

*Full Length Research Paper*

# **Satisfaction, utilitarian performance and learning expectations in compulsory distance education: A test of mediation effect**

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People using the distance education system are students as well as consumers who use the services. In this sense, determining satisfaction with the use of this service is vital to the success of the system. The aim of this study is to determine the relationships between perceived utilitarian performance, expectation confirmation and learning satisfaction structures in universities that have been switched from formal education to distance education at a time due to the COVID-19 pandemic. Through online forms, 416 students who have entered the distance education system were reached. The data obtained were analyzed by following the basic principles of SEM and mediation effect steps put forward by Baron and Kenny. As a result of the analyses, it was determined that the level of expectation of distance education had a partial mediation effect on the relationship between perceived utilitarian performance and learning satisfaction. Results are important because they are a pioneer in the field. In addition, the results of the research were put forward by discussing with the developing literature and in this direction provided suggestions for the field professionals. As of March, 2020, the department of physical education and sports, which continues its education in the normal semester and does not have a distance education program, had to switch to distance education due to the COVID-19 pandemic and closed the spring semester in this way. In this context, a total of 416 students studying in various departments of PES and attending distance education courses were reached online. The research form was created through Google forms and delivered to students who took courses via e-mail.

**Key words:** Education quality, perceived benefit, distance education experience, perceived satisfaction.

## **INTRODUCTION**

Although state institutions tend to ignore their goals, organizations such as universities should produce better effective solutions to this new and competitive context

(Lin, 1997). To this end, permanent relationships with students may provide important advantages to higher education institutions. Especially the determination of the

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satisfaction levels of students regarding services offered is critical in this way. Established long-term relationships may foster positive WOM behavior towards potential, current, and future students. Satisfaction outputs in higher education contain differences with the results of satisfaction perceived linearly. Public education service includes non-profit specific services. Different studies have been carried out on the basis of public higher education (Webb and Jagun, 1997; Eskildsen et al., 1999). Anderson and Sullivan (1993) stated that the effect of satisfaction in education services is more than expected. Conversely, the dissatisfaction with higher education means unsuccessful educational life for students (Astin, 1993; Wiese, 1994), but it will have significant negative consequences for higher education institutions (Ugolini, 1999).

Curran (2008) defined online distance education as a process in which students and teachers interact with each other regarding course contents through online technologies. In this context, Simonson et al. (2009) stated that if 80% or more of the content is delivered online, the course can be considered an online course. Distance online learning activities are constantly increasing in line with technological developments (Kim et al., 2011). Distance education system users are students as well as consumers who use the services. In general, Oliver (1997) defined satisfaction as an assessment of the degree of consumer satisfaction arising from need. Levels of inadequate or excessive satisfaction of needs have different effects on achieving satisfaction. In this respect, Oliver and De Sarbo (1988) found that positive satisfaction arising from expectation confirmation positively is the most important factor in ensuring satisfaction.

Discussions in the online distance education literature have reported different results in similar situations (Tenenbaum et al., 2001). While various studies conducted in the literature on the subject point to the negative effects of students' performance levels, some studies stated that there is no significant difference (Hislop, 2000). Quality in education is important in the presentation of all courses and programs regardless of physical or distance learning. The most important element in the quality framework for online education is perceived satisfaction. It has been determined in many studies (Kim and Hwang, 2012; Wang, 2017), including in different disciplines, that utilitarian performance is an important indicator of quality. Limited visual and communicative signals in online classrooms can cause perceived poor performance Muirhead (2000). In particular, the lack of face-to-face social interaction has been reported as a major disadvantage of online distance courses. In this respect, Rovai and Wighting (2005) stated that isolation, disconnection and loneliness prevented students from participating in the class activities. This will cause the students' perceived academic interests and motivations to decrease their

perceived performance (Russo and Benson, 2005). This indicates that more research needs to be done to make effective conclusions about the performance of the effectiveness of online learning Kim et al. (2011).

There are various opinions related to the motivation of the emergence of online distance education. While Daniel (1999) stated dealing with increasing student numbers and reducing costs, Bischoff et al. (1996) reported that increasing learning outcomes is the main motivation. Apart from all these, it is very important to determine whether online teaching platforms are successful in learning. In this context, Carswell et al. (2000) found that cultural experience in distance education provides more difficult obstacles than technical experience. Althaus (1997) found that students with a higher level of computer experience were more likely to use online discussion groups and perceive them as useful. Readiness and motivation of volunteer participation is the key factor for success in online distance learning.

