The role of service quality in fostering different types of perceived value for student blended learning satisfaction

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Abstract
The present study aims to conceptualize service quality and perceived value in the context of blended learning by redefining and modifying the existing SERVQUAL model, reviewing prior marketing literature on perceived value, and examining the relationships between service quality, perceived value, and student satisfaction. The sample was restricted to colleges in South Korea, where blended learning programs have started to receive much attention. We examined our hypotheses by using regression analysis via the statistical programs Amos 22.0 and SPSS 23.0. The following results are produced. First, the conceptualization of service quality and perceived value was confirmed. Second, the different effects of online and offline service quality on each perceived value are confirmed. Offline service quality is more effective in generating perceived epistemic value, perceived social value, and perceived emotional value than online service quality, whereas online service quality is more effective in triggering perceived conditional value than offline service quality. Finally, perceived emotional value and perceived conditional value are the important determinants of student satisfaction. We address the theoretical implications that (1) service quality and perceived value are conceptualized through modification, refinement, and empirical testing and develop a multidimensional scale for service quality and perceived value, and (2) the sequential and causal relationships among service quality, perceived value, and student satisfaction are confirmed. Practically, we expect that our measurement scales for service quality and perceived value, which have high validity and reliability, can serve as diagnostic tools for blended learning program evaluation from students’ perspective.

Keywords  Service quality · Perceived value · Student satisfaction · Blended learning

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Introduction

Blended learning is considered an alternative to traditional learning in higher education, with some scholars defining it as the “new traditional model” (Porter et al., 2016) or the “new normal” in course delivery (Norberg et al., 2013). Blended learning is the combination of online and offline learning (Boelens et al., 2017; Um et al., 2021). As the rapid rise of information and communication technology (ICT) is attracting considerable attention from education service providers, many universities are seeking new opportunities to (1) increase student satisfaction by offering classes of higher quality, and (2) reduce administrative expenses and managerial costs (Porter et al., 2016; Spanjers et al., 2015). Unlike e-learning, which was previously regarded as a substitute for traditional offline learning, blended learning can implement existing curricula without any functional loss in teaching and learning (Voet & De Wever, 2016). While blended learning is characterized by a set of remarkable and unique features, scholars and practitioners still lack an understanding of its concrete and practical design, and insufficient evidence calls for further research inquiry on topics such as which dimensions should be conceptualized and measured (Garnham & Kaleta, 2002), which potential values are expected, and how those values can increase satisfaction (Graham et al., 2014). Consequently, this lack of evidence makes it challenging for researchers and managers to effectively design and implement blended learning programs as well as establish a diagnostic tool for their assessment.

To address these concerns, this study first attempts to conceptualize the dimensions of blended learning by considering online and offline service quality separately. Classifying the dimensionality of blended learning is critical, primarily because the absence of a shared understanding of this term has produced mixed outcomes and the already-produced outcomes and conclusions are unreliable. Since the conceptual definition of blended learning is addressed only superficially and scholars from different research backgrounds use the term in different contexts, the present study seeks to develop the dimensionality of blended learning based on the SERVQUAL model developed by Parasuraman et al., (1985, 1988). The SERVQUAL model that has long been considered an effective diagnostic tool used to predict customer satisfaction (e.g., Carr, 2007; Chiu et al., 2007; Um et al., 2021). In this respect, quality in higher education has received significant attention from scholars and practitioners due to its ability to predict student satisfaction (McKenzie et al., 2013; Wanner & Palmer, 2015). However, research on the quality of blended learning is still in its infancy, probably because the various streams of existing literature present few reliable ways to measure its quality. In addressing a growing call to conceptualize blended learning and provide validated measurement techniques, this study begins by reviewing relevant literature on the SERVQUAL model and develops its dimensionality by modifying the original SERVQUAL model with respect to blended learning. The definition of key variables in our study is discussed in the following section.

Second, this study explores which values of blended learning can be created, which will in turn lead to student satisfaction. Existing studies have identified
several factors that have been tested to increase satisfaction, many of which have emerged and subsequently disappeared (Seo & Um, 2019). This evidence indicates that while existing scholars have paid attention to the conceptualization of blended learning dimensions, fewer efforts have been made to investigate their consequent effects. Thus, the existing literature stands to benefit from a more rigorous discussion of the value of such contributions. To resolve this issue, this study proposes four different types of perceived value—perceived epistemic value, perceived social value, perceived emotional value, and perceived conditional value—all of which can be expected to be derived from online and offline service quality. Identifying perceived value as a consequent variable of these service quality dimensions and examining their relative effects on each value can provide insight into how to design blended learning programs to maximize student satisfaction. Because the success or failure of a blended learning program depends on student satisfaction, it is worth exploring and testing the sequential and causal relationships between service quality, perceived value, and satisfaction.

In summary, the purpose of this study is to: (1) identify factors that constitute the online and offline service quality of blended learning, (2) examine the relative effects of online and offline service quality dimensions on each of the perceived values, and (3) investigate how the different types of perceived value can work toward student satisfaction. The findings of this study are expected to provide a holistic and comprehensive view of the development and operation of blended learning.

**Literature review**

**Research background**

The October 2021 World Health Organization (WHO) situational report announced that the number of confirmed cases of COVID-19 globally is over 230 million, including 4.8 million deaths (WHO, 2021). The emergence of COVID-19 has sparked the transition from traditional classroom learning to various other types of learning, such as online, virtual, distance, and blended learning (Um et al., 2021), because many universities have been forced to cancel or reschedule their academic activities and provide courses through digital and information technology platforms in response to this unprecedented challenge (Carroll & Conboy, 2020). In this regard, blended learning, which focuses on the joint use of offline and online learning, has been acknowledged as a potential alternative to traditional learning (Boelens et al., 2018). Blended learning is deemed an effective course delivery method in terms of reducing educational expenses and providing flexibility for instructors and students beyond temporal and spatial constraints (Um et al., 2021). In response to the unfavorable conditions caused by the COVID-19 pandemic, universities have been required to establish new processes and practices that will uphold social distancing requirements (Dwivedi et al., 2020). These conditions motivate us to examine how blended learning should be designed and evaluated to create student-perceived value, which will in turn increase student satisfaction. By reviewing the existing literature on service quality and perceived value, this study seeks to offer a
better understanding of blended learning and perceived value in terms of their conceptualization and measurement. The following section will discuss the relevant literature that supports the conceptualization of our research constructs.

