

# PROMOTING STUDENT ENGAGEMENT THROUGH TEAMWORK LEARNING: ASSESSING THE MODERATING INFLUENCE OF AGE, GENDER AND QUALIFICATION

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**Abstract** *More recently, student engagement has been built around the hopeful goal of enhancing all the abilities of students to learn and become lifelong learners in a knowledge-based society. Consequently, student engagement is now receiving heightened attention from all higher education stakeholders. The objective of the present study was to examine the relationship between teamwork learning and student engagement along with the moderating effect of age, gender and educational qualification. It is well recognised that age, gender and qualification directly or indirectly influence the magnitude of engagement of students in higher studies, thus, they have been considered as the moderating variables for the study. The research instrument for the study consisted of standard questionnaires. The sample comprised of 210 students pursuing graduation or post-graduation in different domains, that is, Management, Engineering and Commerce. The research model was analysed using SPSS, AMOS and MACRO process. The findings of this study highlighted that there was a significant association between teamwork learning and student engagement. Furthermore, the findings indicated that young students and those pursuing graduation were more impacting the relationship between the two constructs in comparison to older students and those who were pursuing post-graduation.*

**Keywords:** *Collaborative Learning, Higher Education, Student Engagement, Teamwork Learning, Moderation Analysis, AMOS, MACRO Process*

## INTRODUCTION

Education has a vital role to play in improving the socio-economic position of people, families, communities and subsequently driving the nation's economic and social development. It is most aptly said that the quality of a nation's education defines the level of its national development. Globally, the higher education system has been entrusted to offer quality education, especially to the youth for equipping them with essential skills and capabilities (Fernandes & Singh, 2022) as the employability of higher education graduates is deemed imperative in strengthening economies and in augmenting their competitiveness (Mishra & Braun, 2021). From this perspective, the role of higher education institutions (HEIs) becomes very pertinent because (Roohr et al., 2021) they add to students' knowledge and skills

that further help to enhance their economic productivity and career opportunities along with their entrepreneurial potential which may contribute towards creating new technologies, advancements and development of enterprises (Upadhaya & Chadha, 2019). Since quality and value of education is one of the most critical and persisting concerns in current higher education (Tasopoulou & Tsiotras, 2017), those institutions that are capable of demonstrating gains in learning and learning skills amongst student populations would be considered the best academic institutions in future (Zilvinskis & Rocconi, 2018). Research affirms engagement as a construct that can predict the success of educational institutions if it is tackled carefully (Shum, 2017). Almost all learning models emphasise the role of students' engagement in the overall success of learning which is compelling educational institutions to embrace the idea of increasing

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student engagement. Student engagement measures detect key aspects of the learning process that can contribute towards improving learning and outcomes like achievement and retention (Paulsen & McCormick, 2020). Almost all learning models emphasise the role of students' engagement in the overall success of the learning. As engagement is a core mechanism of knowledge building both in and out of educational contexts (Howard-Jones et al., 2018), it had been described as the "holy grail of learning" (Sinatra et al., 2015). More recently, student engagement has been built around the hopeful goal of enhancing all the abilities of students to learn and become lifelong learners in a knowledge-based society. Considering its significance, fostering student engagement is essential for students' current and future success (Quin, 2017). Due to this, student engagement is now receiving heightened attention from all higher education stakeholders. The more students are engaged within their learning community, the more probability that they may channel that energy back into their learning which would further lead to a range of both short and long-term outcomes, which can further fuel engagement (Bond et al., 2020). The very premise of being engaged adds to the foundation of attitudes and skills that are essential to living a productive and satisfying life after higher education (Carini et al., 2006). In other words, students who are absorbed in educationally productive activities at HEIs develop mannerisms of the mind and heart that enhance their capacity for continuous learning and personal development as life skills.

Notably, disengaged students are more prone to non-productive behaviours in the form of lack of interest and absence from classes, thereby failing to achieve intended learning outcomes and subsequently exhibiting poor performance (Fredricks & Mccolskey, 2012). Within classrooms, student disengagement can be contagious due to its diminishing impact on student motivation that further affects the quality and quantity of participation (Virtanen et al., 2016; Zaccone & Pedrini, 2019). At the macro institutional level, it results in wastage of resources that are invested in students, reduces student learning, increases dropout rate, decreases job opportunities and corrodes the reputation of the institution (Henrie et al., 2015).

Although student engagement does not occur in vacuum, instead, it is influenced and impacted by many contextual factors; however, it is important to consider these wider influences while exploring student engagement (Kahu, 2013; Quin, 2017). Considering the negative impact of relatively low levels of students' engagement, it becomes important for teachers to explore ways to actively engage students in courses (Nguyen et al., 2018). Students' positive engagement is fostered along with the right timing of the use of motivating teaching behaviours (Nicholson & Putwain,

2018).

