# Pre-Service Teachers' Perceptions of the Effectiveness of Microsoft Teams for Remote Learning

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## Abstract

This paper draws on social constructivism and the domestication model and investigates pre-service teachers' perceptions of the usefulness of Microsoft Teams for remote learning. This research is part of a descriptive cross-sectional study. It is neither causal nor relational. The participants comprised of 215 undergraduate pre-service teachers from an all-female teacher training college in Kuwait and were surveyed during year 1 of their three-year academic programme. Descriptive statistical analysis and One-way ANOVA were used to analyse the data. Results indicated an overall positive perception of Microsoft Teams by all participants. The findings suggest that Microsoft Teams is an effective virtual leaning platform because of its quality, user friendliness and functionalities. The respondents perceived that the tool played a significant role in fostering interactive learning and for receiving and providing feedback. However, the pre-service teachers perceived that the platform was not suitable for independent learning and collaborative learning compared to other online collaborative tools. The empirical contribution of this study is founded on the fact that it is conducted in the context of virtual remote learning at an undergraduate teacher education level where there is limited empirical evidence. This study adds to and extends existing literature by contributing to an understanding of the domestication of virtual learning platforms when making the shift from purely traditional classrooms to remote learning.

**Keywords:** Microsoft Teams, pre-service teachers, functionality, interactive learning, collaboration, feedback, social constructivism, domestication model, remote learning

## 1. Introduction

### 1.1 Background

In the wake of COVID-19, there is a significant trend in education systems to embrace remote instruction using digital technologies which invariably include virtual learning platforms (Hodges et al., 2020). There is a sudden need to change education and to integrate virtual learning platforms that emphasise collaborative learning, real-time interactions and discussions between educators and learners, online lectures (live and recorded) accessible via mobile devices, and immediate feedback (Dhawan, 2020). In other words, traditional pedagogy had to be replaced with remote instruction and learning (Hodges et al., 2020). In order to radically revolutionise teaching and learning, educational institutions are using the transformative power of technology and effective collaborative tools to deliver instruction, for example Google Classroom, Microsoft Teams, Zoom. Cisco Webex Meetings, Adobe Connect and Blackboard. While there are debates on efficacy of online learning in the midst of a pandemic, educators are focusing on the flexibility of the platforms in delivering content and resources, student centeredness and its suitability for complementing traditional education (Allo, 2020; Coman et al., 2020; Dhawan, 2020).

When switching to remote learning virtual platforms that support formal and informal learning platforms are needed (Heggart & Yoo, 2018). Microsoft Teams is said to foster synchronous and asynchronous communication which are critical for distance or remote learning (Poston et al., 2020). Therefore, it is argued that Microsoft Teams can be used within formal, non-formal, and informal education and that it supports remote education (Hai-Jew, 2020).

*1.2 Research Problem and Rationale for the Study*

The idea of integrating Microsoft Teams for learning is getting a lot of attention as it is being used by over 115 million daily active users **(**Microsoft, October 28, 2020)**.** Given the rising number of educational institutions moving to remote education there is a need for research on the usefulness of virtual learning platforms for online learning. Despite the plethora of literature on blended learning platforms such as Massive Open Online Courses (MOOCs) and Google Classrooms, no data exists relating to pre-service teachers' perceptions of the usefulness of Microsoft Teams. Since pre-service teachers are expected to be future teachers, the underlying assumption is that they are likely to have different perception of the usefulness of virtual learning platforms compared to students from other undergraduate programmes or secondary school students. It is also assumed that pre-service teachers have different motives and goals than other students for using virtual learning platforms. It is on this premise that the integration of Microsoft Teams as a tool for interactive learning, collaboration and feedback is assessed at the College of Basic Education, PAAET, Kuwait.

*1.3 Aim and Objectives of the Study*

The main aim of this study is to analyse pre-service teachers' perceptions of the usefulness of Microsoft Teams for online learning. Therefore, this study is *descriptive* rather than evaluative. The objectives include:

1) To describe the functionalities of Microsoft Teams influencing pre-service teachers' use of the virtual platform for online learning.

2) To explore pre-service teachers' perceptions of the usefulness of Microsoft Teams for supporting interactive learning.

3) To explore pre-service teachers' perceptions of the usefulness of Microsoft Teams for supporting collaboration and feedback.

4) To analyse survey data through the theoretical concepts of social constructivism and domestication of technology.

This paper comprises of five parts. The first reviews the literature, presents the theoretical framework and formulates three research questions. The second describes the methodology adopted to address the research questions. The results are presented in the third part while the fourth discusses the findings. The last part summarises the conclusions and discusses the implications as well as the limitations of this study.

## 2. Literature Review

A critical review of extant literature was undertaken on topics that were relevant and specifically related to the effectiveness of virtual learning platforms and distance or remote learning. It involved selecting latest empirical studies from 2018 or later with just a few dating earlier and ensuring that the articles align with current study's focus and research questions. Almost all the journal articles were peer-reviewed and specific to the field of technology and education. The descriptors that were used for searching and locating the online resources included "Microsoft Teams", "virtual learning platforms", "pre-service teachers' perceptions", "students' perceptions", "functionality", "interaction", "interactive learning", "collaboration", "feedback", "social constructivism", "domestication model", "remote learning", "integration", "effectiveness', and "usefulness".

