

Obstacles facing agricultural employees in implementing digital leadership skills in the Nineveh Agriculture Directorate

Moetaz Mahmoud Mohamed¹ Wisam Yako Aziz Masso²

¹ University of Mosul / College of Agriculture and Forestry / Department of Agricultural Extension and Technology Transfer, Iraq

² University of Mosul / College of Agriculture and Forestry / Department of Agricultural Extension and Technology Transfer, Iraq

* Corresponding author E-mail: Moetaz.24agp41@student.uomosul.edu.iq

Received (17/03/2026), Received in revised form (02/06/2026)

Accepted (04/08/2026), Available online (30/09/2026)

FJIAS 2026, 2(3): 70-83

ABSTRACT. *In the context of deepening the role of digital leadership within organizations, it is not limited to employing modern technologies alone, but extends to fostering a culture of innovation, experimentation, and continuous learning within the workplace, in addition to encouraging virtual communication and collaboration across social networks and various digital platforms however, the study aimed to identifying the obstacle facing agricultural employees while applying digital leadership skills in agricultural extension work, The research population in this study consisted of the total number of employees in the Mosul Agriculture Directorate and its affiliated agricultural departments, which totaled (310), Then the sample was extracted using Stephen's Law, and thus the research sample was (180) representing (60%) of the general community, A questionnaire was designed to measure the level of application of digital leadership skills by agricultural workers in agricultural extension work in the Nineveh Agriculture Directorate, and the obstacle facing agricultural employees while applying digital leadership skills in agricultural extension work, The results indicate a gap between the possession of digital knowledge and its actual application in field work, especially with regard to benefiting from the outputs of modern technologies in developing agricultural extension performance. the study recommended that the Directorate of Agriculture should take advantage of the widespread use of social media among agricultural employees to develop effective communication channels with farmers and regulate its use to serve the extension process.*

Keywords: agricultural, workplace, implementing.

1. INTRODUCTION

Communication technologies have opened new avenues for agricultural research and extension, particularly in developing countries, where the use of these technologies is seen as a complement to rather than a substitute for traditional extension systems [9].

The widespread use of the Internet and computers, along with the rapid development of communication technologies, has contributed to the development of guidance work and the creation of a communication environment that is compatible with the requirements of the current stage,[1].

in addition to providing broad communication channels that serve the agricultural sector. This also helped disseminate emerging knowledge and ideas, enhance farmers' opportunities to view and apply agricultural research results, and enable them to communicate their problems to relevant authorities to find appropriate solutions, thus contributing to improving the standard of living in rural areas [2].

In the context of this rapid development, modern concepts have emerged that reflect transformations in the field of management and leadership, the most prominent of which is the concept of digital leadership, which is a direct response to the requirements of the digital age [3].

This leadership style is based on employing advanced digital technologies, such as artificial intelligence, big data analysis, and predictive and behavioral analysis, to improve administrative processes and support strategic decision-making [4].

Based on this, the concept of digital leadership is one of the contemporary trends in management thought, as it refers to the ability of leaders to invest digital technologies and modern means of communication in directing institutional work and achieving organizational goals more efficiently [5].

This leadership is characterized by its reliance on information systems and electronic platforms to manage operations and make decisions based on accurate and reliable data. It also plays a role in enhancing effective communication channels between various organizational levels by facilitating the rapid and efficient exchange of information [5].

Within the framework of guidance and knowledge transfer programs, the importance of digital leadership is highlighted in employing modern means of communication to disseminate information and guidance to beneficiaries more quickly and effectively, which supports the achievement of development goals in various sectors [6].

In the context of deepening the role of digital leadership within organizations, it is not limited to employing modern technologies alone, but extends to fostering a culture of innovation, experimentation, and continuous learning within the workplace, [7].

in addition to encouraging virtual communication and collaboration across social networks and various digital platforms. The role of digital leadership is also clearly evident in organizing communication processes and coordinating knowledge transfer between experts and farmers through the use of advanced digital tools [2].

Digital leaders possess the ability to design interactive guidance programs based on analyzing agricultural data and providing information appropriate to the specific characteristics of each agricultural region, based on its climatic conditions, soil nature, and crop types. In addition, digital leadership contributes to developing methods for evaluating the effectiveness of agricultural extension and monitoring farmers' performance after implementing recommendations, which enhances the impact of these programs in improving productivity and achieving sustainable agricultural development [8].

