A structural equation modeling on pandemic session dataset: Turkish university students' new media literacy

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Article Info	Abstract
	This study was conducted to examine the relationship among university students' new media literacy, epistemic emotions, argumentativeness, online self-regulation learning, and online learning self-efficacy perceptions. An associational research design guided the study including structural equation modeling analysis. A total of 3395 students from a state university in Turkey participated in the study through online learning management system of the university during Covid-19 pandemic period. Five different Likert scales were utilized to collect data. Analyses showed that university students' self-efficacy perceptions and online self-regulated learning skills seemed to be effective on their epistemic emotions, argumentativeness and new media literacy skills. Also, participants' epistemic emotions partly predicted their argumentativeness and new media literacy skills. Considering these results, designing online learning environments respectful for university students' intellectual differentiation was suggested.

1. Introduction

In the 21st century, issues such as organ transplantation, obesity, consumption of GMO foods, establishment of nuclear power plants, smart tools, cyborg applications, and the ways to protect against coronavirus are surrounding us. Individuals find themselves in these discussions through various media tools such as news channels, WhatsApp and Facebook. In the citizen typology that individuals should have in such environments, it is observed that individuals have to perform a series of actions such as accessing information and evidence sources using media tools, evaluating this information, adding content, affecting the opinions of others and respecting ideas (Anagun, Atalay, Kilic, & Yaşar, 2016; Chen, Wu, & Wang, 2011; Koc & Barut 2016). These chains of actions mentioned are collected under the concept of media literacy as an umbrella concept. The concept of media literacy, which is one of the popular literacy concepts of the 21st century, has once again made its importance felt in the recent pandemic process experienced by the world countries. Many citizens of the countries have reached local and global statistics about the pandemic, measures and sanction decisions taken by the countries, the types of pandemics that occurred in history, news and scientific content about Covid 19 and the discussions and suggestions of scientists through media tools during the pandemic process. Many countries have also managed to continue their citizens' education and training processes through different types of media tools and online systems. As it

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is stated by Thoman and Jolls (2008, p. 42), "Media no longer just influence our culture. They are our culture" and seem to continue.

In this case, it has now become an obligation for individuals to demonstrate practices such as accessing information, using evidence sources and evaluating them fairly, sharing their own knowledge, and being aware of their own identity and social values in creating media content through media tools, in brief to grow up as media literate individuals (Chen et al., 2011). Because only media literate individuals will have characteristics that can make effective decisions in the media environments that include manipulative and propaganda elements along with correct and necessary information and can filter the contents in media. These structures have been recently discussed under the title of New Media Literacy (NML) in the literature due to some distinguishing features (e.g., media is not just consumption but production) (Chen et al., 2011; Lee, Chen, Li, & Lin, 2015). When NML's four main literacies, including Functional Consumption Literacy, Critical Consuming Literacy, Functional Prosuming Literacy, and Critical Prosuming Literacy, and its components under these literacies are examined, it can be concluded that the theoretical elements of NML are closely associated with the key concepts of educational psychology literature. Despite this relationship which is implicit and waiting for being discovered, it is observed that there is a limited number of NML studies and that there is a need for studies showing the relationship of NML with other variables in different contexts (Tugtekin & Koc, 2020). In this context, to reveal the cognitive and affective factors with which NML is associated may contribute to the literature. Therefore, in this study, it was aimed to examine the relationship of NML with the concepts of epistemic emotions, argumentativeness, self-regulation, and self-efficacy by structural equation modeling. The theoretical reasons for the selection of these concepts are presented in the following titles.

2. Theoretical Framework

2.1. Self-Regulation

Self-regulation focuses on the fact that individuals are responsible for their own learning, can control their own learning processes, make regulations in the learning process when needed and motivate themselves throughout the learning life (Zimmerman, 2000). Self-regulated students can control their learning processes by developing metacognitive strategies such as planning, being organized and motivated (Yukselturk & Bulut, 2007). Individuals with self-regulation skills are expected to manage their resources effectively (Anderton, 2006). These individuals are expected to keep their own learning process under control without needing for teachers and family (Zimmerman, 2002).

The characteristics of self-regulated learners can be explained under three titles: metacognitive, behavioral and motivational (Gaskill & Woolfolk-Hoy, 2002). In this context, when self-regulation is considered in terms of learners, they are individuals with metacognitive characteristics, such as goal setting, planning, monitoring and evaluating their own learning process. From behavioral aspects, they have characteristics such as seeking help, organizing their own learning environment and realizing their own reinforcement in learning. Motivationally, they are self-confident and self-aware individuals who are aware of the responsibility of learning outcomes.

