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An Exploratory Study for the Development of a Survey on Learning Team Process, Impact, and Tutor's Role (PIT) in Facilitating Online Learning

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ABSTRACT

The aim of this article is to learn about teamwork in an online learning environment. to achieve this purpose, we developed a questionnaire based on three initial concepts, learning team process, learning teamwork impact, and tutor's facilitation of learning teamwork. The PIT questionnaire is an instrument that could be used to identify critical factors that online students perceived as important in enhancing their learning and improve their experiences. We used some open-ended questions to support the questionnaire's items analysis. We claim that learning team processes as well as tutor's facilitations does have an impact on students' experiences and learning. For a purposeful learning team, members should set clear goals outlining expectations and that every member should feel a sense of belonging and safe to contribute their ideas. The learning teamwork impact component contributed for the most variance in the PIT questionnaire. Apart from learning content, students indicated that with learning teams they gained collaborative skills, felt motivated and learned pertinent concepts from their peers from different backgrounds. We conclude that online learning teams are a form of community of learners, a place where students and tutors are actively and intentionally constructing knowledge together.

Keywords: Learning Teams, Online Learning, Questionnaire, Teamwork, Tutor's Role

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I. Introduction

Nowadays, thanks to the advancement of information and communication technology (ICT), students on online learning programs can have more interaction between each other using facilities and resources that promote teamwork. Davis (1993) emphasizes that teamwork helps and develops problem solving, responsibility and communication skills. Bhattacharya and Chatterjee (2000) argue that there are many advantages on teamwork but reinforce the relevance that group activities should be planned and guided and that criteria for monitoring and evaluation should be established on a group and individual level. The recent technology allows not only the interaction between the individual and the media, as in the past generation, but with the mediation of tutors also makes possible relevant learning interaction between individuals. In this way, knowledge emerge and can be shared through the collaboration of individuals in teamwork activities.

The stimulus to build up a Likert Scale that can help to better understand tutor's facilitation of learning teamwork in online education was evident in the last decade. Our previous work (Crosta *et al*., 2015; Gray *et al.*, 2015; Gray *et al*., 2018a; Gray *et al*. 2018b; Kennedy & Gray, 2016) have shown that there is room for improvement in the teamwork activities conducted in online learning. The procedures and consequently the impact of those activities should be enhanced and a better understanding of the tutor's and student's role during teamwork activities can promote significant learning, facilitating processes of responsibility, effective engagement and knowledge construction.

The importance of learning teams in online learning cannot be underestimated. At the same time, research as already shown that not all online teams provide a space for authentic learning experiences that result in knowledge acquisition. Hence the importance of identifying some of the factors that impact students' learning in online learning teams. We developed and used a survey tool that aimed to identify learning opportunities and challenges faced by learning team participants. The survey has a Likert scale format and focuses on the following three concepts:

1. Learning Team Process (LTP) – items in this category focused on different stages of learning team process such as forming, storming, norming, and performing stages.

2. Learning Teamwork Impact (LTI) – items focused on the impact of learning, team learning and collaboration on students' learning.

3. Tutor's Facilitation of Learning Teamwork (TFL) – items in this category focused on the role of the tutor in facilitating learning in the teams.

The objective is to understand if statistics supports those concepts. We believe that identifying students' experiences

in those categories would help educational developers in online programmes to design learning team strategies that improve students' experiences and enhance their learning. The mere act of putting people together and calling it a learning team does not guarantee that learning will take place (Vangreiken *et al*., 2016). The use of learning teams within the delivery of online modules is imperative because of their importance of enabling deep and meaningful learning. Working in learning teams can be extremely rewarding. It is an emotional as well as a practical endeavour that requires students to invest time and energy to make it work (Dirkx & Smith, 2004).