Complementing this complementary role, digital leadership contributes to strengthening communication links between various stakeholders involved in agricultural extension, including researchers, farmers, government agencies, and non-governmental organizations. The use of digital technologies enables rapid and accurate information transfer, with the ability to continuously monitor results and analyze data to support scientific decision-making. Thus, agricultural extension becomes an integral part of the digital leadership system that combines scientific knowledge, practical experience, and modern technology, contributing to achieving sustainable agricultural development goals and raising the efficiency of agricultural production. [9] Despite these advantages, implementing digital leadership in organizations, especially in the agricultural sector, still faces a number of challenges. Digital leadership provides broad opportunities to improve work efficiency and enhance the achievement of corporate goals, in addition to its role in supporting communication, cooperation, and developing innovation among employees. However, a technical and administrative gap emerges between the ambitions of digital transformation in agricultural extension and the practical reality that still relies heavily on traditional methods. Despite the availability of modern technologies, there is a weakness in the presence of digital leadership capable of formulating a clear strategic vision to transform guidance work

Research objectives

1 - Arranging the items in the areas of digital leadership skills (digital transformation, technical skill, digital citizenship, adapting to technological changes.) According to its relative importance

2- Identifying the problems facing agricultural employees while applying digital leadership skills in agricultural extension work.

2. MATERIALS AND METHODS

1- Research community and sample

The research population in this study consisted of the total number of employees in the Mosul Agriculture Directorate and its affiliated agricultural departments, which totaled (310) employees in the city center, and in the agricultural departments, which numbered (30) departments, (30) researchers were excluded from the total population using the random sampling method for the purpose of exploratory sampling procedures to conduct stabilization, and thus the population size became (280). Then the sample was extracted using Stephen's Law, and thus the research sample was (180) representing (60%) of the general community, and the research sample of agricultural workers was distributed as shown in the table below according to the Nineveh Agriculture Directorate and its agricultural departments, the number of which reached (170) respondents.

2-Research questioner

To achieve the research objectives, the researcher prepared a questionnaire consisting of two parts: Part One: The study sample questionnaire included a set of personal, social and job variables for agricultural employees in Nineveh and its affiliated agricultural departments, namely (age, gender, specialization, length of job service and academic qualification)

Part Two: A questionnaire was designed to measure the level of application of digital leadership skills by agricultural workers in agricultural extension work in the Nineveh Agriculture Directorate, which contains four areas to measure the level of application of digital leadership, namely (digital transformation, technical skill, digital citizenship, adaptation to technological changes). These areas were taken from previous research and studies to develop the phrases and elements of the model. In addition to relying on previous research and studies, paragraphs were modified and reformulated, and some other paragraphs were added to suit this study by the other researcher. Thus, the scale in its initial form consisted of (60) paragraphs for the four fields, as it included four fields :Digital transformation, technical skills, digital citizenship, adaptation to technological changes.

Part three: The respondents were asked an open-ended question in which they identified the obstacles they face while applying digital leadership skills in agricultural extension work.

Reliability and validity

To study expert honesty or (apparent honesty), we did the following: The questionnaire form was distributed after its initial design consisting of (60) items to a sample of experts, namely a number of teachers in the Department of Agricultural Guidance and Technology Transfer at the College of Agriculture and Forestry and the College of Administration and Economics at the University of Mosul. To determine the validity of the paragraphs and measures regarding stability and finding stability in this study, it was applied to the survey sample which amounted to (30) which was randomly selected by the Ministry of Agriculture and the Department of Agriculture in

Mosul And its agricultural sections, if the researcher used the questionnaire to collect data, he found stability using the Cronbach's alpha equation method, which reached its value for the first domain (digital conversion) (0.831), the second domain (technical skill) (0.871), the third domain (digital citizenship) (0.953), and the fourth domain (adaptation to technological changes) (0.881), while the value of the total stability coefficient reached (88.25) This is a very good value for conducting the current study.

3. RESULTS AND DISCUSSION

Arrange the items in the application-level areas of digital leadership skills (digital transformation skills, technical skills, digital citizenship, and adaptation to technological changes). According to its relative importance

The first area: digital transformation: The paragraphs of the field of digital transformation, one of the fields of digital leadership skills, were arranged according to their relative importance. Table No. (1) shows that the paragraph that ranked first (I take information security and privacy into account when dealing with digital tools in my work) with an arithmetic mean of 3.8 and a percentage weight of 76.1. This indicates that most of the respondents agreed that this paragraph is the most important and practiced compared to the rest of the paragraphs in the questionnaire In this field, the reason for this may be that security awareness is one of the most important things that the employee must pay attention to during work, perhaps due to the sensitivity of agricultural data and its protectors, such as electronic risks.