Self-regulated learning also refers to students' systematic efforts to manage learning processes to achieve their goals (Pintrich, 2004; Zimmerman & Schunk, 2011). Self-regulated learning is usually described in the context of the integration of motivation, emotion and learning strategies (Abar & Loken, 2010). Students who have self-regulation skills in terms of motivation tend to gain competence by specializing in what they do (Pintrich, 2004; Zimmerman, 2011). The studies indicate that motivation and emotion, which are among the components of self-regulation, significantly affect the student's learning experiences (Cho & Heron, 2015). The metacognitive, motivational and behavioral characteristics of successful online experiences under the control of online learners should be examined to observe this effect (Shea & Bidjerano, 2010).

2.2. Self-Efficacy

Self-efficacy is individuals' beliefs about how well they can do the necessary actions to deal with possible situations (Bandura, 1977). Zimmerman (1995) defined self-efficacy as the judgment of an individual about his/her ability to perform and achieve a job. According to Pajares (2002), self-efficacy is the key concept of Social Cognitive Theory, which defends that individuals need to have self-confidence before they can use their skills effectively. When this concept is considered in terms of online learning, it can be defined as an individual's belief in his/her ability to organize and execute the related actions to perform online tasks or activities.

Alqurashi (2016) examined self-efficacy studies in terms of online learning. According to the study the issue is addressed multidimensionally by being not only limited to computer, internet and information seeking skills would make significant contributions to the literature, while revealing the relationships between self-efficacy and online learning. Similarly, Shea and Bidjerano (2010) indicated that self-efficacy is a component of self-regulation, which has a great structure in understanding success in online learning environments.

Furthermore, some studies argue that self-efficacy can be a key component of academic achievement in online learning (Hodges, 2008). Shen, Cho, Tsai and Marra (2013) indicated that self-efficacy was also associated with students' previous online learning experiences and gender, apart from success in online learning. Furthermore, Zimmerman and Kulikowich (2016) also stated that students with a high level of online learning self-efficacy are more likely to be successful in online classes. Lim (2001) indicated that students' computer self-efficacy had a significant effect on their satisfaction and their thoughts about attending online courses in the future.

2.3. New Media Literacy

Along the spread of media tools such as smartphones, tablets, twitter and facebook, individuals have reached a position in which they not only consume the media but also produce. These new technological tools, which are developed and reached individually, have constituted a new phenomenon that appears in the form of new media. Koc and Barut (2016) state that NML is a relatively new phenomenon and define it as a combination of socio-cultural environments created by network technologies, in which any message is digitally generated and distributed by any user. Unlike traditional media literacy, individuals experience a process in which they create, analyze and evaluate their knowledge and content in these socio-cultural environments. In this context, NML includes basic process skills such as access, analysis, evaluation, criticism, production and/or participation in media content (Lee et al., 2015). Therefore, in the 21st century, individuals should be raised as individuals with NML who comprehend the technical and socio-cultural characteristics of the new media, unlike classical literacy (Chen et al., 2011). In their study, Chen et al. (2011) unpacked the NML, and they based this concept on three main mottos. As a result of these three main mottos, including "From Consuming to Prosuming Media Literacy", "From Functional to Critical Media Literacy" "From Computer Literacy to New Media Literacy", Chen et al. (2011) proposed a conceptual framework for NML consisting of (a) functional consuming, (b) functional prosuming, (c) critical consuming and (d) critical prosuming literacies. Lin, Li, Deng, and Lee (2013) revised this framework by justifying that this quadruple structure roughly depicts NML and that this structure is unable to distinguish between cultural environments served by some technological tools (Web1 and Web2). After this new framework, they defined the NML which consisted of ten components under the titles of (a) functional consuming, (b) functional prosuming, (c) critical consuming and (d) critical prosuming.

Accordingly, NML includes specific skills such as

- creating media content by critically understanding a series of technical skills (Consuming Skill) required to consume media content and understanding the meaning of media content at the text level under the **functional consuming literacy**,

- being able to structure media messages on their own (analysis), significantly sampling and rearranging media content (synthesis), questioning, criticizing and appealing the reliability of media content (evaluation) within the context of **critical consuming literacy,**
- a set of technical skills (prosuming skill) required to produce/create media content, activities for distributing the available information (distribution), increasing (partially or completely) or mixing (production) media contents within the context of **functional prosuming literacy,**
- interactive and critical participation in the media (participation), socio-cultural values and ideology issues within the context of **critical prosuming literacy.**

