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# KNOWLEDGE MANAGEMENT AND ASSESSMENT OF THE ONLINE LEARNING SYSTEM OF ROMANIAN EMERGENCY CALL CENTER EMPLOYEES

Abstract. With the increasing use of technology, online training has become a common learning method. The purpose of this article is to evaluate whether online learning, when compared to traditional learning, can lead to better results of 112 operator in terms of professional performance. The hypothesis was that there were no significant differences between the training process results through online and offline courses. The results obtained showed a greater interest in online training. We analysed the grades obtained when assessing the knowledge of 310 operators between 2017 and 2020, before the COVID-19 pandemic period. We used a paired t-test to determine whether online training affects the knowledge and skill outcome of 112 operators.

**Keywords:** knowledge management; online learning; offline learning; T-test, optimisation techniques; Emergency Call System

JEL Classification: D83, C01, C61, C12

#### 1. Introduction

This paper investigates the relationship between online and offline practices regarding staff training when the organisational environment is procedural, as is the case of the 112 Department, part of the Special Telecommunications Service, an organisation with a military structure that is part of the national defense system. It should be noted that bureaucracies have been considered organisation symbols since the early twentieth century, in which efficiency was achieved through the formal delimitation of tasks and the pre-eminence of vertical exchange, Weber (2002). At the same time, bureaucracies remain a predominant form of organisation today (Greenwood and Lawrence, 2005; Lounsbury and Carberry, 2005), especially in public administration, military organisations, and large corporations.

It is important to note that bureaucracies, defined as systems of government in which most of the important decisions are taken by state officials rather than by elected representatives, have also started to rely more heavily on IT, Perin (1991), Afolalu et al. (2021). Adapting to IT development means that it has become necessary for learning to be done using the online system. In a short time, this type of learning has gained a significant share in the training process, Roman and Plopeanu (2021).

Therefore, it seems particularly appropriate to investigate how inside bureaucracy online practices are related to offline practices, especially when we talk about the staff training process and how these relationships can contribute to the transformation of the bureaucratic organisation over time.

The focus of the research is to find out if in a bureaucratic organisation like the Special Telecommunications Service, there is any difference between online and traditional learning in terms of the efficiency of professional knowledge acquisition.

### 2. Literature Review

Human resources are the most valuable assets for any organisation that wants to achieve knowledge management (KM) goals and improve its performance. Therefore, human resource training, knowledge management, and performance are considered essential for the success of an organisation (Nonaka, 1994; Hess and Bacigalupo, 2010).

From a managerial perspective, a knowledge-based organisation is a company that understands how much the performance of employees depends on what is in their minds and adapts its organisational structure and processes to facilitate the creation of an environment conductive to the acquisition, dissemination, and use of knowledge for the supply of high value-added services (Grant, 1996; Castells and Delamare, 1998).

This time, the focus is on the source of information and knowledge, not the tools used to stimulate their creation or use (Starbuck, 1992). Therefore, a decisive role belongs to the ways in which group cohesion, cooperation, and communication between employees can be increased (organisational structure, leadership style, organisational culture, motivation, and reward, etc.).

We find that, although the ways of defining the concept of "knowledge-based organisations" have evolved significantly in recent years, opinions on their existence are still divided. Thus, some authors consider that these organisations are "companies of the future" (Broughton, 2010), while others argue that any organisation is based on knowledge if its work involves the use of the experience skills, and skills of its employees (Grey and Sturdy, 2009). Proponents of this last view note that most of the knowledge employees possess is influenced by their experiences, just as the learning process depends on the internal complexity of the individual's life experience (Zhan et al., 2020).

Investing in your staff's professional development is vital for team retention to the point that 94% of employees would stay at a company longer if it invested in their career development (Pylväs and Nokelainen, 2022). Replacing talent can cost more than retaining the employees you originally had. Employee training and development is often used interchangeably across sectors and encompasses various employee learning practices. More specifically, training involves programs that enable employees to learn precise skills or knowledge to improve performance (Akram et al., 2018). Development programs involve a more expansive employee growth plan for future performance rather than immediate career role improvement (Bota-Avram et al., 2017).

The benefits of training and development are priceless: leaders can efficiently influence employee performance; skilled workers create job satisfaction, commitment, and retention; workforce improvement and engagement lead to the fulfilment of the organisation's objectives (Butler et al., 2021). Despite the type of training and development, it needs to align with the general trend of future workplace skills, support the company's objectives, and be delivered innovatively.

Training is directly related to the skills, knowledge, and strategies necessary to do a particular job. It can include teaching staff members new skills, exposing them to unfamiliar ideas, giving them the chance to practice and get feedback on techniques or styles of working with people, or simply encouraging them to discuss their work with one another. And it can and should be ongoing throughout a staff member's employment (Huppert et al., 2021).

