6. https://doi.org/10.1016/j.iheduc.2008.10.005

Berlyne, D. E. (1954). A theory of human curiosity. *British Journal of Psychology, 45*, 180–191.

Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York: McGraw-Hill.

Berlyne, D. E. (1978). Curiosity and learning. *Motivation and Emotion, 2*(2), 97–175.

Beswick, D. G., & Tallmadge, G. K. (1971). Reexamination of two learning style studies in the light of the cognitive process theory of curiosity. *Journal of Educational Psychology, 62*(6), 456–462. https://doi.org/10.1037/h0031817

Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C. (2009). A meta-analysis of three types of interaction treatments in distance education. *Review of Educational Research, 79*(3), 1243–1289. https://doi.org/10.3102/0034654309333844

Calamlam, J. M., Ferran, F., & Macabali, L. G. (2021). Perception on research methods course's online environment and self-regulated learning during the COVID-19 pandemic. *E- Learning and Digital Media,* https://doi.org/20427530211027722.

Ching, G. S. (2009). Implications of an experimental information technology for elementary students. *Computers & Education, 53*(2), 419-428. https://doi.org/10.1016/j.compedu.2009.02.019

Clarke, V. & Braun, V. (2014) Thematic Analysis. In T. Teo (Ed.), *Encyclopedia of Critical Psychology* (pp. 1947-1952). Springer. https://doi.org/10.1007/978-1-4614-5583-7_311

Collin, K., Van der Heijden, B., & Lewis, P. (2012). Continuing professional development. *International Journal of Training and Development, 16*, 155–163. https://doi.org/10.1111/j.1468-2419.2012.00410.x

Day, H. (1971). The measurement of specific curiosity. In H. Day, D. Berlyne, & D. Hunt (Eds.), *Intrinsic Motivation: A New Direction in Education* (pp. 99–112). Holt, Rinehart,and Winston.

Deci, E. L. (1975). *Intrinsic Motivation*. Springer.

Donalek, J. G. (2004). Demystifying nursing research: Phenomenology as a qualitative research method. *Urologic Nursing, 24,* 516–517.

Grossnickle, E. M. (2016). Disentangling curiosity: Dimensionality, definitions, and distinctions from an interest in educational contexts. *Educational Psychology Review, 28*(1), 23–60. https://doi.org/0.1007/s10648-014-9294-y

Izard, C. E. (1977). *Human emotions*. Plenum.

Joffe, H. (2011). Thematic analysis. In: D. Harper, & A.R. Thompson, (Ed.). *Qualitative methods in mental health and psychotherapy: A guide for students and practitioners*. (pp. 209–23). Wiley.

Kang, M. J., Hsu, M., Krajbich, I. M., Loewenstein, G., McClure, S. M., Wang, J. T. Y., & Camerer, C. F. (2009). The wick in the candle of learning: Epistemic curiosity activates reward circuitry and enhances memory. *Psychological Science, 20*(8), 963-973. https://doi.org/10.1111/j.1467-9280.2009.02402.x

Kashdan, T. B., Gallagher, M. W., Silvia, P. J., Winterstein, B. P., Breen, W. E., Terhar, D., & Steger, M. F. (2009). The Curiosity and Exploration Inventory-II: Development, factor structure, and

psychometrics. *Journal of Research in Personality, 43*(6), 987–998. https://doi.org/10.1016/j.jrp.2009.04.011

Kashdan, T. B., Rose, P., & Fincham, F. D. (2004). Curiosity and exploration: Facilitating positive subjective experiences and personal growth opportunities. *Journal of Personality Assessment, 82*(3), 291-305. http://dx.doi.org/10.1207/s15327752jpa8203_05

Kidd, C., & Hayden, B. Y. (2015). The psychology and neuroscience of curiosity. *Neuron, 88*(3), 449-460. https://doi.org/10.1016/j.neuron.2015.09.010

Lamnina, M., & Chase, C. C. (2019). Developing a thirst for knowledge: How uncertainty in the classroom influences curiosity, affect, learning, and transfer. *Contemporary Educational Psychology, 59,* Article 101785. https://doi.org/10.1016/j.cedpsych.2019.101785

Lee, K., Fanguy, M., Lu, X. S., & Bligh, B. (2021). Student learning during COVID-19: It was not as bad as we feared. *Distance Education, 42*(1), 164-172. https://doi.org/10.1080/01587919.2020.1869529