Engagement plays a pertinent role in students' connectedness with the contents within classrooms and in their relationship with peers and teachers (Singh et al., 2020). A very substantial portion of student engagement and achievement had been explained by teacher and classroom-level variables (Hill & Rowe, 1996). Past studies consider student engagement as an antecedent of student learning (Fredricks & Mccolskey, 2012; Kahu, 2013; Brown et al., 2018). However, the dynamics of student engagement, specifically, the systematic intervention of different approaches in classroom settings remains to be understood poorly (Kahu, 2013). Some previous research findings acknowledge that active learning in groups, social skills and peer relationships are important in engaging learners. In a study that examined the extent to which quality of student effort and peer interaction, student-teacher interaction contributed to students' perception of engagement, Moran and Gonyea (2003) noticed that peer interaction had the strongest predictive capacity for student engagement and outcomes. Much research has defined the advantages of collaborative learning which includes changing students from passive receivers of information to active participants thereby leading to improvement in communication, problem-solving skills, critical thinking, social and teamwork skills and making students being more responsible for their own progress in the educational process (Barkley et al., 2014; Johnson & Johnson, 2013; Nerona, 2017). Collaborative projects and assignments assist students in learning to work and solve problems in cooperation with others. In addition, students also learn how to cope with group dynamics that include social loafing and active listening (Barkley et al., 2014). A few examples of collaborative activities include team-based projects, study groups, and collaborative research. Edmondson (1999) defines team learning as a behavioural process – representing the cyclical process of seeking out (e.g., seeking feedback), gathering (e.g., asking questions) and discussing and integrating information (e.g., discussing errors). Here, the term team learning behaviours is used to encapsulate all the actions that aid in the development of collective knowledge. The distinctive advantages of collaborative learning through teamwork have promoted educators to utilise teamwork intervention as a pedagogical tool. Teamwork pedagogy has received considerable attention across a wide range of academic literature (Riebe et al., 2016). There is an assumption that the more students are exposed to teams, the better their skills will be (Kozlowski & Ilgen, 2006), and by graduation, students will have a developed team profile; the "sink or swim" approach (Livingstone & Lynch, 2000). In response, educational researchers have started to develop team interventions to assist students in building teamwork skills (e.g., Balan et al., 2015; Lizzio & Wilson, 2006).

Interventions, in this context, have generally been either in the form of capability development activities or measures of team engagement (Bacon et al., 1999; Senécal et al., 2008).

## Research Gap

HEIs are facing challenges towards innovating teaching and learning methodologies to enhance the skills, learning experience and academic performance of students (Song et al., 2022). Reflecting upon the importance of student engagement for students' present and future success, its promotion has become essential (Quin, 2017). The way teachers interact with students on a regular day-to-day basis can influence their engagement (Jang et al., 2016; Nguyen et al., 2018). A qualitative study done by Zhang et al. (2015) revealed that individual factors such as communication skills, adaptation, personality (e.g., confidence) can impact students' learning engagement in higher studies. Some other studies stated that students' interpersonal environment (e.g., frequency and nature of contacts with peers and faculty) have the greatest impact on students and further contributes towards their increased engagement (Pascarella et al., 1996) but, very not much is known about the direct role of teamwork learning on student engagement. Studies in the past have explored the antecedents of student engagement by predominantly concentrating on the macro-level factors. They usually talk about the initiatives that educational institutes need to undertake for promoting student engagement, such as, investing in a variety of support services, developing institutional culture and developing social and cultural capital (Porter, 2006; Schuetz, 2008; Smith, 2007; Zepke & Leach, 2010). Previous research on student engagement were primarily focused on individual and environmental factors but later on, influence on teamwork and teamwork learning was also explored, however, these studies were limited to relationship of collaborative work on knowledge acquisition and problem-solving skills (Johnson et al., 1998; Pascarella et al., 1996). Very few such studies have been found in Indian context. Thus, further research needs to be carried out to determine the association between teamwork learning and student engagement in higher education.

The objective of the present study was to examine the relationship between teamwork learning and student engagement along with the moderating effect of age, gender and educational qualification. It is well recognised that age, gender and qualification directly or indirectly influence the magnitude of engagement of students in higher studies, thus, they have been considered as the moderating variables for the study. The structure of the study includes review of literature along with model development which explains the

relationship between the two constructs, namely, teamwork learning and student engagement and moderating effects of the three moderators. It further includes hypothesis testing, discussion and concludes with implication, limitations and future direction of research.

## REVIEW OF LITERATURE

### Teamwork Learning

The term team learning refers to a shift in a team's collective knowledge state and team learning curves represent changes in performance due to team learning over time. Teamwork based learning is a specific technique used to enhance students' engagement in a learning team environment. The concept was initially popularised by Larry Michaelsen (Michaelsen et al., 1982). It is therefore considered as an educational strategy which is often used in academic settings (Sachdeva et al., 2015). Team learning behaviours (i.e., behaviours that assist in the development of collective knowledge) can be further defined into three different types of behaviours such as inter-team, intra-team and fundamental learning behaviours (Wiese & Burke, 2019). As a result of its nature, team learning is a phenomenon that takes place over time (Cronin et al., 2011). For any team learning to occur, information has to be shared among the team members, discussed and scaffolded to existing knowledge and should be stored in some way to be retrieved later.

