Technology Leadership of Administrators as Perceived by Faculty Members in Gathering Stars Digital Economics in Haikou University of Economics

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Abstract

The objectives of this research were 1) to study the technology leadership of administrators and 2) to compare the perception of faculty members classified by gender, work experience, and majors. The sample consisted of 100 faculty members, according to majors. The research instrument was a questionnaire with a validity (IOC values) between .67-1.00 and a reliability value of .98. The data were statistically analyzed by using percentage, mean, standard deviation, t-test, One-way ANOVA, and LSD.

The results of the research were as follows: 1) the technology leadership of administrators was considered at a high level in overall and particular aspects, ranking from the highest to the lowest mean: Connected Learner, followed by Equity and Citizenship Advocate; Visionary Planner; Empowering, and Systems Designer, and 2) the perception of faculty members classified by gender were not different, but the perception of the differential work experience was statistical significance at level .05 and .01, that 1-5 years and 6-10 years was higher than more than 10 years. The differential major was statistical significance at level .05, that Human Resource Management (HR) is higher than Marketing overall and aspect with .05 and .01 in Equity and Citizenship Advocate, while HR is higher than Logistics and Quality Management Engineering in overall and aspect with .05; HR is higher than E-commerce in Equity and Citizenship Advocate, Systems Designer, Total with .05 and .01.

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Introduction

In the 21st century, the world is changing rapidly, and the new challenge of globalization is to enter the Internet of everything into a society known as the "digital age". Compared with the past, technology and information acquisition is simple and fast, and more and more electronic devices are being made, invented and used. Technology is also changing the way we produce, live and learn, and is profoundly influencing our educational philosophy, methods and trends. Over the past decade, rampant changes have been obvious in the way leaders administer and manage technology use in schools (Machado & Chung, 2015). Advanced technologies in IR 4.0, like Artificial Intelligence and the Internet of Things, are changing the role of school leadership, approaches to teaching, and remodeling of classrooms (Hinton, 2018). Schwab and Davis (2018) believe that the rapid development of technology, especially in Industrial Revolution 4.0 (IR 4.0), is clearly affecting all aspects of our lives, including the leadership and educational environments around the world. As a college leader must have the matching technology leadership in order to lead the development of the college better.

Technology leadership is one of the emerging forms of leadership style in the educational environment lately. Like other leadership styles, technology leadership focuses more on organizational management and administration methods based on the use of ICT. To classify this, Esplin et al. (2018) stated that technology leadership is a leader's role in planning, giving instructions and encouraging employees to perform tasks based on technology integration. Technology leadership can inject improved competencies of employees so that they can elevate organizational achievement to a higher level (Shyr, 2017). Based on current needs, skills and knowledge of technology leadership are essential indicators for a school principal in leading the organization towards change in the Industrial Revolution 4.0 (Raman & Thannimalai, 2019).

Gathering Stars Digital Economics College is a college founded together by Haikou University of Economics and Gathering Stars Digital Super media company. It is

an elite full-time undergraduate education digital economy college in China. In line with the development of the digital wave of the economy and the digital transformation of enterprises, the college cultivates comprehensive talents with international vision, international competition and cooperation ability, cross-cultural communication ability, and innovation and entrepreneurship ability in order to meet the talent needs of the global digital economy. However, In the 2023 review and evaluation report of Haikou University of Economics, it was pointed out that there are currently several outstanding problems in teaching management under the background of technology: 1. Most traditional professional faculty member lacks the use of digital technology transformation knowledge and skills 2. Managers cannot fully understand the development potential of digital technology for institutions and lack vision. And 3. Managers need channels for faculty members' technical abilities and are unable to effectively use technical means to participate in teaching activities in the daily teaching process (Haikou University of Economics, 2023). Therefore, leaders should emphasize technology, as administrators must have specific technology leadership abilities in order to manage the organization's personnel development and education procedures effectively; according to ISTE (International Society for Technology in Education) Standards for Administrators (2018) stated that technology leadership serves an important part for encouraging innovation, dealing with digital transformations, and increasing the use of technology to achieve goals for organizations in a constantly changing and expanding environment. ISTE (International Society for Technology in Education) creates standards for technology in international education by working for school administrators, bringing technology leadership standards in education under 5 components:1) Equity and Citizenship Advocate - leaders use technology to ensure access to skilled teachers who actively use technology to meet student learning needs, access to technology and connectivity necessary to participate in authentic and engaging learning opportunities, 2)Visionary Planner -leaders engage others in establishing a vision, strategic plan and ongoing evaluation cycle for transforming learning with technology, 3) Empowering Leader - leaders create a culture where teachers and learners are empowered to use technology in innovative ways to enrich teaching and learning, 4) Systems Designer-leaders build teams and systems to

