

THE IMPACT OF FLOW, SATISFACTION AND REPUTATION ON LOYALTY TO MOOCs: THE MODERATING ROLE OF EXTRINSIC MOTIVATION

To cite this article: José Luis Arquero, Esteban Romero-Frías & Salvador Del Barrio-García (2022) The impact of flow, satisfaction and reputation on loyalty to MOOCs: the moderating role of extrinsic motivation, *Technology, Pedagogy and Education*, 31:4, 399-415, DOI: 10.1080/1475939X.2021.2018031
To link to this article: <https://doi.org/10.1080/1475939X.2021.2018031>

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Declaration of Conflicting Interests The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgments We gratefully acknowledge the help of the Resource Production Centre for the Digital University (CEPRUD) of the University of Granada for providing access to the MOOC database.

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Abstract

Loyalty -the users' commitment to an institution or resource, involving its repeated use and recommending its use to others- and its explaining factors are of paramount importance in a MOOC, where participation is open and many actors with differing interests coexist. The present paper tests a loyalty formation model by using satisfaction, flow state and reputation as explanatory factors. We also examine the role of extrinsic motivation as a potential moderator of inter-variable relationships. Data was gathered from questionnaires distributed to users of a MOOC offered by the University of Granada (Spain).

Our results indicate that EM plays an important moderating role in loyalty formation. Satisfaction, enjoyment and reputation are less important when EM is higher whilst control appears to be more relevant to externally driven users. Practical implications include the recommendation to personalize the users' learning experience with different types of motivation in order to increase loyalty.

Keywords: MOOCs, loyalty, satisfaction, flow, student motivation.

Introduction

MOOCs emerged in 2008 as online, distributed, accessible educational proposals that make use of and contribute to the generation of open resources while providing an enriching educational experience in which participant involvement can vary (Downes, 2008). In 2012, the concept was popularized following the creation of large MOOC platforms (i.e. Coursera, Udacity, edX) which some of the world's most prestigious universities started to use to offer courses. In 2013, the Horizon Report of Higher Education (Johnson et al., 2013) included MOOCs for the first time, classifying them as a technology that would be implemented throughout 2014. In the last 5 years, opinions on the impact of MOOCs have ranged from the vastly-inflated expectations that they would herald the end of universities as we know them, to the current, stable, consolidated view that MOOCs are simply an alternative path into training (Bozkurt et al., 2017) increasingly used by higher education institutions or corporations (Oh et al., 2019).

For our part, we consider MOOCs to represent one further step in the evolution of open educational resources into open educational experiences (Yuan & Powell, 2013; Alario-Hoyos et al., 2017). Currently, they offer people opportunities to seek specific or general knowledge on a subject, although in certain university contexts they are also used as an alternative means of earning

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credits, or integrating MOOC-related technologies into a traditional curriculum (Pérez-Sanagustín et al., 2017).

The characteristics of MOOCs—open enrolment and participation, wide diversity of motivations, coexistence of a wide variety of expectations, interests and backgrounds among learners—result in differing learning behaviors in an educational setting that involves minimal learner-instructor interaction (Littlejohn et al., 2016). In this context, a MOOC's success depends on how users react to it and the extent to which they accept it. These comprise both continued use (Yang et al., 2017) and its ability to generate *loyalty* among users (Arquero et al., 2017), a concept that also includes a willingness to recommend use of the MOOC to others.

The concept of loyalty has been developed in the field of management (Anderson & Srinivasan, 2003) and refers to a sequential process that manifests user preferences for a particular service or brand (Dick & Basu, 1994). In education, loyalty implies a commitment to an institution or resource and involves its repeated use and recommending its use to others (Doña-Toledo & Luque-Martínez, 2020). This construct has been applied both to educational institutions (Nesset & Helgensen, 2009; Doña-Toledo & Luque-Martínez, 2020) and specific technology-based learning experiences, (i.e. Personal Learning Environment; Arquero et al., 2017).

Satisfaction constitutes a key factor in modeling continuance (Junjie, 2017) and loyalty formation (Anderson & Srinivasan, 2003). Satisfaction reflects the degree to which a consumer believes that possessing a product or experiencing a service evokes positive feelings (Rust & Oliver, 1994). In MOOCs, the degree of satisfaction depends on the extent to which the educational experience matches participant expectations. The greater the level of satisfaction, the greater the degree of loyalty we can expect (Ali et al., 2016; Dick & Basu, 1994).

State of flow is another of the many variables identified as antecedents to satisfaction (Trevino & Webster, 1992; Webster et al., 1993). In this context, flow refers to the degree of participant involvement in following a MOOC and helps explain participant satisfaction with the experience. In today's digital society, applications compete to generate immersive experiences that attract the user's attention—hence, for example, the popularization of video format or video games. Technology-mediated educational experiences seek to produce impactful effects in students by using a range of resources that includes videos, the social media or gamification techniques. Recent research has described the effect of flow from a one-dimensional perspective (e.g. Mulik et al., 2020). In contrast, in the present paper, we use a two-dimensional concept and demonstrate that the impact of motivation differs for each component.