*2.1 Functionalities of Microsoft Teams*

Studies have demonstrated that the factors or elements which affect the usefulness of Microsoft Teams are functionality or the usability of the platform and learning convenience (Fatani, 2020; Landrum et al. 2020; Tomczyk et al., 2020). Functionality for the purpose of this study is defined as practicality or the quality of being adapted or designed for actual use. Research results confirm that the functionalities of digital tools for teaching and learning also include uniqueness, attractiveness, ease of use, user-friendliness, visuality and access to digital information (Taghizadeh & Hajhosseini, 2020). Microsoft Teams is unique and intuitive, yet similar to other virtual learning platforms, because it appeals to students and can be accessed using different technical devices such as a computer or tablet or mobile phones (Nemec et al. 2020). Evidence on the ease of use and user-friendliness of online learning suggests that learners can listen to audios and video files of online lectures and materials several times and review them to understand a topic better (Taghizadeh & Hajhosseini, 2020). This suggests that usefulness and students' satisfaction with its functionalities are crucial for the successful integration of a learning platform (Fatani, 2020; Gray & DiLoreto, 2016; Lowenthal & Dennen, 2017).

*2.2 A Tool for Interactive Learning*

In an online learning environment, interaction is virtual and not face to face (Landrum et al., 2020; Smith et al., 2019). These interactions take place with various types of resources, devices, students and lecturers. With regard

to Microsoft Teams, its interactive learning environment is associated with enabling possibilities for group work, discussion developing soft skills and dealing with assignments (Janes & Carter, 2020). Microsoft Teams is arguably an interactive tool because of its features, for instance audio, video, chat and content sharing, which allow students to do their homework assignments, quizzes, group projects, and record lectures with ease (Nemec, Berkova, & Hubalovsky, 2020). Empirical evidence suggests that student-content interaction can influence learner satisfaction with the virtual learning environment (Taghizadeh & Hajhosseini, 2020). Research evidence suggests that Microsoft Teams facilitates interactive learning, effective discussions and fosters interaction between students and instructors, and that it has created a peer learning culture (Janes & Carter, 2020; Jodie, 2020).

*2.3 A Tool for Collaboration and Feedback*

An academic article has labelled Microsoft Teams as an open virtual platforms appropriate for face-to-face, hybrid, and online learning, which allows real-time social and instructional interaction and collaboration (Poston, Apostel & Richardson, 2020). It is claimed to support synchronous and asynchronous learning and allow teachers to create an online class (Class team) so that students and teachers can communicate and collaborate (Nemec et al., 2020). Research shows that Microsoft Teams not only facilitates communication but can improve communication between students and teachers and enhances collaboration between students within an online community (McVey, Edmond & Montgomery, 2019).

A growing body of research suggests that Microsoft Teams is useful as it provides features like chat rooms, collaborative discussion, content sharing, and video conferencing (Buchal & Songsore, 2019; Henderson et al., 2020; McVey et al., 2019). Allison and Hudson (2020) claim that the integration of Microsoft Teams can facilitate learning and effective communication, providing an excellent platform to create and manage assignments, send and receive feedback remotely. Although learning is argued to be "tool dependent" (Major et al. 2018, p. 2015), tools alone cannot support the development of collaboration and peer feedback skills in students as lecturers have to provide scaffolds to help develop these competencies (Lowell & Ashby, 2018). Research has demonstrated that communication problems, caused by a lack of collaborative skills, may inhibit new and first-year students from participating in group work (Le, Janssen, & Wubbels, 2018).

Like other alternative virtual learning platforms, teachers can post assignments to a student or a group of students using the assignment function (Allison & Hudson, 2020). Henderson et al (2020) found that the virtual education programmes delivered using Microsoft Teams facilitated rapid dissemination of new information and provided a platform for discussion and positive feedback. A study from Canada investigated students' use of Microsoft Teams as a collaborative knowledge building platform and revealed that it was suitable for messaging, file sharing and collaborative authoring (Buchal & Songsore, 2019). The findings of the study also demonstrated that the students were comfortable providing and receiving feedback and sharing their discussions and ideas openly. These findings validate the claim that collaboration is key for learning from each other, broadening perspectives and creating new knowledge (Hammond, 2017). Overall, the studies suggest that collaboration, interaction and feedback are at the heart of remote learning.

To sum up, some of the aforementioned studies have provided the basic grounding for the research presented here. More exactly, the review included some of the key aspects enabled by Microsoft Teams: functionality, interactive learning, collaborative knowledge building and feedback. The current study focuses on examining the perceptions of the usefulness of Microsoft Teams as tool for remote learning through the lenses of social constructivism and domestication theory.

*2.4 Theoretical Framework: Conceptualising Virtual Learning Platforms*

The present study applies the theoretical framework of social constructivism and domestication theory to an understanding of the perceived usefulness of Microsoft Teams for remote learning. Social constructivism posits that learning occurs through interactions with the online environment and the individuals in it, for instance through collaboration, team work and communication or discussion (Reid-Martinez & Grooms, 2018; Tularam, 2018). In other words, learning emerges through interaction amongst individuals and with the technology. However, students are expected to participate only if they are given the opportunity to work with small groups. One of the commonalities of these technologies is their potential value in supporting a constructivist approach to learning. Another commonality is that most virtual learning platforms are designed primarily to promote interaction and collaboration. Since Microsoft Teams and its functionalities are claimed to support flexible and active learning and because it allows for group work, collaboration and constructive feedback, it can be said to be a tool that facilitates social constructivism in principles (Martin & Tapp, 2019).

The domestication model, which applies constructivist pedagogy to attain traditional goals, is helpful in

understanding how new technologies are taken and domesticated by users (Engen, 2019). Until recently, the discourse surrounding the use of technology for education was focused on its potential for enhancing learning (Selwyn, 2017). The domestication perspective offers an alternative explanation for understanding the social and cultural aspects regarding the implementation and adaption of technology (Engen, 2019). Domestication refers to the integration of technology by users (Lindeman, Svensson, & Enochsson, 2021). The domestication theory was used in this study as it underpins how pre-service teachers find ways for adapting and using Microsoft Teams as a tool for remote learning. The proponents of this theory posit that the adoption and use of a technology is claimed to go through four successive phases of domestication: appropriation, objectification, incorporation and conversion (Engen, 2019).