Service quality evaluation

Service quality refers to a customer’s total judgment about the excellence or superiority of a service (Parasuraman et al., 1985). When the customer’s pre-expectations are met or exceeded after consumption, the difference can lead to satisfaction (Oliver, 1980). While many attempts have been made to conceptualize various dimensions of service, contemporary scholars have relied primarily on the SERVQUAL scale, which mainly comprises five distinct dimensions: reliability, assurance, tangibles, empathy, and responsiveness (Parasuraman et al., 1985). Despite its convenience and broad applicability, this scale has been criticized because it produces inconsistent results which are dependent upon the context in which it is applied. Therefore, SERVQUAL should be modified with respect to the service context (Brady & Cronin, 2001; Um & Lau, 2018). Since the main target of this research is to examine blended learning programs that use both online and offline lectures, it is necessary to implement a new approach that can encompass distinct features from each dimension (i.e., online and offline) to provide a better understanding of how to evaluate this type of service. While a growing number of studies have explored unique features of blended learning (e.g., educational access, sense of community, and learner engagement) (So & Brush, 2008), most studies still focus on either the online or offline dimension individually and therefore yield an imbalanced view that has produced inconsistent findings. Thus, this study conceptualizes the service quality of blended learning by classifying it into two dimensions (i.e., online quality and offline quality) to allow for a simultaneous examination of each dimension under a single model to explore their relative effects.

Online service quality

While the extant research has explored various dimensions of online education service quality assessments, its conclusions vary noticeably by author and context. For example, regarding the online retailing context, Wolfinbarger and Gilly (2002) uncovered the four factors of website design, reliability, privacy/security, and customer service, while Yang et al. (2004) discovered six factors: reliability, access, ease of use, personalization, security, and credibility. Another study conducted by Yang and Fang (2004) revealed three essential information system-related factors: ease of use, timeliness of information, and security. While those studies focused on system-related features, other studies focus on content-related features to address the deficiencies of the only system-focused scale. For example, Jung (2011) identified seven dimensions that affect learners’ perceptions of e-learning: interaction, staff support, institutional QA mechanism, institutional credibility, learner support, information and publicity, and learning tasks. By highlighting interactions between instructors and e-learners, Liaw (2008) also revealed several factors, such
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As instructor availability and response time and effective communication. Overall, these factors vary and tend to overlap, which calls for additional research efforts designed to integrate and reconceptualize what should be measured with regard to online service quality.

Thus, by synthesizing extant research, this study measures online service quality in blended learning along the dimensions of information quality and system quality. Information quality refers to the degree to which the content of the online course in a blended learning class is appropriate, timely, and easy to understand, whereas system quality focuses on online course designs such as interface, navigation, response time, and responsiveness (DeLone & McLean, 2003; Mckinney et al., 2002).

Offline service quality

As the initial SERVQUAL model is designed to be generic rather than specific (Brady & Cronin, 2001; Um & Kim, 2018), existing scholars have sought to make the original SERVQUAL model workable and applicable in a higher education context through modification, refinement, and empirical testing. As a result, various factors have emerged and subsequently disappeared in the literature, thus making it challenging to reach an academic consensus on which definition should be used. For example, Abdullah (2005) proposed five factors in a Malaysian higher education service: academic aspects, nonacademic aspects, program issues, reputation, and access. Noaman et al. (2017) identified five factors in a case study at King Abdulaziz University: human quality, physical quality, technological quality, financial quality, and information resources. Sultan and Wong (2010) suggested eight factors in Japanese universities: dependability, effectiveness, capability, efficiency, competencies, assurance, unusual situation management, and semester syllabus. The primary reason for various variables emerging and disappearing is because education services, and higher education in particular, differ from other service industries in that they involve multiple stakeholders (i.e., faculties, administrative staff, and students) in service delivery and consumption (Seo & Um, 2019). To avoid this concern, this study measures offline service quality only from the student’s point of view by adopting five factors from the modified SERVQUAL model that have been empirically tested, proved reliable and validated in the higher education context (Seo & Um, 2019).

Perceived value

Prior literature commonly emphasizes that value is something that is determined by an individual’s psychological perceptions rather than by a product or service provider (Teas and Agarwal., 2000; Zeithaml, 1988). Value perceptions, whether good or bad, are estimated by an individual’s cognitive mechanisms when a trade-off between benefits and costs arises. In this respect, Zeithal (1988) views “the get dimension” in response to “the give dimension” as a way to measure a service’s core, intangible attributes/benefits, extrinsic attributes, and consumption. The give dimension, on the other hand, encompasses monetary (i.e., money) and nonmonetary (e.g.,
time, effort, and risk) attributes needed to obtain the service (Cronin et al., 1997). One of the reasons that this study measures perceived value as a consequent variable of service quality and an antecedent of satisfaction is that perceived value has been regarded as the best predictor of competitive success and an even better predictor of consumer behavior in terms of repurchase intention (Cronin et al., 2000; Woodruff, 1997). In this respect, prior literature emphasizes that satisfaction itself is not sufficient to evaluate a service or predict consequent consumer behaviors and thus should be measured with perceived value simultaneously (Woodruff, 1997). Woodruff argues that “consumer satisfaction measurement is not backed up with in-depth learning about customer value and related problems that underlie their evaluations, it may not provide enough of the customer’s voice to guide managers in how to respond” (1997, p. 139). Satisfaction measures may therefore provide more interpretable and informative clues if complemented by perceived value measurements. Based upon this logical and empirical evidence, this study conceptualizes perceived value as an individual’s overall subjective evaluation after the use of a service and examines it as a predictor of satisfaction and an antecedent of service quality.

Although the importance of perceived value has been acknowledged, perceived value has been relatively less examined than satisfaction and quality due to the difficulty with which it is conceptualized and measured (Petrick, 2004). Previous literature has relied on a self-reported single-item measure of perceived value under the assumption that an interpretation of value does not differ by individual (Gale, 1994). Relying on a unidimensional approach, however, appears to lack validity (Petrick, 2004; Woodruff, 1997) and fails to produce consistent findings (Petrick, 2004). To address the deficiency of the unidimensional approach, recent studies have attempted to focus on multiple attributes of perceived value. For example, Zeithaml (1988) developed the SERV-PERVAL scale, in which perceived value consists of five distinct dimensions: quality, monetary price, nonmonetary price, reputation, and emotional response. In a similar vein, Sheth et al. (1991) highlight that an individual’s choice is the result of multiple independent consumption values that can be contingent upon situational importance. Five consumption values are identified: functional value, social value, emotional value, epistemic value, and conditional value. Of the various conceptualizations of perceived value present in the literature (e.g., Holbrook, 1994; Sheth et al., 1991; Ulaga & Eggert, 2005), this study partially follows the idea of Sheth et al. (1991) for (1) its applicability and replicability to diverse disciplines such as sociology, marketing, and consumer behavior (Ledden et al., 2007) and (2) its practicability to an educational domain (e.g., LeBlanc & Nguyen, 1999; Stafford, 1994). Hence, the current study assumes that perceived value is operationalized in four dimensions, namely, epistemic value, social value, emotional value, and conditional value. A brief account of the dimensions of perceived value operationalized in the context of blended learning follows.