In light of all this information, this research has been designed to determine the relationships between the utilitarian performance, expectation confirmation and satisfaction levels perceived by the students participating in distance online education and to determine whether the level of expectation confirmation between the perceived utilitarian performance and their satisfaction levels is a mediation effect or not.

### **Theoretical background for research hypotheses**

Hackman and Walker (1990) stated that technology can affect and change learning outcomes. In this context, Williams (1978) stated that face-to-face meetings could be replaced by video conferences in the near future. Early research on audio and video teleconferencing technologies on user expectations has found that they do not show user satisfaction compared to physical communication (Fowler and Wackerbarth, 1980; Williams, 1978). All research conducted to understand the product/service evaluation process in the formation of the satisfaction response is very important in this sense.

Consumer satisfaction is the response resulting from an assessment of how well a product or service consumption meets a need, desire, or goal (Oliver, 1997). Allen et al. (2002) have a linear relationship with quality perceived from the educational process and learning satisfaction. Astin (1993) defines student satisfaction as the perceived value of the student's educational experiences in an educational institution. Muilenburg and Berge (2005) found significant differences in the way students perceive their online experiences during learning. On-going discussions in the literature on the subject are that students' perceptions of learning expectations may affect their satisfaction levels (Carr, 2000). Kim et al. (2011) reported that online learning experience has a close relationship with learning

satisfaction. Brown (2001) stated that one of the main reasons for this situation is the lack of courage caused by the lack of experience in participating in online distance learning activities.

The expectation disconfirmation theory (EDT) states the importance of explaining consumers' satisfaction with product or service and the nature of its impact on satisfaction. In general terms, failure of expectation confirmation can be expressed as a discrepancy between expectations and perceived performance of products/services. Yi (1990) stated that how positive the performance expectations are met based on the EDT theory will have significant effects on the level of satisfaction. The performance, which is perceived as the opposite of this situation, will stay away from expectations and will create a negative dissatisfaction.

Researches in the literature have examined the product/services with their utilitarian and hedonic dimensions in general (Batra and Ahtola, 1991; Van der Heijden and Sorensen, 2003). Utilitarian consumption performance, which was examined within the scope of the research, is expressed as externally motivated consumption. In this sense, consumption is a tool in reaching results and targets in general. Information technologies developing in parallel with technologies are important in utilitarian consumption. The distance education systems examined within the scope of the research are the tools to be used in reaching the learning objectives. Hassenzahl and Tractinsky (2006) stated utilitarian experience is goal-oriented and emphasizes the functional performance of technology to fulfil the goal/task. This is also in line with the findings of technology acceptance/adoption research. Utilitarian performance can be considered as a strong predictor of technology use intention (Johanna and van der Heijden 2000), and as an important predictor of satisfaction (Venkatesh, 2003).

## METHODS

### Research questions and hypotheses

Within the scope of all this theoretical information, research hypotheses for these research purposes were created as follows.

H<sub>1</sub>: Utilitarian performance perceived from online distance learning activities has a positive effect on students' satisfaction.

H<sub>2</sub>: Utilitarian performance perceived from online distance learning activities has a positive effect on the distance education expectation confirmation of students.

H<sub>3</sub>: Expectation confirmation of online distance education activities has a positive effect on students' educational satisfaction.

H<sub>4</sub>: Expectation confirmation of students from online distance learning activities has a partial mediation effect on the relationship between perceived utilitarian performance and satisfaction.

### Data collection and sampling

As of March 2020, the department of physical education and sports

of Siirt University (PES), which continues its education in the normal semester and does not have a distance education program, had to switch to distance education due to the COVID-19 pandemic and closed the spring semester in this way. In this context, a total of 416 students studying in various departments of Siirt University PES and attending distance education courses were reached online. The research form was created through Google forms and delivered to students who took courses via e-mail. Detailed information about the research was given in the form by adding that voluntariness was essential in participating in the research. In order to prevent one person from responding more than once, IP restrictions have been introduced on online forms. It was determined by the researchers that the research participants were similar to the faculty-student profile (department, gender, age, etc.) (Table 1). This provides clues that the research sample is distributed according to the general sampling.