Loyalty towards a MOOC platform can also be affected by the link between the platform and a given institution and its corporate reputation. Walsh and Beatty (2007) define customer-based

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reputation as the customer's overall evaluation of an organization based on their reactions to its products, services, communication activities, and personnel. Although many MOOCs are offered via large-scale platforms, some institutions create their own spaces—as in the MOOC under study. Given that MOOC platforms compete in a highly dynamic market, these institutions' reputations can affect loyalty.

Consequently, our first objective is to evaluate a model of loyalty formation towards MOOCs in which both satisfaction and reputation are key driving forces. We define loyalty both in terms of recommendation and of potential enrollment in other courses offered through the same platform—a factor essential to any platform's sustainability.

The voluntary nature of MOOCs and their heterogeneous learner population mean we have to analyze participant motivation in order to design better online experiences that achieve greater user acceptance (Alario-Hoyos et al., 2017; Martin et al., 2018)—a connection that requires more research (Chen et al., 2020). Therefore, we must seek to understand how student motivation moderates loyalty formation in users who have completed courses (Watted & Barak, 2018). Although many studies of motivation in MOOCs highlight the role of extrinsic motivation (EM) (Kizilcec & Schneider, 2015; Milligan & Littlejohn, 2017; Shapiro et al., 2017), authors generally fail to identify or simply ignore its effects (Chen et al., 2020, p. 1258). Therefore, the second objective of this paper is to study the moderating effect of EM on the process of loyalty formation.

Essentially, the present study contributes to the existing literature in two ways: (I) by presenting a model of loyalty formation that incorporates personal and institutional factors; and (II) by examining the extent to which different motivation levels (focusing on EM) change how this loyalty is built, moderating the whole model. Potentially, this is of special interest to those universities that have developed their own MOOC platforms, given the fierce competition with the larger platforms that other institutions use.

Literature review

Loyalty

Loyalty has been studied extensively in marketing and management research because it is associated with repeat purchase behavior (Dick & Basu, 1994) and active recommendation to potential users (Shoemaker & Lewis, 1999). Hence, it is usually considered the variable that really must be explained in studies of consumer behavior (Nesset & Helgensen, 2009).

Many authors (e.g. Casaló et al., 2008; Han & Ryu, 2009; Monferrer et al., 2019) emphasize the complex nature of loyalty: it encompasses an affective component, i.e. a psychological link that T. O. Jones and Sasser (1995) described as a feeling of affection for and attachment to both the

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products, services or brand and, even, the organization's people; and a behavioral component, which relates to use, purchase or recommendation actions (or intentions).

In as much as education can be analyzed as a market (institutions as companies, courses and degrees as services, etc.), loyalty to educational institutions has also been studied (e.g. Ali et al., 2016; Nettet & Helgensen, 2009; Sultan & Wong, 2014). However, research into loyalty towards a particular educational experience or educational use of technology is scarce (Arquero et al., 2017). Our approach is mixed in that we believe MOOCs can be understood from two perspectives: as educational technology *per se*, and as institutional platforms that compete with other platforms to attract potential students.

Flow and student satisfaction

Flow is “the holistic sensation that people feel when they act with total involvement” (Csikszentimihalyi, 1975, p. 36). Flow has been used to understand human–computer interaction (e.g., Chang & Zhu, 2012; M. C. Lee & Tsai, 2010) and study the use and acceptance of websites (Koufaris, 2002). In this context, flow can explain the emotional state in which individuals experience total involvement, concentration and enjoyment when navigating a website, a challenge that demands certain skills and which converts itself into exploration, positive attachment and gratification (Sánchez-Franco, 2005). The state of flow includes intense concentration, a sense of control, a loss of self-consciousness, and the transformation of time (Guinaliu-Blasco et al., 2019). Trevino and Webster (1992) described four dimensions of flow: control, attention focus (concentration), curiosity and intrinsic interest (enjoyment). Later research (Moon & Kim, 2001) identified concentration as a sub-dimension of enjoyment–playfulness. B. C. Lee et al., (2009) highlighted enjoyment–playfulness as the main dimension of flow whereas Koufaris (2002) stressed the relevance of perceived control over the environment and one's own actions. Control appears to be crucial in MOOCs, in which students enjoy more flexibility in organizing their own work and determine the extent of their own involvement in social activities like optional forums. So, in the context of the MOOC experience, we consider control and enjoyment to be the key dimensions of flow.

Satisfaction can be defined as the positive customer evaluation of a product or service (M. A. Jones & Suh, 2000) determined by comparing expectations with perceived performance (Anderson & Srinivasan, 2003). In education, research has focused on antecedents to satisfaction, identifying flow as a significant predictor (Hsu et al., 2013; Mulik et al., 2020; Trevino & Webster, 1992; Webster et al., 1993).

The aforementioned arguments support the following hypotheses:

H₁: Flow positively influences student satisfaction.

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H_{1a}: Enjoyment positively influences student satisfaction.

H_{1b}: Control positively influences student satisfaction.

Interaction between institutional reputation, student satisfaction and loyalty

The concept of institutional reputation (IR) has been studied in great depth in marketing research. Walsh and Beatty (2007) define IR as the customer's overall evaluation of an organization on the basis of their reactions to that organization's products, services and communication activities, and its representatives. A positive IR creates a halo effect that contributes to loyalty formation by increasing satisfaction (Jin et al., 2008). Doña and Luque (2020) proposed the university's image be considered an antecedent to both satisfaction and loyalty. Khan et al. (2018) confirm the positive effect of reputation on MOOC adoption.