implement, sustain and continually improve the use of technology to support learning, and 5) Connected Learner - leaders model and promote continuous professional learning for teachers.

Therefore, researchers are interested in studying leadership. Technology leadership is essential to its success. The study's findings will help administrators at Gathering Stars Digital Economics College at Haikou University of Economics promote technology leadership more appropriately and effectively. Consequently, managers must enhance their leadership and leadership style in this situation.

Research Objectives

1. To study the technology leadership of administrators as perceived by the faculty members in Gathering Stars Digital Economics College in Haikou University of Economics.

2. To compare the perception of faculty members on the technology leadership of administrators in Gathering Stars Digital Economics College in Haikou University of Economics classified by gender, work experience, and majors.

Research Hypothesis

The perception of faculty members in Gathering Stars Digital Economics College in Haikou University of Economics on the technology leadership of administrators classified by gender, work experience, and majors were different.

Research Methodology

This research is descriptive in the form of Survey Research (Survey Research).

1. Population and sample

The total population is 100 faculty members in Gathering Stars Digital Economics College at Haikou University of Economics.

The sample consists of 80 faculty members. The researcher used stratified random sampling according to majors, following Krejcie and Morgan's table (1970) to determine the sample size for a given population (Krejcie and Morgan, 1970, as cited in Petchroj, 2019) and selected by simple random sampling.

2. Making tools and inspecting tool quality

2.1 Study theories, research, and concepts concerning technology leadership International Society for Technology in Education, International Society for Technology in Education, ISTE Standards for Education Leaders, accessed January 1, 2024, available from https://www.iste.org/standards/for-education-leaders.

2.2 Study methods for constructing a competency scale of the technology leadership of administrators in Gathering Stars Digital Economics College in Haikou University of Economics.

2.3 Create the questionnaire about the technology leadership of administrators in Gathering Stars Digital Economics College at Haikou University of Economics. It is a questionnaire according to the actual conditions based on the 5-point Likert scale.

2.4 The questionnaire about the technology leadership of administrators as perceived by faculty members in Gathering Stars Digital Economics College in Haikou University of Economics was modified and collected. It was interpreted based on the scoring criteria and interpretation—three experts to examine its validity (Content Validity) in order to make improvements. The IOC or (Index of Item-Objective Congruence) value of this thesis is between .67-1.0, which is higher than .50 the IOC Value based on the IOC criteria.

2.5 Improve and revise the questionnaire according to the advice of experts. Then, present it to the supervising teacher. The thesis is checked again before being put to trial.

2.6 Use the questionnaire to check the accuracy (Reliability) of the questionnaire by using the questionnaire to try (Try-Out) 30 teachers who have similar characteristics to the sample group but are not the sample group, using the criterion of accuracy for the entire issue not less than .70, this edition has a value The accuracy of the entire edition is .98

2.7 Improve, edit and publish it as an actual questionnaire for further use in collecting data with the sample group.

3. Data collection

3.1 Request a document from the Education Program on Educational Administration, Rajapruk University, to Gathering Stars Economics College in Haikou University of Economics to ask for support and cooperation in the data collection.

3.2 The researcher sent the document to Gathering Stars Economics College at Haikou University of Economics to request and ask for support in data collection.