The paragraph that ranked last in the ranking of paragraphs in the field of digital transformation is (I use the results of digital solutions technologies adopted in the agricultural department in my work) with an arithmetic mean of 3.3 and a standard deviation of 66.0. The reason for this may be that agricultural employees do not actually use the results of these technologies in their daily work, perhaps due to the difficulty of integrating them into the job.

Table (1) shows the sequence of paragraphs in the field of digital transformation skills according to their relative importance to agricultural employees in the Nineveh Agriculture Directorate and its affiliated agricultural divisions

Level	Percentage weight	Weighted arithmetic mean	Digital transformation skill paragraphs	Sequence in Questionnaire
3.5	70.58	3.529	Develop a clear program plan for implementing digital transformation technologies in agricultural extension work	1
7	69.30	3.465	Use modern tools and techniques to keep pace with the introduction of technology into extension work with farmers	2

14	67.18	3.359	I participate with senior management in making decisions to embrace digital transformation in my work	3
9	68.82	3.441	Contribute to attending training courses and workshops related to digital transformation and modern technology	4
3.5	70.58	3.529	Use modern technological tools and applications to improve communication with farmers and speed up the delivery of information	5
10	68.58	3.429	Present ideas for developing the digital aspects of the department, especially with regard to learning modern electronic programs at work	6
13	67.30	3.365	Suggest solutions to address the problems that arise during the implementation of digital transformation technologies in my business	7
6	69.42	3.471	I follow up on the results of the digital performance evaluation after introducing any new technology into my job	8
5	70.00	3.50	Make sure to include stakeholders (such as farmers and official authorities) in the stages of implementing digital transformation	9
12	67.76	3.388	Rely on digital data to guide decisions related to agricultural activities	10
15	66.00	3.300	I use the results of digital solution technologies adopted in the agricultural department in my work	11
1	76.12	3.806	I consider information security and privacy when dealing with digital tools in my work	12
2	70.70	3.535	Use digital technologies to speed up the completion of guidance and administrative tasks	13
8	69.06	3.453	Work on entering agricultural data electronically into digital databases	14
11	68.00	3.400	Use digital transformation techniques to prepare reports and monitor work indicators	15

Second area: technical skill:

The paragraphs of the technical skill field, one of the areas of digital leadership skills, were arranged in terms of their relative importance using the weighted arithmetic average and percentage weight. Table No. (2) shows that the paragraph that ranked first (using the computer in preparing reports and data related to work within the department) with an arithmetic average of

4.0 and a percentage weight of 80.9. This indicates that the skill of using the computer to prepare daily reports is the basic pillar of daily work, in addition to the ease of Computer use and its spread among workers in the agricultural sector within the department. The paragraph that ranked last in the ranking of paragraphs in the field of digital transformation is (engage in maintenance and operation courses for digital devices used in agriculture, such as (smart irrigation systems, Precision agriculture software and computers)) with an arithmetic mean of 3.0 and a standard deviation of 60.9. The reason for this for agricultural employees may be that this skill is not basic compared to other skills in their daily work, as well as due to the weak analytical experience of some workers or the need for specialized training in the field of modern irrigation systems and the use of precision and modern agriculture software. In general, the results reflect a positive trend among workers towards using technical skills and digital technologies in agricultural extension work

Table (2) shows the sequence of items in the field of technical skills according to their relative importance to agricultural employees in the Nineveh Agriculture Directorate and its affiliated agricultural divisions

Level	Percentage weight	Weighted arithmetic mean	Technical skill paragraphs	Sequence in Questionnaire
1	80.94	4.047	Using computers to prepare reports and data related to work within Department	1
2	75.06	3.753	Use electronic programs to learn about the latest progress in agricultural technology	2
3	74.58	3.729	I deal with electronic databases to accurately enter agricultural data, especially those related to agriculture	3
11	64.70	3.235	Participate in electronic meetings or video calls to communicate with agricultural guides from other regions and with farmers	4
6	69.06	3.453	I use digital correspondence and email while working	5
12	62.12	3.106	Work on analyzing digital data to measure the results of agricultural extension projects implemented by	6
10	65.06	3.253	Use digital design software such as: power point, Canova (Because it plays a role in easily transferring information to farmers	7
13	60.94	3.047	Engage in maintenance and operation courses for digital devices used in agriculture such as (smart irrigation systems, precision agriculture software and computers)	8
5	69.88	3.494	Rely on social media networks to increase the dissemination of up-to-date information and increase agricultural awareness for farmers	9
9	66.48	3.324	Use interactive electronic platforms to assess farmers' needs and use feedback with them	10