2.4. Epistemic Emotions

Epistemic emotions are related to the knowledge-producing qualities of cognitive tasks and activities (Brun, Doguoglu, & Kuenzle, 2008). Knowledge and the production of knowledge in terms of epistemic emotions are the objects of emotions (Pekrun, Vogl, Muis, & Sinatra, 2017). In brief, individuals' knowledge and the emotions they feel during the acquisition of knowledge can be called epistemic emotions. These emotions generally reveal themselves during cognitive congruity and cognitive incongruity (Muis et al., 2015). However, the factor to take into account here is that cognitive congruity or incongruity does not only arouse epistemic emotions, it may also trigger other emotions (Pekrun et al., 2017). The distinctive factor here is the focus of emotion. For instance, a student's disappointment on failure to find a correct solution to the math problem is considered an epistemic emotion if it is focused on cognitive incongruity caused by unresolved problem. However, the student's disappointment is considered a sense of achievement if the focus is on personal failure and failure to solve the problem (Pekrun et al., 2017). In general, individuals have epistemic beliefs that they are familiar with knowledge and the acquisition of knowledge. When individuals encounter a situation that contradicts their epistemic beliefs, negative emotions are triggered in them, while positive emotions arise in case of epistemic equilibrium. These positive (e.g., enjoyment, curiosity) and negative epistemic emotions (e.g., anxiety, frustration) are effective in maintaining or abandoning a behavior (Muis et al., 2015). In this context, cognitive congruity and incongruity that individuals encounter in new media environments with regard to their epistemological beliefs may trigger individuals' positive and negative emotions about obtaining knowledge, which may enable individuals to choose different strategies in media environments. For instance, in the study of Muis et al., (2015), it was found that epistemic emotions were effective in choosing deep or shallow processes strategies in learning processes. Therefore, epistemic emotions can be an effective parameter on individuals' media literacy levels and this relationship is worth exploring.

2.5. Argumentativeness

Individuals have different orientations during argumentation processes. While some individuals tend to argue (argument approach) during discussions, others tend to avoid (argument avoidance) discussion. This individual tendency that individuals adopt for argumentation is defined as the concept of argumentativeness in the literature (Infante & Rancer, 1982). Argumentativeness is an individual's disposition and explains the attitudes adopted by individuals in the discussion. According to Infante and Rancer (1982), the reason for this individual feature is closely associated with the emotions that individuals have during the discussion. While some individuals consider the argumentation process as an exciting intellectual activity and exhibit an argument approach attitude, some individuals move away from the argumentation through the discussion itself and the negative emotions they have during the argumentation (Infante & Rancer, 1982).

Recent studies include important evidence of the relationship between the concept of argumentativeness and epistemological belief (Nussbaum & Bendixen, 2003) epistemic emotions (Bahcivan, 2019) and self-regulation skills (Yavuzalp & Bahcivan, 2021), although their number is limited. For instance, in a study of Bahcivan (2019), it was concluded that advanced epistemological beliefs triggered positive epistemic

emotions and that these emotions predicted whether individuals participate in argumentation. In that study, a sophisticated epistemological belief also directly affected the attitude of being argument approach. In another study, Demirbag (2021) concluded that the development of metacognitive-self regulation skills positively predicted being an argument approach. As can be seen, the concept of argumentativeness is closely associated with other main concepts (self-regulation, epistemic emotions) selected for this study.

When it is considered in the context of NML, new media tools developed today support the tasks of individuals to create their own products, share them, reflect their social values and identity, and even their ideology. In such environments, individuals share their ideas, open them to the criticism of others and experience a socio-cultural discussion environment. The argument approach or avoidance in such an environment may affect the attitude that individuals adopt in media environments. While individuals who are inclined to discussion consider discussion as an exciting activity and exhibit practices such as creating their own arguments, seeking evidence and problem solving using new media tools related to challenge or conflict issues, individuals with an avoidance attitude may prefer a passive position away from discussion in media environments. Therefore, this individual feature may be effective in predicting the level of media literacy.

3. The Proposed Model and Hypotheses

As can be seen, NML theoretically consists of four main titles and ten components. When the studies are examined, it can be said that the concept of NML is a relatively new concept, and perhaps for this reason, the number of studies examining this concept is considerably limited. Therefore, Tugtekin and Koc (2020) pointed to this situation and examined the NML's relationship with communication skills and democratic tendencies by indicating the need for new studies aimed at developing the scale related to NML, determining the NML levels of individuals and investigating the effects of NML on social and political life, apart from the conceptual structure of NML. In our opinion, despite these enterprising efforts, it is necessary to increase the number of studies on NML and to reveal other variables related to its theoretical background. In particular, according to the literature search we conducted, the relationship of NML with the main keywords in the field of educational psychology is waiting to be discovered.

In this sense, it is highly important to reveal cognitive and affective variables that affect NML. Revealing the relationship of NML with these concepts will contribute to understanding which parameters should be changed and what kinds of interventions should be made to improve NML in the whole picture. Therefore, in this study, it was aimed to test the relationship of NML with the concepts of epistemic emotions, argumentativeness, self-regulation, and self-efficacy by the structural equation modeling.

