SAJAAS

Southeast Asian Journal of Agriculture and Allied Sciences

Volume 3 Issue 1

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Montalbo, Christian Jorge E.[1], Banes, Charlene A.[2], Roberto, John Paul B.[3], Estrella, Ruby Ann C.[4], and Dela Cruz, Sonny E.[5]

[1-5] Institute of Management, Bulacan Agricultural State College

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Abstract

This research evaluates the faculty members of Bulacan Agricultural State College's degree of readiness for the Fourth Industrial Revolution (FIRe) through assessment of their knowledge and competencies. Descriptive method was used to determine the demographic profile, knowledge profile, competency, and readiness of the faculty. Correlation was used to analyze the relationship between level of knowledge and competencies with the readiness of the respondents with FIRe. The findings revealed that most of the respondents are female in their prime working age (25-54 years old) with less than 5 years of experience in teaching. Moreover, they have moderate knowledge on FIRe technologies because some of them are typically owned and used technologies by the respondents that were elevated during the Covid-19 pandemic. The links between knowledge, competences, and readiness were investigated using regression and correlation analysis. Knowledge levels and readiness were shown to be strongly positively correlated, suggesting that as faculty members' knowledge grows, and so does their readiness for FIRe. Furthermore, there were favorable relationships found between preparedness and competencies, including technological, pedagogical, content, and their combinations. These findings highlight the significance of ongoing training and support to improve knowledge and competencies and help to understand the current status of faculty preparedness with FIRe technology. The research offers valuable perspectives for academic establishments seeking to harmonize their faculty development initiatives with the requirements of the Fourth Industrial Revolution.

Keywords: *competencies, faculty, fourth industrial revolution, readiness, technology*

Introduction

The Fourth Industrial Revolution (FIRe), characterized by the synthesis of technologies throughout physical, digital, and biological domains, is converting the way we live, work, and interact. As this revolution unfolds, it becomes increasingly vital for higher educational institutions to ensure that their faculty members are adequately prepared to navigate the challenges and opportunities presented by this quickly evolving landscape.

Educational institutions like Bulacan Agricultural State College (BASC) must prepare because they are people-oriented enterprises, and part of their current employees' functions will be replaced by fourth industrial revolution machinery. Furthermore, and perhaps more importantly, educational institutions train and prepare the future workforce for all industries, and if the aforementioned graduates are not equipped with the necessary minimum skills for the fourth industrial revolution, this could be disastrous, resulting in more displacements as a result of the mantra of no-matching-skills or displacement. AI, blockchain, new computational technologies (such as smarter computers), virtual

[1-5] Institute of Management, Bulacan Agricultural State College

reality, biotechnology that harnesses cellular and bi-molecular processes, robotics, 3D printing, innovative materials, social media, and the internet of things are just a few of the technologies that are driving the fourth industrial revolution (Ujakpa et al., 2020).

Li et al. (2023) stated that the elements of the FIRe such as Internet of Things (IoT), Cloud Technology, big data and Augmented Reality must be integrated in the teaching and learning process. In addition, the integration of FIRe relies on the knowledge, skill and attitude of the lecturers. As mentioned by Kadir et al. (2020), a well-versed lecturer is needed to look forward to the needs of the fourth industrial revolution. However, the underlying problem is that the principle behind the changes and their responsibilities to apply it to the teaching and learning process is the crucial problem faced by the lecturers (Li et al, 2023).

Readiness has been described by Popov & Puchkova (2015) as meaningful learning which resulted from the level of preparedness for a specific task. The Bulacan Agricultural State College as a higher education institution that promotes quality and excellent education must be preparing the teaching force that is responsible for shaping and developing the future workforce.