The satisfaction–loyalty effect is supported by the results of research which found a direct, positive link (e.g. Ali Abbasi et al., 2021; Helm et al., 2010; Hernández-Mogollón et al., 2020; Rust & Zahorik, 2003) that could be based on the social exchange theory (Thibaut & Kelley, 1959): satisfaction is a stimulus that any individual wants to perceive repeatedly, leading to loyalty.

These arguments support the following hypotheses:

H₂: Reputation positively influences student satisfaction.

H₃: Student satisfaction positively influences student loyalty.

The moderating role of motivation

Understanding learners' perspectives and motivation is of special relevance in autonomous, asynchronous, IT-based contexts like MOOCs (Liu et al., 2019), in which the lack of support and of social interaction (Martin et al., 2018), and the need to work at a distance, all demand that students retain interest, persist, and overcome challenges (Deshpande & Chuckholmin, 2017).

Several authors agree that motivation—as defined in self-determination theory (SDT, Ryan & Deci, 2000)—is of major importance in explaining participants' behavior in MOOCs (Joo et al., 2018), e-learning in distance education (Firat et al., 2018), and technology acceptance in educational innovations (Nikou & Economides, 2017).

According to SDT, behavior can be *amotivated* (i.e. no motivation at all), *extrinsically motivated* or *intrinsically motivated*. Intrinsic motivation (IM) is defined as “doing an activity for itself, and the pleasure and satisfaction derived from participation” (Deci & Ryan, 1985, p. 1004); whereas EM is the “performance of an activity in order to attain some separable outcome” (Ryan & Deci, 2000, p. 71). The least determined and best described type of EM is *external regulation*, in which behavior is directed at winning external rewards such as, in a higher education context, badges, certification for courses, or credits.

Research tends to focus on IM, as it is considered the main source of motivation in e-learning (Firat et al., 2018; Shazad et al., 2020), while EM is considered less relevant or even ignored (Chen et al., 2020). However, recent research has highlighted the fact that learner motivation to participate in MOOCs can be better explained as a combination of internal and external factors (e.g. Joo et al., 2018; Liu et al., 2019; Watted & Barak, 2018; Xiong et al., 2015). Therefore, as Barba et al. (2016) suggest, “attention should be given to different conditions that might accommodate different levels of motivation” (p.227). In fact, recent research on MOOCs has highlighted the relevance of EM to explain usage and total performance (Nametoski et al., 2018), acceptance and usage (Romero-Frías et al., 2020), or as a predictor of student engagement (Xiong et al., 2015)¹.

These arguments suggest the following hypothesis:

H₅: Student motivation (EM level) moderates loyalty antecedents.

Having taken these proposed hypotheses into account, we offer our theoretical model of loyalty formation in MOOCs, depicted in Figure 1.

