Exploring the role of social media in collaborative learning: the new domain of learning

Jamal Abdul Nasir Ansari* and Nawab Ali Khan

Abstract

This study is an attempt to examine the application and usefulness of social media and mobile devices in transferring the resources and interaction with academicians in higher education institutions across the boundary wall, a hitherto unexplained area of research. This empirical study is based on the survey of 360 students of a university in eastern India, cognising students’ perception on social media and mobile devices through collaborative learning, interactivity with peers, teachers and its significant impact on students’ academic performance. A latent variance-based structural equation model approach was followed for measurement and instrument validation. The study revealed that online social media used for collaborative learning had a significant impact on interactivity with peers, teachers and online knowledge sharing behaviour. Additionally, interactivity with teachers, peers, and online knowledge sharing behaviour has seen a significant impact on students’ engagement which consequently has a significant impact on students’ academic performance. Grounded to this finding, it would be valuable to mention that use of online social media for collaborative learning facilitate students to be more creative, dynamic and research-oriented. It is purely a domain of knowledge.

Keywords: Students, Social media, Higher education, Faculty members, University, SEM

Introduction

The explosion of Information and Communication Technology (ICT) has led to an increase in the volume and smoothness in transferring course contents, which further stimulates the appeasement of Digital Learning Communities (DLCs). The millennium and naughtiness age bracket were Information Technology (IT) centric on web space where individual and geopolitical disperse learners accomplished their e-learning goals. The Educause Center for Applied Research [ECAR] (2012) surveyed students in higher education mentioned that students are pouring the acceptance of mobile computing devices (cellphones, smartphones, and tablet) in Higher Education Institutions (HEIs), roughly 67% surveyed students accepted that mobile devices and social media play a vital role in their academic performance and career enhancement. Mobile devices and social media provide excellent educational e-learning opportunities to the students for academic collaboration, accessing in course contents, and tutors despite the physical...
boundary (Gikas & Grant, 2013). Electronic communication technologies accelerate the pace of their encroachment of every aspect of life, the educational institutions incessantly long decades to struggle in seeing the role of such devices in sharing the contents, usefulness and interactivity style. Adoption and application of mobile devices and social media can provide ample futuristic learning opportunities to the students in accessing course contents as well as interaction with peers and experts (Cavus & Ibrahim, 2008, 2009; Kukulska-Hulme & Shield, 2008; Nihalani & Mayrath, 2010; Richardson & Lenarcic, 2008, Shih, 2007). Recently Pew Research Center reported that 55% American teenage age bracket of 15–17 years using online social networking sites, i.e. Myspace and Facebook (Reuben, 2008). Social media, the fast triggering the mean of virtual communication, internet-based technologies changed the life pattern of young youth.

Use of social media and mobile devices presents both advantages as well as challenges, mostly its benefits seen in terms of accessing course contents, video clip, transfer of the instructional notes etc. Overall students feel that social media and mobile devices are the cheap and convenient tools of obtaining relevant information. Studies in western countries have confronted that online social media use for collaborative learning has a significant contribution to students’ academic performance and satisfaction (Zhu, 2012). The purpose of this research project was to explore how learning and teaching activities in higher education institutions were affected by the integration and application of mobile devices in sharing the resource materials, interaction with colleagues and students’ academic performance. The broad goal of this research was to contemporise the in-depth perspectives of students’ perception of mobile devices and social media in learning and teaching activities. However, this research paper paid attention to only students’ experiences, and their understanding of mobile devices and social media fetched changes and its competency in academic performance. The fundamental research question of this research was, what are the opinions of students on social media and mobile devices when it is integrating into higher education for accessing, interacting with peers.

A researcher of the University of Central Florida reported that electronic devices and social media create an opportunity to the students for collaborative learning and also allowed the students in sharing the resource materials to the colleagues (Gikas & Grant, 2013). The result of the eight Egyptian universities confirmed that social media have the significant impact on higher education institutions especially in term of learning tools and teaching aids, faculty members’ use of social media seen at a minimum level due to several barriers (internet accessibility, mobile devices etc.).

