Article

Privacy Concerns and Online Learning of Postgraduate Students through the Lens of Stimulus–Organism–Response Model

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Abstract: Based on the stimulus–organism–response (SOR) model, the purpose of the current study is to investigate two types of privacy concerns, i.e., privacy concern abuse (PCA) and privacy concern finding (PCF), in relation to online collaborative learning (OCL). Further, another aim is to investigate knowledge-sharing perceptions (KSP) as a mechanism between PCA and PCF with OCL. A survey was used to collect the data from postgraduate university students in Pakistan. The hypothesized model was tested on 285 valid responses through SPSS 22.0 and AMOS 22.0. The findings show that PCA and PCF negatively and significantly influence OCL. Moreover, KSP mediates the relationship between PCA and PCF with OCL. Based on the results, the implications for teachers, students, and educational institutions are discussed.

Keywords: privacy concerns; knowledge sharing; online collaborative learning; SOR model

1. Introduction

Technology integration is an unavoidable feature of any progressive organization. Almost all of the social spheres are highly dependent upon the effective integration of technology, and COVID-19 has significantly boosted the use of communication technologies in all social sectors, including education [1]. Consequently, the use of LMS, MOOCs, VLEs, and mobile technologies is an integral part of the radical shift from conventional methods to online learning and teaching pedagogies. Likewise, higher education, being a hub of teaching, learning, and research, is inclined to employ all feasible and effective sources for promoting collaborative learning, hence, the research confirms a significant increase in the usage of communication technologies in varying forms [2].

Similarly, social networking sites (SNSs) are some of the effective, flexible, and economical tools used for promoting collaborative learning [3,4]. Numerous researchers confirm the employment of SNSs in classroom activities and assessments, while they are also used in brainstorming, group discussions, peer-reflections, and debates among the students and the teachers [5,6]. Hence, SNSs have turned classrooms into virtual learning communities [7].

Social networking sites (SNSs) provide a ubiquitous space to learners, where they may work in their comfort zone with flexible timings. This motivates active participation and creates an easy environment for both the teachers and learners [8].

SNSs promote peer exchanges and group discussions through the smooth flow of communication, as it diminishes the fear of judgement [9]. The participants may easily collaborate over breaks for sharing handouts, PowerPoint slides, concept maps, reading materials, etc. These work as time-free spaces for the students to think, share, and sleep over ideas (Chugh, Grose, and Macht, 2021) [10]. Similarly, the course facilitators can effortlessly stay connected using the SNSs. It provides a convenient and flexible forum for
providing instructions, assigning homework and assessments, conducting discussions, and providing feedback [8].

However, the negative aspects of the usage of SNS outweigh the benefits in some contexts [11,12]. A number of studies report threats and risks involved in using SNSs in classrooms [13–15]. These studies highlight issues such as the impact on peer-to-peer relationship, addiction and overuse, social stressors, health threats, and a negative impact upon academic performance. The most prominent of these are risks and privacy concerns. The participants are reported to be concerned with invasions of privacy, identity theft, cyber bullying, and hacking [16]. Hence, extensive research was conducted about the usage, benefits, and risks involved in employing SNSs in classrooms [7,17]. However, the factors that negatively influence students’ behavior, and its impact upon online learning behavior, is yet to be discovered, especially regarding postgraduate student behaviors. The postgraduate programs are research-oriented, therefore, it is assumed that the students at this level are comparatively more sensitive about privacy invasions than the students enrolled in undergraduate or school level. The postgraduate students are expected to produce original work, and copyright issues and plagiarism are some of their primary concerns [18]. Consequently, they can be at a higher risk of intellectual theft. Thus, it is crucial to explore the context for the explanation of postgraduate students’ behavior in online learning.