This research explored the challenges and barriers faculty members face in embracing the FIRe. Identification of these obstacles will enable us to develop targeted interventions and support mechanisms to facilitate their transition to this new educational paradigm. The findings of this study will have important implications for higher educational institutions, policymakers, and faculty development programs. By understanding the present state of faculty readiness, institutions can design effective training programs to equip their faculty members with the necessary skills and knowledge to effectively integrate emerging technologies into their teaching practices. Eventually, this will ensure that students are adequately prepared to thrive in the FIRe and contribute to the future workforce. The main objective of the study was to determine the readiness of BASC faculty for FIRe. Specifically, this aimed to 1. describe the demographic profile of the faculty members of BASC; 2. assess the respondents' level of knowledge of FIRe technologies and processes; 3. assess the level of competencies of the respondents; 4. analyze the readiness of the respondents on FIRe;5. analyze the relationship of the level of knowledge and competencies with the readiness of the faculty members of the College towards FIRe technologies; 6. And to analyze the relationship of different competencies to readiness of faculties to FIRe.

The research pursued to shed light on the readiness of faculty members of BASC for FIRe and provide valuable insights for educational institutions. By addressing the constraints and barriers met by faculty members, we can foster an environment that encourages innovation and prepares students for the demands of the future.

Materials and Methods

The research employed a descriptive correlational approach to obtain the needed data in the demographic profile, knowledge level, competency, and readiness of the faculty members of Bulacan Agricultural State College. Correlation was performed to analyze if there is a relationship between the demographic profile and the readiness of the respondents towards FIRe. And to analyze the relationship of different competencies to readiness of faculties to FIRe.

This study used stratified random sampling to select the respondents of the study. The sample size used was extracted using the Slovins' formula. The respondents of the study were faculty members selected from the different institutes of Bulacan Agricultural State College. The researchers coordinated with the Human Resource Department to get the list of teaching personnel employed in the College.

Survey questionnaires were used to primarily gather the data for the study through online surveys. It is divided into four parts, one, the demographic profile of the respondents, two, the level of their knowledge; three, the competencies and fourth, readiness on the fourth industrial revolution. The knowledge level on FIRe of the questionnaire was adapted from the study of Ujakpa et al. (2020), competencies from Layco (2022) and the FIRe readiness from the study of Hecklau et al. (2017)

The gathered data were collected, summarized, tabulated, and analyzed using Statistical Package for the Social Sciences (SPSS). Means, frequency, and percentage were employed to analyze the demographic profile, while Pearson's Product Moment Correlation (Pearson's r) was used to determine the relationship between the level of knowledge on FIRe and the readiness of the respondents.

Results and Discussion

Socio-Demographic Profile

The age, sex and years of experience distribution of the respondents who participated in the study is shown in Table 1 above. Out of the 80 respondents, 63 or 79% came from the ages 25 to 54. This result shows that the majority of the faculty members are in their prime working age. Moreover, the majority or 61.25% of them are female. This result implies that the teaching force of the College is dominated by females. As to the years of experience, 47.5% have been teaching for less than 5 years. This shows that the workforce in teaching is still young.

Table 1.

Socio-Demographic Profile of the Respondents of the study

Socio-demographic Profile	Freq*	%
Age		
24 years old and below	10	12.50
25-54 years old	63	78.80
55-64 years old	6	7.50
No response	1	1.30
Sex		
Male	31	38.75
Female	49	61.25
Years of experience		
4 years and below	38	47.50
5 years to 15 years	26	32.50
16 years to 25 years	7	8.75
26 years to 35 years	4	5.00
36 years and above	3	3.75
No response	2	2.50

**n=80*

Knowledge level on FIRe Technologies

Results showed that in terms of the knowledge on FIRe technologies, the respondents have a moderate knowledge (mean =3.01; SD=0.85) on FIRe this was possibly due to the COVID-19 pandemic where they were able to adapt to technologies for teaching. The findings also showed that they are highly knowledgeable in authentication and fraud detection (mean=4.08; SD=0.99) and a relatively low knowledge level towards detection technologies as they were unfamiliar with it (mean=2.55; SD=0.99). However, in the study of Kadir et. al (2020), this got the lowest level of knowledge.

Table 2.

Knowledge level on FIRe Technologies.