**Perceived epistemic value** represents benefits that are derived from the fulfillment of intellectual curiosity and the acquisition of knowledge from a blended learning class. This is often regarded as the core benefit of education (Stafford, 1994). **Perceived social value** mainly deals with the benefits formed by interpersonal and group interactions (i.e., building friendships or interacting with blended learning course mates) (LeBlanc & Nguyen, 1999). **Perceived emotional value** refers to benefits
that are associated with psychological feelings and affective states. Perceived emotional value can be derived through students’ sense of pleasure or self-achievement (LeBlanc & Nguyen, 1999). Finally, perceived conditional value focuses on the set of situations individuals encounter concerning decision-making. Perceived conditional value plays a key role in online learning programs, as the learning environment extends beyond spatial and temporal constraints (e.g., Heinonen et al., 2013; Ruiz et al., 2008; Watjatrakul, 2016). The conditional dimension in this study mainly addresses temporal and spatial flexibility in association with such programs (Heinonen, 2004). Given that internet-based services are available irrespective of temporal and spatial boundaries, blended-class learners can take advantage of the flexibility they offer (Watjatrakul, 2016). Hence, the current study measures the perceived value that consists of a four-dimensional construct that considers epistemic value, social value, emotional value, and conditional value.

**Student satisfaction**

Today’s competitive market requires service providers to offer high-quality services that can provide customer satisfaction, which will eventually result in a sustainable competitive advantage (Shemwell et al., 1998). In light of this, customer satisfaction has been extensively and broadly examined in many disciplines due to its ability to predict future purchase behavior (Oliver, 1997). Since satisfaction is positively related to one’s intention to retain a service (Ajzen & Fishbein, 1977; Parasuraman et al., 1985), measuring student satisfaction can signal whether instructors have successfully implemented modern, innovative teaching methods (i.e., active learning, flipped learning, blended learning, MOOC). In an education context, student satisfaction has gained much attention from both academics and practitioners because it is strongly associated with student achievement (Biner et al., 1997; Chang & Smith, 2008; Liao & Hsieh, 2011). For example, Yawson et al. (2020) note that higher satisfaction results in higher levels of learning in an e-learning context. Levy (2007) also suggests that satisfaction is highly related to the effectiveness of learning in an e-learning context. This study therefore remains consistent with previous studies and views student satisfaction as an overall post-consumption judgment (i.e., after the experience of a blended learning class) based on cognitive and affective reactions that emerge and accumulate in response to a set of service encounters.

**Hypothesis development**

**The relationship between service quality and perceived value**

Regarding the relationship between service quality and perceived value, the existing literature has documented that service quality acts as an antecedent of perceived value in a variety of service areas (Brady et al., 2001; Cronin et al., 1997, 2000). In evaluating a service, individuals are likely to consider its specific attributes and quality (Andreassen & Lindestad, 1998). This cognitive process views
quality-related factors as the triggers of perceived value, and higher perceived value can be realized when such factors reach or exceed a marginal point (Caruana et al., 2000). Despite the accumulation of academic and empirical findings, the majority of current findings have explored either the relationship between online service quality and perceived value or the relationship between offline service quality and perceived value. It is worth taking both into consideration simultaneously and examining how each dimension works toward each perceived value for two reasons: first, to explore which and to what extent perceived values affect service quality dimensions and to enable blended course instructors to set up an appropriate class in terms of effectiveness and efficiency; and second, to implement meaningful student-oriented quality assessment and perceived value measures that are designed in consideration of the complexities of the blended learning setting.

Turing to the main point of this research, we assume that online and offline quality can work toward generating perceived epistemic value in different ways. On the one hand, online lectures can contribute to generating epistemic value such that various visual aids, control over the pace of learning, and repeated viewing can increase a learner’s understanding (Horn & Staker, 2014). Offline lectures, on the other hand, may yield more clues, such as knowledgeability and teaching attitudes, and create an active and positive atmosphere of real-time participation and discussion during the class (Moore & Kearsley, 2005). While both arguments are persuasive, few studies have explored the relative effect of online and offline quality on perceived epistemic value. Based upon the review of the literature regarding service quality (i.e., online service quality and offline service quality) and perceived epistemic value as well as the accumulation of theoretical and empirical evidence in support of their causality, we establish the following hypotheses:

**H1** Online service quality can increase perceived epistemic value.

**H2** Offline service quality can increase perceived epistemic value.

Regarding the relationship between service quality and perceived social value, online service quality can contribute to perceived social value in that online environments allow students to present their self-image and share ideas by offering social relationship services (i.e., chat rooms, video conferences, and online communities) (Watjatrakul, 2016). Offline service quality can also increase perceived social value by motivating students to be present in the classroom, where more active interactions and communications are realized (Seo & Um, 2019). Few studies have examined the relative impacts of online and offline quality on perceived social value. Thus, we establish the following hypotheses:

**H3** Online service quality can increase perceived social value.

**H4** Offline service quality can increase perceived social value.
Regarding the relationship between service quality and perceived emotional value, perceived emotional value resulting from service quality is related to various affective states that vary from being positive (e.g., confident, excited, happy, delighted) to being negative (e.g., angry, melancholy, fearful) (Carroll & Ahuvia, 2006; Oliver et al., 1997). However, the emotional aspects of utilitarian services (e.g., education, health care, legal) tend to be regarded as less important than their functional aspects (e.g., Ladhari & Rigaux-Bricmont, 2013; Ng & Russell-Bennett, 2015). Recent studies have produced counterevidence that provides support for the role of perceived emotional value in utilitarian services by explaining that the choice of a service is determined by the service’s ability to arouse emotions in consumers (i.e., positive emotions). In blended learning, we assume that such positive feelings can be generated by both online and offline quality. Online service quality works toward perceived emotional value such that (1) the two-way interfaces, visual aids, and variety of programs and courses can trigger a student’s excitement, and (2) studying online requires more self-motivation, self-regulation, and self-managed schedules, all of which can cultivate the student’s sense of achievement and confidence. Offline service quality can offer an environment in which face-to-face interaction and communication are available and physical group activities are conducted (Osguthorpe & Graham, 2003).

This evidence leads us to assert the following hypotheses:

**H5** Online service quality can increase perceived emotional value.

**H6** Offline service quality can increase perceived emotional value.

Finally, regarding the relationship between service quality and perceived conditional value, previous studies report that flexibility in terms of time and place plays a key role in online education and e-learning, thus representing the degree to which learners perceive the efficiency and effects of course design and delivery (Boelens et al., 2017; Sun et al., 2008). On the one hand, online service quality enables learners to control the time, place, path, participation, and pace of their learning (Horn & Staker, 2014). Thus, students are able to study content at their own speed beyond temporal and spatial constraints (Boelens et al., 2017; Horn & Staker, 2014). Unlike online lectures, however, offline lectures may have the opposite effect on the generation of perceived conditional value because lectures are conducted at a designated time and physical participation is mandatory (Demetriadis & Pombortsis, 2007). Although learners are notified that lectures are covered offline and online and that they are not interchangeable, they would prefer to have the flexibility of online lectures if there is no difference in usefulness in the class quality, style, and delivery between the physical and virtual environments (i.e., they are exclusive and thus substitutes). Based on previous findings, we thus present the following hypotheses:

**H7** Online service quality will increase perceived conditional value.
H8 Offline service quality will decrease perceived conditional value.