Learning teams have found to be an operative and effective tool for online education. Working in learning teams, students learn to incorporate different ideas and combine them into a single solution, while at the same time, learning to work within a group in a constructivist approach, where learners are actively involved in a process of knowledge construction (Tarricone & Luca, 2002). The use of learning teams as a pedagogical strategy is aligned with the constructivist learning theory. As per constructivist learning theory, learning is an active process that enhances students' learning experience and foster their critical thinking (Alden 2011; Gomez *et al*., 2010; Volkov & Volkov, 2015). At the same time, learning is affected by interaction and collaboration of all participants that include the teacher and the students (Andersen & Ponti, 2014; Ayoko *et al*., 2012). Arguably, the use of learning teams in online modules is imperative because of their importance of empowering students' deep learning. Alden (2011) highlighted that students explore new subjects in order to tease out underlying meanings, in a mutually helpful manner, so that they can be applied to existing knowledge and on their own context (Davidson & Major, 2014; Hsiung, *et al*., 2014).

Online cohorts are made up of students from different backgrounds. Some of the students might have little experience interacting in online learning environments and participating in virtual asynchronous learning teams. As a result, learning team process is important in developing functional teams where members can learn from their peers. Tuckman (1965) argued that before teams become more productive, they go through stages such as forming, storming, norming and performing. The same author pointed out that group dynamics changes at each stage. The argument suggests that learning team would go through an evolution from a less productive phase i.e., forming stage where members look for more guidance from facilitator to a more independent productive performing stage where team members are more efficient.

Ekblaw (2016) refers that is the tutor's responsibility to ensure that the teams are functioning effectively. According to surveys conducted by students, Ekblaw (2016) points out that the primary reasons for learning teams to fail, are disorganization, unclear objectives, lack of motivation, and conflicts among group members. The author also refers that active teams have common goals, roles and responsibilities shared, group consciousness, effective communication and interaction. Understandably, there are studies that have focused on understanding interaction patterns, evolution of team norms and the learning that occurs in online learning teams. According to Ku *et al.* (2013) learning team dynamics depended on interaction of several factors, such as team communication, trust, collaboration, cohesion and team satisfaction. Tseng *et al*. (2009) in their research with 46 participants found out that trust and organisational practices are important attributes that influence online learning teams' satisfaction.

The maintenance of trust is critical in student teams because a breach can create perceptions of inequity leading to conflicts and reduced feelings of obligation to the team and its tasks (Hunsaker *et al*., 2011). The more trust there in between members, the better the outcome and better student learning (Ennen *et al*., 2015). In online learning teams, it is important to implement clear channels of communication between teams and tutor, to create a state of swift trust at an early stage (Ennen *et al*. 2015). Discussing specific behaviours and skills before groups are assigned can help reduce the risk and uncertainty of group work and create a more open pleasant learning climate. However, despite the documented advantages of learning in teams there are challenges associated with online teams. Olariu and Aldea (2014) identified three main challenges that include lack of face-to-face contact, lack of resources and time zone differences. Therefore, it is important to design procedures / plans to minimize the challenges faced by the online learning teams. Perraton *et al.* (2002) highlight some requirements for online tutors to effectively manage the pedagogical elements of teaching. The pedagogical elements include motivating students, promoting relevant learning, facilitating access to course content, engaging the learner in activities and discussions through communication, monitoring learners' progress, and adjusting learning opportunities to support learners in areas of difficulty.

The literature also identifies a serious deficiency regarding tutors omitting to teach students what is expected from a specific teamwork activity/project; Why it is important to their learning? What are the main achievements that are expected at the end of the task? What kind of collaborative and interpersonal skills are needed to perform the activity? (Hu, 2015). According to Tombaugh and Mayfield (2014) many tutors lack an appreciation of the challenges that students face when trying to work in learning teams. Tutors must explicitly teach students about the purpose and expectations of learning rather than assume that they already know (Capdeferro & Romero 2012; Tombaugh & Mayfield 2014). Educators must clearly articulate the value and process of teamwork, guiding students in how the best way to conduct the team activity (Beccaria *et al*., 2014; Chang & Kang 2016; Garrison *et al*., 2000). At the end of this article and based on the data collected with our survey and with the open-ended questions, we try to highlight some good teaching practices, including tips for tutors to work effectively in teams. Next, we will detail the method that guides the research study.