Statement	Mean	SD	Verbal Interpretation
Fourth industrial revolution	2.90	0.99	Moderate
Cloud Computing	3.26	1.05	High
Internet of things (IoT).	2.90	1.18	Moderate
Augmented Reality	3.20	1.16	Moderate
Big Data	2.95	1.23	Moderate
Mobile devices	3.25	1.14	Moderate
Detection technologies	2.55	1.00	Low
Advance human-machine interface.	2.84	1.13	Moderate
Authentication and fraud detection	4.08	0.99	High
3D printing	2.91	1.18	Moderate
Smart sensors	2.96	1.24	Moderate
Multilevel customer interaction and customer profiling.	2.88	1.16	Moderate
Grand mean	**3.01**	**0.85**	**Moderate**

Competencies towards FIRe

In terms of technological competence, the respondents were competent on FIRe technologies (mean 4.20; SD=0.55212) and strongly competent in using software tools (mean=4.51; SD=0.677) in teaching, which was improved thru seminars and workshops attended. However, installing and uninstalling software programs, as well as creating and archiving documents got the lowest mean verbally interpreted as competent that is due to verification requirements. Dutta and Nessa (2022) revealed that college teachers possess basic knowledge in computer hardware, operating systems, software, devices, file management, storage, digital cameras, scanners, video conferencing, e-resources, and group messaging.

Table 3.

Summary of Competencies

Competency	Grand Mean	SD	Verbal Interpretation
Technological Competence	4.20	0.55	Competent
Pedagogical Competence	4.36	0.46	Strongly Competent
Content Competence	3.90	0.79	Competent
Technological-Content Competence	4.04	0.85	Competent
Pedagogical-Content Competence	4.20	0.77	Competent
Technological-Pedagogical Competence	3.92	0.54	Competent

The study reveals that respondents are strongly competent in all pedagogical competence indicators (mean=4.36; SD=0.46)., with the highest mean being the assessment of students' performance (mean=4.54; SD=0.573). Teachers adapt techniques and approaches to students' knowledge and abilities, assisting their cognitive aspects. However, some respondents are also strongly competent in familiarizing and solving common student understandings (mean=4.25; SD=0.63). This high level of competence was also observed in the study conducted in Central Luzon relating to the readiness of Mathematics teachers (Layco, 2022).

It was found that the faculty are competent on their content competence (mean=3.90; SD=0.79). It was also observed that they possessed sufficient knowledge on various fields of the course which got the highest mean (mean=4.10; SD=0.76). However, being a content expert had the lowest mean (mean=3.69; SD=0.84, suggesting a need for deep understanding and flexibility to help students create cognitive maps and address misconceptions. According to Indira, et al. (2019), teachers must be proficient in navigating technological advancements, and efforts must be made to enhance their competency from recruitment to teaching students appropriate thinking and perspectives.

As to the Technological-Content Competency of the BASC Faculty, the study reveals that BASC faculty possess technological-content competencies, enhancing their effectiveness as lecturers. The highest mean (mean=4.44; SD=0.85) was browsing learning materials and e-journals with a verbal interpretation of strongly competent, while the lowest was creating interactive video content with a verbal interpretation of competent. It is not sufficient to merely insert technology, for as Roblyer and Doering (2014) stated, universities must ensure all adjunct faculty members are technologically trained to meet the needs of a technologically savvy generation of learners, not just incorporating technology.

The study reveals that as to Pedagogical-Content Competency, effective teaching approaches guide students' thinking and learning, providing strong training for economic growth and development. Respondents are competent with their pedagogical content, with a mean score of 4.20. In terms of Technological-Pedagogical Competency, it can be observed that university faculties can effectively utilize social media platforms like Facebook, Twitter, and Instagram for both educational and personal purposes, with a mean score of 4.21 (SD=0.807). Overall, the respondents are strongly competent in use of technological advancement to deliver competitive knowledge to the students with a computed mean of 3.921 and a standard deviation of 0.54.

As per the readiness of the faculty towards FIRe, it showed that they are prepared to integrate FIRe technologies in their classrooms (mean=3.91; SD=0.88) and allow students to be creative using blended learning, a modality adapted to Covid-19 changes (mean=4.19; SD=0.748). However, the lowest mean was recorded for augmented reality usage (mean=3.68; SD=0.88, contrasting with a study of Razak, et.al., (2018), indicating Arab teachers are not yet ready for such technologies.