The base of collaborative learning can be considered in the social constructivist paradigm, and it builds upon the research done by Vygotsky (1978). When the concepts of social constructivism are extended to student learning, it leads to three fundamental assumptions. The first assumption was that knowledge is created by sharing, and the more students share, the more they learn. The second assumption was that participation is essential to learning and the third was that learners will participate if optimal conditions are provided (Bruffee, 1993). This approach suggests that learning should be regarded as a process of peer interaction among learners that is mediated, organised, and structured by the teacher (Ertmer & Newby, 2013). Additionally, it indicates that collaborative learning methods require learners to develop teamwork skills and to understand that individual learning is essentially related to the success of group learning. At the core of social constructivism approach is facilitating student learning by creating more opportunities for social interaction. Previous research findings acknowledge that peer relationships, active learning in groups and social skills are important in engaging learners (Gonyea, 2003). These skills can be inculcated through teamwork learning and teachers can play a vital role towards it by adopting

group assignments/projects and team activities as major part of their pedagogy, especially in higher education. Studies by Shum (2017) and Yilmaz (2011) confirmed that project work, homework, in-class assignments and group discussions led to high levels of academic engagement for post-graduate students. Another form of teamwork is visible in the approach pertaining to cooperative learning. The instructional emphasis in cooperative learning is on group activities and course-related interactions amongst peers. This can be structured and facilitated by the instructor and would typically involve 3–6 students working on a common assignment. Some examples of cooperative learning are group problem-solving exercises, the jigsaw technique, peer review assignments, discussion groups and think pair share (Koljatic & Kuh, 2001). The significance of collaborative work was also emphasised by a study conducted on certified public accountants (CPA) which revealed that prospective CPAs can be encouraged to work collaboratively and think independently along with enhancing their judgement and ethical sensitivity through participating in group activity like group discussion (Li & Ma, 2016).

It has been identified by researchers that the students who engage in collaborative learning are inclined to invest more quality time in learning and they enjoy these experiences more in comparison to the traditional lecture mode (Tinto, 1997). From the perspective of social learning, individuals tend to show higher performance and motivation when other people are being involved in the learning process (Morrison et al., 2019). In both the online and in-class environment, students can enhance their learning experience through collaboration and interactions in group work (Hill et al., 2009). Through working together with other members that have different views and abilities, individuals can observe other group member's attitudes, have a better understanding of topics, teach each other how to work more efficiently and solve problems in a group (Lin & Huang, 2020). Team teaching also enhances effective content delivery (Okon, 2021).

## Student Engagement

Since the early 20<sup>th</sup>-century, research in the field of student engagement had increased momentum. They affirm engagement as a construct that predicts success of educational institutions, if it is tackled carefully (Shum, 2017). At all levels of education, educational institutions are swiftly embracing the idea of increasing student engagement for greater student retention. It has also been identified as a Meta construct and multi-faceted concept (Zhoc et al., 2019) and has been defined in different ways by researchers and scholars. According to Conner (2011), "the National Survey of Student Engagement (NSSE) had

described student engagement as the intersection of the time and energy that students devote to educationally sound activities. Student engagement can be defined as a dynamic process that involves students' personal acts of attention or motivation and their interactions with peers and teachers in a classroom situation. (Lawson & Lawson, 2013). It is also considered as a meta-construct that comprises of four components, namely cognitive, emotional, behavioural and agentic engagement (Fredricks & McColskey, 2012; Reeve, 2012). The cognitive component comprises of the perceived significance of academic work, application of profound learning strategies, self-regulated learning, and using the essential cognitive approaches for the effective understanding of multifaceted concepts (Wang et al., 2012). The emotional component consists of student's positive or negative attitudes towards school or class relationships with teachers and peers as well as feelings of belongingness toward their academic institution. The behavioural component indicates to school-related conduct, contribution in learning, attendance and participation in academic activities. Lastly, agentic engagement was defined as students' constructive contribution into the flow of the instruction they receive. It is the constructive contribution by student in terms of taking initiatives that contribute towards learning and teaching (Reeve & Tseng, 2011).

Student engagement has been proved to have a direct bearing on students' attitudes and motivation toward their educational institute. Wara et al. (2018) accentuated that the absence of positively engaged attitudes leads to an attitude-achievement gap in students which further often leads to self-doubt concerned to academic achievement. Student engagement levels have impacted not only academic efficacy but has also impacted learning and achievement, welfare, socialisation and satisfaction with life (Gunuc & Kuzu, 2015). Additionally, student engagement improves interpersonal relations in an educational setting thereby honing students' personalities and skills that are vital for their professional development (Bhargava, 2021). It has also been positively associated with desired academic, social and learning outcomes (Rasheed et al., 2020). Even in flipped classroom pedagogy, peer learning or collaborative learning gets enhanced through student-student(s) engagement (Fang, 2021).

## Hypotheses Development and Conceptual Model

### Teamwork Learning and Student Engagement

Higher learning institutions are turning to new ways of delivering courses that would improve overall efficiencies

and retention. The Bill and Melinda Gates Foundation (2018) writes “unless we dramatically improve student success in higher education, our (USA) nation will suffer from a shortage of skilled workers needed to ensure global competitiveness and national security”. Thus, academia realised that new ways of teaching and learning were needed to address these pressing issues (Levine & Weingart, 1973). As mostly individuals believe that successful managers are innovative, intelligent and well-informed (Reddy et al., 2023), teamwork learning offers a hope to tackle these expectations and to improve learning outcomes through student engagement in teaching-learning.