In the context of this study, technology appropriation does not merely refer to acquisition and adoption of the virtual learning platform by pre-service teachers. It implies the motivation to use of the technology by embedding it within their practices and through understanding its functionalities and effectiveness (Lindeman et al., 2021). In the objectification phase, the technology becomes a part of the pre-service teachers' everyday life, for instance for dealing with assignments (Engen, 2019). In the incorporation phase, pre-service teachers use the technology not only in their *everyday lives* but also in certain situations or practices, for example when its use is desirable for collaboration and feedback or when it should be restricted (Lindeman et al., 2021). The fourth phase is conversion, wherein pre-service teachers mobilise the technology for interaction and to enhance their relationships with their environment (Lindeman et al., 2021; Engen, 2019). It encompasses activities and discourses that pre-service teachers develop in order to inform others of their intention to use the technology and to participate in knowledge production and consumption through communication. During this phase the pre-service teachers may face cultural challenges and may resist technology (Engen, 2019). The rationale for using domestication theory is that it is suitable for understanding the use of a particular technology and how people experience it (Lindeman et al., 2021; Matassi, Boczkowski, & Mitchelstein, 2019; Sujon, Viney, & Toker-Turnalar, 2018). Overall, the technology must not be seen as just functional but understood and interpreted as meaningful and integrated into the users' socio-cultural context.

*2.5 Research Questions*

In order to examine pre-service teachers' perspectives about the usefulness of Microsoft Teams for remote learning the following research questions were used to guide this study:

1)   What are the functionalities of Microsoft Teams that influence pre-service teachers' to use the virtual platform for online learning?

2)   What are pre-service teachers' perceptions of the usefulness of Microsoft Teams for supporting interactive learning?

3)   What are pre-service teachers' perceptions of the usefulness of Microsoft Teams for supporting collaboration and feedback?

4)   Is there a difference in student teachers' perceptions of the effectiveness of Microsoft Teams for learning?

**3. Research Method**

A cross-sectional study design was used to analyse data collected at one given point in time and in a defined population to assess the usefulness of Microsoft Teams for learning. The rationale for using cross-sectional study design was to describe a population of interest, namely pre-service teachers who were using Microsoft Teams for learning and not to evaluate the tool. This research design is used to understand the prevalence of a phenomenon by typically describing the distribution of variables in a population without manipulating variables (Wang & Cheng, 2020; Allen, 2017). This study is not causal as the intention is to explain the conditions and context of the cause (Loeb et al., 2017). Overall, the intention was not to study change following the integration of Microsoft Teams but to depict the frequency of use the technology by study participants at a particular point in time (Aggarwal & Ranganathan, 2019).

*3.1 Sample*

The participants belonged to 4 different classes and were enrolled in Educational Technology courses at the College of Basic Education, Kuwait, which is an all-female college. This study targeted 261 pre-service teachers but only 215 participants were surveyed (82 % response rate).

Table 1. Demographic characteristics of the sample

| Cohort groups | Experience in using Microsoft Teams | Frequency | Percentage |
|---|---|---|---|
| Class 1 | 0-2 months experience | 55 | 25.6% |
| Class 2 | 3-4 months experience | 53 | 24.7% |
| Class 3 | 5-6 months experience | 54 | 25.1% |
| Class 4 | Over 7 months experience | 53 | 24.7% |
| Total | | 215 | |

All the students shared a defining characteristic typically studying similar subjects and who experienced Microsoft Teams during a selected time period. The participants were chosen from 4 classes and each class consisted of pre-service teachers with varied experience in using Microsoft Teams (see Table 1). The researcher was aware that the selection of only female research participants could lead to gender bias and that it would not allow for making generalisations about male students. This was a matter of thorough reasoning and practicality rather than of poor sample design. Data were collected from December 2020 to January 2021.

*3.2 Research Instrument, Reliability and Face Validity*

A questionnaire developed by Buchal and Songsore (2019) was adapted to fit the purpose of this study. The research instrument uses a five-point scale namely Strongly Disagree (5), Disagree (4), Neutral (3), Agree (2), and Strongly Agree (1). The three hypothesised strands or constructs namely functionality, tool for interactive learning and its usefulness for facilitating collaborative feedback resulted from a review of literature. The variables assigned to each construct were either adapted from other instruments or created for the purpose of this study.

Cronbach's alpha was used to evaluate the internal reliability for the set of items in each strand. The alpha coefficient for the three constructs were: perceptions of functionality 0.9712, tool for interactive learning 0.9708, and tool for collaboration and feedback 0.9707 suggesting that the items have relatively high internal consistency.

In order to validate the ability of the questionnaire to measure what it was designed for, a group of 6 professors, 4 lecturers and 4 experts who were specialised in the use of educational technology were invited. Face validity was established based on the impact score and the frequency percentage of their ratings about the importance of each question. Questions with low impact scores (<1.5) were modified or removed. Finally, 17 items were deemed fit for the survey. The questionnaire consists of two sections; demographic information and students' perceptions of the usefulness of Microsoft Teams for remote learning. *SPSS was* used to calculate *descriptive statistics and o*ne-way ANOVA.

A simple correlation was used to measure the relationship between the 17 variables. It was noticed that there is a correlation in the mean intensity across almost all the elements that were evaluated. In other words, the distribution of the 17 items was highly correlated with each other (Table 2). However, these are not cause-and-effect Cs.