Readiness of the Respondents towards FIRe

Based on the result shown in Table 4, the faculty members of BASC that they are *ready* to integrate the FIRe technologies in their classrooms (mean=3.91; SD=0.88). Furthermore, they are also *ready* to allow students to be creative using blended learning modality in class which got the highest mean (mean=4.19; SD=0.748). Blended learning is one of the modalities adapted by the College to adapt to the changes brought by Covid-19 in delivering education. In contrast, the lowest mean was recorded with the usage of augmented reality in teaching that was verbally interpreted as *ready* (mean=3.68; SD=0.88). This result is different from the study of Razak, et al., (2018) wherein it was found that Arab teachers are not yet ready in using technologies but this is limited to English language.

Table 4.

Readiness of the Respondents towards FIRe.

Statement	Mean	SD	Verbal Interpretation
1. I am ready to use virtual reality as an object of learning in my instruction of the subjects.	3.70	0.88	Ready
2. I am ready to transform my traditional learning environment into a virtual environment.	3.83	0.91	Ready
3. I am ready to utilize augmented realities in teaching my subjects.	3.68	0.88	Ready
4. I am ready to apply artificial intelligence in teaching my subjects.	3.43	1.00	Ready
5. I am ready to create and design interactive systems in my discussions.	3.70	0.93	Ready
6. I am ready to maximize the use of mobile technology in my instruction of the subjects.	4.15	0.80	Ready
7. I am ready to enable students to be creative in their learning by using Blended Learning in my class.	4.19	0.75	Ready
8.I am ready to use different online assessment tools in assessing students` performance.	4.16	0.77	Ready
9. I am ready to use an e-portfolio as a summative form of assessment.	3.93	0.82	Ready
10. I am ready in using Learning Management System (LMS) in teaching my subjects.	3.93	0.81	Ready
11. I am ready to develop electronic learning activities that encourage my students to be critical-thinking learners.	4.00	0.90	Ready
12. I am ready to convert the printed content and activities in the curriculum to digital.	4.09	0.93	Ready
13. I am ready to facilitate hybrid learning strategy in my subjects	4.05	0.88	Ready
Grand Mean	**3.91**	**0.71**	**Ready**

Relationship of knowledge and competency level with readiness on FIRe technologies

Table 5.

Pearson Correlation Analysis Results – The Relationship between Knowledge of FIRe and Readiness on FIRe

		Knowledge FIRe	READINESS
Knowledge FIRe	Pearson Correlation	1	.615**
	Sig. (2-tailed)		.000
	N	80	80
READINESS	Pearson Correlation	.615**	1
	Sig. (2-tailed)	.000	
	N	80	80

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows the relationship between the knowledge level and readiness of the faculty members towards the fourth industrial revolution technologies integration in teaching. The results suggest that there is strong positive correlation with r=.615 with knowledge level and readiness on FIRe. This implies that as the knowledge level of the faculty members increases, their readiness also increases. Abdulrahman (2014) found out that the insufficient knowledge of teachers of using technology to teach showed that they are not ready to utilize e-learning in primary schools even if some have internet access but with bad service. In addition, Avelino and Ismail (2021) stated that the varying level of knowledge of teachers affect the integration of fourth industrial revolution technologies in teaching.

Table 6.

Regression Results – The Relationship between Knowledge of FIRe and Readiness on FIRe

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F.
1	.615[a]	.378	.370	.56393	47.375

[a] Predictors: (Constant), Knowledge

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.388	.230		10.391	.000
	Knowledge FIRe	.499	.072	.615	6.883	.000

[a] Dependent Variable: READINESS

Regression analyses as shown in Table 6 were performed to examine the effect of independent variable (knowledge on FIRe) on the dependent variable (readiness). Regression result indicated that there was a significant effect between knowledge on FIRe and Readiness on FIRe, F =47.4375, R^2 =0.378, p<.001. Knowledge on FIRe explained a variance between the variables (38%). The result showed that knowledge level is a significant positive predictor of readiness (β=0.615, t=6.88, p< .001).

Relationship of content competency level with readiness on FIRe technologies

Table 7.

