Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 4, Month 2021: 412-418

Success Factors and Affecting Constituents for Mass Collaboration Learning; A Case of Jordan Companies

Dr. Amer Hatamleh
Asst. Prof., Head of Management Information System Department,
Faculty of Financial and Business Science, Irbid National University, Irbid, Jordan.
aahatamleh@inu.edu.jo

Abstract

Purpose: The key aim of this study was to identify the success factors of mass collaborative learning. This study also aimed to investigate the moderating effect of co-created knowledge on the association between all the identified factors and mass collaborative learning.

Methodology/Design: The quantitative primary data has been collected through survey questionnaire from the companies operating in Jordan. For data analysis, the use of SEM technique has been made in this study. In SEM, the test of CFA and path assessment has been conducted in this study.

Findings: The results of this study have confirmed the significant and positive direct impact of use of technologies, techniques used for collaborative learning, methods for evaluating quality, and reliability of co-created knowledge (RCK) on mass collaborative learning. On the other hand, the variable of organisational structure type is found to have an insignificant impact on mass collaborative learning. Moreover, with respect to moderating effect, the variable of RCK is found make a significant and positive moderating effect on the association between use of technology (UT) and mass collaboration learning (MCL), whereas it makes the significant but negative moderating effect on the association between methods for evaluating quality (ME) and MCL. However, the moderating effect of RCK on all the other associations that have been investigated in this study was found to be insignificant.

Research Limitations: The broad scope of this research has been one of the key limitation, as findings of this study cannot be applied to any specific industry. On the other hand, the absence of qualitative data has been another major limitation of this study.

Key Words: Mass Collaborative Learning, Reliability of Co-created Knowledge, Use of Technologies, Organisational Structure Types, Techniques used for Collaborative Learning, Methods for Evaluating Quality.

1.0 Introduction

Various successful projects related to the mass collaboration is different fields have represented profound change in terms of functions and acts of the society collectively (Nevari, 2020). The new concept of mass collaboration is associated with collective learning in which the mass of minds intend to build and acquire the knowledge together. These experiments are grounded on poll of fresh knowledge, which helps in terms of developing the partial experience and knowledge of each team member. A significant aspect of the process is to make sure that the knowledge that is created is trustworthy and reliable. In this manner, this generates the need for effective mechanism for the evaluation. In addition to this, it is also essential to understand the learning process through the mass collaboration. It has been argued in the study of Zamiri and Camarinha-Matos (2018) that the information and knowledge can act in variety of ways which might include facts, opinions, interpretations and stories. On the other hand, this information is created for various purposes in order to encourage or inform others. For each one of these diverse purposes and kinds, the information and knowledge can differ and vary enormously in terms of the lifespan, granularity, nature, reliability and value.

Moreover, the information or knowledge can range from poor to high quality while including every aspect among dissimilar printed materials in books, magazines and newspapers which are regulated for accuracy and quality. It has also been stated in the study of Suh and Wagner (2017) that quality of knowledge and information has been an emerging concern for the companies which adversely effects the mass collaboration. In this manner, the companies face huge challenges in terms of ensuring the learning of employees through the mass collaboration. Therefore, is essential for the companies to determine the issues and challenges which are faced in learning through mass collaboration. It has also been argued in the study of Ball (2020) that the companies must determine the most influential and success factors of mass collaboration learning. In this manner, they will be well able to ensure the effectiveness of the mass collaboration. This study has been conducted in the context of Jordan

and, for this purpose, this work summarizes a systematic review of the new literature to identify the factors and components that influence the propensity for mass collaboration.

2.0 Literature Review

The concept of mass collaboration has gained huge significance in the corporate world, and has also been widely discussed in the existing literature. According to Scuotto et al. (2017), emergence of internet-based solution along with the rapid advancement in the communication and information technologies have paved the new opportunities to collaborate in a manner that seemed to be unrealistic few years ago. As per the study of Sörensson and Wu (2019), the concept of mass collaboration can be viewed from different perspective, as there is no universally accepted definition of this concept. In accordance with the same study, in a more simplistic form, the concept of mass collaboration can be explained as the special form of collective actions that occurred in a situation when significant number of people work on a single project independently. The study carried out by Andre and Webster (2017) argues that mass collaboration as an emerging and new area, overlays in some manner in terms of several other collective action, which include crowd sourcing, collective intelligence, peer production, crowd wisdom, community system, user-powered system, human computation, social systems, smart mobs, Wikinomics, and social collaboration.