3.3 Check the completeness of 80 faculty members' questionnaires and analyze the statistical data using a computer program.

4. Data analysis and statistics

4.1 Analyze the personal status data of respondents. By distributing Frequency (Frequency) and Percentage (Percentage)

4.2 Analyze the technology leadership of administrators as perceived by faculty members in Gathering Stars Digital Economics College in Haikou University of Economics by finding the mean ($\overline{\mathbf{X}}$) and standard deviation (S.D.).

4.3 Analysis of data comparing faculty members' perceived by technology leadership of administrators under the Gathering Stars Digital Economics College in Haikou University of Economics classified by personal status Analyzed by t-test. Used to analyze data with 2 groups of primary variables: gender. Moreover, test the hypothesis. One-way ANOVA was used to compare the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics and classified by work experience and majors to conduct hypothesis testing and compare the pairwise means using LSD (least significant difference).

Results

Analysis Results of the technology leadership of administrators, as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics according to research objectives, were as follows.

1. Table 1 and Table 2 show the technology leadership of administrators as

perceived by the faculty members in Gathering Stars Digital Economics College at Haikou University of Economics.

Table 1 The results of the mean, standard deviation, level, and ranking on the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics.

(n=80)

Item	Technology leadership	$\overline{X}$	S.D.	Level	Ranking
1.	Equity and Citizenship Advocate	4.27	.49	High	2
2.	Visionary Planner	4.27	.56	High	3
3.	Empowering Leader	4.27	.57	High	4
4.	Systems Designer	4.26	.57	High	5
5.	Connected Learner	4.31	.53	High	1
	Total	4.28	.51	High	

From Table 1, it found that the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics was considered at the high level ($\overline{X}$=4.28, S.D.=.51) in overall, when considering in each aspects, all aspects were at a high level, ranking from the highest to the lowest mean: Connected Learner ($\overline{X}$=4.31 S.D.=.53), followed by; Equity and Citizenship Advocate; Visionary Planner; Empowering, and Systems Designer.

Table 2 Comparison of the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics classified by gender.

(n=80)

Aspect	Technology Leadership	Gender				t	p-valve
		Male		Female			
		$\overline{X}$	S.D.	$\overline{X}$	S.D.		
1.	Equity and Citizenship Advocate	4.28	.45	4.26	.51	.14	.89
2.	Visionary Planner	4.17	.55	4.33	.56	-1.20	.24

Table 2 (Cont.)

Aspect	Technology Leadership	Gender				t	p-valve
		Male		Female			
		$\overline{X}$	S.D.	$\overline{X}$	S.D.		
3.	Empowering Leader	4.16	.56	4.32	.58	-1.16	.25
4.	Systems Designer	4.16	.52	4.30	.59	-1.00	.32
5.	Connected Learner	4.23	.49	4.35	.54	-.93	.36
	Total	**4.20**	**.48**	**4.31**	**.52**	**-.92**	**.36**

From Table 2, it found that the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College of Haikou University of Economics by gender have no significant difference.

2. Tables 3 and 4 compare the perceptions of faculty members on the technology leadership of administrators in Gathering Stars Digital Economics College in Haikou University of Economics classified by gender, work experience, and majors.

Table 3 Means and standard deviations of the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics by work experience.

(n=80)

Aspect	Technology Leadership	Work experience						F	P-Value
		1-5 years		6-10 years		More than 10 years			
		$\overline{X}$	S.D.	$\overline{X}$	S.D.	$\overline{X}$	S.D.		
1.	Equity and Citizenship Advocate	4.36	.44	4.46	.50	3.91	.33	11.17**	.00

Table 3 (Cont.)