In the selection of these concepts, the concepts with which the different dimensions included in NML are (probably) associated, even if NML is not directly associated with them were selected. For instance, according to some researchers (Chen at al., 2011), it is known that the concept of digital literacy in the content of NML is intertwined with epistemological beliefs (i.e. Gunes & Bahcivan, 2018) self-regulation (Perera, Gardner, & Peiris, 2016) and self-efficacy (Prior et al., 2016). We also have evidence indicating that these concepts are associated with epistemic emotions and argumentativeness (e.g., Bahcivan, 2019). These indirect relationships triggered the idea of discussing these variables together with NML as a whole.

Furthermore, the theory of Rokeach (1968), which is one of the strong theoretical frameworks of educational psychology literature, was used to determine the theoretical relations of the main concepts and to establish the proposed model presented in Figure 1. According to this theory, individuals' behaviors and practices are fed by a belief system that is layered from a central core structure to the surface (from Type A to Type E) and leaks between each other, as in an atomic model. Accordingly, since the variables related to self (self-efficacy and self-regulation) are accepted between Type A and B beliefs, they are among the most central beliefs of the belief system and shape all other belief types. Furthermore, Type C beliefs are called authority beliefs and include beliefs about the source of knowledge. From this point of view, Type

C beliefs can be associated with epistemological beliefs. In this study, epistemological beliefs were represented by emotions based on the result that they predicted epistemic emotions strongly (Bahcivan, 2019). Rokeach (1968) defined a cumulative relationship from the very center to the surface. In this case, Types A and B beliefs should predict Type C. Furthermore, it should be accepted that everything that Type C predicts is predicted by Types A and B.

The NML and argumentativeness variables in this study are not among the belief types indicated by Rokeach (1968). These variables can be considered as knowledge and skill-focused variables surrounded by belief systems. As it was previously demonstrated by Bahcivan (2019), argumentativeness has a very close relationship with epistemic beliefs since it is directly knowledge focused, in other words, it is the way of knowing. On the other hand, NML appears as a comprehensive type of literacy affected by both ways of knowing skills and various belief types. In this context, it can be indicated that argumentativeness is a structure that is affected by epistemic emotions and is closer to epistemic beliefs, while NML is a larger structure that is affected by all the variables mentioned here. Therefore, within this theoretical framework, argumentativeness appears as a variable that also affects NML.
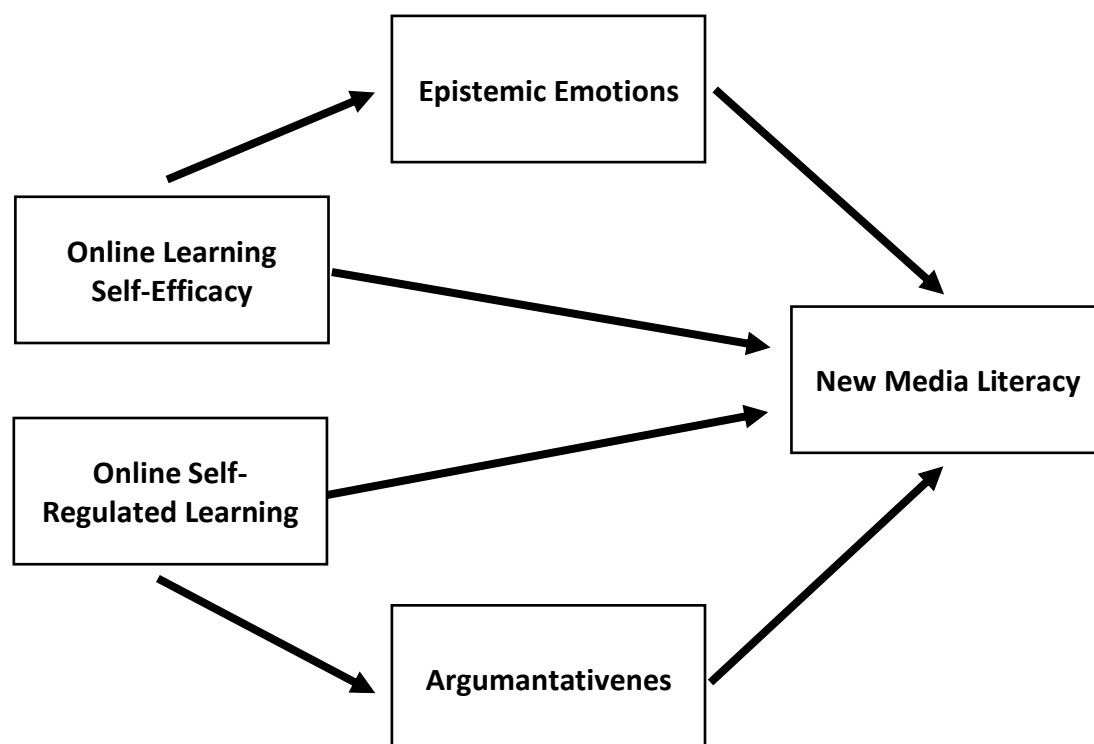

Fig. 1. Suggested model for the study.