Table 2. Correlation between variables

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | | | | | | | | | | | | | | | | |
| 2 | 0.87 | 1 | | | | | | | | | | | | | | | |
| 3 | 0.94 | 0.88 | 1 | | | | | | | | | | | | | | |
| 4 | 0.89 | 0.80 | 0.91 | 1 | | | | | | | | | | | | | |
| 5 | 0.87 | 0.90 | 0.90 | 0.86 | 1 | | | | | | | | | | | | |
| 6 | 0.78 | 0.80 | 0.82 | 0.82 | 0.84 | 1 | | | | | | | | | | | |
| 7 | 0.81 | 0.86 | 0.86 | 0.82 | 0.92 | 0.78 | 1 | | | | | | | | | | |
| 8 | 0.78 | 0.79 | 0.84 | 0.86 | 0.88 | 0.87 | 0.85 | 1 | | | | | | | | | |
| 9 | 0.77 | 0.77 | 0.84 | 0.87 | 0.88 | 0.89 | 0.85 | 0.95 | 1 | | | | | | | | |
| 10 | 0.74 | 0.79 | 0.81 | 0.83 | 0.88 | 0.83 | 0.89 | 0.93 | 0.93 | 1 | | | | | | | |
| 11 | 0.70 | 0.85 | 0.76 | 0.74 | 0.87 | 0.80 | 0.89 | 0.85 | 0.85 | 0.88 | 1 | | | | | | |
| 12 | 0.64 | 0.82 | 0.69 | 0.64 | 0.84 | 0.73 | 0.84 | 0.76 | 0.76 | 0.79 | 0.90 | 1 | | | | | |
| 13 | 0.53 | 0.67 | 0.63 | 0.63 | 0.76 | 0.72 | 0.79 | 0.78 | 0.81 | 0.82 | 0.91 | 0.85 | 1 | | | | |
| 14 | 0.41 | 0.59 | 0.51 | 0.51 | 0.67 | 0.64 | 0.72 | 0.69 | 0.74 | 0.72 | 0.85 | 0.84 | 0.91 | 1 | | | |

| 15 | 0.64 | 0.79 | 0.72 | 0.70 | 0.84 | 0.79 | 0.87 | 0.85 | 0.85 | 0.88 | 0.96 | 0.91 | 0.92 | 0.90 | 1 | | |
| 16 | 0.61 | 0.76 | 0.70 | 0.68 | 0.83 | 0.77 | 0.86 | 0.82 | 0.84 | 0.86 | 0.95 | 0.91 | 0.93 | 0.92 | 0.97 | 1 | |
| 17 | 0.57 | 0.71 | 0.69 | 0.67 | 0.78 | 0.76 | 0.83 | 0.84 | 0.86 | 0.88 | 0.92 | 0.85 | 0.93 | 0.90 | 0.95 | 0.95 | 1 |

The values between 0.9 and 1.0 indicate variables which were very highly correlated. The correlation coefficients of most variables were highly correlated and ranged between 0.7 and 0.9. Values between 0.4 and 0.7 indicate variables which were moderately correlated. Overall, there was positive correlation between all the variables which indicates that there is good internal consistency.

*3.3 Procedure*

Participation in the research was voluntary. The researcher distributed the self-administered questionnaire along with participant information sheets, consent forms and link to the survey to student teachers via Microsoft Forms. The participants returned the completed questionnaires via Microsoft Forms. The overall response rate was 90% for the questionnaire (215/239). Data gathered were analysed using descriptive statistics (mean and standard deviation of variables), frequencies and weighted mean. Through descriptive statistical analyses, this study presents an actual and appropriate summarisation of visual data that is useful for each intended audience (Loeb et al., 2017). One-way ANOVA was also used to compare of means of the four groups of students.

## 4. Results

The descriptive data (see Table 3) are presented here in a narrative style under three thematic headings. The first part of Table 3 (items 1-6) shows that student teachers were quite assured that the Microsoft Teams was effective due to the perceived convenience and usability of the platform. The weighted mean of 3.71 suggest that all the means were relatively close and can be interpreted as being very effective. Although working independently had the lowest rating, Microsoft Teams can be considered to be an effective tool for information dissemination.

Table 3. Descriptive statistics and weighted means

| | Variables | M | SD | N |
|---|---|---|---|---|
| | Functionality | | | |
| 1 | Ideal for Remote Learning | 3.74 | 0.93 | 215 |
| 2 | Allows us to work independently | 3.24 | 1.23 | 215 |
| 3 | Useful for online delivery of content/lecture | 3.76 | 0.93 | 215 |
| 4 | Useful for sharing resources online | 3.78 | 0.87 | 215 |
| 5 | Confidence in successfully and purposefully using Microsoft Teams | 3.52 | 1.11 | 215 |
| 6 | Supports synchronous and asynchronous communication | 4.19 | 0.76 | 215 |
| | *Weighted Mean* | **3.71** | | |
| | Tool for interactive learning | | | |
| 7 | Suitable for interactive learning | 3.37 | 1.09 | 215 |
| 8 | Suitable for discussion | 3.90 | 1.11 | 215 |
| 9 | Suitable for developing soft skills | 3.88 | 1.05 | 215 |
| 10 | Suitable for dealing with assignments | 3.99 | 1.23 | 215 |
| 11 | Suitable for group work | 3.11 | 1.33 | 215 |
| | *Weighted Mean* | **3.65** | | |
| | Tool for collaboration and feedback | | | |
| 12 | Easy to collaborate on discussions/materials related to a lesson/topic | 2.98 | 1.67 | 215 |
| 13 | Supports peer learning | 2.53 | 0.93 | 215 |
| 14 | Usefulness of MS Teams compared to other online collaborative tools | 1.94 | 0.87 | 215 |
| 15 | Ideal for receiving feedback from peers/colleagues | 3.30 | 1.41 | 215 |
| 16 | Ideal for providing feedback and sharing contributions openly | 3.29 | 1.38 | 215 |
| 17 | Ideal for receiving prompt and constructive feedback from lecturer | 3.42 | 1.28 | 215 |
| | *Weighted Mean* | **2.91** | | |