Student engagement has been defined and operationalised in many ways (Skinner 2016; Wigfield et al. 2015). Student engagement research is grounded in teacher-learner relations and involves various forms of active, collaborative and transformative learning, and it emphasises the role of teacher and students as co-producers of knowledge (O’Sullivan & Cleary, 2011). Carini et al. (2006) had mentioned that the more students’ study or practice any subject, the more they tend to learn about it. Since the 1990s, how students engage with their studies and what they, educators and institutions can do to improve engagement has been well researched. Some research focuses on student agency and motivation as major factors in engagement (Schuetz, 2008). Few others highlight the way educators practice and relate to their students (Kuh, 2001; Umbach & Wawrzynski, 2005) in addition to the roles of institutional cultures and structures (Porter, 2006). Research by Howington et al. (2021) suggests that for courses like business statistics, a repertoire of in-class activities may help in engaging students. There is an assumption that the more students are exposed to teams the better their skills will be (Kozlowski & Ilgen, 2006), and by graduation, students would have a developed team profile; the “sink or swim” approach (Livingstone & Lynch, 2000). In response, educational researchers have begun to develop team interventions to assist students in building team skills (e.g., Balan et al., 2015; Lizzio & Wilson, 2006). Interventions, in this context, have generally been either capability development activities or various measures of team engagement (Bacon et al., 1999; Senécal et al., 2008). Accordingly, the need arises to study whether teamwork learning promotes student engagement and further leverage student learning. In particular, there is a requirement to study the influence of collaborative efforts of students reflected through teamwork on their engagement. Thus, based on the literature review, it can be hypothesised that:

H1: There is a significant association between teamwork learning and student engagement.

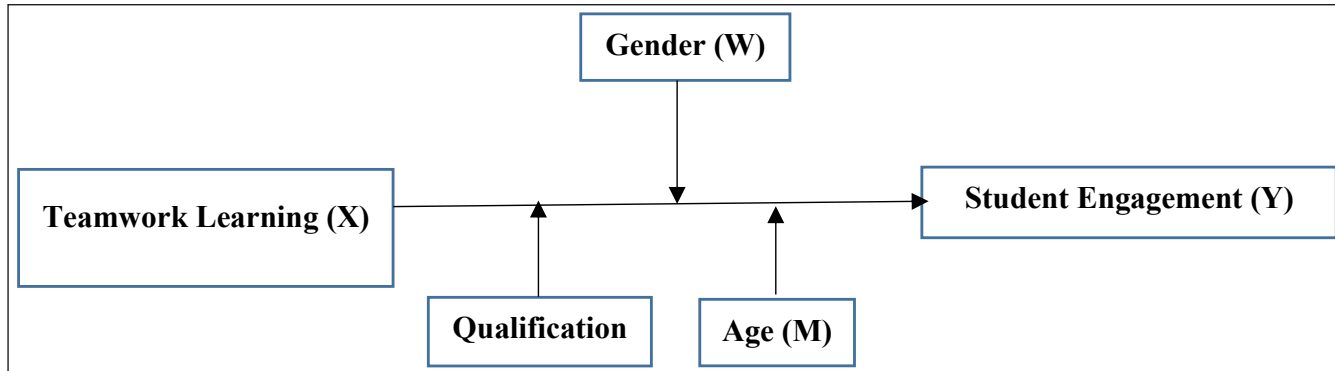
## **Age, Gender and Educational Qualification as Moderators**

The existence of gender differences in the educational experiences of students in higher education has been studied by researchers extensively. Along with ethnicity and race, gender and other demographic attributes do affect student engagement in universities and colleges (Chen et al., 2014). Certain features such as student status, race and ethnicities, class levels and gender act as indicators that can possibly affect the level of student engagement (Zhao & Kuh, 2004). Some studies indicate that women attain better grades because they are more engaged than men in high school as they study more hours, tend to interact more often with teachers and so forth (McCarthy & Kuh, 2006). In the same manner, a study on 128 university students shows that students of age higher than 25 reported higher levels of engagement in learning (Timms et al., 2018). With respect to teamwork, it was revealed that teamwork skills and attitude do not vary with the age (Sachdeva et al., 2015). A study conducted in an engineering university in the United Arab Emirates (UAE) portrayed that female student rated themselves as more effective in their teamwork than male students, whereas male students were more satisfied with their teams as a whole than the female students. Warrington et al.’s (2000) study indicates that female students have superior communication skills. Male students, in comparison to females, are less inclined to adopt cooperative talk or discussion and are unwilling to collaborate to learn thereby, being less of team players. Bernard (1997) also revealed that boys found it quite hard to co-operate in groups and are poor team players. These studies further suggest that female students are likely to have a better experience of the group work process with their female peer students than with male students. Drawing on the above literature, the following hypotheses are proposed:

H2: Gender moderates the relationship between teamwork learning and students’ engagement.

H3: Age moderates the relationship between teamwork learning and students’ engagement.

H4: Educational qualification moderates the relationship between teamwork learning and students’ engagement.



Source: The author.

Fig. 1: Research Model

In this current study, the researchers test the aforesaid relationships and delve into the interaction effect of age, gender and educational qualification on the relationship between teamwork learning and student engagement (Fig. 1).

## METHODOLOGY

### Sample and Data Collection

The present study was conducted in private HEIs of the North-west region of India. The primary data was collected online through Google forms due to its large reach and easy accessibility. The research instrument consisting of standard questionnaires was sent to 250 students pursuing graduation or post-graduation in different domains, that is, Management, Engineering and Commerce through emails. Out of these, only 210 complete questionnaires were considered for the analysis of the study. The non-probability convenience sampling technique was used for data collection. The main reason for obtaining data through this sampling method was due to the ease of obtaining data as few faculty members were known to the researchers in each HEI. The other reason was that it was a very easy, speedy and cost-effective way of collecting data. The demographic information - gender, age, qualification and their academic domain were collected through self-constructed questions whereas the dependent and independent variables, that is, student engagement and teamwork learning respectively were measured on the standard scale. The demographic profile of the respondents is shown in Table 1.