4. The Problem Statement

Considering the purpose and the proposed model presented above, this study was conducted to respond the following research problem:

- What are the structural relations among university students' online learning self-efficacy perceptions, online self-regulated learning skills, epistemic emotions, argumentativeness and new media literacy skills?

5. Methodology

Possible relationships among university students' new media literacy skills, online self-regulated learning skills, epistemic emotions, argumentativeness and online learning self-efficacy beliefs were queried to

make comprehensive predictions. Therefore, this study has an associational research design (Fraenkel, Wallen, & Hyun, 2011).

5.1. Participants

3395 university students studying at state university participated voluntarily in the study. A convenience sampling was applied to reach maximum number of participants (Creswell, 2008). The distribution of participants in terms of certain demographic properties was represented in Table 1. Accordingly, students' ages were mostly observed between 19-26 (M=22.29 and Sd=3.79). Most of participants were faculty students (77.8%).

Table 1.

Demographic Distributions of Participants.

Variable	Trait	Number	Percentage
Gender	Female	2115	62.3
	Male	1280	37.7
Age	19 and under	270	8.0
	20	609	17.9
	21	791	23.3
	22	690	20.3
	23	446	13.1
	24	227	6.7
	25	119	3.5
	26 and above	243	7.2
Class	1 (Freshman)	748	22.0
	2 (Sophomore)	875	25.8
	3 (Junior)	802	23.6
	4 (Senior)	919	27.1
	Graduate	51	1.5
School Type	Faculty	2642	77.8
	College	174	5.1
	Vocational School	528	15.6
	Graduate School	51	1.5
Total		**3395**	**100**

5.2. The Questionnaire

It involved 5 scales measuring participants' scores related to the variables.

Online Self-Regulated Learning Scale

This scale was firstly developed by Lan, Bremer, Stevens and Mullen (2004) to measure university students' self-regulation skills in online learning environments. The scale originally included 86 five-point (from 1 for completely disagree to 5 for completely agree) Likert items distributed to 6 dimensions labeled as goal setting, environment structuring, task strategies, time management, help seeking and self-evaluation. Barnard, Paton and Lan (2008) validated a short version of this scale which included 24 items. This short version of the scale adapted into Turkish by Kilis and Yildirim (2018) with a sample of 321 university students. These researchers validated the instrumentation results with confirmatory factor analysis and reported acceptable fit indices ($\chi2/df=2.45$, CFI=0.90, TLI=0.89 and RMSEA=0.06) as well as alpha reliability scores between 0.67-0.87. In this study, we conducted a confirmatory factor analysis (n=3395) and found acceptable fit indices for the statistical model ($\chi2/df=11.76$, CFI=0.97, TLI=0.96 and RMSEA=0.06). Alpha reliability scores were observed as 0.94, 0.94, 0.87, 0.89, 0.86 and 0.88 respectively for goal setting, environment structuring, task strategies, time management, help seeking and self-

evaluation dimensions. Also, factor loading values (standardized regression weights) were observed between 0.74-0.91. Therefore, this scale was utilized to produce valid and reliable testing results.

Online Learning Self-Efficacy Scale

The scale was developed by Zimmerman and Kulikowich (2016) to measure university students' self-efficacy perceptions in online learning environments. It originally involves 22 five-point (from 1 for completely disagree to 5 for completely agree) Likert items distributed to three factors labeled as learning in the online environment, time management and technology use. Yavuzalp and Bahcivan (2020) adapted the scale into Turkish with a sample of 2087 university students and reported a one factor solution covering 21 items considering the exploratory factor analysis results. Cronbach alpha reliability score was also reported as 0.98 in the same study. In this study, a confirmatory factor analysis (n=3395) was applied for validation. Validation results presented that the scale had acceptable fit indices ($\chi2/df$=18.98, CFI=0.95, TLI=0.94 and RMSEA=0.07). Cronbach alpha reliability score was also calculated as 0.97. Factor loading values of items were observed between 0.70-0.83. Therefore, considering validation analyses, it could be claimed that this scale would produce valid and reliable results.

Epistemic Emotions Scale

This scale was developed by Pekrun, Vogl, Muis and Sinatra (2017) to measure university students' epistemic emotions. It originally involves 21 five-point (1 for not at all and 5 for very strong) Likert items distributed to 7 emotions (factors): curiosity, surprise, anxiety, enjoyment, confusion, frustration and boredom. Each emotion was represented with three adjectives in the scale. Bahcivan (2019) adapted the scale by exploratory factor analysis with a sample of 612 university students. The analysis resulted with a two-factor solution: positive emotions (5 items) and negative emotions (8 items). Alpha reliabilities were also reported as 0.74 and 0.85. In this study, we validated scaling results with a confirmatory factor analysis (n=3395) which resulted in acceptable fit indices ($\chi2/df$=23.52, CFI=0.95, TLI=0.94 and RMSEA=0.08). Alpha reliability scores were calculated as 0.88 and 0.93 respectively for positive and negative emotion dimensions. Factor loading values were observed between 0.62 and 0.84. Considering these results, it can be claimed that this scale produces valid and reliable results.