Knowledge management goes beyond training and development because training and development are not enough, and everyone has their limits. While development is based more on the individual's desires, training is based more on the organisation's needs (Wang and Wu, 2021).

In a world of uncertainty, in which technology, competition or crisis, such as the COVID-19 pandemic, make the environment more turbulent and the need for knowledge is imperative, training often becomes less effective. However, suppose the organisation focuses on employee development. In that case, they might accept uncertainty, but they also might become less able to guide them to the types of knowledge that will count for the future functioning of the organisation. This can lead to frustration and disappointment for employees who are sent to courses but cannot implement or practice what they have learned when they return to their organisations. The result can be a substantial and unnecessary waste of time and resources. Undoubtedly, one of the main advantages of distance learning is the

increased level of flexibility and the fact that many employees can be trained simultaneously (Valizada et al., 2021).

The second considerable advantage is that it offers access to various online resources, such as forums, instant messaging, video conferencing, and virtual courses. These tools mean that employees can experience a sense of community and teaching support like those attending face-to-face courses. In this case, it is essential for employees to be able to interact with a community of employees who study the same course material (Abou-Khalil et al., 2021).

It becomes clear that online learning can range from just a printed course to a fully interactive experience, with knowledge transfer becoming more effective as the learning model consists of a mix of tools such as: printed courses, supportive trainers real-time, online learning community with access to a team of trainers, a mixed interactive learning community accessed by trainers and employees (Caporarello et al., 2021).

The biggest benefit of face-to-face learning is the ability to discuss, collaborate, practice, and play roles, all in real life and under the guidance of a dedicated trainer. Being part of a group and being corrected on the spot are powerful learning tools. Most of all, face-to-face learning is a social event.

Nowadays, there is no better option than online blended learning. It can make the organisation more sustainable and save time and money.

An individual rather than a group also carries out digital learning and therefore presents an opportunity for personalisation. Each employee can use it when they need it and can adapt to the way individuals react. Online items mean that it can be easily reused and revised, not to mention the benefit of easy updates.

#### 3. Materials and Methods

The 112 operators oversee the first reception of emergency calls. In addition to flair, self-control, and distributive attention, the operator must know and apply a wide range of internal regulations and procedures about classification and data gathering: the operator asks what is happening and decides which Emergency Response Organisation should be contacted depending on the information given by the caller. The operator also gathers detailed data about the location and emergency of the caller.

Therefore, the 112-administrator emergency system has the task and duty to ensure the quality of training programs of all operators. Within the 112 departments, there are two main forms of training: the initiation part, the mandatory training which starts after the candidates pass the admission tests, and the compliance training, which extends throughout the entire 112 operator career. Both training programs are important, but the latter has the greatest impact on providing a quality emergency service.

In this regard, the administrator of the Emergency 112 system tried to provide training programs that give them a vocabulary and a way of looking at their work similar to veteran staff, to boost their confidence in their ability to do their jobs, and to shorten the time needed for them to become competent. The main purpose of the

initiation training is to reduce their need to ask other staff for advice or information, by increasing their independence and diminishing the chance that they would make mistakes that could cost the administrator of the emergency 112 system in prestige, citizens' confidence in calling for emergency services or lawsuits.

For veteran staff, training programs help them to become continually more competent at what they do and increase their knowledge of the field by introducing them to the latest regulations on emergency calls, complex cases, mistakes made, and good practices learned and expose them to new ideas which ultimately may improve their own effectiveness and that of the 112-emergency system. Another purpose of compliance training is to keep them from becoming bored and stale, and to maintain interest in and enthusiasm for their work.

In-depth knowledge of the working procedures of all 112 operators, regardless of their experience, is imperative to provide efficient and operational assistance to those who call the 112-emergency number.

The Special Telecommunications Service, as administrator of the 112 system, has learning centers dedicated to the training of 112 operators at a national level, and there is a training department consisting of staff members with the right background and experience in the field of taking emergency calls, completely dedicated to the professional training activities of 112 operators.

In short, the administrator of the 112 system is constantly concerned with providing continuing education programs for all staff, being aware that this leads to increasing organisational efficiency, and keeps it growing. Considering that the 112 operators work countrywide, to ensure a continuous flow of professional training, a mix of online and offline courses is used.

Between 2017 and 2020, the specialised Department of Vocational Training provided both initial training and continuing education programs to 112 operators, nationwide data shown in Table 1.

**Table 1. Data collection** 

Item	2017	2018	2019	2020
Number of programs	3	11	11	16
Initiation	1	7	6	8
Training	2	4	5	8
Number of participants	47	164	939	647
Initiation	4	80	787	176
Training	43	84	152	471

Source: National database www.ins.ro

From the beginning, in different proportions, the professional training of 112 operators has been done both online and physically, in a face-to-face (F2F) environment, as we can see in Figure 1.