II. METHODS

Likert scale is one of the most fundamental and frequently used psychometric tools in educational and social sciences research. We started to craft the questionnaire for a new Likert scale survey based on some authors, such as,

Tseng and Ku (2011), Ku *et al.* (2013), Tseng *et al.* (2009), Aydin and Gumus (2016), Persky (2012) and Topchyan (2015). We selected the items that are more relevant for our purposes, this means, items with a specific focus on tutor's facilitation processes and procedures on learning teamwork in online education. Based also on our previous experience, both as researchers and online education tutors in a doctoral programme, we have also added several items related to specific attitudes and behaviours that have been highlighted by tutors and students in previous studies. The overall aim is to capture the variation and complexity of attitudes within online teamwork learning activities, giving us deeper insights into what tutors and students are thinking and feeling.

A. Sample

Students enrolled in the part-time EdD. program was invited to participate in the study. Those who consented completed an online survey that also had some open-ended questions. Students willing to be interviewed provided their email addresses to be contacted for interviews. The taught component of the program is composed of nine modules. Each module is completed over 10 weeks. During the ten weeks, students are involved in whole class discussions, learning team activities and they submit individual assignments. After students successfully complete the taught component, they move on to the thesis stage. In this study, we wanted to explore students' experiences working in learning teams that are mainly student driven. A total of 38 students completed the Likert scale survey that also had four open ended questions. 28 out of 38 participants indicated their willingness to be interviewed. The results of the interviews are reported in detail elsewhere. In this paper, the focus is on survey results including students' responses to open ended questions that provided some insights on the patterns observed within the survey.

B. The research tool – Process, Impact and Tutor role (PIT) Questionnaire

PIT questionnaire is a 5-point Likert scale from strongly agree to strongly disagree. Survey items were adapted from Tseng and Ku (2011), Ku *et al*. (2013), Aydin and Gumus (2016), Persky (2012) and Topchyan (2015). Twelve 5-point Likert Scale survey questions were adjusted for the purpose of the study. New items were added based on our own academic experience. PIT questionnaire focused on how the team members set goals, share their personal cultural/professional information, trust, providing team members with feedback and learning team composition preferences. Topics related to meaningful and productive contributions setting milestones and communication of the progress, time management vs team commitments, were also highlighted in our questionnaire forming stage. We have also considered items focused on how learning team participants avoid/solve conflicts, how they accepted and valued peers' perspectives and maintenance of trust, listening skills and spoke respectfully to others, understanding others' perspectives, needs and motivations, praise and appreciation. Several items focused on students' perspectives on the role of their tutor as a facilitator in the online program. Questions such as, levels of guidance provided by the tutor, challenges of learning team participation and what solutions do they recommend, and pedagogical and technological interventions that could foster more productive learning teams were included in the survey. Some items focus on whether learning team participation influenced students learning and development of skills that would make them successful in the team and program.

The questionnaire had sections that focused on demographic data, experiences and perceptions of learning teamwork, learning team impact and satisfaction, perception of tutor's facilitation and learning teamwork. The final version of PIT questionnaire had three principal components namely learning team process (LTP), learning team impact (LTI) and the role of the tutor in facilitating learning teams (TFL). There were 22 questions for LTP, 14 for LTI, 6 addressed issues related to the tutor and four open ended questions.

C. Procedure

PIT questionnaire was piloted with a group of volunteer students who were in their thesis stage i.e., had completed the taught component of the program. Edits were made as per suggestions from the pilot. All students enrolled in module 3 to 9 during the month of December 2017 and January/February 2018 were invited to participate in the study. Students were provided with participant information sheet and the consent form. A total of 38 students completed the online survey. Ethics clearance was obtained through the university where students were enrolled in.

III. RESULTS

Results are presented by cluster of each principal component. Within each cluster, we also highlight the main elements that have more impact on students' experiences in learning teams. Though the focus is on the survey tool, we also make use of students' responses to open-ended question as we try to gain some insights on factors that influence students' experiences in learning teams. The principal component is multivariate procedure that is commonly used for reduction purposes to reduce large set of variables to a much smaller set that provides a more meaningful essence of the whole data set. Principal component analysis was used for exploration data analysis purposes to identify possible relationships between each item and the principal components i.e., LTP (Factor 1), LTI (Factor 2) and TFL (Factor 3). The principal component analysis also helped in identifying survey questions within each component that could have contributed the most variation within the group. In addition, the analysis also helped us to identify elements that needed to be explored further in future studies.