Argumentativeness Scale

The scale was developed by Infante and Rancer (1982) to measure university students' argumentativeness. It involves 16 five-point (from 1 for completely disagree to 5 for completely agree) Likert items which are equally distributed to 'argument approach' and 'argument avoidance' factors. Bahcivan (2019) previously adapted the scale into Turkish with a sample of Turkish university students and reported 0.79 and 0.80 alpha reliability scores for each dimension. In this study, a confirmatory factor analysis (n=3395) was conducted for validation. Accordingly, statistical model had acceptable fit indices ($\chi2/df$=14.19, CFI=0.96, TLI=0.95 and RMSEA=0.06). Alpha reliability scores were calculated as 0.93 and 0.91 respectively for argument approach and argument avoidance dimensions. Also, factor loading values were observed between 0.69-0.85. Therefore, it was decided that the scale would produce valid and reliable results.

New Media Literacy Scale

This scale was developed by Koc and Barut (2016) to measure university students' media literacy skills. The scale is composed of 35 five-point Likert items distributed to 4 factors: functional consumption, critical consumption, functional presumption and critical presumption. The researchers conducted factor analyses for validation and reported good fit indices (SRMR=0.050, RMSEA=0.049, GFI=0.89, CFI=0.98 and

NFI=0.97). They also reported Cronbach alpha reliability scores as 0.85, 0.87, 0.89 and 0.93 respectively for functional consumption, critical consumption, functional presumption and critical presumption. In this study, we conducted a confirmatory factor analysis (n=3395) for validation and found acceptable fit indices ($\chi2$/df=23.33, CFI=0.94, TLI=0.93 and RMSEA=0.08). Alpha reliability scores were observed between 0.97-0.98 for all the factors. Factor loading values of each item were also observed between 0.82-0.93. Therefore, according to validation results, this scale was accepted to produce valid and reliable results.

5.3. Data Collection Process

Data collection process was realized through learning management system of the university so that participants responded to the scales through online learning mediums. This process comprised of three sessions. In the first session, participants were requested to reply for online learning self-efficacy and epistemic emotions scales. The second session was realized two weeks later to collect data for online self-regulated learning and argumentativeness scales. Two weeks later, the last session was conducted to reply for the new media literacy scale. Participants were informed about the variables and data collection processes at the beginning of each session. If they selected to participate voluntarily, they were not allowed to leave any item unanswered. After the last session, the data of the participants, who responded to all scales, were combined in the dataset file. This file also involved participants' demographic variables which were provided automatically by the learning management system of the university. All the data was collected solely for this research study during Pandemic session (April-May 2020).

5.4. Data Analysis

Data analyses included two steps. The first step was realized for validation. Confirmatory factor analysis was preferred to produce evidence for validation, because, all the scales were previously adapted into Turkish and/or utilized with a sample of Turkish university students (Tabachnick & Fidell, 2013). Reliability of scaling results were examined by calculating Cronbach's alpha coefficients with SPSS. The second step of data analyses was conducted by structural equation modeling (n=3395) for responding the research problem of the study. Both confirmatory factor analyses and structural equation modeling analyses were conducted with AMOS program. In these analyses, fit index values were examined to check fit of data to the model. Among them, '$\chi2$/df' is critically important; however, Kline (2016) states that chi-square test is very sensitive to sample size. Therefore, high number of participants in the sample may be responsible for high value of '$\chi2$/df' in this study.