| Aspect | Technology Leadership | Work experience | | | | | | F | P-Value |
| | | 1-5 years | | 6-10 years | | More than 10 years | | | |
		$\overline{X}$	S.D.	$\overline{X}$	S.D.	$\overline{X}$	S.D.		
2.	Visionary Planner	4.46	.55	4.43	.54	3.86	.34	11.47**	.00
3.	Empowering Leader	4.42	.52	4.43	.61	3.88	.39	8.94**	.00
4.	Systems Designer	4.36	.59	4.46	.57	3.86	.34	9.46**	.00
5.	Connected Learner	4.44	.51	4.46	.58	3.96	.25	8.55**	.00
	Total	4.41	.47	4.45	.53	3.90	.26	11.63**	.00

*Statistically significant at level .05

**Statistically significant at level .01

From Table 3, it found that the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics classified by work experience, in overall the highest mean was with work experience of 6-10 years ($\overline{X}$=4.45, S.D.=.53), followed by 1-5 years and more than 10 years. classified by work experience was statistical significance at level .05 and .01. They would test with LSD in pair.

Table 4 Means and standard deviations of the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics by major.

(n=80)

Item	Technology Leadership	Major								F	P-Value
		Marketing		Human Resources Management (HR)		E-commerce		Logistics and Quality Management Engineering			
		$\overline{\text{X}}$	S.D.	$\overline{\text{X}}$	S.D.	$\overline{\text{X}}$	S.D.	$\overline{\text{X}}$	S.D.		
1.	Equity and Citizenship Advocate	4.27	.50	4.52	.46	4.07	.44	4.18	.46	3.65*	.02
2.	Visionary Planner	4.07	.47	4.54	.44	4.23	.64	4.19	.60	3.00*	.04
3.	Empowering Leader	4.08	.55	4.55	.42	4.31	.50	4.16	.63	3.01*	.04
4.	Systems Designer	4.06	.57	4.55	.47	4.14	.56	4.18	.60	3.39*	.02
5.	Connected Learner	4.08	.51	4.55	.47	4.30	.56	4.25	.50	3.12*	.03
	Total	4.10	.48	4.54	.44	4.19	.50	4.18	.52	3.55*	.02

*Statistically significant at level .05

From Table 4, it found that the technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics classified by major, in overall the highest mean was with work experience of Human Resources Management ($\overline{\text{X}}$=4.54, S.D.=.44), followed by E-commerce, Logistics and Quality Management Engineering, and Marketing. Classified by major was statistical significance at level .05. They would test with LSD in pair.

Discussion

According to the data analysis and the summary of the research findings, the technology leadership of administrators as perceived by faculty members at Gathering Stars Digital Economics College in Haikou University of Economics was at a high level. The following were the discussions based on the results of technology leadership:

1. The technology leadership was at a high level. It might be that the faculty members of the Gathering Stars Digital Economics College at the Haikou University of Economics believe that high-level technology leadership can help organizations cope with the challenges of technological transformation, encourage and encourage teachers to learn new technologies and use them to meet students ' classroom teaching needs. At the same time, it can enhance teachers ' innovative thinking and abilities, thereby achieving the common growth of teachers and organizations. Chamchoi (2018) identified that administrators with technology leadership possess the expertise to utilize technology effectively in order to enhance both learning and management. Our goal is to promote the use of technology by teachers and staff to satisfy the specific environmental conditions and educational needs of students in managing and delivering education. Promote and inspire teachers and learners to have a strong sense of assurance in utilizing technology, optimize its potential, and comprehend media and technology as the research of Li and Miao (2020) studied on "The Structural Dimensions of Enterprise Digital Leadership and Its Impact". Based on a grounded theoretical study of interviews with 58 Chinese business leaders, this paper builds a conceptual model of the structural dimensions of corporate digital leadership and its effects. It uses leadership and high-level theories to interpret the model. The research results show that corporate digital leadership is composed of five strategic dimensions: digital strategic thinking, digital environment control, digital organizational change, digital talent development, and digital communication and socialization. Corporate digital leadership affects industrial environment innovation and technology at a macro level, influences organizational performance and development by acting on organizational innovation at the organizational level, and affects employee innovation capabilities and performance at the individual level. Business managers must deeply understand the connotation characteristics of corporate digital leadership

so as to develop their leadership and ultimately effectively transform digital leadership to improve organizational performance.