### Measurement tools

In order to determine the utilitarian performance perceived by the participants, the utilitarian structure of the Hedonic/Utilitarian (HED/UT) scale developed by Van der Heijden and Sorensen (2003) was used. The statements of the measurement tool developed by Oliver (1980) to determine whether participants' distance education expectations are met, and used by Deng et al. (2010) was revised for the purposes of the research. Finally, to determine the satisfaction levels of students in distance education, the statements of the measurement tools used for similar purposes in the literature (Bolliger and Wasilik, 2009; Deng et al., 2010) were used. All structures created in this context are evaluated in a five-point Likert expression range (5-Strongly Agree; 1-Disagree). In addition, the questionnaire included questions to determine the demographic characteristics of the participants (age, number of weekly workouts, etc.).

### Data analysis

Firstly, kurtosis and skewness values were determined through the SPSS program to fulfil the normality assumptions of all structures used in the research. There are many opinions in the literature, which state that it would be appropriate to use SEM methodological principles in the analyses to be made for multivariate structures (Byrne, 1998; Hair et al., 2012). In this case, researchers decided to use the basic methodological principles of SEM in the research, which was structured to determine the relationships between multivariate structures. First of all, CFA was conducted for the structures to be used in the research. After the verification of the relevant structures, a structural model was established in line with the research hypotheses. To demonstrate the mediation effect in the structural model, the steps pointed out by Baron and Kenny (1986) were monitored through the AMOS program.

## RESULTS

### Confirmatory factor analysis

Structural equations were created by using the AMOS program to analyse the data collected within the scope of the research. In this context, confirmatory factor analysis (CFA) was applied to determine the validity and reliability levels of the scale items by loading them correctly in their respective structures (Anderson and Gerbing, 1988). Within the scope of the research, AVE values and factor

**Table 1.** Findings regarding the demographic characteristics of the participants.

<b>Gender</b>	<b>N</b>	<b>%</b>	<b>Monitoring device</b>	<b>N</b>	<b>%</b>
Male	272	65.3	Mobile phone	302	72.6
Female	144	34.7	Computer	114	27.4
<b>Age</b>	<b>N</b>	<b>%</b>	<b>Department</b>	<b>N</b>	<b>%</b>
17-22	221	53.1	PES	138	33.2
23-24	133	32	Sports Management	176	42.3
25 and over	62	14.9	Coaching	102	24.5

**Table 2.** Validity and reliability analysis of research structures.

<b>Expectation confirmation of the distance education (AVE: ,77; <math>\alpha</math>: ,92; CR: 93)</b>	<b>Factor load</b>
My experience of using the distance education system meets my expectations	0.814
The service level of the distance education system meets my expectations	0.862
The benefit provided by the distance education system meets my expectation	0.919
The overall performance provided by the distance education system is above my expectations	0.923
<b>Perceived utilitarian performance (AVE: ,70; <math>\alpha</math>: ,93; CR: 93)</b>	
The distance education system works	0.809
The distance education system is practical	0.731
The distance education system is required	0.800
The distance education system is functional	0.849
The distance education system is useful	0.914
The distance education system is useful	0.913
<b>Perceived quality of education (AVE: ,81; <math>\alpha</math>: ,92; CR: 93)</b>	
I learned useful information from the distance education system	0.897
Lessons were effective in the distance education system	0.898
The courses I took in the distance education system broadened my knowledge	0.909

Measurement model goodness of fit values ( $X^2 = 256.460$   $p = 0.000$ .  $X^2/SD = 3.612$ .  $GFI = 0.919$ .  $AGFI = 0.879$ .  $CFI = 0.971$ .  $TLI = 0.963$ .  $IFI = 0.971$ .  $RMSEA = 0.079$ ).

loads of all statements were calculated to reveal discriminant and convergent validity (Fornell and Larcker, 1981; Nunnally and Bernstein, 1994). As a result of the analyses, discriminant and convergent validities of the research structures were revealed (Table 2). To determine the reliability levels of the research structures, Cronbach's alpha and composite reliability (CR) values were calculated and all structures were found to be well above the limits stated in the literature (Table 2). CFA was conducted to analyse the consistency of the measurement model created under the SEM with the data. It has been determined that the measurement model formed in expectation confirmation of distance education, perceived utilitarian performance and perceived quality of education structures sufficiently matches the data ( $X^2 = 256.460$ ,  $p = 0.000$ ,  $X^2/SD = 3.612$ ,  $GFI = 0.919$ ,  $AGFI = 0.879$ ,  $CFI = 0.971$ ,  $TLI = 0.963$ ,  $IFI = 0.971$  and  $RMSEA = 0.079$ ).