A. Principal Component- Learning Team Process (LTP)

Descriptive statistics on items related to experiences of students on learning team process shows that students seem to avoid conflicts, communicate in a courteous tone and accept each other's strengths and weaknesses. It is also important to note that not all students agreed on the positive aspects of learning teamwork. Overall, descriptive statistics paint a picture suggesting that participants had positive experiences and perspectives of learning teamwork.

Principal component analysis (table I) enabled us to explore the specific elements that would have more impact on students' perceptions on learning teamwork. Table I shows items related to learning team processes.

TABLE I: STANDARDIZED FACTOR PATTERN & FACTOR STRUCTURE COEFFICIENTS FOR FREQUENCY OF LEARNING TEAM PROCESS (PRINCIPAL COMPONENT ANALYSIS, PROMAX K=4) (N=38)

	Item	Factor LTP		*h2*
		P	*rs*	
LTP1	We defined the goals, tasks, and timelines for each member at the beginning	0.34	0.67	0.68
LTP2	We generated lots of good ideas for the project	0.68	0.84	0.77
LTP3	We shared personal and cultural information to know each other better	0.67	0.73	0.54
LTP4	We shared our professional experiences and expertise	0.74	0.69	0.58
LTP5	Getting to know one another in my team allowed me to interact with teammates more efficiently	0.53	0.73	0.59
LTP6	Getting to know one another in my team gave me a sense of belonging in the team	0.58	0.72	0.71
LTP7	My teammates trusted each other and worked toward the same goal	0.73	0.82	0.70
LTP8	My teammates took our goals and objectives seriously	0.89	0.89	0.79
LTP9	My teammates replied to messages/responses in a timely manner	0.78	0.85	0.75
LTP10	My teammates gave critically constructive feedback to each other	0.73	0.81	0.67
LTP11	My teammates communicated in a courteous tone	0.65	0.54	0.32
LTP12	My teammates shared valuable knowledge/insight/literature	0.76	0.87	0.78
LTP13	My team worked well together	0.80	0.83	0.70
LTP14	We got our project done on time	0.62	0.62	0.47
LTP15	I avoided conflict	0.79	0.69	0.50
LTP16	I accepted my teammates' strengths and weaknesses	0.66	0.74	0.61
LTP17	I shared responsibilities for the team's success or failure	0.48	0.69	0.54
LTP18	I enjoyed being the learning team leader	-	0.57	0.46
LTP19	I have contributed as much as my teammates	0.39	0.36	0.14
LTP20	My teammates have contributed as much as I have	0.93	0.86	0.75
LTP21	My teammates valued my perspectives and contributions	0.82	0.72	0.56
LTP22	I felt comfortable disagreeing with my teammates while still maintaining a sense of trust	0.78	0.75	0.59

Exploratory factor analysis shows that there are some processes that impacts more on students' experiences. Based on findings show in table I, the following items stood out as process factors that influence students' experiences in learning teams; LTP2, 6, 7, 9, 12, 13 and 20. It is evident that students value generation of new ideas, feeling a sense of belonging, issues of trusting peers, working towards set goals, responding to peers in a timely manner and equitable contributions to team product. In setting up online learning teams, there are many factors that influence students' experiences and perceptions about learning teamwork. Some students felt like they contributed more to the teamwork than others and the impact on analysis was high. In the open-ended questions of the question when students were asked to share their experiences, the following are examples of what they said:

"Teamwork can sometimes be understood as one works and the others agree. This happened to me in module 3, where I did most of the work and my male team members where only there to criticize it and hand out ""orders"". It was very frustrating and thus I asked to change the team. So, it is best when team members can choose the people they want to work with, because people tend to work with other members who pitch in the same amount of work, even though they might have different viewpoints, approaches, etc. That makes it the interesting part of working together."

The above quote implies that there could have been some cultural differences in the team where the female student felt like male team members did not take responsibility but rather, provided critique of work done by others on behalf of the team. It is interesting that participants' responses to LTP3 seem to suggest that not all students value getting to know each other's personal and cultural backgrounds. The following quote seem to suggest the importance of cultural background that impacts learning team experiences for some students.