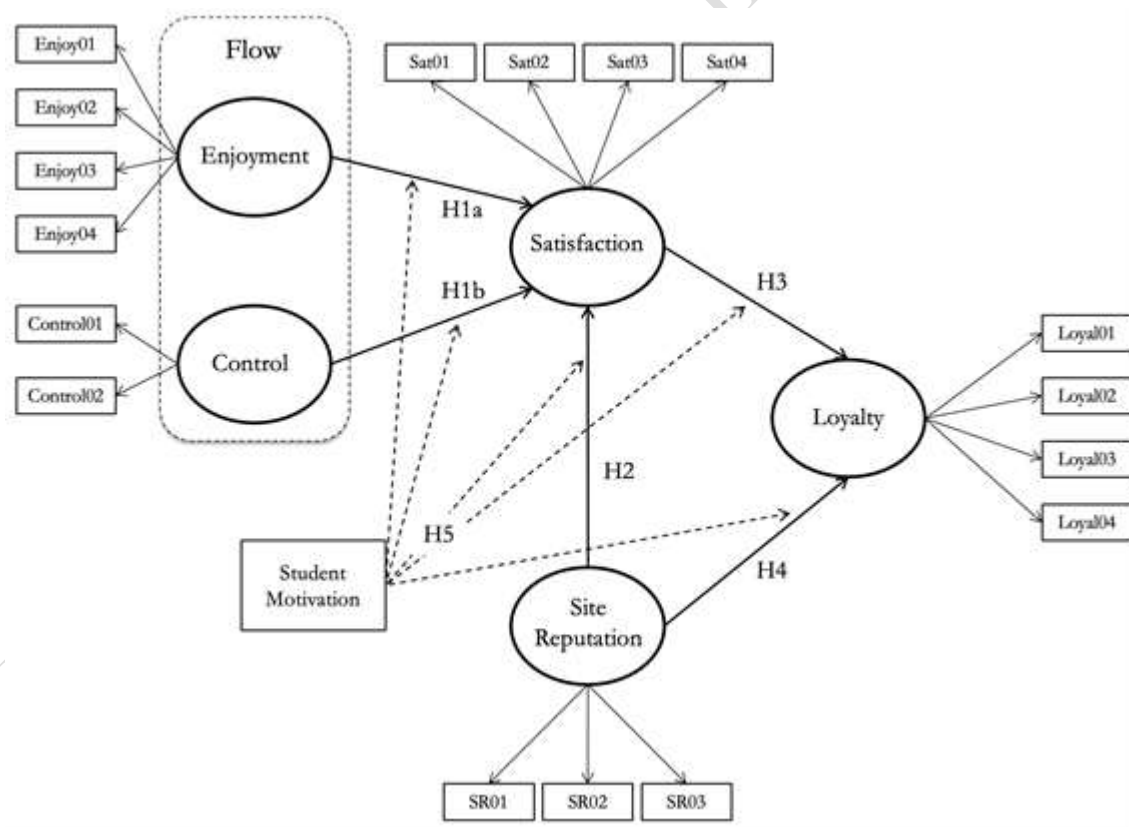


Figure 1. Theoretical model of loyalty building in MOOCs

¹ However, the lack of formal certificates is also considered a disadvantage of MOOCs in comparison with other forms of training (Castaño-Muñoz et al., 2018)

Methodology

Context: Abierta-UGR

The University of Granada (Spain) has developed its own customized MOOC platform service based on Moodle and known as Abierta-UGR (<https://abierta.ugr.es/>). Its most popular course is “The Alhambra: history, art and heritage”, which aimed to analyze the monument from a multidisciplinary perspective. Learners enrolled in the course free of charge, with no pre-requisites, and received certification after completing the six weekly modules’ activities and exams. In addition, University of Granada students could earn elective credits for their degree programs—on payment of a small fee. The MOOC’s contents were mainly based on some 50 short videos (around 3 minutes each), in which over 30 experts participated. Evaluation was based on self-assessment tests (one per module) and one final test. The course also invited students to publish their own content on the platform and participate in social media.

The present study is based on the second edition of the Alhambra MOOC (Spring 2016). The course registered 11 100 users, of whom 7200 completed it (an approximately 65% completion rate).

Data collection

A questionnaire was designed on Google Drive and distributed by direct email to all registered users through the MOOC platform and published in the participants’ Facebook group. A first message was sent during the last week of the course, followed by a second message ten days later.

A total of 2084 students responded to the questionnaire, out of the 7200 who completed the course (30.5%). More women (64.2%) than men (35.8%) participated in the survey. Respondent age ranged up to 72 years, with a mean of 30.3.

Measures

All measures used in the present study were adapted from previously validated scales that had been employed in relevant research in education or management. All the items and scales used, and the psychometric properties of the scales are presented in the Appendix. Unless otherwise indicated, we used an 11-point Likert scale ranging from (0) *totally disagree* to (10) *totally agree*.

Following Webster et al. (1993) and Ghani and Deshpande (1994), flow was measured as a two-part construct comprising enjoyment during MOOC interaction and perceived control.

To measure student satisfaction with the learning experience, we applied a scale based on Szymanski and Hise (2000) and previously used in educational research by other authors (e.g. Arquero et al., 2017; Dehghan et al., 2014; Islam, 2014).

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Following Casaló et al. (2008), reputation was considered both in reference to the MOOC itself and to the wider, institutional perspective, and was measured using a scale adapted from Jin et al. (2008).

Student loyalty was measured with a 4-item scale adapted from Zeithaml et al., (1996) for use in educational research (e.g. Adam & Nel, 2009; Perin et al., 2012; Casaló et al., 2008).

To measure motivation–external regulation, which considers participation to be an activity undertaken to obtain external rewards, we used a single-item scale adapted from Vallerand et al. (1992) that fitted this definition perfectly and was the most relevant extrinsic motive in this context: I took the course to earn credits.

Analysis of the psychometric properties of the scales

Prior to the full data analysis and testing of our hypotheses, the validity and reliability of the multi-item scales were checked by means of confirmatory factor analysis (CFA) using Lisrel 9.3 software (Hair et al., 2010). Robust maximum likelihood was applied, as the variables analyzed did not follow a normal multivariate distribution (Relative Multivariate Kurtosis: 2.523). The CFA results showed that all the parameters were significant ($t > 2.56$, $p < .01$), with a high magnitude (above .7). However, some items presented an R^2 below the suggested cut-off value of .50 (Hair et al., 2010). Following recommendations found in the literature, we discarded the items with the lowest values (SR01: .4; Enjoy03: .34) but kept Enjoy04 (R^2 : .47). After these changes, the CFA model was recalculated. The overall goodness-of-fit indicators improved substantially (Satorra-Bentler S-B Chi-square fell from 1249.05 to 484.27 and RMSEA from .07 to .04). The CFA results yielded standardized parameters above .70 and R^2 values above .50 (see Appendix). These findings provided evidence of the convergent validity of the scales. In addition, average variance extracted (AVE) and composite reliability (CR) exceeded the recommended cut-off values, demonstrating the adequate reliability of the measures.

Discriminant validity was confirmed by applying the procedures suggested by Fornell and Larcker (1981) (Table 1).

Table 1

Descriptive statistics and discriminant validity analysis (correlations and square root of AVE)

	<i>Mean</i>	<i>SD</i>	<i>Loyalty</i>	<i>Reputation</i>	<i>Satisfaction</i>	<i>Enjoyment</i>	<i>Control</i>
Loyalty	9.30	0.97	.84				
Reputation	7.76	1.62	.51	.78			
Satisfaction	9.07	1.06	.68	.58	.86		
Enjoyment	8.59	1.27	.70	.63	.77	.85	
Control	8.89	1.20	.55	.54	.65	.77	.84

Note: Square root of AVE presented in the diagonal in bold.