Table 4. Summary of weighted mean of 4 groups and experience in using Microsoft Teams

| Subscales | 1 0-2 months | 2 3-4 months | 3 5-6 months | 4 Over 7 months | Overall Weighted Mean |
|---|---|---|---|---|---|
| Functionality | 3.7 | 3.74 | 3.6 | 3.79 | 3.71 |
| Tool for Interactive learning | 3.57 | 3.63 | 3.68 | 3.74 | 3.65 |
| Tool for Collaboration and feedback | 2.84 | 2.94 | 2.93 | 2.94 | 2.91 |

The student teachers perceived the tool was very useful for interactive learning, developing soft skills, dealing with assignments and for group work. The weighted mean of 3.65 suggest that Microsoft Teams is a tool for interactive learning (items 7-11). Student teachers' perceptions of usefulness of Microsoft Teams as a tool for collaborative feedback (items 12-17) suggest that Microsoft Teams is useful as a tool for receiving and providing feedback. However, the student teachers were not convinced that Microsoft Teams was effective for peer learning (M=2.53). Likewise, the student teachers perceived that the virtual learning platform was not very useful as compared to other online collaborative tools (M=1.94). This is evident in the overall weighted mean for the items under the subscale 'tool for collaboration and feedback' which was a moderate 2.91 (Table 3 and 4).

*4.1 Perceptions of the Usefulness of the Functionality of Microsoft Teams*

The pre-service teachers primarily highlighted all the items related to functionality as significant. The vast majority of the pre-service teachers agreed (Agree, 50.2%; Strongly Agree, 36.3%) that the technology supported synchronous and asynchronous communication (Figure 1). In response to the statement about their confidence in successfully and purposefully using the learning platform, they responded positively (Agree, 43.7%; Strongly Agree, 16.7%). The data also revealed that an overwhelming majority of the respondents found the tool useful for sharing resources (Agree, 63.7%; Strongly Agree, 13.3. Most of the pre-service teachers felt (Agree, 54.2%; Strongly Agree, 39.6%) that felt that it was useful for online delivery of content/lecture. Although most respondents perceived that the technology was ideal for remote learning (Agree, 53%; Strongly Agree, 9.6%) they were not very convinced that it fostered independent learning (Disagree, 24.7%; Strongly Disagree, 8.4%; Neutral, 17.7%). By agreeing to all the statements they conveyed the importance of having a functional, user friendly technology that was suitable for remote learning.
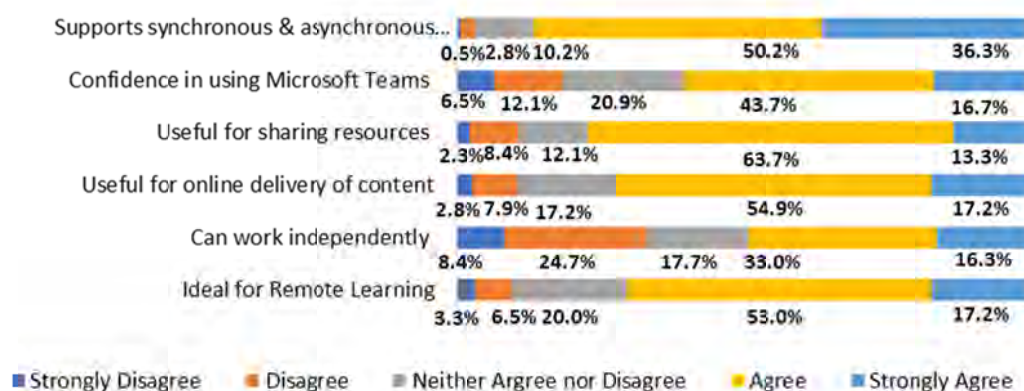


Figure 1. Functionality of Microsoft Teams

*4.2 Perceptions of the Usefulness of Microsoft Teams in Supporting Interactive Learning*

The respondents were given five statements to consider the usefulness of Microsoft Teams in supporting interactive learning. The majority of respondents agreed (53%) or strongly agreed (9.8%) that it was suitable for interactive learning (Figure 2). An overwhelming majority of the respondents felt that the tool was useful for online discussions (Agree, 47.9%; Strongly Agree, 31.6%), developing soft skills (Agree, 51.2%; Strongly Agree, 27.4%), assignments (Agree, 33.5%; Strongly Agree, 44.7%) and for group work (Agree, 36.7%; Strongly Agree, 14%).
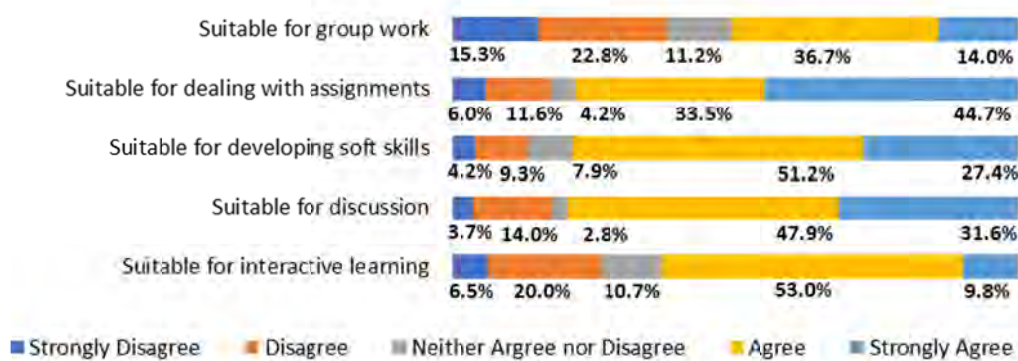
Figure 2. Usefulness of Microsoft Teams in supporting interactive learning

*4.3 Perceptions of the Usefulness of Microsoft Teams for Supporting Collaboration and Feedback*