"One of my teammates appeared to not read any of the collaborative work we had done including brainstorming and working out details. Instead, he posted his own mostly complete work. Nobody responded to him for a long time. My initial response was thinking that perhaps he wasn't interested in working on a team, but then remembered what one of my previous teammates had said about working with students from his region of the world. He said that they were expected to put only completed ideas forward, nothing half-baked. So, I thought, maybe this is it and he hasn't quite transitioned yet to "brainstorming" ideas. I finally suggested that if he could incorporate what he had proposed into the framework we had been working on together, maybe he'd get better feedback. He did so and then folks started responding to him. This team has been so hard to work with. They are quiet and reserved and don't chat about anything. All the work at learning about the group was done in Module 1 small groups, so it was really hard to jump into a totally new group with no background other than the very minimal (and formal) communications via the discussion questions."

The above quote suggests the importance of setting team goals and timelines i.e., LTP1. The LTP1 analysis also suggests that students value having clear expectations for each the group. The above quote also suggests that different students could have different interpretations of what is expected of them when working in learning teams and what it means when collaborating to produce a team product. The student's quote also implies that how students interpret the task and expectations could be cultural where some students might not be comfortable in sharing during brainstorming-rather, contribute well-developed ideas. However, there is also a potential tension of stereotyping peers based on prior experiences with students from certain geographical regions. That also raises questions on whether students' participation strategies are based on culture of merely individual preferences that might not have anything to do with culture.

B. Principal Component- Learning Team Impact (LTI)

We wanted to gain some insights on what students perceive as the impact of learning teamwork on their learning, motivation and acquisition of skills relevant to their learning. The Likert scale factor analysis enabled us to identify key elements that would impact students' learning during online teamwork. Students' responses to open ended questions also provided relevant information that can be used to explain students' preferences. Descriptive statistics shows that most of the participants agreed that working in learning teams helped them to develop skills that impact their learning. For example, majority of the participants strongly agreed that working in learning teams helped them to develop the following skills: collaboration (online and with peers from different cultures); respect for different perspectives; reflective practice and reduced isolation. Learning team composition determines the working dynamics of the group. Of note are the numbers of students who prefer to choose their teammates versus those who had no preferences - almost equal. None of the students disagreed on the prompts LTI12 that asked about working with peers from different cultural backgrounds. The discrepancy between LTI12 and LTI13 was interesting given that 20% of the participants do not enjoy working with peers in different time-zones yet 87% enjoy working with peers from different cultures.

Principal component analysis of Learning Team Impact (table II) shows how students are allocated into learning teams has less impact as compared to other components related to benefits of learning from teamwork.

The EdD program is composed of students and tutors in different parts of the worlds and with diverse professional, academic and cultural backgrounds. The analysis suggests that students also enjoy working with peers from different cultures. The findings seem to suggest that though students enjoy intercultural collaboration and learning from peers from different backgrounds, differences in time zones also influence those experiences in an online learning environment.

Table II shows that all items related to LTI a significant impact on students' experiences and learning in online teamwork. In an open-ended question when asked about what would make learning teams effective, one student summed it up by listing the following: "1) Commitment- that all teammates are committed to allocating time towards contributing and in meeting deadlines. 2) Information sharing- sharing of ideas, tools to be used, articles read, and personal/professional experiences to allow richer content and higher work quality. 3) Leadership- there must be someone in the team that is willing to take up the leading role in producing a work schedule/plan, and in making sure that each teach member live up to the demands of the work required. This helps in terms of procrastination; people waiting for each other to start or to go the extra mile. 4) Set expectation- it's important that when we are put in a team, we get to know each other and understand each other's expectations. In my past learning team, some members would lay it out to the team that they may face some work commitments and therefore will not be able to contribute much for the week, or when someone is sick, or something. This allows us to plan the workload in such a way, the rest helps to compensate for a teammate's inability to contribute due to some circumstances. 5) Open mind - it's important to have an open mind when dealing with students from different background and learning level. Because it is an online learning, we know people by name and through their writing. We usually profile another teammate through their writing and through the tone we use when reading their write-up. But sometimes, we end up misjudging a person. It's a totally different dimension of interpreting the individual's personality and character when you are doing an online programme."