Pearson correlation analysis was used to determine the correlation coefficients of all structures analysed within the scope of the research. As a result of the analyses, it was revealed that the correlation coefficients of all structures were not statistically significant and not above 0.85 (Table 2). This provides evidence of the external validity of the measurement model (Bagozzi et al., 1991).

After the validity and reliability of the research model, it was determined that the structural model created to determine the causal relationships between the structures used in the research (Perceived utilitarian performance, learning satisfaction and expectation confirmation) was well-matched ( $X^2 = 249.507$   $p = 0.000$ ,  $X^2/SD = 3.564$ ,  $GFI = 0.880$ ,  $AGFI = 0.920$ ,  $CFI = 0.972$ ,  $TLI = 0.964$ ,  $IFI = 0.972$ ,  $RMSEA = 0.079$ ). This provided an empirical opportunity to detect the mediation effect within the scope of the research Figure 1.

After ensuring the validity of the research model, the

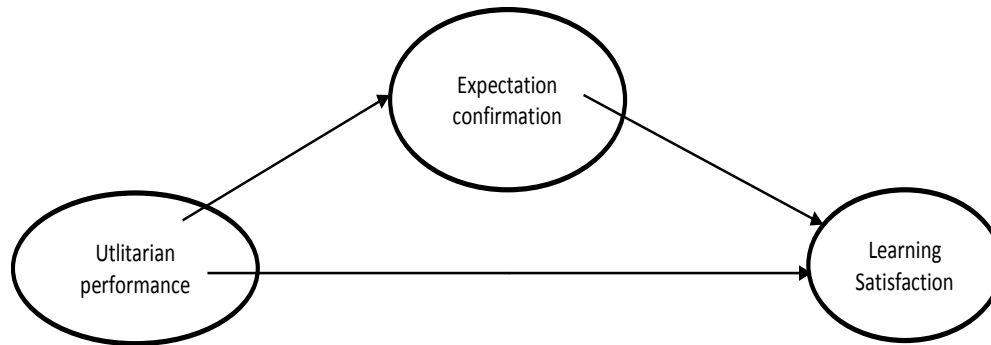


Figure 1. Research model.

research structural model was created to reveal the causal relationships within the hypotheses. It was determined that the goodness of fit values of the model was above the limits expressed in the literature. In this context, in line with the steps proposed by Baron and Kenny (1986), the mediation effect of expectation confirmation between the utilitarian performance and satisfaction structures was examined.

Firstly, a statistically significant relationship was investigated between the dependent variable and the independent variable (Table 4). A statistically significant relationship was found between the dependent variable (learning satisfaction) and the independent variable (Perceived utilitarian performance) of this study ( $R^2 = 0.806$ ;  $p < 0.01$ ).  $H_1$  hypothesis formed in this direction was accepted. The second step was to determine a significant relationship between the independent variable and the intermediary variable. In this study, a statistically significant relationship was found between the independent variable (perceived utilitarian performance) and the intermediate variable (distance education experience) ( $R^2 = 0.761$ ;  $p < 0.01$ ). This result led to the acceptance of the generated  $H_2$  hypothesis. Baron and Kenny (1986) stated that the intermediate variable was determined to have a statistically significant relationship between the dependent variable (when used with the independent variable in the model) as a third step. It was found that there was a significant relationship between the mediating variable (distance education experience) and the dependent variable (perceived quality of education) (when used with the independent variable in the model) ( $R^2 = 0.728$ ;  $p < 0.01$ ). In this case, the  $H_3$  hypothesis was accepted. To talk about the mediation effect, the last step was that the coefficient of the independent variable in the basic model with the dependent variable was greater than the coefficient in the structural model. The results obtained within the scope of the study confirm this step (Table 3). As a result of the analysis of all steps stated by Baron and Kenny (1986), all the assumptions proposed were provided and it was revealed that expectation confirmation partially mediated between the perceived utilitarian performance and learning

satisfaction and the  $H_4$  hypothesis was accepted (Table 5).