To fill this gap, based on the stimulus–organism–response (SOR) model by Mehrabian and Russell [19], the current study explores the interplay of students’ privacy concerns, their knowledge-sharing perception, and online learning behavior. The model comprises of a stimuli (privacy concern), organism (knowledge-sharing perception), and response (online learning behavior). The students’ knowledge sharing is presumably dependent on the beliefs, which may be influenced by the percentage of risks involved in sharing the learned information, knowledge, or ideas. The model attempts to explain the mediation of knowledge-sharing perception between privacy concerns and the online learning behavior of the postgraduate students (see Figure 1).

Figure 1. Proposed Model.

2. Review of the Literature

2.1. Privacy Concern and Online Collaborative Learning

Privacy denotes “the control of transactions among individuals, which aim to reduce vulnerability or increase autonomy” [20], p. 10. This research explores privacy through
two dimensions, namely, privacy concern abuse (PCA) and privacy concern finding (PCF). PCA is the perceived potential concern about the misuse of the information or knowledge shared. This can be explained as the learners’ fear of intellectual theft, or their perception of risks in abuse of the knowledge they have shared. The other aspect, PCF, indicates the fear of discovery of shared knowledge (personal information) by an unintended audience, or the risk of being exposed through the shared knowledge. This involves the risks of personal information being exposed to strangers or an unknown audience. Scams, invasions of privacy, hacking, or the accidental revelation of knowledge are examples of such concerns.

Privacy concerns have a negative impact upon the perceived usefulness of online forums [21], and the concept has a negative relationship with online learning [22,23]. Rajab and Soheib [24] elaborate that privacy concerns are the major determinant of online participation by students. A study by Youn [25] and Chang [26] reveals that students refrain from using some online forums due to the privacy concerns, and that the consumer educators should teach and make their students aware of effective coping mechanisms. However, a study by Dwyer, Hiltz, and Passerini [27] suggests that online relationships can be established despite the weak level of trust. Contradictorily, Zhai, Wang, and Ghani [17] confirm a positive relationship between privacy concerns and knowledge-hiding perception. This implies that the more concerned the students are about privacy, the more they hide knowledge, and this hampers online collaborative learning (OCL).

H1a. PCA will negatively influence OCL.
H1b. PCF will negatively influence OCL.

2.2. Mediating Role of Knowledge-Sharing Perception (KSP)

The stimulus–organism–response (SOR) model explains the psychology of the connection between the environmental factors, an individual’s organism (i.e., a person’s belief, feelings, perception, thinking, ideas, or understanding), and their response to the factors [28]. The model explains how the external factors influence the individual’s mental state, thus, having an impact upon their behavior [29]. This model has been used in a number of studies in varying domains [29–32]; hence, SOR is an appropriate lens to evaluate the context under consideration.

KSP is one of the strong factors influencing students’ behavior in OCL [33]. A study by Majid and Panchapakesan [9] confirms a strong relationship with the students’ behavior in online learning. Their study also discusses inadequate depth in a relationship as a barrier in knowledge sharing, which implies that trust plays a significant role in determining the students’ KSP. Similarly, Lin, Hung, and Chen [34] also found trust as the major determinant of KSP, proving to have a positive relationship with the behavior of the participants.

Knowledge sharing is the foundation and one of the core purposes of collaborative learning in both face-to-face and online modes. The participants are expected to exchange ideas, share knowledge, and work collaboratively while exploring the prescribed content. Knowledge sharing in an online learning environment has a positive impact upon the academic performance of the students [35,36]. This implies that the more students share knowledge, the more learning occurs. Thus, any online forum established or used without consideration of the antecedents may cause fatal results [37]. This implies that SNSs should ideally promote knowledge sharing, and any factor hampering the aim should be lessened. Privacy concerns are reported to have a negative impact upon the users’ knowledge-sharing behavior [38]. This means that privacy concerns can alter the participants’ perception of knowledge sharing, which, in turn, can have an impact upon OCL. Therefore, KSPs mediate the relationship between privacy concerns and OCL.