Social media and mobile devices allow the students to create, edit and share the course contents in textual, video or audio forms. These technological innovations give birth to a new kind of learning cultures, learning based on the principles of collective exploration and interaction (Selwyn, 2012). Social media the phenomena originated in 2005 after the Web2.0 existence into the reality, defined more clearly as “a group of Internet-based applications that build on the ideological and technological foundation of web 2.0 and allow creation and exchange of user-generated contents (Kaplan & Haenlein, 2010). Mobile devices and social media provide opportunities to the students for accessing resources, materials, course contents, interaction with mentor and colleagues (Cavus & Ibrahim, 2008, 2009; Richardson & Lenarcic, 2008).
Social media platform in academic institutions allows students to interact with their mentors, access their course contents, customisation and build students communities (Greenhow, 2011a, 2011b). 90% school going students currently utilise the internet consistently, with more than 75% teenagers using online networking sites for e-learning (DeBell & Chapman, 2006; Lenhart, Arafeh, & Smith, 2008; Lenhart, Madden, & Hitlin, 2005). The result of the focus group interview of the students in 3 different universities in the United States confirmed that use of social media created opportunities to the learners for collaborative learning, creating and engaging the students in various extra curriculum activities (Gikas & Grant, 2013).

Research background and hypotheses
The technological innovation and increased use of the internet for e-learning by the students in higher education institutions has brought revolutionary changes in communication pattern. A report on 3000 college students in the United States revealed that 90% using Facebook while 37% using Twitter to share the resource materials as cited in (Elkaseh, Wong, & Fung, 2016). A study highlighted that the usage of social networking sites in educational institutions has a practical outcome on students’ learning outcomes (Jackson, 2011). The empirical investigation over 252 undergraduate students of business and management showed that time spent on twitter and involvement in managing social lives and sharing information, course-related influences their performance (Evans, 2014).

Social media for collaborative learning, interactivity with teachers, interactivity with peers
Many kinds of research confronted on the applicability of social media and mobile devices in higher education for interaction with colleagues. 90% of faculty members use some social media in courses they were usually teaching or professional purposes out of the campus life. Facebook and YouTube are the most visited sites for the professional outcomes, around 2/3rd of the all-faculty use some medium fora class session, and 30% posted contents for students engagement in reading, view materials (Moran, Seaman, & Tinti-Kane, 2011). Use of social media and mobile devices in higher education is relatively new phenomena, completely hitherto area of research. Research on the students of faculty of Economics at University of Mortar, Bosnia, and Herzegovina reported that social media is already used for the sharing the materials and exchanges of information and students are ready for active use of social networking site (slide share etc.) for educational purposes mainly e-learning and communication (Mirela Mabić, 2014).

The report published by the U.S. higher education department stated that the majority of the faculty members engaged in different form of the social media for professional purposes, use of social media for teaching international business, sharing contents with the far way students, the use of social media and mobile devices for sharing and the interactive nature of online and mobile technologies build a better learning environment at international level. Responses on 308 graduate and postgraduate students in Saudi Arabia University exhibited that positive correlation between chatting, online discussion and file sharing and knowledge sharing, and entertainment and enjoyment with students learning (Eid & Al-Jabri, 2016). The quantitative study on 168 faculty members using partial least square (PLS-SEM) at Carnegie classified Doctoral
Research University in the USA confirmed that perceived usefulness, external pressure and compatibility of task-technology have positive effect on social media use, the higher the degree of the perceived risk of social media, the less likely to use the technological tools for classroom instruction, the study further revealed that use of social media for collaborative learning has a positive effect on students learning outcome and satisfaction (Cao, Ajjan, & Hong, 2013). Therefore, the authors have hypothesized:

**H1:** Use of social media for collaborative learning is positively associated with interactivity with teachers.

Additionally, Madden and Zickuhr (2011) concluded that 83% of internet user within the age bracket of 18–29 years adopting social media for interaction with colleagues. Kabilan, Ahmad, and Abidin (2010) made an empirical investigation on 300 students at University Sains Malaysia and concluded that 74% students found to be the same view that social media infuses constructive attitude towards learning English (Fig. 1).

Reuben (2008) concluded in his study on social media usage among professional institutions revealed that Facebook and YouTube used over half of 148 higher education institutions. Nevertheless, a recent survey of 456 accredited United States institutions highlighted 100% using some form of social media, notably Facebook 98% and Twitter 84% for e-learning purposes, interaction with mentors (Barnes & Lescault, 2011).