2. According to the comparative analysis of the perception of faculty members on the technology leadership classified by gender overall had no significant difference, it might be that the faculty members of the Gathering Stars Digital Economics College in Haikou University of Economics believe that technology leadership was mainly about various abilities such as technical ability, decision-making ability, and team collaboration. It was no gender attribute, and people pay more attention to the actual abilities and contributions of leaders rather than gender identity. Regardless of gender, as long as they have appropriate skills and qualities, they have the potential to become excellent technical leaders. While faculty members in the technology leadership classified by work experience overall had significant differences, 1-5 years and 6-10 years higher than more than 10 years. Technology leadership is an emerging leadership that has emerged in the rapidly developing digital age. In less than 10 years, faculty members have a higher level of understanding and acceptance of technology. Compared to older faculty members, young faculty members have stronger learning abilities and can quickly grasp technological advantages and apply them in the teaching process. At the same time, with the acceleration of organizational digital transformation, the demand for technological leadership in the future workplace continues to increase. By recognizing and pursuing technological leadership, young faculty members can better adapt to the needs and development trends of the future workplace. Finally, faculty members on the technology leadership classified by major had significance difference, Human Resources is higher than Marketing in overall and aspect with .05 and .01 in Equity and Citizenship Advocate; while Human Resources is higher than Logistics and Quality Management Engineering in overall, and aspect with .05; moreover, Human Resources is higher than E-commerce in Equity and Citizenship Advocate, Systems Designer, Total with .05 and .01. It might be compared to other majors, Human Resource Management is a more traditional profession, and some faculty members focus more on traditional Human Resource Management functions such as recruitment, training, performance management, etc., while emerging technologies have not been fully integrated into their knowledge system;

However, some faculty members may actively follow the forefront of technology, believing that technological innovation is the future trend of Human Resource Management and an important driving force for professional development. Therefore, this will inevitably lead to a significant cognitive bias among Human Resource Management faculty members towards technological leadership. The other three majors are all emerging majors, and the three industries themselves are highly technology intensive. Therefore, as faculty members of emerging majors, they pay more attention to learning and using technology in their daily teaching process, actively cultivate innovative consciousness, and integrate new technologies into classroom teaching and research work. In summary, faculty members majoring in Human Resource Management have a greater deviation in their understanding of technology leadership compared to the other three majors.

Recommendation

Based on the review of related literature, knowledge and ideas of experts, results of technology leadership of administrators as perceived by faculty members of Gathering Stars Digital Economics College in Haikou University of Economics. The researcher has suggestions as a guideline for technology leadership as follows:

1. Equity and Citizenship Advocate: The item "Equity and Citizenship Advocate" had the lowest mean: administrators have the model of digital citizenship by critically evaluating online resources. Administrators should first clarify the evaluation criteria, confirm whether the evaluation resources come from reliable and authoritative experts or institutions, check whether the information in the resources is accurate, and ensure the timeliness and objectivity of the resources; Secondly, when validating resources, multiple sources of information should be compared to verify their consistency and accuracy, evaluate the depth, breadth, and clarity of the resources, and conduct in-depth analysis; Finally, regular training on digital literacy should be provided to faculty members to enable them to evaluate online resources critically. Administrators themselves should become exemplary Equity and citizens, encourage faculty members to share experiences and insights and create a good learning atmosphere.

2. Visionary Planner: The item of "Visionary Planner" was the lowest mean:

administrators engage others in establishing a vision and strategic plan for transforming technology Learning. Administrators should establish open and transparent communication channels, clarify vision and goals, set up regular communication meetings to ensure smooth information flow, provide training and learning plans to help faculty members master new technologies, methods, and thinking, improve their innovation ability, give faculty members autonomy in decision-making within an appropriate scope, allow them to participate in the decision-making process, stimulate their sense of responsibility and enthusiasm, and finally establish a reward mechanism to reward and publicly recognize teachers who propose innovative ideas and make positive contributions. At the same time, establish an effective feedback mechanism to timely collect opinions and suggestions from team members.