H2a. KSPs mediate the relationship between PCA and OCL.
H2b. KSPs mediate the relationship between PCF and OCL.
3. Methods

3.1. Participants and Procedure

The purpose of the current study is, firstly, to investigate the relationship between two dimensions of privacy concerns (i.e., PCA and PCF) and OCL. The second purpose is to investigate the mediating role of KSP between the relationship of PCA and PCF with OCL. The proposed model was tested through data collection from postgraduate (master’s and PhD) students in Pakistan. Only those students who had learning experience using social media participated in the survey. The questionnaires were distributed in the English language because the medium of education in Pakistan is English, and all the participants were well-educated i.e., master’s and PhD students. A cover letter was attached with each questionnaire that explained the purpose of the research, ensure the anonymity, and that they are participating voluntarily in the study and can withdraw anytime. Total of 450 questionnaires distributed, however, 295 responses were received. Six out of the 291 responses were incomplete, hence, 285 valid responses (63.33% of the total) could be used for testing the study model.

The sample size was calculated on “Daniel Soper sample calculator (https://www.danielsoper.com/statcalc/calculator.aspx?id=89, accessed on 30 June 2021)”, using the values of effect size 0.30, number of latent variables 4, and observed variables 19 to run structural equation modelling (SEM). The minimum recommended sample size was 137. Our final sample was 285 respondents, which was enough to run the study model through SEM. Moreover, we selected master’s and PhD students, the reason being both of these programs are research-oriented degree programs, and Zhai et al. [17] reported that the privacy concern of these students is relatively high in term of discussing or sharing ideas on online learning platforms.

The demographic characteristics of the sample include age, gender, qualification, and type of social media using for learning. The sample is 49.5% male and 50.5% female. Majority of the respondents (76%) are up to 33 years of age. The respondents consist of 55.4% master’s students and 44.6% PhD students. The social network site used by most of the respondents is Facebook (i.e., 47%).

3.2. Measurements

The items of the constructs were measured on a Likert scale (5 = strongly agree, 1 = strongly disagree).

Privacy concerns: two aspects of privacy concerns were measured, each through four items. The scale was adapted from the Dinev and Hart [39] study. Two of the sample items are, “When I use the SNS for learning, I am concerned that the information/knowledge and ideas I submit could be misused” and “When I use the SNS for learning, I have the feeling of being watched”.

Knowledge-sharing perceptions: knowledge-sharing perceptions items were adapted from Davenport and Prusak [37] and Wasko and Faraj [40]. The sample item is “I perceive that sharing knowledge with others on social media is useful for learning new knowledge”.

Online collaborative learning: Seven items from the study of So and Brush [41] were adapted for measuring the Online Collaborative Learning. The sample item is: “When I use social networking sites, I feel I am part of the online learning community”.

3.3. Data Analysis

Measurements and path model of the study are examined through the structural equation modeling (SEM). AMOS (version 22.0, IBM, Armonk, NY, USA) is employed. SEM is an efficient tool, widely applied to confirm the measurements and path model [42]. Thus, it is used in this study for testing the proposed hypothesis. Islam et al. [43] and Usman et al. [44] also employed SEM in their recent studies to test a similar proposed model.
4. Results

4.1. Measurement Tests

Common method bias (CMB) issues assessed through Harman’s single factor technique show that the first factor delivers a value of 38.61%, which is less than 50% of the total variance, and provides support for the idea CMB that is not a major concern. Secondly, the inter-correlations coefficients are less than 0.90, which further proves that there are no issues related to CMB in the current study.

The reliability and validity of the instrument is required to be assessed before initiating the final processing for obtaining the results [42,45,46]. Hence, the assessment of Cronbach’s alpha (CA), composite reliability (CR), average variance extracted (AVE), and factor loadings confirm that the scales are reliable and valid, because all the values meet the threshold criteria (see Table 1). The inter-correlations of the study variables are less than the value of AVE’s square roots (see Table 2), confirming discriminant validity. Thus, the initial statistical analysis confirms the reliability and validity of the study measures. Thus, we moved forward to test the hypothesized relations.