Information and communication technology (ICT), such as web-based application and social networking sites enhances the collaboration and construction of knowledge byway of instruction with outside experts (Zhu, 2012). A positive statistically significant relationship was found between student’s use of a variety of social media tools and the colleague’s fellow as well as the overall quality of experiences (Rutherford, 2010). The potential use of social media leads to collaborative learning environments which allow students to share education-related materials and contents (Fisher & Baird, 2006). The report of 233 students in the United States higher educations confirmed that more recluse students interact through social media, which assist them in collaborative learning and boosting their self-confidence (Voorn & Koomers, 2013). Thus hypothesizes as

**H2:** Use of social media for collaborative learning is positively associated with interactivity with peers.

![Fig. 1 Research Model](image-url)
Social media for collaborative learning, interactivity with peers, online knowledge sharing behaviour and students’ engagement

Students’ engagement in social media and its types represent their physical and mental involvement and time spent boost to the enhancement of educational Excellency, time spent on interaction with peers, teachers for collaborative learning (Kuh, 2007). Students’ engagement enhanced when interacting with peers and teacher was in the same direction, shares of ideas (Chickering & Gamson, 1987). Engagement is an active state that is influenced by interaction or lack thereof (Leece, 2011). With the advancement in information technology, the virtual world becomes the storehouse of the information. Liccardi et al. (2007) concluded that 30% students were noted to be active on social media for interaction with their colleagues, tutors, and friends while more than 52% used some social media forms for video sharing, blogs, chatting, and wiki during their class time. E-learning becomes now sharp and powerful tools in information technology and makes a substantial impact on the student’s academic performance. Sharing your knowledge will make you better. Social network ties were shown to be the best predictors of online knowledge sharing intention, which in turn associated with knowledge sharing behaviour (Chen, Chen, & Kinshuk, 2009). Social media provides the robust personalised, interactive learning environment and enhances in self-motivation as cited in (Al-Mukhaini, Al-Qayoudhi, & Al-Badi, 2014). Therefore, it was hypothesised that:

**H3: Use of social media for collaborative learning is positively associated with online knowledge sharing behaviour.**

Broadly Speaking social media/sites allow the students to interact, share the contents with colleagues, also assisting in building connections with others (Cain, 2008). In the present era, the majority of the college-going students are seen to be frequent users of these sophisticated devices to keep them informed and updated about the external affair. Facebook reported per day 1,00,000 new members join; Facebook is the most preferred social networking sites among the students of the United States as cited in (Cain, 2008). The researcher of the school of engineering, Swiss Federal Institute of Technology Lausanne, Switzerland, designed and developed Grasp, a social media platform for their students’ collaborative learning, sharing contents (Bogdanov et al., 2012). The utility and its usefulness could be seen in the University of Geneva and Tongji University at both two educational places students were satisfied and accept ‘Grasp’ to collect, organised and share the contents. Students use of social media will interact ubiquity, heterogeneous and engaged in large groups (Wankel, 2009). So we hypotheses

**H4: More interaction with teachers leads to higher students’ engagement.**

However, a similar report published on 233 students revealed that social media assisted in their collaborative learning and self-confidence as they prefer communication technology than face to face communication. Although, the students have the willingness to communicate via social media platform than face to face (Voorn & Kommers, 2013). The potential use of social media tools facilitates in achieving higher-level learning through collaboration with colleagues and other renewed experts in their field (Junco,
Heiberger, & Loken, 2011; Meyer, 2010; Novak, Razzouk, & Johnson, 2012; Redecker, Ala-Mutka, & Punie, 2010). Academic self-efficacy and optimism were found to be strongly related to performance, adjustment and consequently both directly impacted on student’s academic performance (Chemers, Hu, & Garcia, 2001). Data of 723 Malaysian researchers confirmed that both male and female students were satisfied with the use of social media for collaborative learning and engagement was found positively affected with learning performance (Al-Rahmi, Alias, Othman, Marin, & Tur, 2018). Social media were seen as a powerful driver for learning activities in terms of frankness, interactivity, and friendliness.