6. Result and Discussion

A structural equation modeling analysis was conducted to examine the possible connections among university students' online learning self-efficacy perceptions, online self-regulated learning skills, epistemic emotions, argumentativeness and new media literacy skills. Analyses yielded a model (see Figure 2) holding acceptable fit indices ($\chi2$/df=7.59, CFI=0.91, TLI=0.90 and RMSEA=0.04). Complex relationships among the variables of the study get lowered clarity in Figure 2. Therefore, Table 2 was prepared to represent all the relationships among these variables. Table 2 demonstrated also level of significance for these standardized regression weights (β).
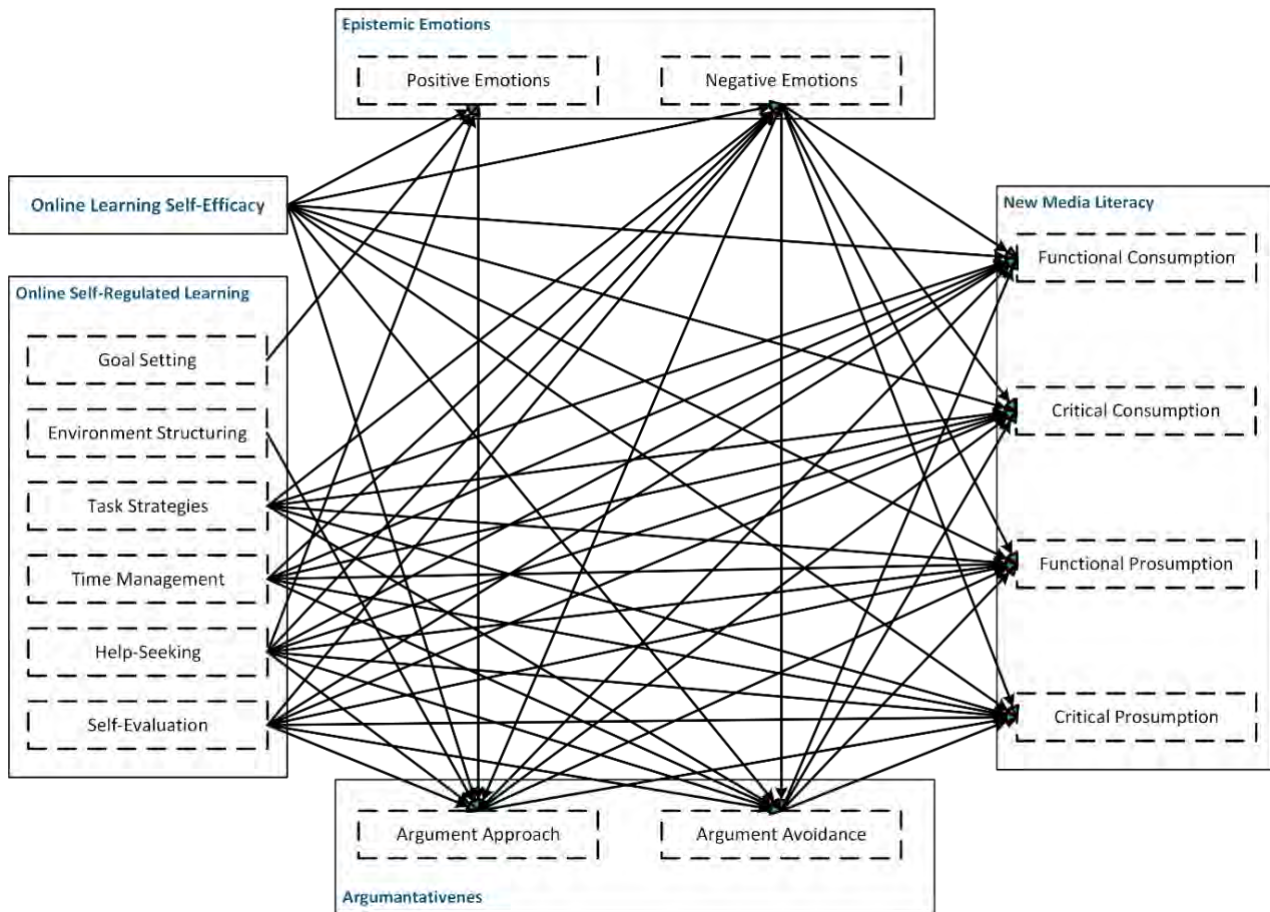
Fig. 2. Significant Relations Observed in the Statistical Model.

As can be seen in Figure 2, most of the proposed relations were observed in the statistical model. In general, university students' self-efficacy perceptions seemed to be effective on their epistemic emotions, argumentativeness and new media literacy skills. A very similar result was also handled for participants' online self-regulated learning skills. However, results also showed that participants' self-regulation skills under goal setting and environment structuring dimensions were not related to their new media literacy skills. Just a limited number of relationships were observed between self-regulated learning skills, classified under goal setting and environment structuring, and other variables of the proposed model. In addition, results showed that the relationship between positive epistemic emotions and other variables seemed limited in terms of amount. Positive epistemic emotions were just positively related to argument approach. Whereas negative epistemic emotions significantly related to all dimensions in argumentativeness and new media literacy skills. Finally, results showed that both dimensions of argumentativeness were significantly related to all dimensions of new media literacy.

Table 2.

Standardized Regression Weights of Significant Relations in the Model.