**The relationship between perceived values and student satisfaction**

A growing body of research has produced theoretical and practical evidence in support of the relationship between perceived value and satisfaction in diverse service areas, such as mobile value-added services (Kuo et al., 2009), restaurants (Ryu et al., 2008), tourism (Chen & Chen, 2010), and health care services (Shabbir et al., 2016). The accumulation of theoretical and empirical evidence acknowledges the importance of a sustainable competitive advantage that can be dependent upon a service provider’s ability to produce high-quality services that bring customer satisfaction (Shemwell et al., 1998). In this respect, Ravald and Grönroos (1996) contend that value has a direct influence on customer satisfaction. Zeithaml (1988) also addresses that customers who perceive higher value are more likely to remain satisfied than those who perceive lower value. While the relationship between perceived value and customer satisfaction has been recognized, to the best of our knowledge, the degree to which each type of perceived value leads to satisfaction in size and direction is less explored in the field of blended learning. Thus, this study hypothesizes that satisfaction can be triggered by four identified perceived values (i.e., epistemic value, social value, emotional value, and conditional value). Therefore, we form the following hypotheses:

H9 Perceived epistemic value will increase student satisfaction.

H10 Perceived social value will increase student satisfaction.

H11 Perceived emotional value will increase student satisfaction.

H12 Perceived conditional value will increase student satisfaction.

The proposed hypotheses are depicted in Fig. 1.

**Research methodology**

Quantitative studies are useful for generalizing the causes and effects of behavior through hypothesis testing with statistical evidence (i.e., accepted or rejected). Of the various statistical techniques used in quantitative research, a survey-based approach has several theoretical and practical advantages: (1) numerical values obtained from the survey enable scientists to conduct statistical analyses; (2) scientific objectivity can be obtained through data analysis and interpretation based on statistical rules; and (3) it is economical in terms of time and money (Seo & Um, 2019). Due to these benefits, this study adopts a survey method and expects that the interpretation of the results of our data treatment will be validated and reliable.
Sampling and data collection

Regarding respondent selection, we explored universities in South Korea that had operated a blended learning class over three years. The primary target for data analysis in this study is students in a liberal arts college who are currently pursuing a blended learning program in South Korea, where blended learning programs have started to receive more attention as a means of cost reduction and flexibility enhancement. We only included the universities from each of which a chief administrator agreed to participate in this research and thus was willing to reveal a list of classes and the students’ contact information. For sample selection, we took a random sample approach to mitigate selection bias concerns. We deliberately excluded students who were not currently taking part in this class at the time of survey initiation because of the difficulty in retrieving their past experiences. Thus, students who recently finished a course completion were targeted because they are less likely to be sensitive to grade evaluation and can easily recall their recent experiences in a blended learning class. The survey questionnaire was designed through the following procedures. An initial questionnaire was designed by adapting measurement items of each construct from previous studies that had been theoretically demonstrated and practically proven to be valid and reliable. Then, five in-depth interviews were conducted with a blended learning instructor who was familiar with the blended learning environment. We asked three academics bilingual in both English and Korean to translate the original English questionnaire into Korean, and another two academics to translate back from Korean to English to confirm that conceptual equivalence remained between the original English and the translated Korean versions of the questionnaire. A pretest with the final Korean questionnaire was performed with twelve students who had taken a blended learning course. Finally, items were modified, excluded, and rearranged to reflect the feedback we received for accuracy and clarity. Data were obtained using a paper self-administered survey on a voluntary basis with a cover letter presenting our research purposes, private and
confidential concerns, and the researcher’s contact information. The names of the universities were not revealed to maintain confidentiality.

Among the 450 identified students, 33 students’ contact information was not workable and not matched with the identified students. Thus, a total of 417 eligible students were obtained as participants in this study. Of the remaining sample of 417 students, 251 were finally accepted for the data treatment and analysis for the following reasons: (1) 63 students were excluded because they were not taking this class at the time data collection started; (2) 57 students were excluded because they dropped out during the semester; and (3) 46 respondents were found to have turned in insincere reports or reports with missing information. The details of the sample information are displayed in Table 1.

**Measurement development**

To conceptualize and measure the research variables, we identified and extracted the measurement items from previous studies that had been validated and are reliable. The full-scale survey comprised thirty-seven items representing eight hypothesized factors. The latent variables used in this study were as follows: online service quality consisting of two subfactors (information quality and system quality) (DeLone & McLean, 2003; McKinney et al., 2002); offline service quality consisting of five items each representing reliability, assurance, tangibles, empathy, and responsiveness (Parasuraman et al., 1988; Yang et al., 2016); perceived epistemic

| Characteristic                          | Frequency | Percentage |
|----------------------------------------|-----------|------------|
| The past experience of a blended learning | None      | 113        | 45.0      |
|                                        | 1         | 72         | 28.7      |
|                                        | 2–3       | 30         | 12.0      |
|                                        | 4 ≤       | 36         | 14.3      |
| Gender                                 | Male      | 99         | 39.4      |
|                                        | Female    | 152        | 60.6      |
| Age                                    | 17–19     | 191        | 76.1      |
|                                        | 20–22     | 49         | 19.5      |
|                                        | 23–25     | 11         | 4.4       |
| Grade                                  | 1         | 239        | 95.2      |
|                                        | 2         | 2          | .8        |
|                                        | 3         | 2          | .8        |
|                                        | 4         | 8          | 3.2       |
| Computer skills                        | Beginner  | 125        | 49.0      |
|                                        | Normal    | 130        | 51.0      |
| Internet use                           | < 10 h    | 91         | 36.3      |
|                                        | 10 h ≤ N < 15 h | 54 | 21.5 |
|                                        | 15 h ≤ N < 20 h | 48 | 19.1 |
|                                        | 20 h ≤    | 58         | 23.1      |
value (LeBlanc & Nguyen, 1999); perceived social value (Leblanc & Nguyen, 1999); perceived emotional value (LeBlanc & Nguyen, 1999); perceived conditional value (Arbaugh, 2000; Marks et al., 2005; Sun et al., 2008); and student satisfaction (Seo & Um, 2019). All items were measured with a seven-point Likert scale (where 1 = “strongly disagree” and 7 = “strongly agree”). The initial model was developed with thirty-seven items with each variable containing between three and five items and several items that presented low factor loadings were dropped out for scale purification. Thus, twenty-nine items were used for hypothesis testing (see Table 2).

In addition to the research variables used in this study, we selected three control variables that may impact the proposed relationships: the previous experience of a blended learning class, the level of computer skills, and the degree of internet use. Measuring the previous experience of a blended learning class is essential because an individual may be well aware of how the class is being operated, which may in turn impact all variables proposed in this study. Second, the level of computer skills needs to be controlled because the effectiveness and applicability of a blended learning class may vary across individuals’ ability to deal with computers. Last, the degree of internet use needs to be controlled because the time an individual spends on the internet can be an indicator of the individual’s familiarity with the internet environment.