Junco et al. (2011) conducted research on the specific purpose of the social media; how Twitter impacted students’ engagement, found that it was extent discussion out of class, their participation in panel group (Rodriguez, 2011). A comparative study conducted by (Roblyer, McDaniel, Webb, Herman, & Witty, 2010) revealed that students were more techno-oriented than faculty members and more likely using Facebook and such similar communication technology to support their class-related task. Additionally, faculty members were more likely to use traditional techniques, i.e. email. Thus hypotheses framed is that:

**H5: More interaction with peers ultimately leads to better students’ engagement.**

Social networking sites and social media are closely similar, which provide a platform where students can interact, communicate, and share emotional intelligence and looking for people with other attitudes (Gikas & Grant, 2013). Facebook and YouTube channel use also increased in the skills/ability and knowledge and outcomes (Daniel, Isaac, & Janet, 2017). It was highlighted that 90% of faculty members were using some sort of social media in their courses/ teaching. Facebook was the most visited social media sites as per study, 40% of faculty members requested students to read and views content posted on social media; majority reports that videos, wiki, etc. the primary source of acquiring knowledge, social networking sites valuable tool/source of collaborative learning (Moran et al., 2011). However, more interestingly, in a study which was carried out on 658 faculty members in the eight different state university of Turkey, concluded that nearly half of the faculty member has some social media accounts.

Further reported that adopting social media for educational purposes, the primary motivational factor which stimulates them to use was effective and quick means of communication technology (Akçayır, 2017). Thus hypotheses formulated is:

**H6: Online knowledge sharing behaviour is positively associated with the students’ engagement.**

Using multiple treatment research design, following act-react to increase students’ academic performance and productivity, it was observed when self-monitoring record sheet was placed before students and seen that students engagement and educational productivity was increased (Rock & Thead, 2007). Student engagement in extra-curriculum activities promotes academic achievement (Skinner & Belmont, 1993), increases grade rate (Connell, Spencer, & Aber, 1994), triggering student performance and positive expectations about academic abilities (Skinner & Belmont, 1993). They are
spending time on online social networking sites linked to students engagement, which works as the motivator of academic performance (Fan & Williams, 2010). Moreover, it was noted in a survey of over 236 Malaysian students that weak association found between the online game and student’s academic performance (Eow, Ali, Mahmud, & Baki, 2009). In a survey of 671 students in Jordan, it was revealed that student’s engagement directly influences academic performance, also seen the indirect effect of parental involvement over academic performance (Al-Alwan, 2014). Engaged students are perceptive and highly active in classroom activities, ready to participate in different classroom extra activities and expose motivation to learn, which finally leads in academic achievement (Reyes, Brackett, Rivers, White, & Salovey, 2012). A mediated role of students engagement seen in 1399 students’ classroom emotional climate and grades (Reyes et al., 2012). A statistically significant relation was noticed between online lecture and exam performance.

Nonetheless, intelligence quotient, personality factors, students must be engaged in learning activities as cited in (Bertheussen & Myrland, 2016). The report of the 1906 students at 7 universities in Colombia confirmed that the weak correlation between collaborative learning, students faculty interaction with academic performance (Pineda-Báez et al., 2014) Thus, the hypothesis

H7: Student’s Engagement is positively associated with the student’s academic performance.

Methodology

To check the students’ perception on social media for collaborative learning in higher education institutions, Data were gathered both offline and online survey administered to students from one public university in Eastern India (BBAU, Lucknow). For the sake of this study, indicators of interactivity with peers and teachers, the items of students engagement, the statement of social media for collaborative learning, and the elements of students’ academic performance were adopted from (AL-Rahmi & Othman, 2013). The statement of online knowledge sharing behaviour was taken from (Ma & Yuen, 2011). The indicators of all variables which were mentioned above are measured on the standardised seven-point Likert scale with the anchor (1-Strongly Disagree, to 7-Strongly Agree). Interactivity with peers was measured using four indicators; the sample items using social media in class facilitates interaction with peers; interactivity with teachers was measured using four symbols, the sample item is using social media in class allows me to discuss with the teacher.; engagement was measured using three indicators by using social media I felt that my opinions had been taken into account in this class; social media for collaborative learning was measured using four indicators collaborative learning experience in social media environment is better than in a face-to-face learning environment; students’ academic performance was measured using five signs using social media to build a student-lecturer relationship with my lecturers, and this improves my academic performance; online knowledge sharing behaviour was assessed using five symbols the counsel was received from other colleague using social media has increased our experience.
Procedure and measurement