TABLE II: STANDARDIZED FACTOR PATTERN & FACTOR STRUCTURE COEFFICIENTS FOR FREQUENCY OF LEARNING TEAM IMPACT (PRINCIPAL COMPONENT ANALYSIS, PROMAX K=4) (N=38)

	Item	Factor LTI		*h2*
		P	*rs*	
LTI1	Learning with a learning team helps me develop online collaboration skills	0.62	0.83	0.75
LTI2	Learning with a learning team helps me learn more than if I studied alone	0.94	0.90	0.83
LTI3	Learning with a learning team helps me reflect on my own learning	0.98	0.90	0.82
LTI4	Learning with a learning team improves my performance in other aspects of the module	0.99	0.90	0.82
LTI5	Learning with a learning team helps me develop cooperative leadership skills	0.90	0.82	0.69
LTI6	Learning with a learning team helps me develop more respect for different perspectives	0.97	0.87	0.77
LTI7	Learning with a learning team increases my motivation to learn	0.89	0.91	0.87
LTI8	Learning with a learning team makes me feel less isolated in an online course	0.82	0.80	0.65
LTI9	Learning with a learning team is a valuable learning experience for me	0.87	0.95	0.91
LTI10	Learning with a learning team is a productive use of course time for me	0.87	0.92	0.85
LTI11	I enjoy learning team activities	0.76	0.90	0.85
LTI12	I enjoy working with teammates from different cultures	0.45	0.46	0.33
LTI13	I enjoy working with teammates from different time zones	0.79	0.77	0.61
LTI14	In general, I prefer to work with teammates of my choosing rather than being assigned to a team	-	-	0.06

C. Principal Component- Tutors' Facilitation of Learning Teamwork (TFLT)

Descriptive statistics on items related Tutors' Facilitation of Learning Teamwork highlight tutor's relevance to keep team members participating in the group project; to develop of a sense of community among teammates; and to provided critically constructive feedback on the finished group project. Tutor presence and facilitation is important in online learning. Most of the students value the role played the online tutors in providing constructive feedback, guidance, developing sense of community and assessing contributions fairly.

TABLE III: STANDARDIZED FACTOR PATTERN & FACTOR STRUCTURE COEFFICIENTS FOR FREQUENCY OF TUTORS' FACILITATION OF LEARNING TEAMWORK (PRINCIPAL COMPONENT ANALYSIS, PROMAX K=4) (N=38)

Item		Factor TFLT		*h2*
		P	*rs*	
TFLT 1	Tutor helped to keep team members participating in the group project	0.77	0.83	0.71
TFLT 2	Tutor acted as a referee when group members cannot resolve differences/conflicts	0.66	0.69	0.48
TFLT 3	Tutor provided guidance on the group project	0.79	0.86	0.75
TFLT 4	Tutor provided critically constructive feedback on the finished group project	0.68	0.70	0.52
TFLT 5	Tutor have been fair in judging my contributions to the teamwork	0.72	0.70	0.49
TFLT 6	Tutors' actions helped develop of a sense of community among teammates	0.89	0.90	0.81

Table III shows the overall impact of different elements related to role of tutor on students' learning team experiences. On item tutor 2, students were split on viewing the tutor as a referee when there is a misunderstanding within the group. That could suggest that students were able to resolve conflicts on their own or there were no major conflicts that would require a tutor to intervene. When responding to open ended questions in the survey, one student indicated that some online tutors were not as visible/present in learning team spaces as they are in whole class discussion forum. A student said

"Also, in Module 6 our tutor was very much disengaged… We had the feeling that he was pretty much absent from our teamwork and on more than one occasion seemed to have no idea what was going on in the team. Again, this was less than optimal in terms of creating a learning environment… but I did learn from it, including having to rely solely on my team-mates."

The student's response suggests that online tutor presence does enhance learning teamwork and creation of a learning environment that is conducive to learning. The impact of prompt 'tutor 6' supports the argument that tutors play a significant role in the development of learning community

D. Overall PIT Questionnaire Statistical Value

Table IV below shows the Eigenvalues, the percentage of variance explained per subscale and the total variance explained by PIT questionnaire.