**Measurement reliability and validity**

Prior to hypothesis testing, we examined construct validity and reliability via the statistical programs Amos 22.0 and SPSS 23.0 to confirm whether the latent variables in this study were validated. Validity represents the degree to which measurement items accurately reflect an underlying construct, whereas reliability represents the degree to which those measurement items are consistent in measuring the underlying construct. Since all of the constructs used in this study are latent variables that are unobservable and hypothetical, calculating and showing acceptable ranges of construct validity and reliability is a prerequisite for causal relationship testing.

First, regarding reliability testing, this study calculated the Cronbach’s α value for each construct and found that every score was greater than 0.8, which provides statistical evidence that high internal consistency was achieved (Johnson & Wichern, 2002) (see Table 2). Second, regarding the validity testing, we examined unidimensionality and discriminant validity; unidimensionality refers to the degree to which a group of measurements can reflect a latent variable, whereas discriminant validity tests whether constructs that are supposed to be theoretically distinct appear to be unrelated statistically. Confirmatory factor analysis (CFA) was conducted to calculate three indicators (i.e., standardized factor loadings, composite reliability, and average variance explained) to assess the unidimensionality of each construct (Bagozzi & Yi, 1988). As shown in Table 2, the scores for each indicator appear to show acceptable ranges given that: (1) all standardized factor loadings are greater than the cutoff of 0.5 and appear significant at the 0.01 level; (2) the composite reliability of each construct is greater than the cutoff of 0.7 and ranges from 0.821 to 0.935; and (3) the average variance explained for each construct is greater than
Table 2  Measurement items and confirmatory factor analysis results

| Construct and instruments | Standardized factor loadings | S.E | C.R |
|---------------------------|-----------------------------|-----|-----|
| **Online Service Quality (Information-featured)** | Cronbach’α = 0.863; CR = 0.850; AVE = 0.591 |       |     |
| (Source: DeLone & McLean, 2003; McKinney et al., 2002) | |       |     |
| The content of the course materials provided by the blended learning class web site is complete | 0.742 | 0.119 | 12.226 |
| The content of the course materials provided by the blended learning class web site is easy to comprehend | 0.868 | 0.179 | 9.940 |
| The course materials provide by the blended learning class web site are well represented with text and graphics | 0.837 | 0.191 | 9.769 |
| The content of course materials provided by the blended learning class web site is relevant to the topic | 0.599## |       |     |
| **Online Service Quality (System-featured)** | Cronbach’α = 0.832; CR = 0.874; AVE = 0.699 |       |     |
| (Source: DeLone & McLean, 2003; McKinney et al., 2002) | |       |     |
| The blended learning class web site can quickly load all the text and graphics | 0.805 | 0.075 | 13.612 |
| It is easy to navigate the blended learning class web site | 0.907 | 0.081 | 15.029 |
| The blended learning class web site functions well all the time | 0.791## |       |     |
| **Offline Service Quality** | Cronbach’α = 0.924; CR = 0.926; AVE = 0.714 |       |     |
| (Source: Parasuraman et al., 1988; Yang et al., 2016) | |       |     |
| I realize that the instructor shows good education attitude, knowledge and lecturing skills in the offline class | 0.821 | 0.060 | 15.288 |
| I realize that the instructor shows a prompt and voluntary response to my questions and demand in the offline class | 0.860 | 0.064 | 16.382 |
| I realize that the instructor shows good attention, understanding, and manner for each individual student in the offline class | 0.879 | 0.059 | 16.931 |
| I realize that the instructor maintains the accuracy of deliver of appointment as scheduled in the offline class | 0.844 | 0.055 | 15.926 |
| I realize that the classroom provides comfortable study environments | 0.819## |       |     |
| **Perceived Epistemic Value** | Cronbach’α = 0.937; CR = 0.935; AVE = 0.781 |       |     |
| (Source: LeBlanc & Nguyen, 1999) | |       |     |
| The content of the whole class keeps me interested | 0.911 | 0.039 | 25.031 |
| I learn new things from the whole class | 0.845 | 0.048 | 20.338 |
| Construct and instruments | Standardized factor loadings | S.E | C.R |
|---------------------------|------------------------------|-----|-----|
| The whole course content contributes to the high value of my education | 0.839 | 0.045 | 19.989 |
| The academic guidance from this whole class has enhanced my academic knowledge | 0.937## | | |
| Perceived Social Value | Cronbach’α = 0.937; CR = 0.821; AVE = 0.605 |
| People who are important to me think that taking this blended learning class is a good thing to do | 0.762 | 0.102 | 11.536 |
| People who influence what I do think that taking this class is a good idea | 0.820 | 0.089 | 12.341 |
| The social interaction with fellow students on this class makes this class more interesting | 0.750 | | |
| Perceived Emotional Value | Cronbach’α = 0.831; CR = 0.904; AVE = 0.761 |
| Taking this blended learning class boosts my self-confidence | 0.922## | | |
| My performance on this blended learning class depends upon my personal effort | 0.933 | 0.043 | 24.171 |
| Taking this blended learning gives me a sense of self-achievement | 0.749 | 0.055 | 15.401 |
| Perceived Conditional Value | Cronbach’α = 0.937; CR = 0.895; AVE = 0.680 |
| Taking this blended learning class gives prompt feedbacks | 0.809 | 0.083 | 13.431 |
| Taking this this blended learning class saves me a lot of time | 0.874 | 0.078 | 14.671 |
| Taking this blended learning class allows me to more effectively arrange my schedule | 0.843 | 0.073 | 14.092 |
| This blended learning class gives me a control over the pace of learning. | 0.769## | | |
| Student Satisfaction | Cronbach’α = 0.937; CR = 0.929; AVE = 0.813 |
| I am happy on my decision to take a blended learning class | 0.808## | | |
| I did the right decision to enroll when I decide to a blended learning class | 0.963 | 0.056 | 19.117 |
| I am happy that I enrolled in this blended learning class | 0.927 | 0.055 | 18.327 |

A measurement item attached to ## did not produce S.E. and C.R. because its loading was fixed to 1
the cutoff 0.5 and ranges from 0.591 to 0.813. We also calculated the whole measurement model fit, which appeared to be satisfactory ($\chi^2 = 798.061; \text{df} = 347; \chi^2/\text{df} = 2.300; \text{CFI} = 0.927; \text{IFI} = 0.928; \text{RMSEA} = 0.072$). Last, regarding the discriminant validity, we compared the AVE value of each variable to all corresponding squared correlations and found that the lowest AVE was also greater than the highest squared correlation, which statistically supports discriminant validity (Fornell & Larcker, 1981) (see Table 3).