A sample of 360 undergraduate students was collected by convenience sampling method of a public university in Eastern India. The proposed model of study was measured and evaluated using variance based structured equation model (SEM)-a latent multi variance technique which provides the concurrent estimation of structural and measurement model that does not meet parametric assumption (Coelho & Duarte, 2016; Haryono & Wardoyo, 2012; Lee, 2007; Moqbel, Nevo, & Kock, 2013; Raykov & Marcoulides, 2000; Williams, Rana, & Dwivedi, 2015). The confirmatory factor analysis (CFA) was conducted to ensure whether the widely accepted criterion of discriminate and convergent validity met or not. The loading of all the indicators should be 0.50 or more (Field, 2011; Hair, Anderson, Tatham, & Black, 1992). And it should be statistically significant at least at the 0.05.

Demographic analysis (Table 1)

The majority of the students in this study were females (50.8%) while male students were only 49.2% with age 15–20 years (71.7%). It could be pointed out at this juncture that the majority of the students (53.9%) in BBAU were joined at least 1–5 academic pages for their getting information, awareness and knowledge. 46.1% of students spent 1–5 h per week on social networking sites for collaborative learning, interaction with teachers at an international level. The different academic pages followed for accessing material, communication with the faculty members stood at 44.4%, there would be various forms of the social networking sites (LinkedIn, Slide Share, YouTube Channel, Researchgate) which provide the facility of online collaborative learning, a platform at which both faculty members and students engaged in learning activities.

As per report (Nasir, Khatoon, & Bharadwaj, 2018), most of the social media user in India are college-going students, 33% girls followed by 27% boys students, and this reports also forecasted that India is going to become the highest 370.77 million internet users in 2022. Additionally, the majority of the faculty members use smartphone 44% to connect with the students for sharing material content. Technological advantages were the pivotal motivational force which stimulates faculty members and students to exploits the opportunities of resource materials (Nasir & Khan, 2018) (Fig. 2).

When the students were asked for what reason did they use social media, it was seen that rarely using for self-promotion, very frequently using for self-education, often used for passing the time with friends, and so many fruitful information the image mentioned above depicting.

Instrument validation

The structural model was applied to scrutinize the potency and statistically significant relationship among unobserved variables. The present measurement model was evaluated using Confirmatory Factor Analysis (CFA), and allied procedures to examine the relationship among hypothetical latent variables has acceptable reliability and validity. This study used both SPSS 20.0 and AMOS to check measurement and structural model (Field, 2013; Hair, Anderson, et al., 1992; Mooi & Sarstedt, 2011; Norusis, 2011).

The Confirmatory Factor Analysis (CFA) was conducted to ensure whether the widely accepted criterion of discriminant and convergent validity met or not. The
Table 1 Demographic Profile $n = 360$

| Variables                          | Subgroups       | Percent |
|------------------------------------|-----------------|---------|
| Gender                             | Male            | 49.2    |
|                                    | Female          | 50.8    |
| Age                                | 15–20           | 71.7    |
|                                    | 20–25           | 18.3    |
|                                    | 25–30           | 5.8     |
|                                    | 30–35           | 4.2     |
| Qualification                      | Intermediate    | 60.0    |
|                                    | Graduate        | 22.8    |
|                                    | Post Graduate   | 13.3    |
|                                    | Other           | 3.9     |
| No. of facebook friends            | None            | 36.1    |
|                                    | 1–200           | 30.0    |
|                                    | 200–400         | 13.1    |
|                                    | 400–600         | 20.8    |
| Number of academic groups joined   | None            | 25.6    |
|                                    | 1–5             | 53.9    |
|                                    | 6–10            | 14.2    |
|                                    | 11–15           | 1.9     |
|                                    | Above 15        | 4.4     |
| Number of educational paged followed | None           | 13.9    |
|                                    | 1–5             | 44.4    |
|                                    | 6–10            | 20.8    |
|                                    | 11–15           | 11.4    |
|                                    | Above 15        | 9.4     |
| A frequency of social media        | 1–5 h/week      | 46.1    |
|                                    | 5–10 h/week     | 24.2    |
|                                    | 10–15 h/week    | 17.2    |
|                                    | More than 15 h/week | 12.5  |

Source: Computed and compiled by researchers on the basis of a questionnaire

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Fig. 2 Reasons for Using Social Media
loading of all the indicators should be 0.70 or more it should be statistically significant at least at the 0.05 (Field, 2011; Hair, Anderson, et al., 1992).