Configuration of groups and multigroup invariance analysis

We used the *polar extremes approach* (Hair, Hult, et al., 2014) to assess the moderating effect of EM on the relationships proposed (H₅). Following this method (Hair, Black, et al., 2014), participants were classified in three groups on the basis of the distribution of the moderating variable (EM) and the central range group was discarded for comparison (George & Prybutok, 2015). In this case, the distribution of the variable (Figure 2) showed that most respondents were concentrated in the upper and lower parts of the distribution (low EM and high EM). Thus, students with a low level of agreement with the item (0, 1, 2) were assigned to the low_EM group (n : 476) and those indicating a strong motivation to gain extra credits (8, 9, 10) were allocated to the high_EM group (n : 1239); the 369 cases in the central range group were discarded.

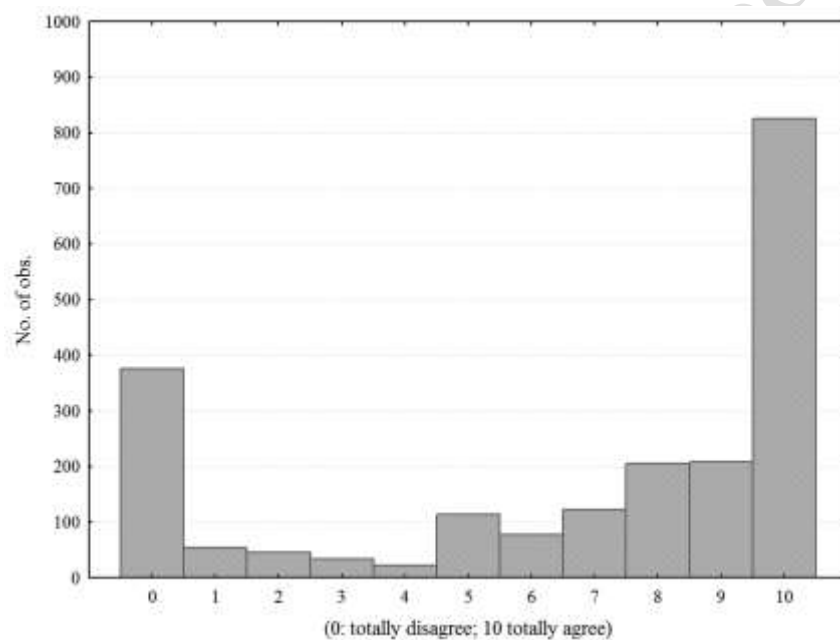


Figure 2. Frequency distribution of the EM variable

To avoid misleading results from our comparison of groups, we needed to test the invariance of the measures (Arquero et al., 2017) for configural and metric invariance (Cheung & Rensvold, 2002). Therefore, multi-group CFA was performed comparing different nested models to test both levels of invariance. We started with the most restricted model (M0) in which only the pattern was invariant across groups, allowing the other parameters to differ between groups (configural invariance). Our data analysis yielded adequate overall goodness-of-fit indicators (S-B Chi-square: 587.35; $p < .01$; d.f.: 168; RMSEA: .05; CFI: .99), confirming this first level of invariance. Next, to analyze metric invariance, we used a second model (M1) in which equal factorial loadings across the groups were restricted. Metric invariance was also confirmed: M1 presented a slightly higher Chi-square value than M0 and adequate overall goodness-of-fit index values (S-B Chi-square: 604.34; $p < .01$;

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d.f.: 178; RMSEA: .05; CFI: .99). However, the scaled Chi-square S-B test (Satorra & Bentler, 2001) comparing M1 and M0 was statistically non-significant ($\Delta \chi^2 = 13.70$; $p = .18$).

Results

To test our proposed model (Figure 1) and our hypotheses (H₁ to H₄) structural equation modeling (SEM) was applied using Lisrel 9.3. The results reveal overall goodness-of-fit indexes within the recommended limits (Hair et al., 2010): S-B Chi-square = 547.39; d.f.: 82, p-value < .01; RMSEA = .05; CFI = .99; Critical N: 437.47.

Hypothesis H₁ suggested that the level of student satisfaction with the MOOC would relate positively to the level of flow state, measured in terms of enjoyment and perceived control experienced while interacting with the course. Our results (Figure 3) showed the positive direct impact of enjoyment on satisfaction ($\beta_{\text{Enjoyment} \rightarrow \text{Satisfaction}}$: .62; $p < .01$), confirming H_{1a}. Furthermore, the level of satisfaction increased as subjects perceived they had a higher level of control over the Abierta-UGR platform ($\beta_{\text{Control} \rightarrow \text{Satisfaction}}$: .12; $p < .01$), validating H_{1b}.