Nonresponse bias and common method bias

Nonresponse bias is a concern that can lead to invalidated findings if the survey sample fails to represent the population accurately. Nonresponse bias can increase concern when there is a tremendous gap in answers between actual and potential respondents (Armstrong & Overton, 1977). To detect the issue of nonresponse bias, we conducted a t-test by comparing early and late respondents along several demographic factors (i.e., gender, age, grade, and the degree of internet usage on a weekly basis). The results revealed that the two groups were not significantly different, thus suggesting that this study is less likely to suffer from nonresponse bias.

In addition, common method bias is another concern that this study may suffer from since we relied on a single respondent with a self-administered questionnaire. To detect whether this study is free of common method bias, this study employed a common later factor test suggested by Podsakoff et al. (2003). This approach enables researchers to determine the occurrence of common method bias by making a comparison between the model fit indices for the original CFA measurement model with those for the identical model in which a common latent factor is additionally included. The scores for the original measurement model were ($\chi^2 = 798.061; \text{df} = 347; \chi^2/\text{df} = 2.300; \text{CFI} = 0.927; \text{IFI} = 0.928; \text{RMSEA} = 0.072$), whereas for the extended model they were ($\chi^2 = 763.661; \text{df} = 346; \chi^2/\text{df} = 2.207; \text{CFI} = 0.932; \text{IFI} = 0.933; \text{RMSEA} = 0.069$). These model fit indices reveal that common method bias is of minimal concern (Satorra & Bentler, 2001).

Results

We examined the proposed relationships through a hierarchical regression analysis, which enables researchers to test whether variables of interest can explain the statistical significance of variance in a dependent variable in stages after accounting for all other variables. Because education research is similar to other social science disciplines in that it prevalently deals with variables that are highly correlated, this methodological approach allows researchers to realize the genuine effect of a predictor on a consequent variable after other potential variables are controlled.

For hypothesis testing, we set up two models (e.g., M1 and M2) to examine the effects of online and offline service quality on perceived epistemic value. Only control variables are entered in M1, whereas predictors (i.e., online and offline service quality) are added to M2. The control variables were entered into the baseline model...
The role of service quality in fostering different types of...

as: (1) the previous experience of a blended learning class (actual numbers entered); (2) the level of computer skills (beginner and normal, beginner used as a reference point); and (3) the average hours of internet use on a weekly basis. We use the average item scores for information quality and system quality as indicators to conceptualize and measure online service quality. Likewise, the other variables are estimated by entering the average item scores for each dimension. The same procedures are applied to the examination of the effect of those predictors on perceived social value (i.e., M3, M4), perceived emotional value (i.e., M5, M6), and perceived conditional value (i.e., M7, M8). Predictive power was determined by significance improvement in $R^2$ from the baseline model to the predictor-added model using the F-statistic (Pedhazur & Schmelkin, 2013). In addition, the effect of each of perceived value on student satisfaction is tested by establishing M9 (i.e., only control variables are entered) and M10 (i.e., four different types of perceived value are entered). As seen in Table 4, “Change in $R^2$” in association with F statistics appears to be statistically significant, indicating that the results in stages from the regression analysis are validated and reliable.

The first two hypotheses that investigate the relationships between online service quality and perceived epistemic value ($H1$) and between offline service quality and perceived epistemic value ($H2$) are supported. The results from M2 reveal that online and offline service quality are positively associated with perceived epistemic value (i.e., $H1$: 0.163**; $H2$: 0.462**). Regarding the relationship between those predictors and perceived social value, the results from M4 reveal that online service quality and offline service quality are positively related to perceived social value (i.e., $H3$: 0.130**; $H4$: 0.521**). Thus, H3 and H4 are supported. In the examination of those contributors to perceived emotional value, the results from M6 show that online and offline service quality both work effectively toward perceived emotional value (i.e., $H5$: 0.182**; $H6$: 0.479**). Finally, the findings from M8 provide support for H7 and H8, respectively (i.e., that both online service quality and offline service quality contribute to the generation of perceived conditional value) (i.e., $H7$: 0.637**; $H8$: 0.129*). In addition to the effects of the main predictors on the mediators, the effects of each perceived value on satisfaction are tested. The results from M10 reveal that the coefficient values of perceived emotional value and perceived conditional value are only statistically significant, supporting $H11$ (0.250**) and $H12$ (0.623**). The results of the regression analysis are summarized in Table 4.

Discussions

This study seeks to address the challenging issues of blended learning by developing the conceptualization of blended learning and perceived value and examines the way blended learning contributes to satisfaction through different types of perceived value. Accordingly, we have provided two distinct constructs (i.e., online service quality and offline service quality) to operationalize blended learning and revealed four different types of value (i.e., epistemic value, social value, emotional value, conditional value) that conceptualize perceived value. Accordingly, this study established twelve hypotheses and examined the proposed relationships based on data
### Table 3  Descriptive statistics and correlation matrix

| Constructs                                      | Mean  | SD    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |
|------------------------------------------------|-------|-------|------|------|------|------|------|------|------|------|
| Online service quality (information)            | 5.187 | 0.995 | 0.303| 0.407| 0.293| 0.187| 0.205| 0.386| 0.244|
| Online service quality (system)                 | 4.442 | 1.195 | .550*| .125 | 0.139| 0.097| 0.117| 0.111| 0.180|
| Offline service quality                         | 5.750 | 0.933 | .638*| .353*| .518 | 0.347| 0.334| 0.100| 0.223|
| Perceived epistemic value                       | 5.109 | 0.999 | .542*| .372*| .720*| 0.625| 0.594| 0.457| 0.231|
| Perceived social value                          | 4.806 | 1.119 | .433*| .312*| .589*| .790*| 0.446| 0.285| 0.134|
| Perceived emotional value                       | 4.778 | 1.225 | .453*| .342*| .578*| .771*| .668*| 0.314| 0.243|
| Perceived conditional value                     | 4.533 | 0.899 | .622*| .333*| .301*| .676*| .534*| .560*| 0.464|
| Student satisfaction                             | 4.798 | 1.291 | .494*| .424*| .472*| .481*| .366*| .493*| .681*|

1. Correlations were below and their corresponding squared correlations were above the diagonal
2. **Significant at 0.01
collected from 251 college students in South Korea. Our results confirm the effects of online and offline service quality on different types of value (from H1 to H8 are supported) and that emotional value and conditional value are found to increase student satisfaction (i.e., H11 and H12 are supported); epistemic value and social value are not significantly related to satisfaction (i.e., H9 and H10 are rejected). Based on our findings, we provide theoretical and practical implications.