Litman J.A. (2012). Epistemic Curiosity. In: N.M. Seel (eds). *Encyclopedia of the Sciences of Learning*. Springer. https://doi.org/10.1007/978-1-4419-1428-6_1645

Litman, J. A., & Jimerson, T. L. (2004). The measurement of curiosity is a feeling of deprivation. Journal of Personality Assessment, *82*, 147. https://doi.org/10.1207/s15327752jpa8202_3

Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin, 116*, 75-98

McHugh, M. L. (2012). Interrater Reliability: The Kappa Statistic. *Biochemia Medica, 22*(3), 276– 82. https://doi.org/10.11613/BM.2012.031

Neuwirth, L. S., Jović, S., & Mukherji, B. R. (2020). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education*, 1- 16. https://doi.org/10.1177/1477971420947738

Panigrahi, R., Srivastava, P. R., & Sharma, D. (2018). Online learning: Adoption, continuance, and learning outcome—A review of the literature. *International Journal of Information Management, 43,* 1-14. http://dx.doi.org/10.1016/j.ijinfomgt.2018.05.005

Panksepp J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. Oxford University Press.

Patton M., Q. (2002). *Qualitative research and evaluation methods* (3rd.) Sage Publications.

Peterson, E. G. (2020). Supporting curiosity in schools and classrooms. *Current Opinion in Behavioral Sciences, 35,* 7–13. https://doi.org/10.1016/j.cobeha.2020.05.006

Piaget, J. (1952). *The origins of intelligence in children*. International Universities Press.

Ramdass, D., & Zimmerman, B. J. (2011). Developing self-regulation skills: The important role of homework. *Journal of Advanced Academics, 22*(2), 194–218. https://doi.org/10.1177/1932202X1102200202

Rule, A., & Barrera, M., III. (2008, May). Three authentic curriculum-integration approaches to bird adaptations that incorporate technology and thinking skills. Retrieved from ERIC database. (ED501247)

Schmitt, F. F., & Lahroodi, R. (2008). The epistemic value of curiosity. *Educational Theory, 58*(2), 125-148. https://doi.org/10.1111/j.1741-5446.2008.00281.x

Sharpe, R., & Benfield, G. (2005). The student experience of e-learning in higher education. *Brookes eJournal of Learning and Teaching, 1*(3), 1-9.

Spielberger, C. D., & Starr, L. M. (1994). Curiosity and exploratory behavior. In H. F. O'Neil, Jr. & M. Drillings (Eds.), *Motivation: Theory and Research* (pp. 221-243). Erlbaum.

UNESCO, (2020). *90 million students out of school due to COVID-19: UNESCO releases first global numbers and mobilizes response*. Retrieved from https://en.unesco.org/news/290-million-students-out-school-due-covid-19-unesco-releases-first-global-numbers-and- mobilize

Voils S. A., Childs-Kean, L., M. & Thomas, A. (2019) Relationship between pharmacy students' use of self-regulated learning strategies and course outcomes. *American Journal of Pharmaceutical Education, 83*(10), 75-66. https://doi.org/10.5688/ajpe7566.

Wang, S., K, & Reeves, T. C. (2006). The effects of a Web-based learning environment on student motivation in teda high school earth science course. *Educational Technology Research and Development, 54*(6), 597-621. https://doi.org/10.1007/s11423-006-9016-3

Zimmerman, B. J., & Risemberg, R. (1997). Becoming a self-regulated writer: A social cognitive perspective. *Contemporary Educational Psychology, 22*(1), 73–101. https://doi.org/10.1006/ceps.1997.0919

Authors *Contact*

Seda SARAC
Assistant Prof. Seda SARAC
Bahcesehir University
Faculty of Educational Sciences
Elementary Education 34353
Besiktas/İstanbul

E-mail: seda.sarac@es.bau.edu.tr

Enisa MEDE
Associate Prof. Enisa MEDE
Bahcesehir University
Egitim Bilimleri Fakultesi
English Language Education 34353
Besiktas/İstanbul

E-mail: enisa.mede@es.bau.edu.tr

Ergun AKGUN
Assistant Prof. Ergun AKGUN
Bahcesehir University
Faculty of Educational Sciences
Elementary Education 34353
Besiktas/İstanbul

E-mail: ergun.akgun@de.bau.edu.tr