## DISCUSSION

The main motivation of this research is to determine the relationships between perceived performance, satisfaction and expectations of university students in the compulsory transition to distance education due to the COVID-19 pandemic. The acceptance of the hypotheses created within the scope of the research contributed to the discussions in the related literature, as well as provided important clues to the field scholar about the actions they need to take on a current topic. This research, especially regarding the current situation, reveals the importance of its results as being a pioneer in the literature.

Oliver and De Sarbo (1988) believe that expectation confirmation is the most important determinant in evaluating whether performance is better than expectation and satisfaction. Researches on this issue have provided empirical evidence that perceived product service performance and performance expectations are an important function (Oliver, 1980; Khalifa and Liu, 2003). The results of this study are parallel to similar studies in the related literature within the scope of distance education activities. Relevant field scholars should conduct researches to determine student expectations and shape their distance education systems accordingly which researchers think will be important in the success of the distance education system.

Researches on online communication conference systems in the literature have shown that the attitudes of the user towards previous usage experience and skills affect user satisfaction positively (Kerr and Hiltz, 1982). Regarding the subject, Hostetter and Busch (2006) stated that students with online distance education experience have higher perceived educational performance. Trainings to be given on the use of online learning environments called virtual classrooms will be effective in meeting the educational expectations of students (Hiltz,

**Table 3.** Correlation matrix.

Correlation	1	2	3
Utilitarian performance	1.000		
Expectation confirmation	0.883**	10.000	
Perceived learning satisfaction	0.847**	0.782**	10.000
Average	20.32	20.43	20.42
Standard deviation	10.15	10.22	10.16

\*p&lt;0.01.

**Table 4.** Model values before the mediating variable analysis.

Analysis	Std. R <sup>2</sup>	S.E.	T-value	P-value	Result
H <sub>1</sub> learning satisfaction ≤ utilitarian performance	0.806	0.039	200.87	0.000	Significant

\*p&lt;0.01.

**Table 5.** Model values after the mediating variable analysis.

Analysis	Std. R <sup>2</sup>	S.E.	T-value	P-value	Result
H <sub>2</sub> expectation confirmation ≤ utilitarian performance	0.761	0.034	190.57	0.000	Significant
H <sub>3</sub> learning satisfaction ≤ utilitarian performance	0.728	0.082	80.92	0.000	Significant
H <sub>4</sub> learning satisfaction ≤ utilitarian performance	0.253	0.067	30.79	0.000	Significant

\*p&lt;0.01.

1986). Within the scope of the research, the low levels of students' satisfaction with regard to the relevant structures ( $\bar{x}$ : 2.42; SD: 1.16) may be related to the students' lack of experience in these environments. In this direction, it is thought that the comprehensive visual and textual trainings that will be given to students for distance education system will be important in increasing their satisfaction and therefore their experience.

Online distance education platforms point to a serious cultural shift between students and teachers. Leaving the traditional face-to-face training activities and communicating in a largely asynchronous environment can be expressed as a radical change in this sense. This is a sign of a new culture with its own rules and traditions. Adaptation of all stakeholders in the distance education platform to the new culture can be stated as the key factor of success. The low utilitarian performance perceived by the students within the scope of the research can be expressed as a difficulty in adapting to the culture formed within this scope. It may be an important step for the field professionals to make studies adapting students to the new culture that will emerge. In this research, it was determined that a very important part of the students attended distance education courses via mobile phones. In this sense, making the applications developed only for mobile phones can be a very

important step towards satisfaction.

There are important differences between the costs of distance education and traditional face-to-face education. The cost should be taken into account not only in the cost of the educational institution, but also in costs for transportation, displacement and the solution of various problems (housing, heating, etc.). In parallel with the increasing number of students and the digitalized world, it is inevitable that all educational institutions move to the distance education system partially or completely. In this sense, institutions that can perform distance education activities based on solid infrastructure foundations will gain important advantages on the way to student satisfaction.