8	67.42	3.371	Work on using the platforms and websites provided by the Ministry of Agriculture to perform guidance and work tasks	11
7	68.82	3.441	I follow modern agricultural technical developments and make sure to apply them in my field of work	12
4	73.76	3.688	I work on using desktop computer programs to prepare agricultural reports and data	13

The third area: digital citizenship

The paragraphs of the field of digital citizenship, one of the fields of digital leadership, were arranged in terms of their relative importance using the weighted arithmetic average and percentage weight. Table No. (3) shows that the paragraph that ranked first (avoid sharing unreliable agricultural news or information by publishing it at work) with an arithmetic average of 3.6 and a percentage weight of 72.5. The reason for this may be that most agricultural employees take into account their professional responsibility not to share unreliable news in addition to their commitment to reputation and credibility and to avoiding misinformation in the news to protect the work from the circulation of false information. This indicates the existence of an acceptable awareness among the respondents of the importance of adhering to safe digital behavior and adapting to the requirements of the modern digital environment in agricultural extension work.

The paragraph that ranked last in the ranking of paragraphs in the field of digital transformation is (Work to encourage the team in implementing policies related to digital leadership to ensure sustainable impact and achieve the desired goals) with an arithmetic mean of 3.1 and a standard deviation of 63.4. The reason for this may be that most agricultural employees do not have sufficient powers and organizational authority to encourage the team, and implementing the digital leadership policy is characterized by difficulty and challenge compared to other routine procedural tasks.

Table (3) shows the sequence of paragraphs in the field of digital citizenship skills according to their relative importance to agricultural employees in the Nineveh Agriculture Directorate and its affiliated agricultural divisions

Level	Percentage weight	Weighted arithmetic mean	Paragraphs in the field of digital citizenship	Sequence in Questionnaire
5	68.24	3.412	Work in line with the new digital leadership strategy	1
13	64.00	3.200	I participate in decisions that build future visions for expected developments in the digital agricultural sector	2
6	68.12	3.406	Make sure to follow global developments in the field of agricultural digital transformation	3

			and work to implement them in a way that suits my practical reality	
10	66.40	3.320	Make sure to take into account farmers' future needs when providing agricultural extension services through digital programs	4
14	63.52	3.176	Use future technological tools (such as artificial intelligence and smart connected systems) to develop the efficiency of my agricultural extension work	5
15	63.42	3.166	Encourage the team in implementing digital leadership policies to ensure sustainable impact and achieve desired goals	6
4	69.88	3.494	I respect the intellectual property rights of all digital applications used in my business	7
2	71.06	3.553	I work to take into account my work plans in line with digital transformation and adapting to future developments and current developments	8
7.5	67.42	3.371	Coordinate my daily activities in line with a future strategy for my digital business	9
11.5	65.52	3.276	I develop my digital citizenship in my work despite the challenges of the times	10
11.5	65.52	3.276	I work to have equal opportunities with my colleagues to learn digital tools	11
7.5	67.42	3.371	I build future decisions in my business based on accurate digital reports and data	12
9	66.94	3.347	I participate in spreading safe digital culture among my colleagues at work	13
3	70.24	3.512	Consider the privacy of agricultural information and do not publish it without official permission	14
1	72.58	3.629	Avoid sharing unreliable agricultural news or information by publishing it at work	15

Fourth area: Adapting to technological changes

The paragraphs of the field of adaptation to technological changes, one of the areas of digital leadership, were arranged in terms of their relative importance using the weighted arithmetic average and percentage weight. Table No. (4) shows that the paragraph that ranked first (priority was given to learning and experimenting with modern agricultural technology when it was issued) with an arithmetic average of 3.9 and a percentage weight of 78.2. The reason for this may be that most agricultural employees realize that the agricultural sector is witnessing rapid technological developments, so It is necessary to learn this technology in order to survive and give everything new to the farmer to increase production and productivity. The paragraph that ranked last in the ranking of paragraphs in the field of digital transformation is (I periodically review my capabilities

to keep pace with technical developments, especially agricultural ones, and I benefit from them in my current work) with an arithmetic mean of 3.4 and a standard deviation of 69.3. The reason for this may be that most agricultural employees believe that their current experience is sufficient to manage the work assigned to them and they do not feel the urgent need for periodic review except when a crisis occurs at work.