**Theoretical implications**

This study has attempted to extend the knowledge of perceived service quality, perceived service value, and customer satisfaction by critically examining the definition of each construct and testing the sequential effect of those variables by applying them in an educational context (i.e., blended learning). Based on the findings of this study, we have made several theoretical and practical contributions. First, the current study sought to operationalize service quality dimensions in the consideration of blended learning and produced two distinct constructs: online service quality and offline service quality. While the existing literature has made great efforts to conceptualize service quality dimensions in relation to online classes (DeLone & McLean, 2003; McKinney et al., 2002) and offline classes (e.g., Parasuraman et al., 1988; Yang et al., 2016), few scholars have explored what should be measured in terms of a blended learning context. Because the modification of the measurement in service quality is essential due to its wide variance in service contexts (Brady & Cronin, 2001; Um & Lau, 2018), conceptualizing service quality and showing the accuracy and applicability of its measurement items are necessary to effectively understand the decision-making processes and future behaviors of blended learning learners. We have developed and empirically validated a multidimensional scale for measuring blended learning service quality and established a multidimensional and hierarchical model for online service quality consisting of information and system quality as well as offline service quality that consists of reliability, assurance, tangibles, empathy, and responsiveness. This unambiguous conceptualization enables both academics and blended learning instructors to establish an effective and efficient environment for blended learning.

Second, this study has yielded validated and reliable measurement items for perceived value in the context of blended learning. Based on our review of the literature, this study identifies four different types of perceived value: perceived epistemic value, perceived social value, perceived emotional value, and perceived conditional value (i.e., temporal and spatial value). Our findings highlight that a multidimensional scale appears to be a better indicator to explain the perceived value of blended learning, both statistically and empirically, than a traditional single item (i.e., value for money) (Boksberger & Melsen, 2011). Beyond a single-item approach, which lacks validity and contributes to inconsistent findings (Boksberger & Melsen, 2011; Petrick, 2004; Woodruff, 1997), this study reveals the conceptualization and measurement of each perceived value through rigorous statistical analyses. In addition, regarding the conceptualization of perceived conditional value, we reoperationalize its construct by taking temporal and spatial aspects of the perceived value of
Table 4 The results of hypotheses

| Dependent variables | Perceived epistemic value | Perceived social value | Perceived emotional value | Perceived conditional value | Student satisfaction |
|---------------------|---------------------------|------------------------|--------------------------|-----------------------------|----------------------|
|                     | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 |
| **Control variables** |    |    |    |    |    |    |    |    |    |      |
| Past experience     | 0.047 | 0.114** | −0.013 | 0.041 | 0.03 | 0.082 | −0.08 | −0.015 | −0.103 | −0.059 |
| Computer skill(normal) | 0.044 | 0.033 | −0.029 | −0.038 | 0.01 | 0.002 | −0.003 | −0.015 | −0.027 | −0.027 |
| Internet use(10–15 h) | 0.044 | 0.032 | 0.059 | 0.049 | 0.064 | 0.057 | 0.026 | 0.013 | 0.063 | 0.039 |
| Internet use(15–20 h) | 0.057 | −0.031 | 0.039 | −0.032 | 0.116 | 0.047 | 0.043 | −0.042 | 0.061 | 0.012 |
| Internet use(20 h<) | −0.048 | −0.009 | −0.088 | −0.057 | −0.017 | 0.017 | −0.043 | −0.007 | −0.054 | −0.035 |
| **Predictors** |    |    |    |    |    |    |    |    |    |      |
| Online service quality |    |    |    |    |    |    |    |    |    |      |
| Offline service quality |    |    |    |    |    |    |    |    |    |      |
| Mediators |    |    |    |    |    |    |    |    |    |      |
| Perceived epistemic value |    |    |    |    |    |    |    |    |    |      |
| Perceived social value |    |    |    |    |    |    |    |    |    |      |
| Perceived emotional value |    |    |    |    |    |    |    |    |    |      |
| Perceived conditional value |    |    |    |    |    |    |    |    |    |      |
| Change in $R^2$ | 0.013 | 0.553 | 0.018 | 0.371 | 0.017 | 0.367 | 0.011 | 0.51 | 0.023 | 0.498 |
| Change in F value | 0.662 | 146.6** | 0.883 | 68.246** | 0.86 | 67.149** | 0.546 | 123.877** | 1.149 | 57.009** |

**Path significant at 0.01; * significant at 0.05**
blended learning. Consistent with recent findings (e.g., Holbrook, 1994; Sheth et al., 1991; Ulaga & Eggert, 2005; Zeithaml, 1988), the results of this study also confirm that perceived value is neither a simple trade-off between costs and benefits nor merely an outcome of any other single factor. Thus, our findings can increase the understanding of blended learning by capitalizing on the measurement items that have been tested and proved to show high validity and consistency. Thus, the distinction between the different types of perceived value can broaden the academic understanding of blended learning instruction in terms of its design from students’ perspective.

Third, the current study examined the relationships between three variables—namely, service quality, perceived value, and satisfaction—all of which have dominated the services literature over the last two decades. While those constructs have appeared to be conceptually distinct, those terms are used interchangeably in the marketing literature and thus produce inconsistent results (Anderson & Fornell, 1994). Notably, our results produce evidence that the causal sequence (i.e., service quality—perceived value—satisfaction) is robust in the context of blended learning. Our results confirm that those three variables are discriminated theoretically and statistically (e.g., Choi et al., 2004; Cronin et al., 2000) and that the sequential relationship among service quality, perceived value, and satisfaction is confirmed (e.g., Choi et al., 2004; Petrick, 2004). Thus, sequential and causal relationships can provide better insight into predicting satisfaction accurately and comprehensively.

Fourth, regarding our hypotheses, we demonstrated the significant effects of online service quality and offline service quality on different types of value, thereby supporting Hypotheses H1 to H8. Consistent with previous studies (e.g., Alves, 2011; Dlačić et al., 2014; Lai et al., 2012; Leonnard, 2018), this study also determined that quality determines perceived value. More specifically, we found that offline service quality is more effective in generating perceived epistemic value, perceived social value, and perceived emotional value than online service quality, whereas online service quality is more effective in triggering perceived conditional value than offline service quality. The results of our study corroborate earlier findings that perceived service quality as an antecedent of perceived value (e.g., Alves, 2011; Dlačić et al., 2014; Lai et al., 2012; Leonnard, 2018) and that both perceived service quality and perceived value are multidimensional and multilevel (e.g., García and Caro, 2010; Chahal & Kumari, 2010; Um et al., 2021). In the context of higher education, a rich body of research has highlighted that service quality is a significant predictor of perceived value (e.g., Alves, 2011; Dlačić et al., 2014; Lai et al., 2012; Leonnard, 2018). In this sense, our findings are noteworthy such that a deeper understanding of the causal relationship between blended learning quality and perceived value is explored and the respective effects of online and offline service quality on different types of perceived value are examined. Unlike previous studies that have attempted to comprehend blended learning as a whole without separating each dimension and view perceived value as a unidimensional construct, this study examined the relative effects of online and offline quality on each type of perceived value so that our findings can broaden the current understanding of service quality and perceived value relationships in a systematic way. Therefore, it is confirmed that because each predictor (i.e., online and offline service quality) brings a
different effect on the facilitation of perceived values, the generation of those values can be harvested by the simultaneous use of both sides.