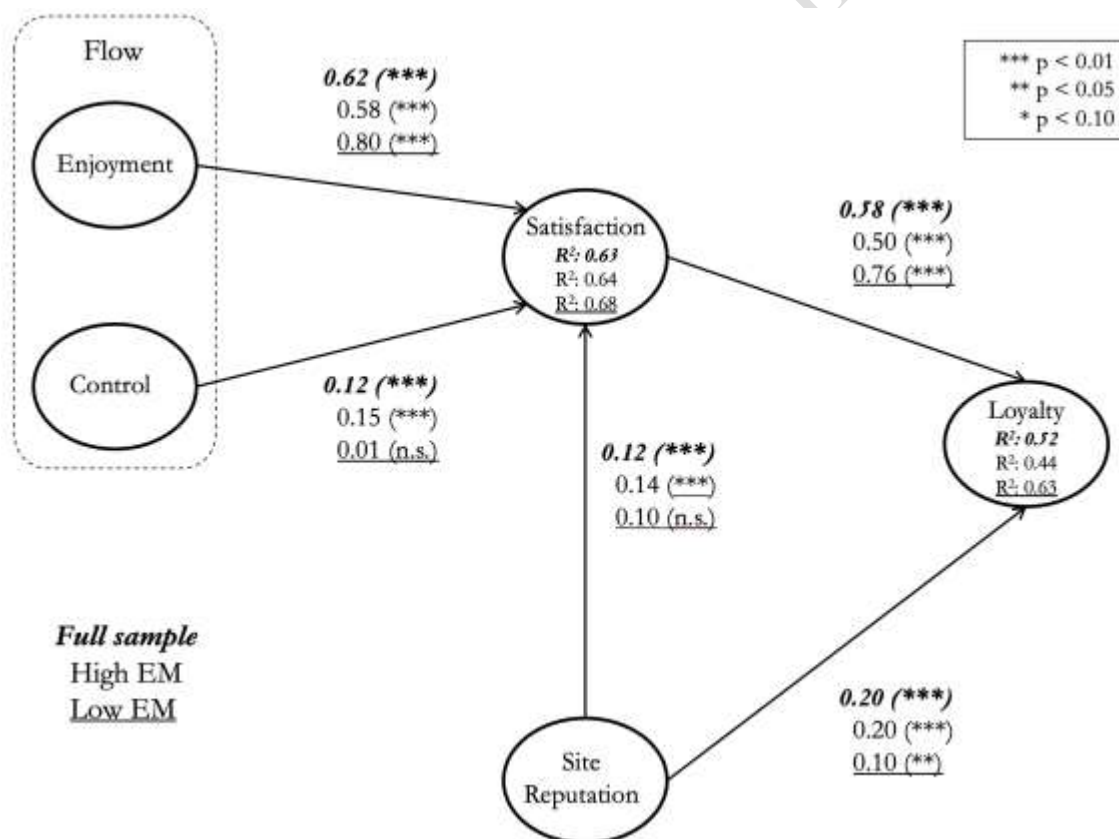


Figure 3. Multigroup test results

Therefore, these results show that students in flow state presented significantly higher levels of satisfaction with the experience, and that the contribution that enjoyment made to this was greater than that made by perceived control. Our results also supported H₂. The effect of reputation on satisfaction was positive and significant ($\beta_{\text{Reputation} \rightarrow \text{Satisfaction}}: .12; p < .01$). Similarly, our results showed the positive, significant impact of satisfaction on loyalty ($\beta_{\text{Satisfaction} \rightarrow \text{Loyalty}}: .058; p < .01$). Hence, the greater the level of the participants' satisfaction with the learning experience, the more likely they were to recommend the platform or use it again themselves. Thus, H₃ was supported. Reputation also had a positive, significant impact on loyalty, providing support for H₄ although this was weaker ($\beta_{\text{Reputation} \rightarrow \text{Loyalty}}: .20; p < .01$) than in the case of satisfaction. Consequently, the chances of a student recommending courses to others or enrolling in another Abierta-UGR course depended more on their satisfaction with the experience, and less on the reputation of the University of Granada, the platform and/or the course.

Finally, it is to be noted that the explanatory power of the model can be considered high: R² for satisfaction is 0.62 and for loyalty, 0.52.

Having tested and confirmed measurement invariance, we calculated the results of applying our proposed theoretical model to each group (Figure 3).

Initial analysis of these parameters indicated most of them differed across groups. To test the significance of these differences and, therefore, analyze the moderating role of external motivation, the differences between parameters were tested using nested models (Table 2).

Table 2

Test of differences of parameters between groups

	Standardized coefficients <i>High_EM - Low_EM</i>	No Restricted Model SB Chi-square (df: 197)	Restricted Model SB Chi-square (df: 198)	Δ scaled SB Chi-square <i>p-value</i>
Enjoyment→Satisfaction	.58*** - .80***	551.64	556.01	.03
Control→Satisfaction	.15*** - .01(n.s.)	551.64	555.19	.09
Reputation→Satisfaction	.14*** - .10(n.s.)	551.64	552.63	.60
Satisfaction→Loyalty	.50*** - .76***	551.64	560.69	.01
Reputation→Loyalty	.20*** - .10**	551.64	552.77	.83

The impact of the enjoyment component of flow on satisfaction differed as a function of motivation. For those students who were not especially motivated by gaining credits (low_EM group) it was significantly higher than for those students who were more extrinsically motivated (high_EM) ($\beta_{\text{Low_EM}}: .80***$ vs. $\beta_{\text{High_EM}}: .58***$, $p = .03$). In contrast, the impact of the control component of flow on satisfaction was higher for students motivated by external rewards

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($\beta_{\text{Low_EM}}$: .01; n.s. vs. $\beta_{\text{High_EM}}$: .15***, $p = .09$), whereas it can be considered inexistent for low_EM users; although the differences were only marginally significant ($p < .10$).