Table (4) shows the sequence of paragraphs in the field of skill of adapting to technological changes according to its relative importance to agricultural employees in the Nineveh Agriculture Directorate and its affiliated agricultural divisions

Level	Percentage weight	Weighted arithmetic mean	Paragraphs of adaptation to technological changes	Sequence in Questionnaire
1	78.24	3.912	Prioritize learning and experimenting with modern agricultural technology when it is released	1
4	74.48	3.724	I deal openly with technological updates in the work environment, especially those that increase my technical knowledge	2
6.5	73.30	3.665	I am reconsidering the arrangement of methods and implementation tasks to suit the changes of new technologies in my work	3
6.5	73.30	3.665	I share my technical knowledge with colleagues to facilitate the adaptation process to new digital systems	4
9	72.48	3.624	I constantly follow the latest information related to agricultural extension, digital agriculture and the Internet of Things	5
12	69.76	3.488	I do not hesitate to use modern digital technologies in my work, despite the difficulty of using them from the beginning	6
13	69.64	3.482	I use feedback to develop my technical skills and updates because they impact my learning of the latest	7
10	70.94	3.547	Look at technological change as a way to advance my business, especially new ideas related to agricultural extension	8
11	70.48	3.524	Relying on digital means in the event of new and sudden technical challenges arising in my field of work	9

14	69.30	3.465	I periodically review my ability to keep pace with technical developments, especially agricultural ones, and I benefit from them in my current work	10
3	74.58	3.729	I easily adapt to updates to the software and electronic systems I use in my work	11
5	73.64	3.682	I constantly follow updates in the field of agricultural technology	12
2	75.52	3.776	I believe that the use of technology is necessary to develop the performance of agricultural extension work	13
8	72.94	3.647	Find new learning resources on modern agricultural technology	14

Obstacles facing agricultural employees in applying digital leadership skills in the Nineveh Agriculture Directorate and its agricultural divisions

Table No. (25) shows that the obstacle that came first in the ranking of obstacles to implementing digital leadership skills for agricultural employees in the Nineveh Agriculture Directorate and its affiliated agricultural divisions was the obstacle (weakness of the technological infrastructure in agricultural institutions, Especially the weakness of the Internet) as 123 respondents agreed that this obstacle is one of the main obstacles in applying digital leadership skills with an average arithmetic of 0.72 and a percentage weight of 72.35 delegations. The reason for this may be that digital transformation and applying digital leadership skills cannot be achieved in isolation from the existence of an integrated physical and technical environment; The Nineveh Agriculture Directorate and its affiliated agricultural divisions face tangible challenges related to the obsolescence of computer hardware and equipment, as well as general weakness and constant interruptions in the Internet, especially in agricultural divisions located in districts, sub-districts, and remote areas outside the center of the governorate. This lack of infrastructure is a major stumbling block that thwarts the efforts of employees and leaders. No matter how much desire or motivation they have for digital development, the absence of basic means and tools (such as a stable and fast Internet) prevents them from activating electronic platforms, exchanging data, and completing transactions flexibly, which made this technical obstacle rank first in the eyes of the study sample

In second place came an obstacle (the lack of specialized training courses in the field of digital leadership and the use of modern technologies in agricultural extension work). 112 respondents agreed that this obstacle is one of the main obstacles in applying digital leadership skills in agricultural extension work, with an arithmetic average of 0.66 and a percentage weight of 56.88. The reason for this may be the shift towards "digital leadership." The use of modern technology in agricultural extension requires special skills not available with traditional expertise. Therefore, the absence of training courses leaves employees without the cognitive cover to keep pace with developments. Desire for change versus poor support: Pointing this barrier second means that

employees have awareness of the importance of digital, but lack the "corporate qualification and training" that would enable them to apply these skills practically

Table No. (25) shows the obstacles facing agricultural employees in the Nineveh Agriculture Directorate and its agricultural divisions in applying digital leadership skills