Finally, regarding our hypotheses on the effect of perceived value on college student satisfaction, we found that this effect was significant. Consistent with earlier findings (e.g., Halimatussakdiah et al., 2020; Kuo et al., 2009; Teeroovengadum et al., 2019), our findings also suggest that perceived value is a significant predictor of college student satisfaction. While our findings corroborate previous findings (e.g., LeBlanc & Nguyen, 1999; Shemwell et al., 1998; Zeithaml, 1988) by and large, when taking a deeper look at each type of perceived value on college student satisfaction, we observed that their respective effect on satisfaction appears different in size and significance; perceived emotional value (i.e., H11) and perceived conditional value (i.e., H12) are significantly related to satisfaction, whereas epistemic value (i.e., H9) and social value (i.e., H10) are not. We provide possible explanations for the two hypotheses that were not supported in this study. Epistemic value, which refers to the fulfillment of students’ curiosity, cannot drive college students’ satisfaction unless their commitment is ensured. Since students are regarded as coproducers in creating classes, regardless of their instructors’ efforts and the system’s quality, students’ overall satisfaction cannot be shaped if their participation and engagement are low. In addition, social value, which refers to benefits derived from interaction with the instructor and with other students, may not drive student satisfaction because interpersonal and group interactions, particularly those online, may be neither familiarized nor activated. In this sense, future studies are recommended to examine whether the effects of epistemic and social value on college student satisfaction are significant among students who are highly engaged in class and familiar with online learning environments.

**Practical implications**

In addition to the theoretical implications, practical implications should be addressed. First, the outcomes of this study can help college program operators better understand how online and offline service quality can influence learners’ satisfaction. The empirical findings indicate that online and offline service quality generate each of the perceived values in size. Offline service quality can have a greater impact on perceived epistemic value, perceived social value, and perceived emotional value, and online service quality is more effective in triggering perceived conditional value in terms of temporal and spatial flexibility. This evidence indicates that, in terms of the design of blended learning, instructors should pay more attention to which types of quality should be taken into account to create and increase perceived value from the students’ point of view. For example, if an instructor considers perceived conditional value to be most important, he or she can add more weight to online than to offline lectures. On the other hand, if a course considers knowledge delivery or physical and group activities similarly, offline service quality should be weighted more heavily to meet the needs of students.

In addition, we introduced a diagnostic tool to identify the causes of learner satisfaction by embracing four different types of perceived value. The proposed
measurements—which have been tested and thus proved to be validated and reliable—can be used as a practical tool to evaluate blended learning programs from the students’ perspective. This outcome is noteworthy in the field of blended learning in that its performance evaluation tools appear to be limited due to the absence of accurate measurements. Therefore, the measurements that we identified and tested are expected to serve as a predictive tool for the service evaluation of blended learning solely from the point of view of learners.

Finally, blended learning is becoming a recent global trend in many education fields, and universities in South Korea have developed various blended learning programs to offer college students more academic options and thus fulfill their requirements. Despite their growing popularity, however, practitioners have suffered from the absence of an evaluative tool and more attention has been given to the online service quality dimensions. However, our results highlight that offline service quality should not be overlooked and that both offline and online service quality should be taken into account when predicting students’ perceived value and satisfaction. Thus, the simultaneous use of online and offline service quality can produce more reliable and valid results in terms of blended learning evaluation and student satisfaction.

**Limitations and future considerations**

Like many other studies, this study also reveals several limitations. First, the data obtained and used in this study rely on a cross-sectional survey and may produce limited results outside of our proposed relationships. Because the completion of a college class usually takes several months, the results can vary significantly depending on when the survey is conducted. Therefore, future research is recommended to collect data at different times to provide more conclusive evidence of quality and satisfaction in a blended learning context.

Second, this study relied on a single source of data collection to examine the proposed relationships. That is, this study estimated the research construct by using the students’ responses. While this approach is cost-effective and meets the objectives of this research given that colleges involves many stakeholders, such as professors, administrative staff, and university policy-makers, we suggest that future studies include various respondents to view the quality of blended learning at multiple angles.

Third, this study did not examine the instructor’s relational and professional aspects such as responsiveness, interaction, and assurance and only focused on system- and information-related features. One of the reasons for this was that such aspects were contained in offline service quality measurement items. This study assumed that the instructor quality is uniform; however, it relied on the perception rather than the actual quality of instructors, and this perception can differ between online and offline classes. Thus, future studies are encouraged to take instructor quality into consideration when conceptualizing online service quality and comparing whether the perception of instructor quality between online and offline remains the same.
Finally, the respondents in this study were chosen from several universities in South Korea, and the limited sample size may weaken its generalizability and applicability to other countries. Additionally, the results may differ by university characteristics such as college type (e.g., research-oriented or teaching-oriented) and ranking, since some universities may invest financially, academically, and culturally in blended learning, while others may invest only marginally. Therefore, future studies are recommended to take other aspects (e.g., school size, learning experience, and educational access) of a university into account to produce more convincing results.

Conclusion

Given that the current learning environment is unfavorable due to the COVID-19 pandemic, universities are forced to adopt new course delivery methods to continue to provide academic courses. Blended learning, which is the combination of offline and online learning, has received much attention due to its effectiveness in terms of cost reductions and flexibility enhancements for instructors and students. Therefore, in response to an increasing call to provide theoretical and empirical evidence regarding the conceptualization of blended learning and its effects on college student satisfaction, this study explores what constitutes blended learning and how it contributes to different types of perceived value as well as how each value increases student satisfaction. The findings of this study are noteworthy given that scholars have as yet failed to reach a consensus on the conceptualization of blended learning. Through a thorough review of the marketing and education literature regarding service quality, perceived value, and satisfaction, this study provides a conceptualization of blended learning with higher validity and reliability in terms of measuring college student satisfaction through perceived value. Our findings offer several theoretical and practical insights.

For theoretical implications, this study seeks to operationalize blended learning by creating two distinct constructs: online and offline service quality. Consistent with findings in the marketing and education literature, our conceptualization is confirmed through a series of statistical procedures and measurement items for each construct prove to be validated and reliable as a result. In addition, our findings reveal that blended learning, perceived value, and student satisfaction are discriminated theoretically and statistically and that the causal and sequential relationships are robust. With regard to practical implications, our findings help college program operators better understand how online and offline service quality influence college student satisfaction. In addition, the proposed measurements in this study can be used as a practical tool to evaluate blended learning programs. Because many universities tend to suffer from the absence of accurate measurements on blended learning, evaluating blended learning performance with our proposed measurement items will offer better insight into the design and implementation of blended learning programs as well as predict and estimate student satisfaction.
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Declarations

Conflict of interest  We have no conflict of interest to declare.

Ethical standards  At the time of data collection there was no formal requirement to seek approval from the ethical committee at our faculty. All procedures performed in this study were in accordance with the ethical standards of the national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent  Informed consent was obtained from all individual participants included in the study.

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