CR or CA-based tests measured the reliability of the proposed measurement model. The CA provides an estimate of the indicators intercorrelation (Henseler & Sarstedt, 2013). The benchmark limits of the CA is 0.7 or more (Nunnally & Bernstein, 1994). As per Table 2, all latent variables in this study above the recommended threshold limit. Although, Average Variance Extracted (AVE) has also been demonstrated which exceed the benchmark limit 0.5. Thus all the above-specified values revealed that our instrument is valid and effective. (See Table 2 for the additional information) (Table 3).

In a nutshell, the measurement model clear numerous stringent tests of convergent validity, discriminant validity, reliability, and absence of multi-collinearity. The finding demonstrated that our model meets widely accepted data validation criteria. (Schumacker & Lomax, 2010).

The model fit was evaluated through the Chi-Square/degree of freedom (CMIN/DF), Root Mean Residual (RMR), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Goodness of fit index (GFI) and Tucker-Lewis Index (TLI). The benchmark limit of the CFI, TLI, and GFI 0.90 or more (Hair et al., 2016);

| ITEMS  | INTT | INTP | ENG | CL | SAP | OKSB | CA | AVE | CR |
|--------|------|------|-----|----|-----|------|----|-----|----|
| INTT4  | .898 |      |     |    |     |      |    |     |    |
| INTT3  |      | .847 |     |    |     |      |    |     |    |
| INTT2  |      | .930 |     |    |     |      |    |     |    |
| INTT1  |      | .825 |     |    |     |      |    |     |    |
| INTP4  |      |      | .896|    |     |      |    | .935| .935|
| INTP3  |      |      | .864|    |     |      |    |     |    |
| INTP2  |      |      | .930|    |     |      |    |     |    |
| INTP1  |      |      | .846|    |     |      |    |     |    |
| ENG3   |      |      |     | .881|     |      |    | .899| .899|
| ENG2   |      |      |     | .897|     |      |    |     |    |
| ENG1   |      |      |     | .775|     |      |    |     |    |
| CL3    |      |      |     | .922|     |      |    | .922| .922|
| CL2    |      |      |     | .912|     |      |    |     |    |
| CL1    |      |      |     | .835|     |      |    |     |    |
| SAP5   |      |      |     |     | .867|      |    | .942| .942|
| SAP4   |      |      |     |     | .875|      |    |     |    |
| SAP3   |      |      |     |     | .852|      |    |     |    |
| SAP2   |      |      |     |     | .866|      |    |     |    |
| SAP1   |      |      |     |     | .894|      |    |     |    |
| OKSB5  |      |      |     |     |     | .867|    | .928| .928|
| OKSB4  |      |      |     |     |     | .897|    |     |    |
| OKSB3  |      |      |     |     |     | .891|    |     |    |
| OKSB2  |      |      |     |     |     | .881|    |     |    |
| OKSB1  |      |      |     |     |     | .696|    |     |    |

Source: Computed and compiled by researchers on the basis of a questionnaire

INTT Interactivity with Teacher, INTP Interactivity with Peers, ENG Students Engagement, CL using social media for Collaborative Learning, SAP Students’ Academic Performance, OKSB Online Knowledge Sharing Behavior, CA Cronbach α coefficient for latent variables, CR Composite Reliability, AVE Average Variance Extracted
Kock, 2011). The model study demonstrated in the table, as mentioned above 4 that the minimum threshold limit was achieved (See Table 4 for additional diagnosis).