Percentage weight	arithmetic mean	Iterations	Obstacles facing agricultural employees in applying digital leadership skills	sequence
72.35	0.72	123	Weak technological infrastructure in agricultural enterprises, especially weak Internet.	1
65.88	0.66	112	Lack of specialized training courses in the field of digital leadership and the use of modern technologies in agricultural extension work.	2
64.71	0.65	110	Weak technical skills among some agricultural employees and their lack of sufficient experience in using digital applications and programs.	3
64.12	0.64	109	Resistance of some workers to change and reliance on traditional methods of performing agricultural extension work.	4
58.24	0.58	99	Lack of administrative and institutional support to adopt digital transformation and apply digital leadership skills within agricultural institutions.	5
57.06	0.57	97	Limited financial allocations necessary to provide modern technologies and maintain electronic devices and software.	6
55.88	0.56	95	Excessive job burdens and administrative tasks reduce employees' opportunities to develop digital skills.	7
53.53	0.54	91	Weak electronic coordination and exchange of digital information between different departments and administrative units..	8
52.53	0.52	89	Issues related to cybersecurity and data protection, which may limit the widespread use of digital technologies.	9
50.00	0.50	85	Weak awareness of the importance of digital leadership and its role in improving the efficiency of agricultural extension work and developing services provided to farmers.	10

4. CONCLUSION

1.The results showed a variation in the levels of application of digital leadership areas, with technical skill areas and digital transformation emerging at relatively high levels, while the area of adaptation to technological changes was within the intermediate level, indicating a need to enhance the ability to respond to rapid technical developments .

2.The field of adaptation to technological changes ranked first in terms of relative importance, which reflects the awareness of workers in the agricultural sector in Nineveh of the nature of the transformations witnessed by extension work and the necessity of keeping pace with them .

3. The results of the paragraph analysis showed that aspects related to the direct use of technologies (such as computer reporting and consideration of information security) receive greater attention, while aspects related to the use of digital systems outputs in decision-making are still below the required level .

4.The results indicate a gap between the possession of digital knowledge and its actual application in field work, especially with regard to benefiting from the outputs of modern technologies in developing agricultural extension performance .

5.It can be concluded that the reality of digital leadership in the Nineveh Agriculture Directorate represents a transitional phase towards digital transformation, where the basic components are available, but achieving integration requires more institutional support and continuous training .

CONFLICT OF INTEREST

None of the authors will claim a conflict of interest.

REFERENCE

- [1] Al-Obaidi, Muhammad Jassim. (2021). Modern technologies and their role in developing the agricultural sector. Baghdad: Dar Al-Yazuri Scientific, p. 210.
- [2] Abdel Wahed, Ahmed Mohamed. (2015). Communications technology and its role in developing agricultural extension. Tikrit University Journal of Agricultural Sciences, 15(2), 13-22.
- [3] Al-Ani, Saadoun Hamid. (2021). Digital leadership and its role in developing institutional performance. Journal of Administrative Sciences, 17(1), 1-12.
- [4] Avolio, B. J., Kahai, S., & Dodge, G. E. (2000). E-leadership: Implications for theory, research, and practice. The Leadership Quarterly, 11(4), 615–668.
- [5] Al-Samarrai, Mahmoud Abdel Karim. (2022). Digital leadership in light of contemporary technological transformation. Journal of Management and Economics, 11(3), 30-39.

- [6] Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., & Buckley, N. (2015). *Strategy, not technology, drives digital transformation: Becoming a digitally mature enterprise*. MIT Sloan Management Review and Deloitte University Press.
- [7] Al-Taie, Mazen Jabbar. (2018). Electronic agricultural guidance and its role in transferring agricultural technology. Mosul: University of Mosul, College of Agriculture and Forestry, p. 96.
- [8] swanson, B. E., & Rajalahti, R. (2010). *Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing, Transforming, and Evaluating Extension Systems*. World Bank.
- [9] kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., & Buckley, N. (2015). *Strategy, Not Technology, Drives Digital Transformation*. MIT Sloan Management Review and Deloitte University Press.
- [10] Al-Jubouri, Ali Hussein. (2020). Agricultural extension programs and their role in disseminating agricultural innovations. Iraqi Journal of Agricultural Sciences, 51(4), 41-45.
- [11] Abdel Wahed, Mohamed. (2015). Electronic agricultural extension and rural development. Cairo: Dar Al Fikr. p. 6.