Regarding how motivation affects the influence of satisfaction on loyalty formation: for low_EM students, the impact of satisfaction on loyalty was substantially greater than for high_EM students ($\beta_{\text{Low_EM}}$: .76*** vs. $\beta_{\text{High_EM}}$: .50***, $p = .01$).

Although the test results did not support further significant differences between groups, it is interesting to note that the impact of reputation over satisfaction is not significant for low_EM users, while it is for the high_EM group ($\beta_{\text{Low_EM}}$: .01; n.s. vs. $\beta_{\text{High_EM}}$: .14***).

These results could be complemented by an analysis of the overall effects of the independent variables—flow and reputation—on the dependent variable, loyalty (Table 3). The most noticeable difference is the remarkable impact of the enjoyment component of flow on loyalty, which is substantially higher for the low_EM group (.53 vs .28). In this case, the difference in the impact of enjoyment on the mediating variable (satisfaction) is amplified by the differences between the groups on the satisfaction→loyalty path.

Table 3

Standardized Total Effects

	<i>Standardized coefficients Full sample</i>	<i>Standardized coefficients High_EM</i>	<i>Standardized coefficients Low_EM</i>
Enjoyment→Loyalty	.33	.28	.53
Control→Loyalty	.06	.07	.01
Reputation→Loyalty	.20	.18	.22

In the case of reputation, although the direct effects on loyalty (and satisfaction) are higher for the high_EM group, the total effect is influenced by the mediation of satisfaction and the differences in the direct impact of satisfaction→loyalty, which is considerably higher for the low_EM group. The total effect of the control component of flow on loyalty is weak.

In general, we can assume that, as stated in H₅, EM level is a relevant moderator of the way loyalty was formed.

Discussion

The present work aims to explain loyalty formation in the MOOC experience and to examine the role of EM as a moderator of the inter-variable relationships in the model proposed (using flow state, satisfaction and reputation as antecedents). Several studies have analyzed satisfaction and reputation as antecedents to loyalty towards websites or platforms both in educational and in

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commercial settings (e.g., Arquero et al., 2017; Doña-Toledo & Luque-Martínez, 2020; Helm et al., 2010). However, our work incorporates the moderating effect of EM on these variables in order to understand how students with different levels of EM build their loyalty towards MOOCs. We would emphasize that a large number of participants demonstrated high EM, which contradicts the findings of other studies (e.g. Alario-Hoyos et al., 2017, Abdullatif & Velázquez-Iturbide, 2020). Undoubtedly, this apparently contradictory evidence indicates the need to recognize the variety of motivations present in MOOC participants and that institutions need to respond to their varied profiles. The need to investigate the variety of motivations in the heterogeneous population of MOOC learners has been highlighted in recent research (Alario-Hoyos et al., 2017; Martin et al., 2018) aimed at the design of better and more engaging courses. Our work provides additional supportive evidence.

For high_EM participants, those whose main motivation is to earn complementary credits, the degree of satisfaction was less important in loyalty building than for those with low_EM (0.50 vs. 0.76). The same occurred in the relationship between flow–enjoyment and satisfaction. Enjoyment appeared to be less relevant for the high_EM group (0.66 vs. 0.85) whereas the effect of flow–control was only significant for the high_EM group (0.16). In this case, the two-dimensional view of flow—in contrast with recent research (e.g. Mulik et al., 2020) based on a one-dimensional concept—provides us with a deeper understanding of the effect of motivation.

The pursuit of external achievement implies that the high_EM group might prefer more structured educational designs that reduce uncertainty and obstacles to reach the final goal. So, control clearly needs to be taken into account for this participant type, who seems to avoid distractions. In this line, Littlejohn et al. (2016) noted that those learners more concerned with gaining a certificate ‘tend to conceptualize the MOOC as a formal learning activity, adopting a more uniform and linear approach’ (p.47). This could be the result of the evolution of MOOCs within the educational system, leading to their current state of maturity, in which they have been integrated into the universities’ standard learning offer. Given that the platforms themselves have encouraged earning credits or diplomas as a way to monetize their courses, learners and their motivations vary enormously, pointing to an increase, as found in the present study, in the number of participants with EMs. Connectivist MOOCs (Siemens, 2005)—based on more open structures that shrink informal learning, establishing unexpected connections or discovery—could be appropriate only for students with low EM, who are not really oriented towards gaining an external incentive—a model that might be better suited to an xMOOC approach (Ebben & Murphy, 2014). Given the diversity of MOOC participants, the design of varied training activities should be of interest in order to maintain user interest and increase loyalty.

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Reputation has been shown to have a low impact on loyalty and this was stronger in high_EM students, who may consider it important to have a well-recognized institution supporting the credits earned. The issue of reputation is of particular interest for people who aim to obtain a certificate for professional purposes. Consortia of universities—in which many universities with different levels of reputation offer courses in the same space—are one of the main phenomena in the sector (Coursera, edX).

Practical implications, limitations, future research lines and conclusion

The findings derived from the present study have important implications for MOOC educational designers and platform managers.