Table1: Demographic Profile of the Respondents

	Frequency	Percent
<b>Gender</b>		
Male	142	67.6
Female	68	32.4
<b>Age (Years)</b>		
17 – 21	40	19
22 - 25	140	66.7
25 - 28	30	14.3
<b>Educational Qualification</b>		
UG	39	18.6
PG	171	81.4

Source: The author.

The sample for the study constituted of 67.6% males and 32.4% females. Most of the respondents (66.7%) were of 22–25 years of age, followed by 17–21 years (19%) and 25–28 years (14.3%). The majority of the respondents (81.4%) were pursuing their post-graduation whereas only 18.6% of respondents were pursuing their graduation course.

## Measures

### Teamwork Learning Scale

The independent variable teamwork learning was measured on 10 items consisting of Students’ Self-Assessment of team learning scale given by Neves and Nakhai (2016). The responses were measured on a five-point Likert scale ranging from 1-Strongly Disagree to 5-Strongly Agree.

### Student Engagement Scale

The dependent variable Student Engagement is measured on 22 items scale designed by Reeve and Tseng (2011). To measure the different aspects of engagement, the scale consists of four subscales: Agentic Engagement was measured with five items, Behavioural Engagement was measured with five items, Emotional Engagement was measured with four items and Cognitive Engagement was measured with eight items. All the items were measured on a five-point Likert scale.

### Reliability

The reliability of the items in each scale was calculated using SPSS by conducting pilot study on 40 students. The internal consistency of the items was calculated using Cronbach’s

alpha coefficient. The result shows the value of Cronbach’s alpha is 0.940 for the teamwork learning scale, 0.843 for agentic engagement, 0.862 for behavioural engagement, 0.829 for emotional engagement and 0.893 for cognitive engagement sub-scales. As the value of Cronbach’s alpha is greater than 0.7 for different scales used in this study, all scales are considered to be reliable to measure the variables (Hair et al., 2010). The validity of the scales was evaluated using Confirmatory Factor Analysis Technique in AMOS.

### Evaluation of Measurement Model

In this study, reliability and validity of each scale is measured using IBM SPSS AMOS software. Tables 2–4 summarise the factor loading of each item used in different scales and average variance explained (AVE) and composite reliability (CR) of different scales.

**Table 2: Reliability and Validity of Scale – Teamwork Learning**

Variables and Items	Factor Loading	Alpha	AVE	CR
<b>Teamwork Learning</b>		0.94	0.6133	0.9406
My abilities to express myself in a group setting and to articulate the views others is improved	0.732			
My ability to facilitate communication in a group setting and to elicit ideas from everyone is improved in team working	0.723			
My ability to plan and organize group tasks and develop priorities is improved in a team	0.817			
My ability to direct the activities of different people and to take care of operational details is improved in a team	0.811			
I improved my ability to analyze a situation, to make fact-based judgments, and to foster creativity and effective group decision-making methods	0.777			
I improved my ability to reconcile differences of opinion, resolve disputes, and overcome impasses while working in a group	0.800			
I learned to promote solidarity and trust among team members, and to deal with people with different goals, abilities, and backgrounds	0.772			
I became a better at working in a group and at being supportive of others when help is needed	0.800			
I improved my ability to develop a goal, inspire others, and set challenging goals for myself and the team	0.778			
I improved my ability to focus on a task, to clarify group objectives, and to monitor the performance of a group	0.815			

Source: The author.

Table 2 shows the convergent validity and construct reliability of the scale used to measure the students’ own reflection about teamwork learning. The factor loading of all 10 items is also shown in the table. As per Hair et al. (2006), items that have factor loading below 0.60 should not be considered for analysis. The result of the analysis shows that all the items had factor loading more than 0.60 and hence were considered related to the independent variable. The AVE of the scale was calculated as 0.6133 which is

considered to be good as per the recommendations of Hair et al. (2012) [AVE > 0.5]. This depicted that all items in the scale are explaining 61.33% variation in the variable. The CR that reflects the internal consistency among different items used in the scale, was calculated as 0.9406. It portrayed that the CR value is higher than the acceptable range (CR > 0.7) as suggested by Hair et al. (2016). This confirms that the scale used for measuring independent variable teamwork learning is valid and reliable.

**Table 3: Reliability and Validity of the Student Engagement Scale**

Student Engagement	Factor Loading	Alpha	AVE	CR
<b>Agentic Engagement</b>		0.843	0.538	0.82
During class, I ask questions.	0.637			
I tell the teacher what I like and what I don’t like.	0.807			
I let my teacher know what I’m interested in.	0.852			
During class, I express my preferences and opinions.	0.609			
I offer suggestions about how to make the class better.				
<b>Behavioural Engagement</b>		0.862	0.586	0.874
I listen carefully in class.	0.713			
I try very hard in school.	0.611			
The first time my teacher talks about a new topic, I listen very carefully.	0.809			
I work hard when we start something new in class.	0.829			
I pay attention in class.	0.841			
<b>Emotional Engagement</b>		0.829	0.617	0.862
I enjoy learning new things in class.	0.763			
When we work on something in class, I feel interested.	0.915			
When I am in class, I feel curious about what we are learning.	0.864			
Class is fun.	0.551			
<b>Cognitive Engagement</b>		0.893	0.519	0.905
When doing schoolwork, I try to relate what I’m learning to what I already know.	0.723			
When I study, I try to connect what I am learning with my own experiences.	0.789			
I try to make all the different ideas fit together and make sense when I study.	0.833			
I make up my own examples to help me understand the important concepts I study.	0.816			
Before I begin to study, I think about what I want to get done.	0.725			
When I’m working on my schoolwork, I stop once in a while and go over what I have been doing.	0.498			
As I study, I keep track of how much I understand, not just if I am getting the right answers.	0.716			
If what I am working on is difficult to understand, I change the way I learn the material.	0.603			

Source: The author.