TABLE IV: EIGENVALUES PERCENTAGE OF VARIANCE EXPLAINED PER SUBSCALE & TOTAL VARIANCE EXPLAINED

Subscales	Subscale LTP	Subscale LTI	Subscale TFLT
	P	*P*	*P*
Eigenvalues	3.85	20.15	2.72
% Of variance explained	9.37%	47.99%	6.48%
% Total variance explained		63.94%	

Although principal component analysis (PCA) in its standard form is a widely used and adaptive descriptive data analysis tool, it also has many adaptations of its own that make it useful to a wide variety of situations and data types in numerous disciplines (Jolliffe & Cadima, 2016). We had a reasonable proportion of variance explained and (most importantly) we have some substantive sense, supported in our tutors' experience and we had to take that in consideration on our analysis. For this specific study, our aim was if exploratory PCA supported the concepts that we believe would help educational developers in online programmes to design learning team strategies that improve students' experiences and enhance their learning. For this exploratory study, we had three factors extracted from the solution. They explain nearly 64% of the total variability of the scale. Each factor corresponds to one of our initial subscales and Factor 2 (Learning Team Impact) explains nearly 48% of the total variance explained.

IV. DISCUSSION

The purpose of this section is to interpret and describe the significance of our results considering what was already known about on learning team impact, process and tutor's role in facilitating online learning and to explain any new understanding or insights that emerged as a result of the use of our survey. Research has shown that creation of effective learning teams can be a challenge (He & Gunter, 2015; Hu, 2015). Olariu and Aldea (2014) indicated that about twenty five percent of virtual learning teams are not fully effective. Hence the important of identifying critical elements that would help educators to create learning environments that support creation of effective learning teams. The PIT questionnaire is an instrument that could be used to identify critical factors that online students perceived as important in enhancing their learning and improve their experiences. It was evident from our study that learning team processes as well as tutor's facilitations does have an impact on students' experiences and learning.

The LTP questions on the PIT questionnaire focused on issues related to team members setting goals, providing feedback, shared responsibilities (to avoid social loafing), communication, acceptance, and trust. We argue that for a functional learning team, members should set clear goals outlining expectations and that every member should feel a sense of belonging and safe to contribute their ideas. The LTI component contributed the most variance in the PIT questionnaire. Apart from learning content, students indicated that they gained collaborative skills; felt motivated and learned relevant ideas from their peers from different backgrounds. Hence the importance of having students to get to know each other. Learning teams are a form of community of learners. Our findings align with Rourke *et al.* (2001) argument on the relevance and important of social presence in learning communities. These authors pointed out that social presence is where community members represent themselves socially and enhance behaviours that foster closeness and openness. Fostering learning team norms and values is also where the tutor plays a significant role. The principal component about tutor facilitation identified elements valued by students include feedback and enhancing students' sense of belonging to the "community".

Regarding experiences and perceptions of students on learning teamwork, there is a global positive and encouraging feedback that can be retrieved from PIT questionnaire taking in consideration students' responses.

Kemp (2006) recognized in her study that online teamwork involves listening, research, time management and sharing opinions, which contributes to the student's perceptions of a meaningful and experiential learning. A different opinion was expressed by Hart *et al.* (2001), although almost all students had the opportunity to practice group work, few felt there was enough preparation for the experience. In our study students seem to avoid conflicts, communicate in a courteous tone, and accept each other's strengths and weaknesses, but it is also important to note that not all students agreed on the positive aspects of learning teamwork. In particular, they feel that they are not well equipped to handle with different levels of contributions within the group and deal with group members who were not contributing appropriately. This follows the study of Murray (2003) which emphasised that some students felt that group work assessment was unfair because frequently only the outcome was assessed and not students' success in developing teamwork skills. Students also complained that there were rarely any consequences for a student who does not contribute effectively to the group process. Some students have highlighted that getting late responses from peers could disrupt the team activity and some students were not contributing as much as they did. Overall, our sample paint a picture which suggests that participants had positive experiences and viewpoints of learning teamwork. It is also important that more students felt comfortable disagreeing with their teammates while marinating a sense of trust. Literature has shown that trust is important in practical learning teams (Ennen *et al*., 2015; Tseng *et al*., 2009).

Tseng and Ku (2011) emphasize that learning team dynamics depended on interaction of factors. In our study it's clear the relevance given by the participants of setting team goals and timelines. The analysis also suggests that students value having from the beginning clear expectations for each team activity. This aligns with the study of Oakley *et al.* (2004), which underlines that all members of the group should agree on the result, and it should have specific parts and aspects that can be visibly seen. This allows the group members to determine when they are done, because it contains everything, they intended. Once a clear intended result is visible, the group members can determine the process to fulfill on that goal.