Pearson Correlation Analysis Results – The Relationship between Content Competency and Readiness on FIRe

		READINESS	Content
READINESS	Pearson Correlation	1	.479**
	Sig. (2-tailed)		.000
	N	80	80
Content	Pearson Correlation	.479**	1
	Sig. (2-tailed)	.000	
	N	80	80

** Correlation is significant at the 0.01 level (2-tailed).

The result of the correlation analysis between content competency and readiness for the fourth industrial revolution is shown in Table 7. Significant relationship was found with the value of r=0.479 suggesting a moderately positive correlation between these two variables. This shows that teachers' higher level of content competency means high level of readiness. Layco (2022) stated that the mastery of the subject matter is crucial in Education 4.0 as it influences teacher competency to teach and the method of student assessment. Incorporating relevant and up-to-date content related to the fourth industrial revolution can enhance the overall readiness of individuals to face the challenges in the rapidly changing industrial environment.

Table 8.

Regression Results – The Relationship between Content Competency and Readiness on FIRe

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
1	.479[a]	.229	.219	.62775	23.176

[a] Predictors: (Constant), Content

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.702	.464		3.669	.000
	Content	.566	.118	.479	4.814	.000

[a] Dependent Variable: READINESS

Table 8 presents the result for the regression analysis of content competency and readiness on FIRe technologies. It reveals that there was a significant effect between the independent and dependent variable, F =23.176, R^2 =0.229, p<.001. Content competency explained a variance between the variables (23%). This means that content competency is a significant positive predictor of readiness (β=0.479, t=4.814, p< .001).

Relationship of technological competency level with readiness on FIRe technologies

Table 9.

Pearson Correlation Analysis Results – The Relationship between Technological Competency and Readiness on FIRe

		Technological	READINESS
Technological	Pearson Correlation	1	.580**
	Sig. (2-tailed)		.000
	N	80	80
READINESS	Pearson Correlation	.580**	1
	Sig. (2-tailed)	.000	
	N	80	80

** Correlation is significant at the 0.01 level (2-tailed).

The relationship of technological competency and readiness on FIRe is shown in Table 9. This shows that there is a moderately strong positive correlation between these two variables with r=0.580. This implies that readiness increases as content competency increases. Technological proficiency is increased through prioritizing training programs, having a thorough grasp of how to use technology in many circumstances, and encouraging an attitude of constant learning and adaptability. According to

Razak et al. (2018), as cited by Avelino and Ismail (2021), teachers should participate in training programs that might enhance their technical proficiency in order to be more prepared.

Table 10.

Regression Result – The Relationship between Technological Competency and Readiness on FIRe

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
1	.580[a]	.336	.328	.58240	39.549

[a] Predictors: (Constant), technological

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.775	.503		1.541	.127
	technological	.746	.119	.580	6.289	.000

[a] Dependent Variable: READINESS

The model summary of regression analysis is shown in Table 10 to examine the effect of technological competency and readiness. It indicates that readiness is affected by the technological competency, F =39.549, R^2 =0.336, p<.001. The result showed that technological competency is a significant positive predictor of readiness (β=0.580, t=6.289, p< .001).

Relationship of pedagogical competency level with readiness on FIRe technologies

Table 11.

Pearson Correlation Analysis Results – The Relationship between Pedagogical Competency and Readiness on FIRe

		READINESS	PEDAGOGICAL
READINESS	Pearson Correlation	1	.435**
	Sig. (2-tailed)		.000
	N	80	80
PEDAGOGICAL	Pearson Correlation	.435**	1
	Sig. (2-tailed)	.000	
	N	80	80

** Correlation is significant at the 0.01 level (2-tailed).

The significant relationship of r=0.435 between Pedagogical Competency and Readiness for FIRe. This suggests a moderate positive correlation between these two variables, the higher the pedagogical competency the readiness to FIRe also increases. The role of pedagogical competency in fostering readiness for the FIRe. This may involve incorporating innovative teaching methods, promoting interdisciplinary approaches, and ensuring that educators receive ongoing professional development to stay current with educational trends and industry demands. Nevertheless, the efficacy of these teaching-learning systems and their successful pedagogical methods and endpoints are not adequately guaranteed (Ramli et al., 2020).

Table 12.