### Results

Path coefficient of several hypotheses has been demonstrated in Fig. 3, which is a variable par relationship. \( \beta \) (beta) Coefficients, standardised partial regression coefficients signify the powers of the multivariate relationship among latent variables in the model. Remarkably, it was observed that seven out of the seven proposed hypotheses were accepted and 78% of the explained variance in students’ academic performance, 60% explained variance in interactivity with teachers, 48% variance in interactivity with peers, 43% variance in online knowledge sharing behaviour and 79% variance in students’ engagement. Social media collaborative learning has a significant association with teacher interactivity \((\beta = .693, P < 0.001)\), demonstrating that there is a direct effect on interaction with the teacher by social media when other variables are controlled. On the other hand, use of social media for collaborative learning has noticed statistically significant positive relationship with peers interactivity \((\beta = .704, p < 0.001)\) meaning thereby, collaborative learning on social media by university students, leads to the high degree of interaction with peers, colleagues. Implied 10% rise in social media use for learning purposes, expected 7.04% increase in interaction with peers.

Use of social media for collaborating learning has a significant positive association with online knowledge sharing behaviour \((\beta = .583, p < 0.001)\), meaning thereby that the more intense use of social media for collaborative learning by university students, the more knowledge sharing between peers and colleagues. Also, interaction with the teacher seen the significant statistical positive association with students engagement.

### Table 3 Correlations Statistics

|       | N  | Mean   | Std. Deviation | INT_P | INT_T | EN_G | SA_P | OKS_B | C_L |
|-------|----|--------|----------------|-------|-------|------|------|-------|-----|
| INT_P | 360| 4.4049 | 1.58108        |       | .634a | 1    |      |       |     |
| INT_T | 360| 4.0938 | 1.42197        |       |       | .734a| 1    |       |     |
| EN_G  | 360| 4.1278 | 1.42849        | .663a |       | .795a| 1    |       |     |
| SA_P  | 360| 4.3628 | 1.50129        | .642a | .708a | .659a| .667a| 1     |     |
| OKS_B | 360| 4.4972 | 1.45246        | .526a | .558a | .659a|       | .640a | 1   |
| C_L   | 360| 4.2852 | 1.55916        | .626a | .694a | .746a| .760a| .640a | 1   |

Source: Computed and compiled by researchers on the basis of a questionnaire

*Correlation is significant at the 0.01 level (2-tailed)

### Table 4 SEM fit indices

| Fi indices | Cut off values from literature | Model study | References |
|------------|--------------------------------|-------------|------------|
| Absolute fit measure | | | Arbuckle (2008); Byrne (1994); Hair et al.(2016); Harrington (2009); Raykov and Marcoulides (2000); Schumacker and Lomax (2010), Tabachnick, Fidell, and Ullman (2007) |
| CMIN/DF | 1–2, Sometimes 1–5 | 1.524 | |
| RMR | < 0.05, < 0.08 | .008 | |
| RMSEA | < 0.05, < 0.08 | .084 | |
| Incremental fit measure | | | |
| CFI | > 0.90 | .935 | |
| TLI | > 0.90 | .924 | |
| GFI | > 0.90 | .856 | |

Source: Computed and compiled by researchers on the basis of a questionnaire
(\(\beta = 0.450, p < 0.001\)), telling that the more conversation with teachers, leads to a high level of students engagement. Similarly, the practical interpretation of this result is that there is an expected 4.5% increase in student’s participation for every 10% increase in interaction with teachers. Interaction with peers has a significant positive association with students engagement (\(\beta = 0.210, p < 0.001\)). Practically, the finding revealed that 10% upturn in student’s involvement, there is a 2.1% increase in peer’s interaction. There is a significant positive association between online knowledge sharing behaviour and students engagement (\(\beta = 0.247, p < 0.001\)), and finally students engagement has been a statistically significant positive relationship with students’ academic performance (\(\beta = 0.972, p < 0.001\)), this is the clear indication that more engaged students in collaborative learning via social media leads to better students’ academic performance.

**Discussion and implication**

There is a continuing discussion in the academic literature that use of such social media and social networking sites would facilitate collaborative learning. It is human psychology generally that such communication media technology seems only for entertainment, but it should be noted here carefully that if such communication technology would be followed with due attention prove productive. It is essential to acknowledge that most university students nowadays adopting social media communication to interact with colleagues, teachers and also making the group be in touch with old friends and even a convenient source of transferring the resources. In the present era, the majority of the university students having diversified social media community groups like Whatsapp, Facebook pages following different academic web pages to upgrade their knowledge.