Regarding Learning Team impact and satisfaction students expressed that learning team composition determines the working dynamics of the group. In this study, the numbers of students who prefer to choose their teammates versus those who had no preferences are almost equal. Ekblaw (2016) stresses some factors that should be considered in building online learning teams, such as the diversity of technology used, peers from different cultures, time zone differences, part-time and full-time students. It was interesting to know that our participants enjoy working with peers and tutors in different parts of the world and with diverse professional, academic and cultural backgrounds. The findings seem to suggest that students enjoy intercultural collaboration and learning from peers from different backgrounds, recognizing that differences in time zones influences overall learning team outcomes. As pointed out by Yamazaki and Kayes (2004) cross-cultural learning is a process that enables individuals to acquire new knowledge and techniques as well as to absorb new attitudes and values with respect to different cultures because of the experience. Online learning facilitates cross-cultural learning, and the value of this process beats the challenges highlighted by Olariu and Aldea (2014) that includes lack of face-to-face contact, lack of resources and time zone differences.

Regarding Perceptions of Tutors' Facilitation of Learning Teamwork, our participants emphasize Tutor's presence and facilitation as a crucial element in online learning. Most of the students value the role played by the online tutors in providing constructive feedback, guidance, developing sense of community and assessing contributions fairly. Rapidly evolving developments in online learning raise the question of the tutors' role, and the skills and competencies that underpin those roles, and the need for professional development opportunities (Bennet & Marsh, 2002). McPherson and Nunes (2004) explain that delivering online learning modules is not simply a matter of selecting a tutor with subject matter expertise and/or technical skills, but also involves choosing educationalists with the pedagogical, information, and communication skills that are required to manage and facilitate online learning. Chang and Kang (2016) refer that successful online learning teams depends on tutors acquiring new competencies and becoming aware of their potential and inspiring the learners.

The students' responses suggest that tutor's presence does enhance learning teamwork and facilitates the creation of a learning environment that is conducive to meaningful learning and the development of a sense of learning community. The tutor of any classroom, face-to-face or online education, has considerable influence in shaping the learning environment and has the main responsibility for creating the conditions that encourage a deep approach to learning. This will determine the construction of a dynamic and co-operating community of inquiry (Garrison *et al*., 2000). Tutors must have pedagogical skills and content knowledge that allow them to manage a learning environment that encourages students to learn independently and collaboratively. This requires on students' side the development of critical thinking, responsibility and cooperation skills (Beccaria *et al*., 2014).

V. Concluding Remarks

The research literature is clear on the fact that merely forming learning teams and providing technology will not create, per se, any impact and will not lead to learning. There are several factors that contribute to whether any teaching and learning environment leads to significant learning (Laurillard 2002). The composition of the group and the roles of the participants affect the effectiveness of learning teams (Guldberg & Pilkington, 2006). Opportunities for alternate forms of interaction such as time to work on task and time to develop online relationships are also important. To create new knowledge and competencies through learning teams careful attention should be paid to the process. The key to peer learning is the facilitation of a supportive learning environment where learners guided by the tutor develop and test ideas, express opinions, and offer and request help. Our study points that this isn't a process that can be left unmonitored. For learners to participate and

gain positively from the experience, tutors have a responsibility to guarantee that the learning outcomes are visibly demarcated to allow students to take ownership of their learning, monitor their progress and evaluate their success. The focus of this study is on the development of a survey that has the aim to identify learning opportunities and challenges faced by learning team participants. The study was implemented in a cross-cultural learning in an authentic learning environment around the world and with students from different locations. The survey focused on the three concepts Learning team process, Impact of learning teamwork, and Tutor's facilitation of learning teamwork. The results have identified students' experiences in those concepts and the issues highlighted in students' responses could help to plan new learning team methodologies / strategies for improving students' learning experiences and to create conditions for the development of deep and meaningful learning. The results of this study, even with a small sample, which restricts generalisation of the results, may enrich the current state of knowledge of the field, and might be useful for the online teaching communities.

CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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