Figure 2 depicts that a large majority of the pre-service teachers perceived that Microsoft Teams was ideal for receiving prompt and constructive feedback from lecturers (Agree, 27.9%; Strongly Agree, 24.2%), from peers/colleagues (Agree, 27.4%; Strongly Agree, 25.6%), and for providing feedback and sharing contributions openly (Agree, 34%; Strongly Agree, 21.9%). Although most participants claimed that Microsoft Teams was easy to collaborate and learn a particular topic or lesson (Agree, 34.4%; Strongly Agree, 21.4%), a large majority disagreed that it was not useful compared to other online collaborative tools (Disagree, 37.2%; Strongly Disagree, 35.4%). Likewise, most pre-service teachers were doubtful if the platform supported peer learning (Disagree, 14.4%; Strongly Disagree, 32.5%; Neutral, 40.9%).
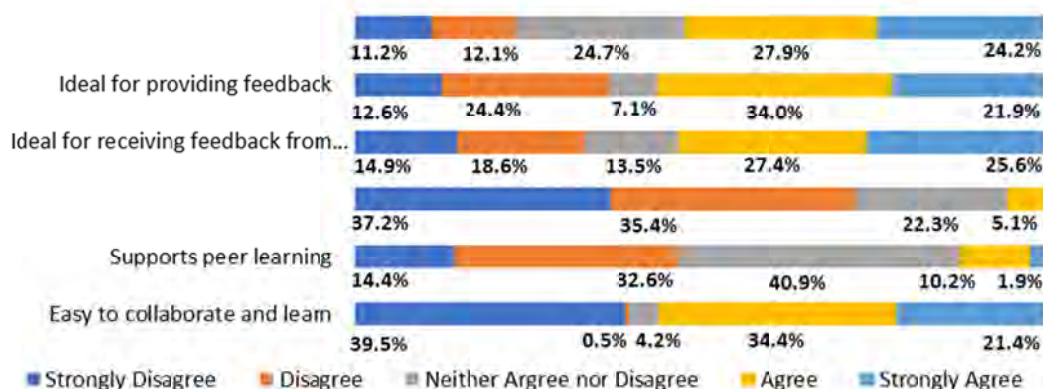


Figure 3. Usefulness of Microsoft Teams for supporting collaboration and feedback

Overall, the descriptive suggests that the student teachers perceived that Microsoft Teams was congruent with their learning goals and objectives.

*4.4 Variations in the Perception of the Effectiveness of Microsoft Teams*

One-way ANOVA measures were used to compare student groups to establish if differences existed in their perceptions of Microsoft Teams as a learning platform. The objective was to examine if groups with varying experience in using Microsoft Teams (independent variable) would influence pre-service teachers' perceptions of the tool for remote learning (a dependent variable).

The hypotheses tested for the subgroup 'perceptions of functionality' were:

Hypothesis H1. There is a significant difference in participants' perceptions of the functionality of Microsoft Teams based on their experience in using the tool.

Hypothesis Ho1. There is no significant difference in participants' perceptions of the functionality of Microsoft Teams based on their experience in using the tool.

Table 5. Functionality of Microsoft Teams: Differences in perceptions of the 4 cohorts

| Variable | Source of Variation | SS | df | MS | F | P-value |
|---|---|---|---|---|---|---|
| 1 | Between Groups | 0.66 | 3 | 0.22 | 0.2514 | 0.8603 |
| | Within Groups | 184.27 | 211 | 0.87 | | |
| 2 | Between Groups | 3.42 | 3 | 1.14 | 0.7505 | 0.5232 |
| | Within Groups | 320.01 | 211 | 1.52 | | |
| 3 | Between Groups | 1.03 | 3 | 0.34 | 0.3980 | 0.7551 |
| | Within Groups | 182.39 | 211 | 0.86 | | |
| 4 | Between Groups | 2.91 | 3 | 0.97 | 1.2914 | 0.2783 |
| | Within Groups | 158.38 | 211 | 0.75 | | |
| 5 | Between Groups | 0.19 | 3 | 0.06 | 0.0522 | 0.9842 |
| | Within Groups | 261.46 | 211 | 1.24 | | |
| 6 | Between Groups | 2.46 | 3 | 1.15 | 1.0451 | 0.9130 |
| | Within Groups | 1.75 | 211 | 0.74 | | |

It is evident from the results (Table 5) there were no statistically significant differences between the cohorts as determined by one-way ANOVA for all the six variables ($p => .05$). The p-values are greater than the significance level, and therefore there is not enough evidence to reject the null hypothesis (Ho1). This implies that the perceptions of the student teachers belonging to the four classes are statistically the same. Since p-value is greater than 0.05 running post hoc tests is not warranted. Therefor the weighted mean scores were used to interpret the finding. Even though there was not a significant difference, the pre-service teachers belonging to Group 4 had a slightly higher weighted mean suggesting that students with over 7 months experience may have different perceptions than the least experienced.

The hypotheses tested for the subgroup 'tool for interactive learning' were:

Hypothesis H2. There is a significant difference in participants' perceptions of the usefulness of Microsoft Teams as a tool for interactive learning based on their experience in using the tool.

Hypothesis Ho2. There is no significant difference in participants' perceptions of the usefulness of Microsoft Teams as a tool for interactive learning based on their experience in using the tool.