In the existing literature, the concept of mass collaboration has been explained from different perspectives like innovation, knowledge construction, collaborative learning, knowledge management, and organisational sustainability (Zamiri and Camarinha-Matos, 2018). The significance of mass collaboration has also been well acknowledge and recognised in the existing literature. As mentioned in the study of Sancho (2016), mass collaboration holds huge significance for different businesses, as it enables them to easily tap into the international markets, and also in ensuring the success of project through with lower cost, faster time, innovation, and with better problem solving approach. Apart from that, the existing literature also identifies several challenges and issues that are linked with learning through mass collaboration.

As mentioned in the study of Potter et al. (2010), organisational structure has always been one of the major concerns that is linked with mass collaborative learning, as most of the organisations often find it difficult to ensure the right selection of organisational structure that support the mass collaborative learning within the organisation. Therefore, it is important for organisations to must identify the factors that can lead towards the successful execution of mass collaborative learning within the organisation. The study conducted by Zamiri and Camarinha-Matos (2019) also identifies organisational structure as one of the key influential factors of mass collaborative learning, as it outlines the way responsibilities, duties, and authorities can be synch and effectively manage to accomplish key organisational goals.

According to Andre and Webster (2017), the right use of technique for collaborative learning has been a major factor that support mass collaboration within the organisation. In accordance with the same study, the right use of technique is likely to play a crucial role in enhancing the overall process of learning and teaching. Moreover, the use of effective technique promises to assist both learners and teachers to become more productive. However, the selection of different techniques and methods to use for mass collaboration highly depends on different organisational context. On the other hand, the study conducted by Zamiri and Camarinha-Matos (2019), also identifies the technology usage and methods for evaluating quality as another important factors that determines the effectiveness of mass collaborative learning within the organisation. Furthermore, the major challenge concerning to mass collaborative learning is associated with building a mechanism that helps in evaluating the credibility, validity, reliability, and trustworthiness of co-created knowledge. Hence, this study aims to identify some of the most influential factors of mass collaboration in the context of Jordanian companies.

3.0 Theoretical Framework

This study is grounded on the determination of issues and challenges in learning through the mass collaboration. Therefore, the theory of organisational knowledge creation relates to the topic. The theory was presented by Nonaka (1994) which posits that the creation of organisational knowledge is dependent on continuous dialogues among explicit and tactic knowledge through four patterns of interactions which include externalisation, internalisation, combination and socialisation. This relates to the concept of mass collaboration due to the fact that mass collaboration involve all four aspects which helps the individuals in terms of learning and providing knowledge to other people. However, personal characteristics of the employees may vary which might be an issue or challenge towards the mass collaboration. In this manner, the dynamic theory of organisational knowledge creation has been employed in this study.