Regression Results – The Relationship between Pedagogical Competency and Readiness on FIRe

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
1	.435[a]	.189	.179	.64387	18.175

[a] Predictors: (Constant), PEDAGOGICAL
[b] Dependent Variable: READINESS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.001	.686		1.459	.149
	PEDAGOGICAL	.666	.156	.435	4.263	.000

[a] Dependent Variable: READINESS

Based on the regression result in Table 12, the influence of pedagogical competency can explain 43.5% of Readiness on FIRe. Other factors explain the remaining 56.5%. The results found that the value of F = 18.175, R^2 = 0.189 and p <0.001 show that the regression model could be used to predict their Readiness on FIRe (β=0.435, t=4.263, p< .001).

Relationship of pedagogical-content competency level with readiness on FIRe technologies

Table 13.

Pearson Correlation Analysis Results – The Relationship between Pedagogical-Content Competency and Readiness on FIRe

		READINESS	Pedagogical-Content Competency
READINESS	Pearson Correlation	1	.645**
	Sig. (2-tailed)		.000
	N	80	80
Pedagogical-Content Competency	Pearson Correlation	.645**	1
	Sig. (2-tailed)	.000	
	N	80	80

** Correlation is significant at the 0.01 level (2-tailed).

The obtained correlation coefficient of r=0.645 indicates a moderate positive correlation between Pedagogical-Content Competencies (PCC) and readiness for the FIRe. This implies that as PCC increase, there is a tendency for readiness for the FIRe to also increase. The strength of the correlation, being moderate, suggests a significant association between these two variables. The findings underscore the importance of investing in and enhancing PCC among faculty members. Educators who are well-versed in both the subject matter and effective teaching methodologies are better positioned to equip students with the interdisciplinary skills demanded by the FIRe. To promote efficacy beliefs, a construct of Shulman's (1986) theory cited by Lekhu (2023), pedagogical content knowledge is of great importance in teacher education programs.

Table 14.

Regression Result – The Relationship between Pedagogical-Content Competency and Readiness on FIRe

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
1	.645[a]	.416	.409	.54630	55.595

[a] Predictors: (Constant), pedacontentcomp

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.925	.405		2.284	.025
	Peda-content comp	.727	.098	.645	7.456	.000

[a] Dependent Variable: READINESS

Regression result in Table 14 indicated that there was a significant effect between Knowledge on FIRe and Readiness on FIRe [F =55.595, p<.001, R =0.645]. Based on the regression result, the influence of pedagogical-content competency can explain 64.5% of Readiness on FIRe (β=0.645, t=7.456, p< .001).

Relationship of technological-content competency with readiness on FIRe technologies

The correlation analysis shows a highly significant relationship of r=0.651 between Technological-Content Competency (TCC) and readiness for the FIRe. This suggests a strong positive correlation between these two variables. This implies that as Technological-Content Competencies increase, there is a inclination for readiness for the FIRe to also increases. Higher Educational sector and training programs should consider integrating both technological and content-related components in their curricula. This could involve interdisciplinary approaches, case studies that bridge technology and industry-specific content, and practical applications that mimic real-world scenarios.

Table 15.

Pearson Correlation Analysis Results – The Relationship between Technological-Content Competency and Readiness on FIRe

		READINESS	Technological-Content
READINESS	Pearson Correlation	1	.651**
	Sig. (2-tailed)		.000
	N	80	80
Technological - Content	Pearson Correlation	.651**	1
	Sig. (2-tailed)	.000	
	N	80	80

** Correlation is significant at the 0.01 level (2-tailed).

The model summary of regression analysis is shown in Table 16 to examine the effect of technological-content competency and readiness. It indicates that readiness is affected by the technological-content competency, F = 57.395, p<.001, R =.651. The result showed that technological-content competency is a significant positive predictor of readiness (β=0.651, t=7.576, p< .001).

Table 16.