**Table 4: Discriminant Validity of Students’ Engagement Scale**

	Agentic Engagement	Behavioural Engagement	Emotional Engagement	Cognitive Engagement
Agentic Engagement	0.733			
Behavioural Engagement	0.623	0.765		
Emotional Engagement	0.563	0.744	0.785	
Cognitive Engagement	0.584	0.757	0.762	0.72

Source: The author

To estimate the discriminant validity of the constructs agentic, behavioural, emotional and cognitive engagement in students' engagement scale, correlation of estimates was calculated in IBM SPSS AMOS and are shown in Table 4. The diagonal values shown in the matrix in Table 4 shows the square root of the AVE whereas the off-diagonals values are the correlation coefficient. The Fornell-Larcker criterion results revealed that the square root of the AVE's of the constructs were above the correlations of all other constructs. Therefore, the Students' engagement scale has established the discriminant validity for this study.

### Regression and Moderation Analysis

In this study, first simple linear regression was performed to determine the relationship between independent variable teamwork learning and dependent variable student engagement in SPSS. After that Moderation effect of categorical variables gender and age was analysed in PROCESS MACRO SPSS to find out whether these variables have significant impact on the association of teamwork learning and student engagement. For all significance testing, a standard two-tailed alpha threshold of .05 was used.

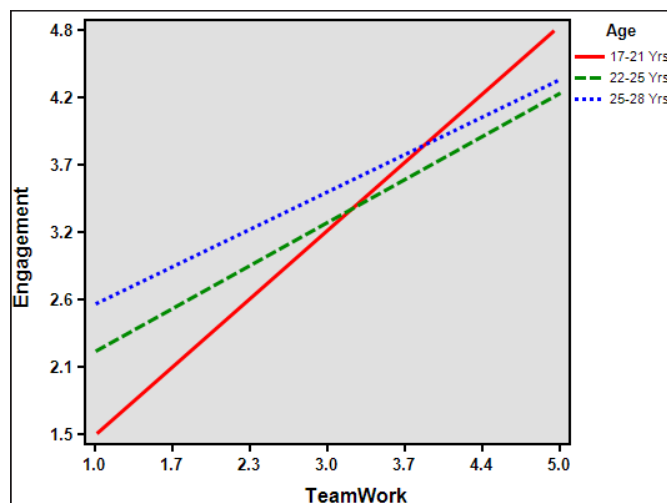
The regression model shows a linear positive significant relationship between teamwork learning and student engagement ( $p < 0.05$ ). The value of adjusted R square (0.517), shows that teamwork learning explains 51.7% variation in students' engagement. Teamwork learning was a significant predictor ( $\beta = 0.719, p < 0.05$ ) of student engagement. Based on the results of the linear regression, we accept the alternate hypothesis.

*H1: There is a significant association between teamwork learning and students' engagement.*

### Test of Gender as Moderator

To determine the impact of gender on the relationship of independent variable (teamwork learning) and dependent variable (student engagement), analysis was conducted with the following hypothesis. The output is summarised in Fig. 1 and Table 6.

*H2: Gender moderates the relationship between teamwork learning and students' engagement.*



Source: The author.

**Fig. 2: Moderation Analysis of Gender on the Association of Teamwork Learning and Student Engagement**

**Table 5: Moderation Analysis of Gender on the Association of Teamwork Learning and Student Engagement**

Model Summary		R2			F	
		<b>0.5241</b>			<b>75.635</b>	
	<b>B</b>	<b>SE</b>	<b>t</b>	<b>P</b>	<b>LLCI</b>	<b>ULCI</b>
Teamwork learning	0.571	0.117	4.881	0.000	0.340	0.801
Gender	0.115	0.284	0.406	0.684	-0.445	0.676
Interaction	-0.002	0.080	-0.028	0.9772	-0.160	0.155

Source: The author.

It can be observed from Fig. 2 and Table 5 that, the interaction effect of gender on the association of teamwork learning and student engagement is not significant ( $p\text{-value} = 0.9772$ ). Therefore, we accept the null hypothesis and conclude that gender does not moderate the relationship of dependent and independent variables. It is also observed that, in the presence of a moderator (gender), teamwork learning explains only 52.41% of variation in student engagement and there may be other factors that may cause variation in the dependent variable. It was also inferred from the graph that better

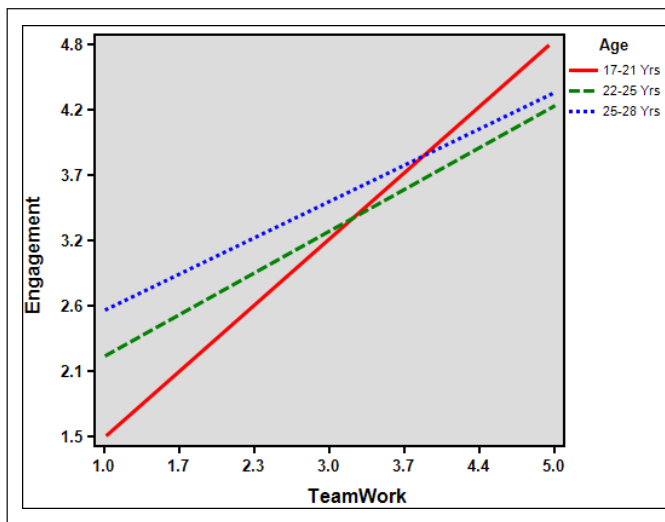
teamwork learning results in better student engagement for both males and females.