4.0 Conceptual Framework

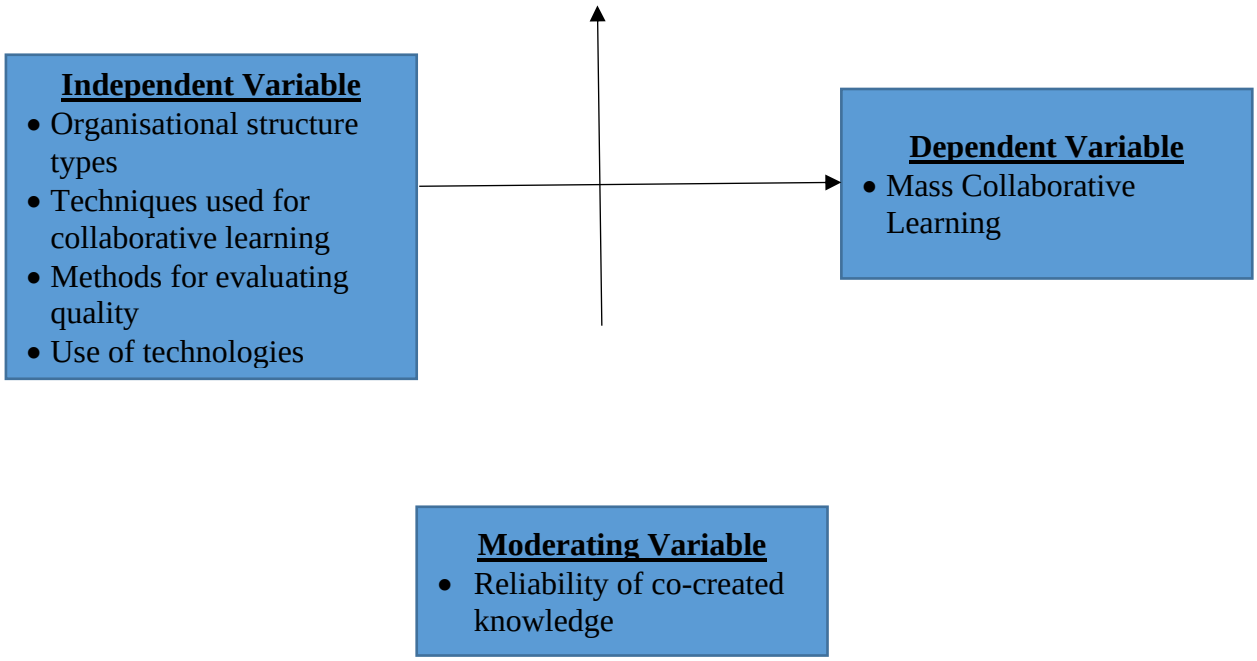

Figure 1 Conceptual Framework

The above presented figure 1 outlines all the key variables of this study. The core aim of this study is to identify the success factors of mass collaborative learning. For that purpose, upon reviewing the previous literature, researcher has highlighted different factors, which are taken as independent variables in this study. These variables include the types of organisational structure, methods for evaluating quality, techniques used for collaborative learning, and use of technologies. This study aims to investigate the impact of all these factors on mass collaborative learning. Moreover, figure 1 also highlight reliability of co-created knowledge as a moderating variable of this study. Based on the aforementioned conceptual framework, the following hypothesis are developed:

H1: There is a significant impact of organisational structure types on mass collaborative learning.
H2: There is a significant impact of techniques used for collaborative learning on mass collaborative learning
H3: There is a significant impact of methods for evaluating quality on mass collaborative learning
H4: There is a significant impact of use of technologies on mass collaborative learning
H5: There is a significant impact of Reliability of co-created knowledge on mass collaborative learning.
H6: Reliability of co-created knowledge significant moderates the association between organisational structure types and mass collaborative learning.
H7: Reliability of co-created knowledge significantly moderates the association between techniques used for collaborative learning and mass collaborative learning.
H8: Reliability of co-created knowledge significantly moderates the association between methods for evaluating quality and mass collaborative learning.
H9: Reliability of co-created knowledge significantly moderates the association between the use of technologies and mass collaborative learning.

5.0 Methodology

According to Queirós et al. (2017), the right use of methods and approaches plays a pivotal role in accomplishing the key research objective, and in ensuring the reliability and authenticity of the overall research outcomes. Therefore, in this study researcher has make sure to make the right use of different approaches and methods to successfully execute this study. Considering the nature of this study, the use of quantitative researcher design has been made. Since, the nature of this study demands more fact based evidence to prove the significance of various success factors of mass collaborative learning, therefore the use of quantitative research design has

been considered as more appropriate for this study. On the other hand, for data collection, researcher has utilized primary sources to collect new and valuable data about the research topic. This helps in maintaining the novelty of the study, and to make an important contribution in the existing body of literature. In this regard, the data has been collected through conducting survey questionnaire from the organisations operating in Jordan.

With regards to the sampling technique, the use of convenience sampling technique has been made in this study. Through this technique, researcher selects the study participants on the basis of easy accessibility and availability of the respondents (Taherdoost, 2016). Moreover, the research instrument used in this study was questionnaire, which was composed of several close-ended questions with 5 point-liker scale, which provides the option from strongly disagree to strongly agree. In data analysis, the Structural Equation Modelling (SEM) has been used in this study, which was carried out through SmartPLS 3.0. As per the study of Sardeshmukh and Vandenberg (2017), SEM technique helps in testing the more complicated models, and in examining the association between different variables. In SEM, researcher has conducted the tests of path assessment to test the association between dependent and independent variables of this study, whereas confirmatory factor analysis has been conducted to test the reliability and validity of the model. In this regard, the test conducted in confirmatory factor analysis include composite reliability, Cronbach's alpha, discriminant validity, factor loading, and average variance extracted (AVE).