Extrinsic motivation has been found to be important in loyalty formation towards this type of online course. As long as EM is generally high, managers should bear in mind that offering optional credits through MOOCs can attract a large number of university students for whom the degree of satisfaction with the experience is not as important as it is for those with low EM levels. This is not only true of university students; professional workers often have to accredit hours of continuing training on specific topics each year in order to maintain professional certification. In their case, the recognition of this training through MOOCs opens a door of opportunity to offer courses to high EM learners, thus increasing the platforms' generation of resources.

Therefore, we should perhaps discriminate between these user types by providing differentiated learning experiences. MOOC designers should consider how specific learning objects and structure meet or do not meet participants' different needs and motivations (Brooker et al., 2018). Likewise, for low EM participants, enriching the educational experience by generating challenging additional content would increase their satisfaction without extending these proposals to the entire community. This is clearly supported by the greater impact of enjoyment on satisfaction experienced by low EM participants. Massive courses that mix together students with very different expectations could very well reduce the added value of the educational experience for both groups, especially for those with a low EM level.

These results would support the call for a personalized learning movement, a trend highlighted by the NMC Horizon Report - Higher Education Edition (Adams Becker et al. 2017). The implementation of Adaptive Learning Technologies in MOOC design could foster the adaptation of content and activities to suit different sets of student motivations and skills. One way to generate a personalized experience for each group would be to divide the students at the beginning of the course and establish two separate teams of facilitators—one for each group—providing different pedagogical experiences based on the same contents but with groups

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that are more homogeneous in terms of motivation. Facilitators for high_EM participants would focus more on providing technical and administrative assistance as well as supporting performance in the essential course activities; facilitators for low_EM participants would provide additional resources, raise discussions and broaden the course content and issues, as well as putting the participants in touch with experts and agents accessible via social networks. This could be implemented with no significant additional cost by using the same platform and common core resources.

Our future lines of research will look further into how different types and levels of motivation are associated with variables relating to a successful learning experience (Brooker et al., 2018). In doing so, we will incorporate into the model objective variables obtained from platform logs so we can assess the degree of use and other behaviors with objective as opposed to perceptual variables. This should help us design more complex models that improve the explanatory power of loyalty formation. Also, in future editions of the MOOC, we intend to collect information at different stages of the course in order to examine the role of motivation in those students who leave (dropouts) as well as those who complete the course.

As the present study is based on a MOOC delivered by a single University platform, in the future we would hope to analyze the issue of reputation in a comparative study involving MOOCs delivered via large-scale platforms, on which international institutions compete within a single space.

To conclude, our study makes a significant contribution by recognizing the value that EM plays in loyalty to MOOCs, which provides evidence contrary to the idea that EMs have a negative impact on intention to use MOOCs—one component of our loyalty variable (Abdullatif & Velázquez-Iturbide, 2020). Both types of motivation are valid, and platforms should be ready to attract users regardless of the motivation that drives them. Our model has a high explanatory capacity including a reduced set of variables that focus on personal (satisfaction) and institutional (reputation) factors to assess the formation of satisfaction and loyalty towards MOOCs.

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Appendix

Descriptive statistics (mean and SD) and psychometric properties of the scales

<i>Constructs and scales</i>	<i>Mean</i>	<i>SD</i>	<i>Standardized loadings</i>	<i>R²</i>	<i>CR</i>	<i>AVE</i>
Loyalty						
Now that I have completed this Abierta-UGR course...						
Loyal01: I will tell others about its positive aspects	9.27	1.13	.86***	.75	.90	.70
Loyal02: I will recommend it to anyone who asks me for advice	9.31	1.13	.90***	.82		
Loyal03: I will encourage my classmates to take courses that this platform	9.30	1.07	.88***	.78		
Loyal04: I will take other courses that use this platform	9.32	1.10	.71***	.50		
Site Reputation						
SR01: In general, I consider that the Abierta-UGR platform is well-known	6.62	2.49	Discarded			
SR02: The Abierta-UGR platform has a good reputation	8.04	1.83	.73***	.54	.76	.61
SR03: The institutions that organize the course have a good reputation	8.64	1.83	.83***	.69		
Satisfaction						
In general, my experience of the audiovisual contents on the Abierta-UGR platform...						
Sat01: leaves me feeling (0) totally dissatisfied - (10) totally satisfied)	8.98	1.30	.83***	.69	.92	.74
Sat02: is that they are (0) Not interesting at all - (10) very interesting)	9.02	1.23	.84***	.70		
In general, my experience of the Abierta-UGR course format leaves me feeling...						
Sat03: (0) totally dissatisfied (10) totally satisfied)	9.11	1.11	.90***	.81		
Sat04: (0) very unhappy (10) very happy	9.17	1.10	.87***	.76		
Enjoyment						
I think that my experience of the Abierta-UGR course format has been...						
Enjoy01: interesting	9.13	1.14	.92***	.84	.88	.72
Enjoy02: pleasant	9.15	1.17	.90***	.82		
Enjoy04: fun	7.86	2.03	.70***	.47		
Enjoy03: exciting	8.21	1.74	Discarded			
Control						
While using the <i>Abierta-UGR</i> platform...						
Control01: I felt calm	9.02	1.23	.91***	.83	.82	.70
Control02: I felt that I was in control	8.75	1.40	.75***	.56		

Note: All items have been translated from the original Spanish instrument.

*** $p < 0.01$