Table 1. Reliability and validity analysis.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimate</th>
<th>Cronbach’s Alpha</th>
<th>Composite Reliability</th>
<th>Average Variance Extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA</td>
<td>PCA1</td>
<td>0.780</td>
<td>0.850</td>
<td>0.850</td>
</tr>
<tr>
<td></td>
<td>PCA2</td>
<td>0.806</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCA3</td>
<td>0.709</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCA4</td>
<td>0.767</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCF</td>
<td>PCF1</td>
<td>0.796</td>
<td>0.869</td>
<td>0.871</td>
</tr>
<tr>
<td></td>
<td>PCF2</td>
<td>0.814</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCF3</td>
<td>0.817</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCF4</td>
<td>0.740</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KSPs</td>
<td>KSP1</td>
<td>0.804</td>
<td>0.884</td>
<td>0.894</td>
</tr>
<tr>
<td></td>
<td>KSP2</td>
<td>0.925</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>KSP3</td>
<td>0.877</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>KSP4</td>
<td>0.674</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCL</td>
<td>OCL1</td>
<td>0.862</td>
<td>0.940</td>
<td>0.940</td>
</tr>
<tr>
<td></td>
<td>OCL2</td>
<td>0.833</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OCL3</td>
<td>0.852</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OCL4</td>
<td>0.742</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OCL5</td>
<td>0.814</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OCL6</td>
<td>0.865</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OCL7</td>
<td>0.848</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Mean, standard deviation, and correlation results.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GEN</td>
<td>1.51</td>
<td>0.50</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2. AGE</td>
<td>2.02</td>
<td>0.96</td>
<td>−0.258**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3. Edu</td>
<td>1.58</td>
<td>0.49</td>
<td>0.130*</td>
<td>−0.162**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4. TSNS</td>
<td>2.52</td>
<td>0.91</td>
<td>−0.090</td>
<td>0.065</td>
<td>−0.103</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5. PCA</td>
<td>2.57</td>
<td>0.78</td>
<td>−0.033</td>
<td>0.025</td>
<td>0.011</td>
<td>0.054</td>
<td>0.767</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6. PCF</td>
<td>2.72</td>
<td>0.82</td>
<td>0.082</td>
<td>0.004</td>
<td>−0.005</td>
<td>0.043</td>
<td>0.302**</td>
<td>0.792</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7. KSP</td>
<td>3.58</td>
<td>10.03</td>
<td>0.064</td>
<td>0.028</td>
<td>−0.111</td>
<td>0.027</td>
<td>−0.347**</td>
<td>−0.412**</td>
<td>0.826</td>
<td>1</td>
</tr>
<tr>
<td>8. OCL</td>
<td>3.31</td>
<td>10.08</td>
<td>−0.041</td>
<td>0.044</td>
<td>0.078</td>
<td>−0.020</td>
<td>−0.467**</td>
<td>−0.335**</td>
<td>0.317**</td>
<td>0.832</td>
</tr>
</tbody>
</table>

Note: ** p < 0.01, * p < 0.05. The bold values are the square root of AVE.
4.2. Correlations Results

The means and standard deviations of the variables and their inter-correlations are demonstrated in the anticipated directions (see Table 2). The results of Table 2 indicate that PCA and PCF are both negatively and significantly correlated with OCL, as \( r = -0.467, p < 0.01 \) and \( r = -0.335, p < 0.01 \), respectively. Similarly, PCA and PCF negatively and significantly correlate with KSP, as \( r = -0.347, p < 0.01 \) and \( r = -0.412, p < 0.01 \), respectively. KSP and OCL are positively and significantly correlated, as \( r = -0.317, p < 0.01 \). In addition, Table 2 indicates that the demographic variables observed are insignificant with the study variables.