6.0 Results

6.1 Confirmatory Factor Analysis

The below-mentioned table 1 present the results of confirmatory factor analysis, which is considered as one of the most important component of SEM, as it helps in ensuring the validity and reliability of the model. In table 1, the results of factor loadings are highlighted to examine the validity of each indicators. According to Marsh et al. (2020), to confirm the validity of all the indicators, the minimum value of factor loading must be 0.6. Hence, all the figures of factor loading presented in table 1 are over 0.6, which means that all the indicators are statistically valid. On the other hand, the reliability of all the variables have been analysed through the measure of measure of Cronbach's alpha and composite reliability. In accordance with the study of Alimudin et al. (2017), the acceptable value for composite reliability and Cronbach's alpha is minimum 0.7. Based on this criteria, all the values outlined in table 1 are found to be over 0.7, which confirms the reliability of all the variables. Moreover, researcher in this study has also examined the convergent validity through Average Variance Extracted (AVE). According to Valentini and Damasio (2016), the most suitable threshold for AVE is 0.5, thus anything above 0.5 is enough to prove the validity of all the latent constructs. As per the results presented in table 1, all the values of AVE are found to be above 0.5, which confirms the validity of all the latent constructs.

Table 1 Confirmatory Factor Analysis

Latent Constructs	Indicators	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Mass Collaborative Learning	MCL1	0.763	0.849	0.898	0.689
	MCL2	0.832			
	MCL3	0.886			
	MCL4	0.835			
Methods for Evaluating Quality	ME1	0.941	0.851	0.930	0.870
	ME2	0.924			
Organisational Structure Types	OST1	0.917	0.834	0.923	0.857
	OST2	0.935			
Reliability of Co-created Knowledge	RCK1	0.844	0.883	0.917	0.735
	RCK2	0.834			
	RCK3	0.870			
	RCK4	0.881			
Techniques used for Collaborative Learning	TUCL1	0.938	0.797	0.846	0.651
	TUCL2	0.693			
	TUCL3	0.769			
Use of Technologies	UT1	0.960	0.791	0.897	0.814
	UT2	0.840			

***: significance at 1%

6.2 Discriminant Validity

Discriminant validity is considered as another important component of CFA, which helps in evaluating whether or not there is singularity among two constructs. According to Ab Hamid et al. (2017), HTMT is one of the most useful method to test discriminant validity whose value is considered to be acceptable if it is below 0.85. In this regard, all the values that are outlined in table 2 are below 0.85, which declares the discriminant validity among different constructs of this study.

Table 2 Discriminant Validity

	Mass Collaborative Learning	Methods for Evaluating Quality	Organisational Structure Types	Reliability of Co-created Knowledge	Techniques used for Collaborative Learning
Methods for Evaluating Quality	0.510				
Organisational Structure Types	0.275	0.451			
Reliability of Co-created Knowledge	0.519	0.334	0.308		
Techniques used for Collaborative Learning	0.335	0.487	0.242	0.136	
Use of Technologies	0.396	0.398	0.501	0.245	0.090

6.3 Model Assessment

The valuespresented in table 3 shows that the variance in all the independent variables and moderating variable including mass collaborative learning, methods for evaluating quality, organisational structure types, techniques used for collaborative learning, use of technologies, and reliability of co-created knowledge explains the 44.2% of variance in mass collaborative learning.

Table 3 Model's Quality

	R Square	R Square Adjusted
Mass Collaborative Learning	0.442	0.427

6.4 Path Assessment

After confirming the validity and reliability of all the variables used in this model, researcher has conducted path assessment to examine the association between all the variables. As per the results of path assessment presented in table 4, variable of methods for evaluating quality is found to have a significant impact on mass collaborative learning [B=162; p-value=0.001< 0.01]. On the other hand, the impact of OST on MCL is found to be insignificant [B=-0.079; p-value=0.138]. Moreover, the impact of TUCL on MCL is found to be significant [B=0.244; p-value=0.000<0.01], while the impact of UT on MCL is also the same [B=0.195; p-value=0.000<0.01]. The findings of path assessment also confirms the significant impact of RCK on MCL [B=0.362; p-value= 0.00<0.01]. On the other hand, with respect to the results of moderating effects, the variable of RCK is found to significantly moderates the association between UT and MCL [B=0.262; p-value= 0.00<0.01]. In contrast, RCK make the significant but negative moderating impact on the association between ME and MCL [B=-0.125; p-value= 0.046<0.05]. However, the moderating effectof RCK is found to be insignificant on all the other associations that have been investigated in this study.