Regression Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
1	.651[a]	.424	.417	.54266	57.395

[a] Predictors: (Constant), TECHNOCONTENT
[b] Dependent Variable: READINESS

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.039	.384		2.707	.008
	TECHNO-CONTENT	.710	.094	.651	7.576	.000

[a] Dependent Variable: READINESS

Relationship of technological pedagogical competency with readiness on FIRe technologies

The correlation analysis reveals a highly significant relationship of r=0.765 between Technological-Pedagogical Competency and readiness for FIRe. This indicates a strong positive correlation between these two variables. This implies that as Technological-Content Competencies increase, there is an inclination for readiness for the FIRe to also increases. The significance of integrating technological and pedagogical components in their higher education institution programs. This involves not only teaching technological skills but also incorporating effective pedagogical approaches that leverage technology to enhance the learning experience and prepare students for the demands of the evolving industrial landscape. Knowing how to use appropriate technology-based tools to facilitate the learning of content is known as technological pedagogical content knowledge (TPACK) as cited by Koh, et al. (2011)

Table 17.

Pearson Correlation Analysis Results – The Relationship between Technological Pedagogical Competency and Readiness on FIRe

		READINESS	Technological-Pedagogical
READINESS	Pearson Correlation	1	.765**
	Sig. (2-tailed)		.000
	N	80	80
Technological - Pedagogical	Pearson Correlation	.765**	1
	Sig. (2-tailed)	.000	
	N	80	80

** Correlation is significant at the 0.01 level (2-tailed).

Regression analyses as shown in Table 18 were performed to examine the effect of independent variable (Technological-Pedagogical Competency) on the dependent variable (readiness). Regression result indicated that there was a significant effect between technological-pedagogical on FIRe readiness on FIRe, F =110.330, p<.001, R =.765. The result showed that technological-pedagogical is a significant positive predictor of readiness (β=0.765, t=10.504, p< .001).

Table 18.

Regression Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F
1	.765[a]	.586	.581	.46012	110.329

[a] Predictors: (Constant), TECHNOPEDA

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.070	.382		-.184	.855
	TECHNO-PEDA	1.015	.097	.765	10.504	.000

[a] Dependent Variable: READINESS

Conclusion

The study provides a comprehensive understanding of the current state of faculty members in relation to FIRe technologies at the College. The insights gained can inform strategic decisions, policy formulation, and targeted interventions to foster a technologically proficient and ready teaching force, well-equipped to navigate the challenges and opportunities presented by the Fourth Industrial Revolution.

The study offers important new information about the sociodemographic makeup, degree of expertise, skills, and preparedness of college faculty members for technologies associated with the Fourth Industrial Revolution (FIRe). The bulk of responders are in the prime working age range of 25 to 54, and a sizable fraction are female. The faculty members have a high degree of competency in technology, pedagogy, content, and their combinations, but only a limited understanding of FIRe technologies. The teaching members exhibit remarkable proficiency in evaluating students' performance and utilizing software tools, suggesting a good attitude toward embracing technological improvements. But there's always opportunity for progress, especially in some areas where expertise is very low, including augmented reality and detection technologies. Faculty members' readiness for FIRe technology is demonstrated by their willingness to use blended learning modalities and incorporate these technologies into the classroom. The degree of preparedness for augmented reality is lower, though, which points to a possible area for focused training and development. Significant correlations between knowledge levels, competences, and preparedness for FIRe technologies are shown by correlation and regression studies. More specifically, there is a positive relationship between preparedness, competencies, and knowledge levels shows that faculty members are more prepared to adopt FIRe technology as they gain more knowledge and skills. The results highlight how crucial it is for faculty members to participate in ongoing professional development programs in order to increase their proficiency with FIRe technology.

Based on all these findings, it was concluded that the faculty members of Bulacan Agricultural State College had embarked on the road to preparing for Fourth Industrial Revolution (FIRe) but they were not yet fully prepared due to challenges experienced in institutionalizing the technology and the additional support they needed to operate in the forthcoming FIRe.

Recommendations

1. The institution may organize training/workshops incorporating FIRe technologies in teaching classes to raise faculty awareness and readiness on FIRe technologies in education.

2. The institution may also invest in FIRe technologies that can be used by all faculty members in delivering education which may result in increasing the industry readiness of the students.

3. Future research may be conducted on the alignment of the curriculum and the readiness of the students on the fourth industrial revolution.

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