Table 6. Microsoft Teams as a tool for interactive learning: Differences in perceptions of the 4 cohorts

| Variable | Source of Variation | SS | df | MS | F | P-value |
|---|---|---|---|---|---|---|
| 7 | Between Groups | 0.72 | 3 | 0.23 | 0.1984 | 0.8973 |
| | Within Groups | 251.52 | 211 | 1.19 | | |
| 8 | Between Groups | 0.73 | 3 | 0.24 | 0.1947 | 0.8999 |
| | Within Groups | 263.02 | 211 | 1.24 | | |
| 9 | Between Groups | 0.42 | 3 | 0.14 | 0.1279 | 0.9434 |
| | Within Groups | 233.67 | 211 | 1.10 | | |
| 10 | Between Groups | 3.17 | 3 | 1.05 | 0.6994 | 0.5534 |
| | Within Groups | 318.81 | 211 | 1.51 | | |
| 11 | Between Groups | 5.22 | 3 | 1.74 | 0.9869 | 0.3998 |
| | Within Groups | 372.09 | 211 | 1.76 | | |

It is evident from the results (Table 6) that the student teachers exhibited statistically no significant differences ($p => .05$) in their perception of the effectiveness of Microsoft Teams as a tool for interactive learning. The p-values are greater than the significance level, and therefore there is not enough evidence to reject the null hypothesis (Ho1). As the p-value was greater than 0.05, post hoc tests were not carried out. The weighted mean scores of Group 4 for this subscale (M=3.65) suggest that the pre-service teachers with over 7 months experience may have different perceptions than the least experienced.

The hypotheses tested for the subgroup 'effectiveness of Microsoft Teams as tool for collaboration and feedback' were:

Hypothesis H3. There is a significant difference in participants' perceptions of the effectiveness of Microsoft Teams as a tool for collaboration and feedback based on their experience in using the tool.

Hypothesis Ho3. There is no significant difference in participants' perceptions of the effectiveness of Microsoft Teams as a tool for collaboration and feedback based on their experience in using the tool.

Table 7. Microsoft Teams as a tool for collaboration and feedback: Differences in perceptions of the 4 cohorts

| Variable | Source of Variation | SS | df | MS | F | P-value |
|---|---|---|---|---|---|---|
| 7 | Between Groups | 0.72 | 3 | 0.23 | 0.1984 | 0.8973 |
| | Within Groups | 251.52 | 211 | 1.19 | | |
| 8 | Between Groups | 0.73 | 3 | 0.24 | 0.1947 | 0.8999 |
| | Within Groups | 263.02 | 211 | 1.24 | | |
| 9 | Between Groups | 0.42 | 3 | 0.14 | 0.1279 | 0.9434 |
| | Within Groups | 233.67 | 211 | 1.10 | | |
| 10 | Between Groups | 3.17 | 3 | 1.05 | 0.6994 | 0.5534 |
| | Within Groups | 318.81 | 211 | 1.51 | | |
| 11 | Between Groups | 5.22 | 3 | 1.74 | 0.9869 | 0.3998 |
| | Within Groups | 372.09 | 211 | 1.76 | | |

Variations in perceptions on effectiveness of Microsoft Teams as a tool for collaboration and feedback were likewise tested. The results (Table 7) suggest that there were no statistically significant differences between the cohorts as determined by one-way ANOVA for all the six variables (p=>.05). The p-values are greater than the significance level, and therefore there is not enough evidence to reject the null hypothesis (Ho1). Once again, as the p-value was greater than 0.05, post hoc tests were not carried out. The weighted mean scores for this subscale (M=2.94) for Groups 2 and 4 suggest that the pre-service teachers belonging to these classes with varied experience which might have influenced their perceptions.

## 5. Discussion

This study assessed pre-service teachers' perceptions of the usefulness of Microsoft Teams. The descriptive data suggests that the pre-service teachers perceived that Microsoft Teams was compatible with their learning goals and objectives. It was also hypothesised that there would be significant differences in the perceptions of pre-service teachers from four different classes about the functionality of Microsoft Teams (Hypothesis 1), its usefulness of as a tool for interactive learning (Hypothesis 2) and as a tool for collaboration and feedback (Hypothesis 3). One-way ANOVA was conducted to determine whether differences existed in the perceptions of the pre-service teachers. Results confirmed that there was no significant difference in participants' perceptions.

The descriptive and One-way ANOVA results are analysed through the theoretical concepts of social constructivism and domestication of technology. When looking at the results from a constructivist theoretical perspective, the student teachers were able to build new knowledge through appropriation of the technology, interactions, collaboration and from prompt, objective, and critical feedback. This was reflective of past studies (for example Allison & Hudson, 2020; Henderson et al. 2020; Reid-Martinez & Grooms, 2018; Tularam, 2018), which argue about the importance of interaction, collaboration and feedback in constructivist online learning environments. However, online learning platforms where students participate through feedback and interaction should be structured accordingly, and guidelines should be established to enable the appropriate use of virtual learning tools.

The "domestication model" helped in analysing and identifying the usefulness of Microsoft Teams as a platform for learning (Lindeman et al., 2021; Matassi et al., 2019; Sujon et al., 2018). With regard to appropriation, the pre-service teachers observed that Microsoft Teams was appropriate and an essential learning platform within the domain of the teacher training programme. The participants considered functionality or usability as a combination of expediency and utility. This result supports previous research that students referred Microsoft Teams because of its quality, user friendliness and tool functionalities (Hai-Jew, 2020; Tomczyk et al., 2020). This finding is also congruent with the claims made by Engen (2019) that appropriation involves an understanding of the functionalities and effectiveness of technology. Microsoft Teams appeared to have played a key role in the students' routines, for instance interacting with materials and lecturers. Research suggests that student-content interaction can motivate students to use the technology (Taghizadeh & Hajhosseini, 2020). Participants' confidence and competencies in using the tool for learning provided insight into their domestication of the new technology for their own learning (Engen, 2019). For instance, the pre-service teachers stated that MS Teams was an enabling environment that supported soft skills development. In other words, the pre-service

teachers appeared to the give the impression that Microsoft Teams was flexible and equipped them with digital skills as well as the confidence, motivation and competence to apply successfully in other situations, for instance as in-service teacher. It is noteworthy that such results were projected in recent studies (for example Lindeman et al., 2021; Allo, 2020; Coman et al., 2020; Demeshkant, 2020; Dhawan, 2020; Janes & Carter, 2020; Engen, 2019).