Table 4 Path Assessment

Path	Path Coefficient	T Statistics	P Values
Methods for Evaluating Quality -> Mass Collaborative Learning	0.162***	3.245	0.001
Organisational Structure Types -> Mass Collaborative Learning	-0.079	1.482	0.138
RCK*ME -> Mass Collaborative Learning	-0.125**	1.997	0.046
RCK *OST -> Mass Collaborative Learning	-0.114	1.770	0.077
RCK *TUCL -> Mass Collaborative Learning	0.022	0.349	0.727
RCK*UT-> Mass Collaborative Learning	0.262***	3.976	0.000
Reliability of Co-created Knowledge ->Mass Collaborative Learning	0.362***	7.062	0.000
Techniques used for Collaborative Learning ->Mass Collaborative Learning	0.244***	5.137	0.000

Use of Technologies ->Mass Collaborative Learning	0.195***	3.807	0.000

***: showing significance at 1%; **: showing significance at 5%; * significant at 10%

7.0 Discussion

The core aim of this study was to identify the success factors of mass collaborative learning. For that purpose, the impact of different variables on mass collaborative learning have been examined in this study, which include techniques used for collaborative learning, use of technologies, organisational structure types, and methods for evaluating quality. As per the findings of this study, the significant impact of methods for evaluating quality on mass collaborative learning has been identified. This is also found to be consistent with the study of Nedbal et al. (2013), according to which one of the major concern or ambiguity that revolves around following the mass collaborative learning approach is associated with evaluating the quality of knowledge, as there is no universally accepted tool for evaluating the knowledge quality. Therefore, the methods used for evaluating quality can make the significant influence on mass collaborative learning. On the other hand, the outcomes of this study also confirms the significant impact of techniques used for collaborative learning and use of technologies on mass collaborative learning. This is also validated from the study of Zamiri and Camarinha-Matos (2019), according to which the techniques and technologies that are used in the process of mass collaborative learning have tend to provide clear directions for enhancing the quality level of learning and teaching. In contrast, the results of this study found no significant impact of organisational structure types on mass collaborative learning.

Concerning to the results of moderating variable, the direct impact of RCK is found to be significant on mass collaborative learning. In accordance with the findings of path assessment, the variable of RCK is found to significantly moderate the association between UT and MCL. In contrast, the findings of this study reveals significant but negative moderating effect of RCK on the association between ME and MCL. However, the moderating effect of RCK is found to be insignificant on all the other association that have been examined in this study.

8.0 Conclusion

This study outlines several important factors that can make the positive impact on mass collaborative learning within the organisation. This study also examines the moderating impact of reliability of co-created knowledge on the association between success factors of mass collaborative learning and the effectiveness of mass collaborative learning. The outcomes of this study confirms the significant and positive impact of methods of evaluating quality, use of technologies, and techniques used for collaborative learning on mass collaborative learning. However, there is no significant impact of organisational structure type on mass collaborative learning has been identified in this study. On the other hand, the direct impact of reliability of co-created knowledge on mass collaborative learning is found to be significant and positive. Moreover, as per the findings, the variable of RCK is found to significantly moderate the association between UT and MCL. Moreover, as per the results, RCK makes a significant but negative moderating impact on the association between ME and MCL. However, the moderating effect of RCK is found to be insignificant on all the other associations that have been investigated in this study. Based on the overall findings of this study, projected hypotheses including H2, H3, H4, H5, H8 and H9 are accepted, whereas all the other hypothesis are rejected.

9.0 Recommendations

Based on the overall outcomes of this study, the following recommendations are proposed to the companies operating in Jordan:

- Companies operating in Jordan are advised to design a standard and comprehensive approach to evaluate performance for mass collaborative learning, which promises to embrace wide range of methods related too performance assessment, from conventional to highly unique.
- It has been also been recommended to the companies to must form a proper mechanism for the purpose of assessing the credibility and reliability of co-created knowledge, which will help in ensuring the effectiveness of mass collaborative learning practices within the organisation.
- The companies are also advised to make the right use of techniques that foster the environment for offering collective intelligence. In this regard, some of the useful techniques to make the positive influence on mass collaborative learning can include reciprocal teaching, discussion, collaborative writing, graphical information organising, and problem solving.