Predictor Variable	Direction	Dependent Variable	β	ρ<
Goal Setting	→	Positive Emotions	0.13	0.05
Environment Structuring	→	Argument Approach	0.11	0.05
Task Strategies	→	Negative Emotions	0.18	0.05
	→	Argument Avoidance	0.40	0.05
	→	Functional Consumption	0.75	0.05
	→	Critical Consumption	0.76	0.05
	→	Functional Presumption	0.87	0.05
	→	Critical Presumption	0.94	0.05
Time Management	→	Negative Emotions	-0.14	0.05
	→	Argument Avoidance	-0.28	0.05
	→	Functional Consumption	-0.77	0.05
	→	Critical Consumption	-0.76	0.05
	→	Functional Presumption	-0.78	0.001
	→	Critical Presumption	-0.78	0.05
Help Seeking	→	Positive Emotions	0.43	0.001
	→	Negative Emotions	0.90	0.001
	→	Argument Approach	0.49	0.001
	→	Argument Avoidance	0.87	0.001
	→	Functional Consumption	0.88	0.001
	→	Critical Consumption	0.90	0.001
	→	Functional Presumption	0.88	0.001
	→	Critical Presumption	0.86	0.001
Self-Evaluation	→	Negative Emotions	-0.32	0.001
	→	Argument Approach	-0.15	0.05
	→	Argument Avoidance	-0.70	0.001
	→	Functional Consumption	-0.45	0.001
	→	Critical Consumption	-0.45	0.001
	→	Functional Presumption	-0.48	0.001
	→	Critical Presumption	-0.46	0.001
Self-Efficacy	→	Positive Emotions	0.08	0.05
	→	Negative Emotions	-0.32	0.001
	→	Argument Approach	0.08	0.05
	→	Argument Avoidance	-0.39	0.001
	→	Functional Consumption	-0.59	0.05
	→	Critical Consumption	-0.64	0.05
	→	Functional Presumption	-0.56	0.05
	→	Critical Presumption	-0.62	0.05
Positive Emotions	→	Argument Approach	0.50	0.001
Negative Emotions	→	Argument Approach	-0.29	0.001
	→	Argument Avoidance	-0.47	0.001
	→	Functional Consumption	-0.80	0.001
	→	Critical Consumption	-0.81	0.001
	→	Functional Presumption	-0.79	0.001
	→	Critical Presumption	-0.76	0.001
Argument Approach	→	Functional Consumption	0.11	0.05
	→	Critical Consumption	0.11	0.05
	→	Functional Presumption	0.09	0.05
	→	Critical Presumption	0.11	0.001
Argument Avoidance	→	Functional Consumption	-0.34	0.001
	→	Critical Consumption	-0.32	0.001
	→	Functional Presumption	-0.34	0.001
	→	Critical Presumption	-0.31	0.001

The results of this study are mostly coherent with previous findings and theoretical approaches in the literature. For example, self-regulation and self-efficacy beliefs, labeled as Types A and B beliefs, predicted epistemic emotions (Type C) as Rokeach (1968) stated. Also, epistemological emotions were significantly related to argumentativeness. Similar findings were declared by Bahcivan (2019). When the results on NML are examined, while argument approach positively predicts all components of NML, argument avoidance negatively predicts all components of NML. This is an expected result according to the clues we obtained from certain research studies, although there is no study directly on these two variables. Because, when it is examined carefully, it will be observed that the strategies such as questioning, evaluating and criticizing sources of evidence, which are frequently used in argumentation environments by the individuals who are inclined to argue, are closely associated with NML (Lee et al., 2015). Furthermore, individuals with argument approach participated in the discussion through new media and exhibited their own ideas, which may have positively predicted their new media literacy features. Similarly, NML levels of those with avoidance attitude may therefore be negatively predicted. Because many studies showed that new media environments are positively related to the communication abilities and democratic engagement that can be considered to be closely associated with the discussion action (Kim & Yang, 2016; Tugtekin & Koc, 2020). When the relationship between epistemic emotions and NML is examined, negative epistemic emotions predicted NML negatively, which is also an expected result, although it is not a study directly based on these two concepts. Because negative epistemic emotions generally trigger shallow learning processes (Muis et al., 2015). Furthermore, negative epistemic emotions are triggered by naive epistemological beliefs. Naive epistemological beliefs negatively predict digital literacy (Chen et al., 2011), which can be considered as one of the sub-components of NML (Gunes & Bahcivan, 2018). The data obtained from these studies confirmed the result we found.

7. Conclusions and Implications

In conclusion, considering the results and the discussions presented above, it can be stated that university students' beliefs about self, epistemic emotions and argumentativeness are effective on their NML skills. Therefore, it can be suggested that online learning environments respectful for intellectual differentiations can be arranged and implemented for university students. Online learning environments may affect university students' beliefs about self positively so their NML skills. Following researchers should conduct research studies to examine the possible effects of such learning environments on NML skills via experimental designs. These learning environments may also involve digital technologies related to argumentation focused pedagogies. These technologies and learning experiences handled through them will most probably be effective on students' argumentations skills positively. According to the results of the study, argument approach students presented better literacy skills related to new media in comparison to argument avoidance students. Therefore, argumentation focused pedagogies should be implemented in university learning mediums.

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