4.3. Hypotheses Testing

The measurement model indices are evaluated through AMOS 22.0. The findings show that the model significantly satisfies the conditions for the model fitness criteria [42,45], and the results are: \( \chi^2 / df = 2.209, \text{RMSEA} = 0.065, \text{CFI} = 0.951, \text{and SRMR} = 0.045 \).

Then, we run the path model to check the hypothesized relationships. The model fitness indices of the path model also confirm that the study model is fit and meets the criteria, as \( \chi^2 / df = 2.380, \text{RMSEA} = 0.070, \text{CFI} = 0.944, \text{and SRMR} = 0.094 \) [45]. Afterwards, the path model was run in AMOS 22.0 and the output is reported in Figure 2. The calculations show the significant negative effect of PCA on OCL \( (\beta = -0.384, p < 0.01) \), hence, H1a is confirmed. Similarly, PCF also has a negative significant effect on OCL \( (\beta = -0.179, p < 0.01) \), which confirms H1b. The mediation effect can be checked in Table 3, and we calculated the bootstrap interval of the indirect effect of PCA and PCF on OCL through KSPs \( (\beta = -0.084, 95\% \text{CI} (-0.152; -0.030)) \) and \( (\beta = -0.090, 95\% \text{CI} (-0.151; -0.040)) \), respectively. The mediations are proven to be significant, as the intervals do not include 0, and, thus, H2a and H2b are confirmed.

![Figure 2. Path results.](image-url)
Table 3. Indirect effects.

<table>
<thead>
<tr>
<th>Path</th>
<th>Indirect Effect</th>
<th>S.E</th>
<th>LBCI 95%</th>
<th>UBCI 95%</th>
<th>p-Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCA → KSP → OCL</td>
<td>−0.084</td>
<td>0.038</td>
<td>−0.152</td>
<td>−0.030</td>
<td>0.010</td>
<td>Confirmed</td>
</tr>
<tr>
<td>PC → KSP → OCL</td>
<td>−0.090</td>
<td>0.032</td>
<td>−0.151</td>
<td>−0.040</td>
<td>0.007</td>
<td>Confirmed</td>
</tr>
</tbody>
</table>

Note: PCA = privacy concern (abuse), PCF = privacy concern (findings), KSP = knowledge-sharing perceptions, OCL = online collaborative learning.

5. Discussion

In this study, the relationship of privacy concerns to online learning is studied using the stimulus–organism–response (SOR) model. It is presumed that the students’ concerns about privacy have an effect upon online learning, i.e., students’ beliefs about privacy alters their perception about sharing knowledge on SNSs while learning online. The results from the study prove that privacy concerns have a strong influence on online learning. The findings show a negative relationship, which implies that the rising privacy concerns (abuse and finding) negatively affect online learning. The majority of the responses validate that sharing academic knowledge is risky while using SNSs, and they believe that their personal information or shared academic content may not be used for the intended purpose. The results are consistent with those of Kim [21] and Anwar [20], who found the belief that SNSs are, comparatively, an unsafe forum for online learning, as there is a high chance of information leakage. The findings from Rajab and Soheib [22] confirm similar outcomes, where privacy is found to be a major determinant of student’s behavior in online collaborative learning.

The results of the second set of hypotheses again prove a significant mediating role of knowledge-sharing perceptions between the relationship of privacy concerns and online learning. Knowledge sharing is one of the fundamental components of collaborative learning; hence, any learning activity cannot be conducted successfully unless the participants are open to share knowledge. As stated in the study of Al-Emraan et al. [47], usage behavior is altered by student’s beliefs about information leakage. Similarly, the study of Nilsen et al. [48] identifies a number of issues voiced by the students, such as technological, personal, and teaching methodology, about online learning. The study proves that the perception about sharing knowledge mediates the relationship between privacy concerns and online learning, which implies that knowledge-sharing perception is affected by privacy concerns, therefore, altering the online learning. Privacy concerns are also proven to be a negative factor in the studies by Kozar [49] and Bedenlier et al. [50], where students are observed to be reluctant in using webcams during online sessions. It can be simplified to privacy concerns having a significant impact upon the knowledge-sharing perception, which then alters the online learning outcomes. The responses from the students show that they feel they lose control over the information they share, they are being watched, the information they shared may be used in an unforeseen manner, and they may find themselves in trouble. These are also the highlighted causes (i.e., privacy concerns) of the knowledge hiding on SNSs in online collaborative learning [15]. Moreover, the findings could be categorized into rationalized hiding, playing dumb, and evasive hiding, which validates the intentional hiding by the students while collaborating online. Hence, knowledge-sharing perception is one of the major determinants in our findings. The results confirm that the participants on any SNS will feel more comfortable to share their knowledge and collaborate openly. Contradictorily, the more concerned the students are about their privacy, the less they collaborate and share.