**Test of Age as Moderator**

To study the nature of the relationship between dependent and independent variables in the presence of respondents' age as moderator, the analysis is done through IBM SPSS PROCESS MACRO with the following hypothesis:

*H3: Age moderates the relationship between teamwork learning and students' engagement.*

The output of the software is summarised in Fig. 3 and Table 6.



Source: The author.

**Fig. 3: Moderating Effect of Age on the Association of Teamwork Learning and Student Engagement**

**Table 6: Moderating Effect of Age on the Association of Teamwork Learning and Student Engagement**

Model Summary	R2			F		
	<b>0.553</b>			<b>85.089</b>		
	B	SE	t	P	LLCI	ULCI
Teamwork Learning	0.986	0.112	8.749	0.000	0.764	1.208
Age	0.782	0.193	4.049	0.000	0.401	1.162
Interaction	-0.211	0.055	3.805	0.000	-0.320	-0.101
<b>Conditional Effect</b>						
17 -21 Years	0.695	0.048	14.498	0.000	0.601	0.790
22- 25 Years	0.574	0.037	15.283	0.000	0.500	0.648
25 - 28 Years	0.452	0.050	8.920	0.000	0.352	0.552

Source: The author.

From Table 6, it can be observed that age had a significant moderating impact ( $p < 0.05$ ) on the association of teamwork learning and student engagement. Therefore, we reject the Null hypothesis. The result also reflects that, in the presence of moderating variable age, the independent variable (teamwork learning) explains only 55.3% variation in the dependent variable (student engagement). To determine the impact of teamwork learning on student engagement for different age groups of respondents, multi-group analysis technique was performed in PROCESS MACRO. The results depicted that though the association of teamwork learning and student engagement was positive and significant for all three age groups of the respondents, however the conditional effect was observed to be highest ( $\beta = 0.695$ ) for 17–21 years of age, followed by the respondents of 22–25 years of age ( $\beta = 0.574$ ). Hence, it can be concluded that better teamwork learning leads to better student engagement for young students.

**Table 7: Moderation (Gender & Age) Analysis on Association of Teamwork Learning and Student Engagement**

Model Summary	R2			F		
	<b>0.561</b>			<b>52.162</b>		
	B	SE	t	P	LLCI	ULCI
Teamwork Learning	1.124	0.203	5.514	0.000	0.722	1.525
Gender	0.413	0.295	1.397	0.163	-0.169	0.997
Interaction 1	-0.093	0.866	-1.075	0.283	-0.264	0.077
Age	0.821	-0.206	3.973	0.000	0.414	1.229
Interaction 2	-0.219	0.062	-3.531	0.000	-3.42	-0.096
<b>Conditional Effect</b>						

Gender	Age	B	SE	T	P	LLCI	ULCI
Male	17 - 21 Years	0.728	0.067	10.831	0.000	0.596	0.861
Male	22 - 25 Years	0.602	0.049	12.291	0.000	0.505	0.698
Male	25 - 28 Years	0.475	0.053	8.922	0.000	0.37	0.58
Female	17 - 21 Years	0.635	0.063	10.000	0.000	0.51	0.761
Female	22 - 25 Years	0.509	0.066	7.626	0.000	0.377	0.64
Female	25 - 28 Years	0.382	0.086	4.434	0.000	0.212	0.552

Source: The author.

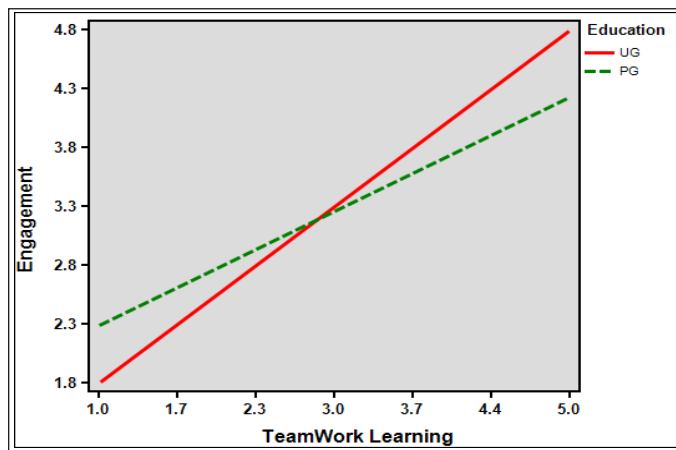
To study the nature of the relationship between dependent and independent variables in the presence of two moderators' age and gender together, analysis was performed and results are summarised in Table 7. The interaction effect of moderator 1-gender was not significant as p-value was greater than 0.05 ( $p = 0.283$ ). However, the interaction effect of age was found to be significant with p-value of less than 0.05. After analysing the conditional effect, it can be concluded that young males and females (17–21 years of age) observe more engagement from teamwork learning as compared to the other two age categories of the respondents. Though, the impact of teamwork learning on student engagement seems to be significant across all age and gender categories.