### Limitations and future research

All scientific research has some limitations for various reasons. In this sense, the reported limitations will provide important clues for future research. Within the scope of this research, basic methodological principles of quantitative research methods were used. The inclusion of qualitative research methodologies in new research may be important in providing more important insight into the subject. This research has determined student

satisfaction towards distance education systems and different results can be obtained in the research of holistic education satisfaction in new researches to be carried out. Within the scope of the research, only PES students were reached, which may be important in revealing the difference between departments in new researches for students studying different departments. Finally, testing new models that include different variables for the discussions developing in the literature will make important contributions to the literature.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests

## REFERENCES

- Allen M, Bourhis J, Burrell N, Mabry E (2002). Comparing student satisfaction with distance education to traditional classrooms in higher education: A met analysis *The American Journal of Distance Education* 16(2):83-97.
- Althaus SL (1997). Computer-mediated communication in the university classroom: An experiment with on-line discussions. *Communication Education* 46(3):158-174.
- Anderson EW, Sullivan MW (1993). The Antecedents and Consequences of Customer Satisfaction for Firms. *Marketing Science* 12(2):125-143.
- Anderson JC, Gerbing DW (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin* 103(3):411-423.
- Astin AW (1993). The Jossey-Bass higher and adult education series What matters in college? Four critical years revisited. *Liberal Education* 79(4): 4-12.
- Bagozzi RP, Yi Y, Phillips LW (1991). Construct validity in organizational research. *Administrative Science Quarterly* 36(3):421-458.
- Baron RM, Kenny DA (1986). The moderator–mediator variable distinction in social psychological research: Conceptual strategic and statistical considerations. *Journal of Personality and Social Psychology* 51(6):1173-1182.
- Batra R, Ahtola OT (1991). Measuring the hedonic and utilitarian sources of consumer attitudes. *Marketing Letters* 2(2):159-170.
- Bischoff WR, Bisconer SW, Kooker BM, Woods LC (1996) Transactional distance and interactive television in the distance education of health professionals. *The American Journal of Distance Education* 10(3):4-19.
- Bolliger DU, Wasilik O (2009). Factors influencing faculty satisfaction with online teaching and learning in higher education. *Distance Education* 30(1):103-116
- Brown RE (2001). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks* 5(2):18-35.
- Byrne BM (1998). *Structural Equation Modeling with LISREL PIRELIS and SIMPLIS: Basic concepts applications and Programming*. New Jersey: Lawrence Erlbaum Associates.
- Carr S (2000). As distance education comes of age the challenge is keeping the students. *Chronicle of Higher Education* 46(23):39-41.
- Carswell L, Thomas P, Petre M, Price B, Richards M (2000). Distance education via the internet: The student experience. *British Journal of Education Technology* 31(1):29-46.
- Curran C (2008). Online learning and the university In WJ Bramble and S Panda (Eds) *Economics of distance and online learning: Theory practice and research*. New York: Routledge.
- Daniel JA (1999). Effects of learning style and learning environment on achievement of physical therapy graduate students in distance education. Unpublished PhD Thesis Texas Tech University Texas.
- Deng Z, Yaobin L, Kwok KW, Jinlong Z (2010). Understanding Customer Satisfaction and Loyalty: An Empirical Study of Mobile Instant Messages in China *International Journal of Information Management* 30(4):289-300.
- Eskildsen J, Martensen A, Gronholdt L, Kristensen K (1999). Benchmarking student satisfaction in higher education based on the ECSI methodology. *Higher Education Institutions* 9(18):385-402.
- Fornell C, Larcker DF (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* 18(1):39-50.
- Fowler G, Wackerbrith M (1980). Audio Teleconferencing versus Face-to-Face Conferencing: A Synthesis of the Literature. *Western Journal of Speech Communication* 44(3):236-252.
- Hackman MZ, Walker KB (1990). Instructional communication in the televised classroom: The effects of system design and teacher immediacy on student learning and satisfaction. *Communication Education* 39(3):196-206.
- Hair J, Sarstedt M, Pieper T, Ringle CM (2012). The use of Partial Least Squares Structural Equation Modeling in strategic management research: A review of past practices and recommendations for future applications. *Long Range Planning* 45(5):320-340.
- Hassenzahl M, Tractinsky N (2006). User experience - A research agenda. *Behaviour and Information Technology* 25(2):91-97.
- Hiltz RS (1986). The "Virtual classroom": Using computer-mediated communication for university teaching. *Journal of Communication* 36(2):95-104.
- Hislop G (2000). Working professionals as part-time on-line learners *Journal of Asynchronous Learning Networks* 4(2):73-85.
- Hostetter C, Bush M (2006). Measuring Up Online: The Relationship between Social Presence and Student Learning . *Satisfaction Journal of Scholarship of Teaching and Learning* 6(2):1-12.
- Johanna BI, van der Heijden MA (2000). The development and psychometric evaluation of a multidimensional measurement instrument of professional expertise. *High Ability Studies* 11(1):9-39.
- Kerr E, Hiltz SR (1982). *Computer Mediated Communication Systems*. Academic Press NY.
- Khalifa M, Liu V (2003). Determination of Satisfaction at Different Adoption Stages of Internet Based Services. *Journal of Association for Information System* 4(5):206-232.
- Kim DJ, Hwang Y (2012). 'A study of mobile internet user's service quality perceptions from a user's utilitarian and hedonic value tendency perspectives' *Information Systems Frontiers* 14(2):409-421.
- Kim J, Kwon Y, Cho D (2011). Investigating factors that influence social presence and learning outcomes in distance higher education. *Computers and Education* 57(2):1512-1520.
- Lin AMY (1997). Bilingual education in Hong Kong in *Bilingual education* (pp. 281-289) Springer Dordrecht.
- Muilenburg LY, Berge ZL (2005). Student barriers to online learning: A factor analytic study. *Distance Education* 26(1): 29-48.
- Muirhead W (2000). Online education in schools. *International Journal of Educational Management* 14(7):315-324.
- Nunnally JC, Bernstein IH (1994). *Psychometric theory* New York: McGraw-Hill.
- Oliver RL (1997). *Satisfaction: A behavioral perspective on the customer* New York.
- Oliver RL (1980). A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions. *Journal of Marketing Research* 17(4):460-469.
- Oliver RL, De Sarbo WS (1988). Response Determinants in Satisfaction Judgments. *Journal of Consumer Research* 14(4):495-507.
- Rovai AP, Wighting MJ (2005). Feelings of alienation and community among higher education students in a virtual classroom. *The Internet and Higher Education* 8(2): 97-110.
- Russo T, Benson S (2005). Learning with invisible others: Perceptions of online presence and their relationship to cognitive and affective learning. *Educational Technology and Society* 8(1):54-62.
- Simonson MR, Sharon S, Michael A, Susan Z (2009). *Teaching and Learning at a Distance: Foundations of Distance Education* 4th ed Boston: Allyn and Bacon.
- Tenenbaum G, Naidu S, Jegede O, Austin J (2001). *Constructivist*