3. Empowering Leader: The item "Empowering Leader" had the lowest mean: Administrators assist faculty members in utilizing technology to enhance learning and address varied cultural and social-emotional requirements of students. Administrators should provide technical support and training, promote diverse teaching resources, encourage faculty members to use network technology to collect and organize diverse teaching resources to meet the diverse cultural needs of students, establish an effective communication platform between faculty members and students, support faculty members to use social media, instant messaging tools. to maintain communication with students, not limited to academic issues, but also including communication in daily life, emotions, and other aspects, and timely discover and solve students' social and emotional problems; Finally, faculty members can be encouraged to innovate teaching and evaluation methods, use technological tools to collect and analyze students' learning data and provide data support for teaching decisions.

4. Systems Designer: The item "Systems Designer" had the lowest mean: Administrators have a critical role in promoting and facilitating the successful integration of technology in classrooms. Administrators should collaborate with teachers to establish goals for technology integration; provide necessary technical training for teachers, including skills in software usage, equipment operation, troubleshooting, to ensure that they can proficiently master and flexibly apply

technical tools; Encourage teachers to update their teaching concepts, focus on cultivating students' innovative thinking and practical abilities, and guide teachers to recognize the auxiliary role of technology in teaching; Actively building and improving the technological infrastructure of the school, purchasing or developing software and resources suitable for teaching needs.

      5. Connected Learner: The item of "Connected Learner" was the lowest mean: administrators participate regularly in online professional learning networks to collaboratively learn with and mentor other professionals. Administrators should clearly define learning objectives, including desired skills, knowledge areas, or industry trends, choose appropriate online courses, seminars, etc. (such as MOOC, Coursera) based on the objectives, utilize social media, online forums, or professional community platforms, collaborate with other professionals to undertake projects or tasks, and encourage faculty members to guide and provide feedback to each other; As a administrators, one can pass on their learning outcomes and insights to team faculty members through internal training, workshops, or online sharing, and provide personalized guidance and support based on the different needs of team faculty members.

References

Chamchoi, S. (2018). *School management in digital era*. Chulalongkorn University Press.

Esplin, N. L., Stewart, C., Thurston, T. N., & Martin, T. (2018). Technology leadership perceptions of Utah elementary school principals. *Journal of Research on Technology in Education*, *50*(4), 243–257. https://doi.org/10.1080/15391523. 2018.1490936

Haikou University of Economics. (2023). *Annual review and evaluation report 2023*.

Hinton, S. (2018, October 19). *How the fourth industrial revolution is impacting the future of work*. Forbes. https://www.forbes.com/sites/theyec/2018/10/19/ how-the-fourth-industrial-revolution-is-impacting-the-future-of-work

Petchroj, L. (2019). *Statistics for research and techniques for using SPSS* (3rd revised ed.). Charoendee Mankong.

Li, Y., & Miao, L. (2020). The structural dimensions of enterprise digital leadership and its impact: A study of grounded theory in the Chinese context. *Journal of Wuhan University of Science and Technology*, *42*(6), 125–136. https://doi.org/10.14086/j.cnki.wujss.2020.06.013

Machado, C. J., & Chung, C. S. (2015). The role of technical leadership in achieving strategic goals. *Journal of Technology Management, 10(2)*, 45-62. https://doi.org/10.1016/j.jtechman.2015.01.002.

Raman, A., & Thannimalai, R. (2019). Importance of technology leadership for technology integration: Gender and professional development perspective**.** *SAGE Open, 9*(4), 1-13. https://doi.org/10.1177/2158244019893707.

Schwab, K., & Davis, N. (2018). *Shaping the Fourth Industrial Revolution* (1st ed.). Crown Publishing Group.

Shyr, W. J. (2017). The relationship between technology leadership and teacher ICT competency in junior high schools. *Journal of Educational Technology & Society*, *20*(2), 220–230.