6. Implications

This study explored the antecedents, moderating effect, and outcome of knowledge-sharing perception through the stimulus–organism–response (SOR) model. Hence, the SOR model was uniquely used as a lens to find out the effect of privacy concerns upon the online learning where knowledge-sharing perception plays a mediating role. Hence, this
study has a theoretical contribution on two levels. One aspect is the investigation of privacy concerns as an antecedent of online learning, while the second is the investigation about the knowledge-sharing perception as an organism between privacy concerns (as a stimulus) and online learning (as a response). Moreover, this study focused on tertiary level students. Thus, this study investigated the impact of privacy concerns on online learning, specifying the usage of SNS by tertiary level students through SOR theory, which is a unique domain.

In addition, the research under consideration has significant practical implications. Firstly, the results from the study indicate that the teachers should practically work on minimizing the negative impact of privacy concerns, through creating awareness about the ethical considerations while using SNSs. Similarly, the counseling of students about knowledge-sharing perceptions could also benefit in collaborative learning.

Thirdly, the study confirms that privacy concerns influence knowledge-sharing behavior, hence, negatively impacting online learning. This implies that online collaborative learning could not be effective and smooth without an openness towards knowledge sharing. Hence, an online environment should ideally be a platform for the students where they may freely share and exchange knowledge. The teachers, supervisors, and management in this case should work on mitigating the factors causing the rise in privacy concerns. Furthermore, the results from the study also contribute to the aspect of teaching practices. The results from the study brings our attention towards the methodology, teaching styles, and design of activities in online teaching. The teachers should strategically work on conducting such activities where there are fewer chances of students’ discomfort related to privacy concerns.

7. Limitations and Future Studies

This study has significant contributions, however, there are some limitations. The construct provides a one-dimensional aspect of the knowledge-sharing perception. A multidimensional construct could provide an insight to more significant aspects about knowledge-sharing perceptions. It could inform, in detail, about the types of knowledge or the types of activities that are more sensitive towards privacy concerns. Moreover, the data were collected from Pakistani students only, and the data collection from other cultural contexts could be more generalizable. It could give a picture about the behavioral responses of students in other contexts. Future studies can focus on knowledge-sharing perceptions as an organism with a stimulus such as classroom environment, organizational culture, or educational background of the students, while the creativity, productivity, motivation, attitude, or innovative behavior can work as a response. Finally, this study investigates privacy concerns as contextual factors and KSPs as personal factors that play a significant role in OCL. Future studies could extend this line of research to investigate other contextual factors, such as teachers’ behaviors in online learning platforms, internet access, ease of use of technology, and personal level factors of learners, such as students’ internet and technology self-efficacy, psychological ownership of knowledge, and psychological entitlement, etc.

8. Conclusions

The findings of this study are quite promising, as they provide empirical support for the potential and significant role of PCA and PCF in OCL. Simultaneously, this study contributes to the literature by investigating KSP as a mechanism between the relationship of PCA and PCF with OCL. Ultimately, our findings provide insights that can be used by educational institutions, who should address issues such as privacy concerns and the consequences, because such concerns restrict the collaboration of online learners. Concurrently, this study sets the stage for further research into how contextual and individual level factors influence OCL.
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