### Test of Educational Qualification as Moderator

To check the moderating effect of educational qualification of the respondents on the association of teamwork learning and student engagement, the following hypothesis was formulated and data was analysed:

*H4: Educational qualification moderates the relationship between teamwork learning and student engagement.*

The output is summarised in Fig. 4 and Table 8.



Source: The author.

**Fig. 4: Moderating Effect of Educational Qualification**

**Table 8: Moderation Analysis of Qualification**

Model Summary	R2		F		F	
	<b>0.550</b>		<b>84.045</b>			
	B	SE	t	P	LLCI	ULCI
Teamwork Learning	1.029	0.144	7.108	0.000	0.744	1.315
Qualification	0.771	0.292	2.636	0.009	0.194	1.347
Interaction	-0.268	0.082	-3.268	0.001	-0.43	-0.106
<b>Conditional Effect</b>						
Undergraduates	0.761	0.068	11.049	0.000	0.625	0.897
Postgraduates	0.492	0.044	11.032	0.000	0.404	0.581

Source: The author.

Table 8 portrays that the educational qualification of the respondents moderates the relationship between teamwork learning and student engagement significantly ( $p < 0.05$ ), which supports the alternative hypothesis proposed in this study. It was also revealed that, in the presence of moderating variable (educational qualification), the independent variable (teamwork learning) explains only 55% (R square) variation in the dependent variable, that is, student engagement. Additionally, the conditional moderating impact of qualification on the relationship of independent and dependent variables was more for the respondents pursuing graduation courses ( $\beta = 0.761$ ) as compared to those who were pursuing post-graduation.

## DISCUSSION AND CONCLUSION

It had been observed that student engagement is a prerequisite for acquiring skills and knowledge as well as it is also a mediator of achievement and important life outcomes (Pino-James, 2017). Past studies also specify that group work can improve students' genuine engagement in the content (Roseth et al., 2008), in asking better questions (King & Rosenshine, 1993), and in offering meaningful

explanations. The motive of this study was to examine the relationship between teamwork learning and student engagement along with analysing the moderation effect of age, gender and educational qualification on the association between these two constructs. Through the analysis, it was firstly observed that there is a significant association between teamwork learning and student engagement. This means that any variation in teamwork learning would impact students' engagement either positively or negatively. The stated outcome of the present study is consistent with prior research findings (Kuh, 2008; Johnson & Johnson, 2004; Baines et al., 2007; Gillies & Boyle, 2010, 2011). Past studies by Shum (2017) and Yilmaz (2011) had confirmed that teamwork learning such as project work, in-class assignments and homework and group discussions led to increased levels of academic engagement of post-graduate students.

Secondly, our research results illustrate the moderating effects of demographic variables as well. It has been found that age and educational qualification would impact the relationship between teamwork learning and student engagement, whereas the gender of students would not have any bearing on the association of these two constructs. Young students (17–21 years of age) would experience more engagement from teamwork learning as compared to higher age group categories. The other moderated relationship effect confirms the indirect effect of educational qualification on the association between teamwork learning and student engagement. These results reveal that the engagement level of students pursuing graduation courses would be more impacted through teamwork learning as compared to those who were pursuing post-graduation. This further indicates that student engagement of young learners who are pursuing graduation courses would be more susceptible to variations in the use of teamwork learning experiences in an educational setting. These outcomes are also consistent with past research findings. Students' participation in a class activity cognitively declines as they grow older. It was also revealed that students' affective engagement decreases when they grow older for both the genders (Amir et al., 2014). However, the study by Wang et al. (2012) reported that girls and boys did not significantly differ in terms of their classroom engagement. Harper et al. (2004) discovered that women and men were equally engaged in their social and academic engagement experiences.

## IMPLICATIONS

The conclusions offered by the present study would prove to be useful for HEIs as the academicians can better understand their audience and explore the pedagogy and activities that require teamwork amongst students thereby contributing

towards their engagement during academics. The HEI can methodically design curriculum and suggest pedagogical interventions that induce teamwork and group activities. The possible assignments may include group projects, collaborative assignments and social work-oriented projects to ensure their enhanced engagement. Another significance of the study would be for the student community as it would help in creating awareness that their teamwork skills and learnings have a direct bearing on their engagement and higher engagement has proved to be useful in both the personal and professional lives of learners. Thus, they may undertake initiative and seek support and guidance as well as collaborate with fellow learners to improve their engagement.

## LIMITATION AND FUTURE DIRECTION OF RESEARCH

The aim of the study was to examine the relationship between teamwork learning and student engagement along with the moderating impact of gender, age and educational qualification of students in HEIs. We conclude that there exists a significant relationship between teamwork learning and student engagement. Furthermore, the study also concludes that the age and qualification of students have an indirect effect on the relationship between the two variables. However, the study is bound by certain limitations such as it is limited to the HEIs in north-western states of India, a larger sample across diverse regions of the country could offer greater insights. As the study is based on Indian students only who have mostly observed a collectivist national culture, the results may differ in an individualistic national culture. Thus, future researchers may consider extending this research work to different nations. Subsequent to this, there is ample scope for using diverse methodologies such as action research studies, experimental and longitudinal, intervention-based research to attain more generalised conclusions. Future research studies may also utilise different variables for understanding teamwork learning and its role in influencing student engagement. Apart from this, a similar kind of study can be conducted with different occupational individuals.

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