Practically for every 10% rise in students’ engagement, expected to be 2.1% increase in peer interaction. As the study suggested that students engage in different sites, they start discussing with colleagues. More engaged students in collaborative learning through social media lead better students’ academic performance. The present study revealed that for every 10% increase in student’s engagement, there would be an expected increase in student academic performance at a rate of 9.72. This extensive research finding revealed that the application of online social media would facilitate the students to become more creative, dynamics and connect to the worldwide instructor for collaborative learning.
Accordingly, the use of online social media for collaborative learning, interaction with mentors and colleagues lead better student’s engagement which consequently affects student’s academic performance. The higher education authority should provide such a platform which can nurture the student’s intellectual talents. Based on the empirical investigation, it would be said that students’ engagement, social media communication devices facilitate students to retrieve information and interact with others in real-time regarding sharing teaching materials contents. Additionally, such sophisticated communication devices would prove to be more useful to those students who feel too shy in front of peers; teachers may open up on the web for the collaborative learning and teaching in the global scenario and also beneficial for physically challenged students. It would also make sense that intensive use of such sophisticated technology in teaching pedagogical in higher education further facilitates the teachers and students to interact digitally, web-based learning, creating discussion group, etc. The result of this investigation confirmed that use of social media for collaborative learning purposes, interaction with peers, and teacher affect their academic performance positively, meaning at this moment that implementation of such sophisticated communication technology would bring revolutionary, drastic changes in higher education for international collaborative learning (Table 5).

**Limitations and future direction**

Like all the studies, this study is also not exempted from the pitfalls, lacunas, and drawbacks. The first and foremost research limitation is it ignores the addiction of social media; excess use may lead to destruction, deviation from the focal point. The study only confined to only one academic institution. Hence, the finding of the project cannot be generalised as a whole. The significant positive results were found in this study due to the fact that the social media and mobile devices are frequently used by the university going students not only as a means of gratification but also for educational purposes.

Secondly, this study was conducted on university students, ignoring the faculty members, it might be possible that the faculty members would not have been interested in interacting with the students. Thus, future research could be possible towards faculty members in different higher education institutions. To the authors’ best reliance, this is

| Hypotheses | Path coefficient | Accepted? |
|------------|------------------|-----------|
| H1: Use of social media for collaborative learning is positively associated with interactivity with teachers. | .693*** | Yes |
| H2: Use of social media for collaborative learning is positively associated with interactivity with peers. | .704*** | Yes |
| H3: Use of social media for collaborative learning is positively associated with online knowledge sharing Behavior. | .583*** | Yes |
| H4: More interaction with teacher leads to higher students’ engagement. | .450*** | Yes |
| H5: More integration with peers ultimately leads to better student’s engagement. | .210*** | Yes |
| H6: Online knowledge sharing behaviour is positively associated with the Students’ engagement. | .247*** | Yes |
| H7: Student’s Engagement is positively associated with the student’s academic performance. | .972*** | Yes |

Source: Computed and compiled by researchers on the basis of a questionnaire

*** = p <.001
the first and prime study to check the usefulness and applicability of social media in the higher education system in the Indian context.

Concluding observations

Based on the empirical investigation, it could be noted that application and usefulness of the social media in transferring the resource materials, collaborative learning and interaction with the colleagues as well as teachers would facilitate students to be more enthusiastic and dynamic. This study provides guidelines to the corporate world in formulating strategies regarding the use of social media for collaborative learning.

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Authors’ contributions

Jamal Abdul Nasir Ansari: The first author of this manuscript has performed all sorts of necessary works like the collection of data from respondents, administration of the questionnaire. Collection of information from the respondents was quite challenging. The author faced a lot of difficulties while collecting data. The main contribution of the author in this manuscript is that the entire work, like data analysis and its interpretation performed by him. Additionally, the author has tried to explore and usefulness of social media and its applicability in transferring the course contents. Nawab Ali Khan: The second author of this manuscript has checked all types of grammatical issues, and necessary corrections wherever required. The author(s) read and approved the final manuscript.

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Availability of data and materials

The corresponding author declared here all types of data used in this study available for any clarification. The author of this manuscript ready for any justification regarding the data set. To make publically available of the data used in this study, the seeker must mail to the mentioned email address. The profile of the respondents was completely confidential.

Competing interests

The authors declare that they have no competing interests.

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