The pre-service teachers had objictified the learning platform and considered it as a resource to be manipulated and used, for instance taking advantage of its usefulness in delivering content and lectures, dealing with assignments and for sharing resources. They felt that the technology had reduced the distance between learners and lecturers, for example receiving feedback from instructors, and strengthened relationships with colleagues, for example getting feedback from peers. This finding is consistent with arguments made by recent researchers (for example of Lindeman et al., 2021, Nemec et al., 2020; Martin & Tapp, 2019).

The pre-service teachers incorporated Microsoft Teams into the daily routines based on their beliefs about the technology in particular. Descriptive data shows that although the participants found the platform useful and meaningful, they did not feel that it were useful compared to other online collaborative tools and were unsure about its role in facilitating peer learning and independent learning. Research suggests that the reason behind this uncertainty is the notion that these learning activities can be performed with the help of other virtual collaborative tools (Lindeman et al., 2021). Conversely research has also shown that Microsoft Teams fosters a peer learning culture and students can work together in a group which is more effective than working alone (Jodie, 2020). One interesting finding is that the experience of pre-service teachers in incorporating Microsoft Teams played a key part in their perceptions about the technology.

The domestication of Microsoft Teams entailed conversion or adaption as the technology influenced the pre-service teachers to use it as a learning platform. The conversion to the virtual platform occurred primarily through its use as a communication tool, for instance asynchronous and/or synchronous communication. Results suggest that the participants perceived Microsoft Teams to be very useful for communication or discussions as well as for receiving and providing feedback. This relates to literature which suggests that communication and feedback are key for enhancing collaboration between students within an online community (Allison & Hudson, 2020; McVey et al., 2019).

Overall, the results suggest that Microsoft Teams can make a valuable contribution to remote learning, mainly for offering options for interaction and communicating knowledge, and developing and/or maintaining supportive relationships between students and teachers.

## 6. Conclusion

With the emergence of Microsoft Teams and continued impact of such virtual learning platforms on learning, this paper represents a timely and much-needed reflective space upon the dynamics and outcomes of technological changes we see in the world around us. The research attempted to offer an analysis of Microsoft Teams as seen through the lens of pre-service teachers with varying experiences in using the virtual learning platform. Although this descriptive study has described Microsoft Teams as an important social phenomenon, it does not provide causal proof, and the results cannot be generalised beyond the specific findings. This is because the constructs of interest or perceptions of functionality and the usefulness of the tool for interaction or collaboration are contextual. These perceptions may vary across populations as the quality, value or worth of a technology are often shaped more by the beliefs and values of the users. However, it has compelling implications on both policy, practice and theory.

This study contributes to the literature on virtual learning platforms by integrating social constructivism and domestication theory. The key findings are:

1) Microsoft Teams is suitable for remote learning and can be appropriated because of its functionality or usability;

2) It is flexible and equips pre-service teachers with digital skills as well as the confidence, motivation and competence required to become future teachers;

3) The objectification of the learning platform allowed the pre-service teachers to manipulate it and take advantage of its usefulness in delivering content, dealing with assignments and for sharing resources;

4) Although the pre-service teachers were using Microsoft Teams that was incorporated by their lecturers, they were not certain about its potential as a tool for collaboration as well as its role in facilitating peer learning and independent learning as compared to other virtual collaborative tools;

5) Through conversion the pre-service teachers adapted the technology for communication and discussions as well as for receiving and providing feedback.

The results will specifically contribute to the currently sparse knowledge of the use of the application of the domestication model in research related to virtual learning environments in the context of teacher education. It provides a comprehensive understanding of Microsoft teams as a virtual learning platform, its prevalence, and discusses the possibilities of using the technology in pre-service teacher education.

Research on Microsoft Teams within the field of virtual learning platform is also sparse and existing research has not focused on the unique pedagogical characteristics of the technology. A lack of relevant knowledge of these characteristics could increase the risk of lessening the importance of the use of Microsoft Teams and other virtual learning platforms. To fill this gap, examining the pre-service teachers' understandings and experiences of their use of the virtual learning platform is important. This paper addressed the theoretical potential of Microsoft Teams as a virtual learning platform.

*6.1 Implications for Practitioners*

Findings suggest that Microsoft Teams is ideal for remote learning and can be an alternative tool to other virtual learning platforms, for example its functionality or usability and its suitability for interactive learning and collaborative feedback. This study may be useful for educators intending to integrate virtual learning platforms with the aim of fostering student interaction and collaborative feedback. By drawing on social constructivism and domestication theory and linking this to the perceptions of pre-service teachers, it is hoped that educators and policy makers will have a better basis for making decisions about whether or not to incorporate virtual learning platform such as Microsoft Teams in teacher training colleges. The study also demonstrates that the successful domestication of virtual learning platforms in teacher education should include determination and professional learning and development.

*6.2 Implications for Researchers*

Future research could focus on the effectiveness of Microsoft Teams using an empirical study, for example a mixed methods research design, to provide additional definitive evidence which may support the benefits of using this virtual learning tool in pre-service teacher education.

*6.3 Limitations*

Since this is a one-time measurement of pre-service teachers' exposure to the use of Microsoft teams, it is difficult to derive causal relationships from cross-sectional analysis. By surveying pre-service teachers this study has collected valuable data, but generalisations should be made with caution. The researchers also acknowledge that the range of participants was limited and covered only those with limited experience in using Microsoft teams. This study did not examine the challenges faced by the pre-service teachers and their use of Microsoft teams to mitigate issues. Future research could focus on these challenges.

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