- pedagogy in conventional on-campus and distance learning practice: An exploratory investigation. *Learning and Instruction* 11(2):87-111.
- Ugolini M (1999). University dropout: A problem and an opportunity. In Proceedings of the TQM for Higher Education Institutions Conference: Higher Education Institutions and the Issue of Total Quality 25(4): 417-436.
- Van der Heijden H (2003). Factors influencing the usage of websites: the case of a generic portal in The Netherlands. *Information and Management* 40(6):541-549.
- Van der Heijden H, Sorensen LS (2003). In measuring attitudes towards mobile information services: An empirical validation of the HED/UT scale. *Measuring Attitudes Towards Mobile Services* 11(3):12-24.
- Venkatesh V (2000). Determinants of Perceived Ease of Use: Integrating Control Intrinsic Motivation and Emotion into the Technology Acceptance Model. *Information Systems Research* 1(4):342-365.
- Wang J (2017). The computer program structure for assigning individuals to populations: Easy to use but easier to misuse. *Molecular Ecology Resources* 17(5): 981-990.
- Webb D, Jagun A (1997). Customer care customer satisfaction value loyalty and complaining behaviour: Validation in a UK university setting. *Journal of Consumer Satisfaction Dissatisfaction and Complaining Behaviour* 10(1):139-151.
- Wiese MD (1994). College choice cognitive dissonance: Managing student/institution fit. *Journal of Marketing for Higher Education* 5(1):35-47.
- Williams E (1978). Teleconferencing: Social and psychological factors. *Journal of Communication* 84(1):125-131.
- Yi Y (1990). A critical review of consumer satisfaction. *Review of Marketing* 4(1):68-123.