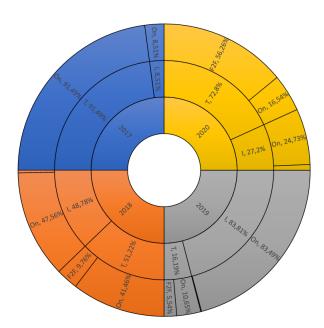


Figure 1. Type of trained operators nation-wide in 2017-2020

Note: I – Initiation program; T – Training program; On – Online program; F2F – Physically program (face-to-face).

Source: Data processing

Within the 112 department, the success of a training program is measured through the scores at the final exam following the training program and, subsequently, by monitoring the way operators apply the knowledge acquired in their daily activities.

As we did not know the answer to the question: "What is the best option for my organisation: online training or offline training?" and which option is better, we analysed the results of offline and online training programs, measured by grades at the final examination. This study is scientific, and has a scientific character, given that the research universe is 569 operators. The validity of the sample and the reliability of the research tools are essential conditions in the research methods in the field of social sciences. In this study, the probability theory or the central limit theorem was used to test the validity of the sample size. The central limit theorem indicates that "obtaining large samples (usually sample size> 30) from any sample, the sample mean will follow an approximately normal distribution" (Kvanli et al.,1989; Owen, 2001).

The calculation of the sample size for this research is done according to the formula:

$$n = (z)^{2} *p*(1-p) / d^{2},$$
(1)

where: n = sample number> 30; z = level of confidence according to the standard normal distribution (for a level of confidence of 95%, z = 1.96, for a level of confidence of 99%, z = 2.575); p = estimated proportion of the population that presents the characteristic (when unknown we use p = 0.5); d - tolerated margin of error.

A sample of 310 participants (operators) was used to substantiate the study. The results from the sample of operators have a margin of error of  $\pm 3.7\%$ , guaranteed with a probability of 95%.

#### 4. Results

The results of the analyses carried out around key competencies necessary for 112 operators indicated the need to develop communication skills, both in the direction of increasing communication skills and reducing emotional vulnerability and stress management. These involve practicing concrete ways to relax, adaptable to the workplace (active relaxation, controlled breathing methods, and mindfulness), and assertiveness training (effective communication), namely to refuse, to ask for help, to delegate, to negotiate diplomatically and exploring how each participant organises and manages their time.

In this sense, during the pandemic period, with the involvement of the psychology department staff, but also by collaborating with an external provider, in 2020, several 112 operators were trained in communication management, stress, and post-traumatic stress disorder, as well as discrimination and racism.

To measure the performance of 112 operators, we have compared their performance by considering their assessment results at the final evaluation, measured by grade, under two conditions: face-to-face (F2F) and online course performance, between 2017 and 2019 (Table 2).

The difference between the conditions was not so obvious; in these circumstances, using a t-test helped us to decide whether the difference between the conditions was real or whether it was due merely to chance fluctuations.

**Table 2. Data interpretation** 

Item	Number of operators with Very Good assessment at the final evaluation of F2F compliance training	Number of operators with Very Good assessment at the final evaluation of online compliance trainings	Difference, D
1HY of 2017	279	289	-10
2HY of 2017	259	262	-3
1HY of 2018	255	254	1
2HY of 2018	239	241	-2
1HY of 2019	282	288	-6
2HY of 2019	255	265	-10

 $\Sigma D = -30$ 

Source: Data processing

The t-test enabled us to decide whether the mean of F2F courses is different from the mean of online courses in terms of performance (Table 3).

Given that the same subjects (310 operators) have participated in both conditions of the experiment, we used "matched pairs" or "repeated measures" t-test. This test aims to determine whether there is statistical evidence that the mean difference between the paired observations is significantly different from zero.

P(T<=t) two-tail is 0,040859404. Since the p-value is less than our alpha, 0.05, we reject the null hypothesis that there is no significant difference in the means of each sample.

A short-structured questionnaire was used for a survey to determine and validate the operators' perception of the training system and its impact on professional activity. The researchers used an unlikely sampling technique, which involves choosing a sample of people who show availability and agree to answer the survey questions.

The basis of the questionnaire consisted of seven elements of impact on professional training, especially in the online system. A total of 100 questionnaires were distributed to the operators.