10.0 Future Research

This key aim of this research was to identify the success factors and affecting constituents for mass collaborative learning; however, there were some areas that can be improved in future researches to make a valuable contribution in the existing literature. Firstly, the scope of this study has been too broad, as there was no specific industry has been taken to conduct the investigation. Therefore, in future, the same study can be carried

out on any particular industry to provide more precise and accurate results. Moreover, the absence of qualitative data has been another limitation of this study. Hence, the future researchers can consider conducting the same study with mixed research design to provide more conclusive results.

References

1. AB Hamid, M., Sami, W. & Sidek, M. Discriminant validity assessment: Use of Fornell & Larcker criterion versus HTMT criterion. Journal of Physics: Conference Series, 2017. IOP Publishing, 012163.
2. Alimudin, A., Septian, D., Sasono, A. D. & Wulandari, A. 2017. Effect of Spiritual Leadership to Organizational Culture and Employee's Loyalty. *Jurnal Terapan Manajemen Dan Bisnis*, 3**,** 76-86.
3. Andre, J. & Webster, R. Fostering Entrepreneurial and Collaborative Skills in Business Management Students in Vietnam. International Conference on Economics and Business Management, Foreign Trade University, Hanoi, 2017.
4. Ball, Z. 2020. *Intelligent Group Structuring for Mass Collaboration within Engineering Design.* State University of New York at Buffalo.
5. Marsh, H. W., GUO, J., DICKE, T., PARKER, P. D. & CRAVEN, R. G. 2020. Confirmatory factor analysis (CFA), exploratory structural equation modeling (ESEM), and set-ESEM: optimal balance between goodness of fit and parsimony. *Multivariate behavioral research*, 55**,** 102-119, doi.org/10.1080/00273171.2019.1602503.
6. Nedbal, D., Brandtner, P., Auinger, A. & Erskine, M. A. The critical mass in collaborative digital business ecosystems for innovation: A case exploration of readiness and willingness. 2013 7th IEEE International Conference on Digital Ecosystems and Technologies (DEST), 2013. IEEE, 96-101.
7. Nevari, J. (2020). Collaboration matters-A retrospective of three user-centred building projects at Aalto University.
8. Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science,* 5**,** 14-37.
9. Potter, A., Mcclure, M. & Sellers, K. (2010). Mass collaboration problem solving: A new approach to wicked problems. 2010 International symposium on collaborative technologies and systems, IEEE, 398-407.
10. Queirós, A., Faria, D. & Almeida, F. (2017). Strengths and limitations of qualitative and quantitative research methods. *European Journal of Education Studies,Vol 3, No7, pp 369-387* doi.org/10.46827/ejes.v0i0.1017.
11. Sancho, J. (2016). Learning opportunities for mass collaboration projects through learning analytics: A case study. *IEEE Revista Iberoamericana de Tecnologias del Aprendizaje*, Vol 11**,** No 3, pp148-158, doi: 10.1109/RITA.2016.2589482.
12. Sardeshmukh, S. R. & Vandenberg, R. J. (2017). Integrating moderation and mediation: A structural equation modeling approach. *Organizational Research Methods,* 20**,** 721-745, doi.org/10.1177/1094428115621609.
13. Scuotto, V., Del Giudice, M. & Obi Omeihe, K. 2017. SMEs and mass collaborative knowledge management: toward understanding the role of social media networks. *Information Systems Management*, Vol 34**,** No3, pp 280-290, doi.org/10.1080/10580530.2017.1330006 .
14. Sörensson, H. & WU, P. (2019). *Collaborative Learning and Innovation-A Way to Overcome Inertia in Construction*, Master's thesis.
15. Suh, A. & Wagner, C. (2017). How gamification of an enterprise collaboration system increases knowledge contribution: an affordance approach. *Journal of Knowledge Management*, Vol *2, No 2, pp 416-431* doi.org/10.1108/JKM-10-2016-0429.
16. Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. *How to Choose a Sampling Technique for Research (April 10, 2016)*.
17. Valentini, F. & Damasio, B. F. (2016). Average Variance Extracted and Composite Reliability: Reliability Coefficients/Variancia Media Extraida e Confiabilidade Composta: Indicadores de Precisao. *Psicologia: Teoria e Pesquisa*, 32.
18. Zamiri, M. & Camarinha-Matos, L. M. Learning through mass collaboration-issues and challenges. Doctoral Conference on Computing, Electrical and Industrial Systems, 2018. Springer, 3-17.
19. Zamiri, M. & Camarinha-Matos, l. M. (2019). Organizational structure for mass collaboration and learning. Doctoral Conference on Computing, Electrical and Industrial Systems, Springer, 14-23.