Table 3. T-test results

t-Test: Paired Two Sample for Means	Number of operators with Very Good assessment in the final evaluation of F2F compliance training	Number of operators with Very Good assessment in the final evaluation of online compliance training						
Mean	261,5	266,5						
Variance	264,7	359,5						
Observations	6	6						
Pearson Correlation	0,979319286							
Hypothesized Mean Difference	0							
df	5							
t Stat	-2,738612788							
P(T<=t) one-tail	0,020429702							
t Critical one-tail	2,015048373							
P(T<=t) two-tail	0,040859404							
t Critical two-tail	2,570581836							

Source: Author's results

Respondents were asked to classify their opinions and attitudes according to a Likert scale: 1 = very low effect, 2 = low effect, 3 = neutral effect, 4 = strong effect, and 5 = very strong effect, for each item. The five-point scale was chosen to extend the respondents' answers, determining each representative item's weighting. This approach calculates the Relative Importance Index (RII) and determines the rank of impact factors on the online training system. RII was used for analysis due to its proper function in this research. RII value range is from 0 to 1 and was calculated in Table 4. The aggregate overall index is the average of individual relative importance indexes for the specific elements indicated.

**Table 4. General presentation of impact results** 

Item	Evaluation					Total	Stand.	Weight	RII	Rank
	5	4	3	2	1	Total	Dev. (S)	Weight	KII	Kank
Career prospects	45	43	5	4	3	100	21,93171	423	0,846	4
Work efficiency	55	40	2	1	2	100	25,66125	445	0,890	2
Ability to learn online	63	33	2	2	0	100	27,68574	457	0,914	1
Interest in training programs	44	44	10	1	1	100	22,21486	429	0,858	3
Obligation to participate	10	24	42	9	15	100	13,6565	305	0,610	7
The novelty of knowledge	8	67	22	1	2	100	27,57716	378	0,756	6
Ability to learn F2F	27	57	14	2	0	100	23,33452	409	0,818	5

Source: Author's results

The results of this study place "Ability to learn online" in the first position with RII = 0.914 in the respondents' options. Access to information technologies is agreed upon by respondents, perhaps in terms of the particularity of work. Knowledge transfer is much easier, work efficiency increases (rank 2) and interest in training programs increases (rank 3).

We performed correlation tests to understand the association between all these indicators. The Pearson correlation coefficients computed with Excel between the five accessible issues analysed are presented in Table 5.

Therefore, we found a positive strength (values between 0,5 up to 1.0) for the following variables: Interest in training programs with Career prospects (0,939231); Interest in training programs with the Ability to learn online (0,722483); Career prospects with the Ability to learn online (0,721851). The possibility of participating in online training sessions has led to an increase in operators' interest for them, and, in the long run, they will be able to advance in their careers.

**Table 5. Pearson Correlation Results** 

Item	Career prospects	Work efficiency	Ability to learn online	Interest in training programs	Obligation to participate	The novelty of know-ledge	Ability to learn F2F
Career prospects	1						
Work efficiency	0,10657	1					
Ability to learn online	0,721851	0,149412	1				
Interest in training programs	0,939231	-0,03494	0,722483	1			
Obligation to participate	0,415643	-0,0368	0,394461	0,38042	1		
The novelty of knowledge	0,358548	0,49205	0,293253	0,178445	0,11501	1	
Ability to learn F2F	0,55177	-0,07482	0,336551	0,481748	0,383866	0,172506	1

Source: Author's results

The results are now different and consistent regarding the correlation between the qualitative indicators. We do find some medium correlation between the turnover and relevance and verifiability. However, the highest correlation is found between the qualitative characteristics that suggest the fact that it influence each other in a great way.

In conclusion, there is a difference between the scores obtained by our sample of operators. Thus, we can consider that the number of operators who followed the online version of the compliance training program exceeds the number of operators who followed the traditional compliance training version, considering the good marks on the final exam of the evaluation.

## 5. Conclusions

This paper investigates the role of human resource training in the successful goals of knowledge management and organisational performance, through the relationship between online and offline practices. In terms of knowledge acquisition,

for a long period of time, the professional training of 112 operators was carried out using both forms of training.

The results indicate that online training of human resources is related to better assessment. This conclusion can substantiate the approach to continue and intensify the training of this category of employees through online programs. Another practical benefit of this study is the fact that it helps to reach organisational purposes (through a better understanding of the elements that are involved).

Compliance training will continue to be done mainly online or, where possible, through a mix of online and offline. In contrast, the initial training of new employees will traditionally be done in specialised training centers.

It is desirable that the application of their knowledge management practices is not made out of inertia, based on empirical and intuitive principles. We believe that knowledge management is necessary to ensure a high degree of completeness and depth in knowledge management practices and to address all critical factors that may arise, which may be the subject of future research.

Therefore, the future approach that will target the post-pandemic period will consider the development of training in the form of a mix of F2F and online, to benefit from the advantages of each form of training.

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