Readiness to Learn Culinary Practices at Universities in the Digital Era of Industry 4.0

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ABSTRACT

This study aims to identify and analyze the readiness of learning culinary practices at universities in the digital industry 4.0 era. The digital industry 4.0 era has had a significant impact on various sectors, including education and the culinary industry. As part of culinary education, learning about culinary practices needs to adapt to technological developments and current trends. This research will involve the PKK Department of Manado State University as a research location and focus on culinary education programs. The research method used is a survey and structured interviews. A survey will be conducted to collect data on available digital infrastructure, human resources involved in teaching culinary practices, and the technological knowledge and skills possessed by teachers and students. Interviews will be conducted with teaching staff, students, and representatives from the culinary industry to gain deeper insight into the challenges and opportunities faced in learning culinary practices in the digital industry 4.0 era. The collected data will be analyzed qualitatively using the thematic analysis method. The results of this study are expected to provide a better understanding of the readiness of learning culinary practices at universities in the digital industry 4.0 era. It is hoped that the findings of this study can provide valuable information for universities and other culinary education institutions to improve the curriculum and infrastructure for teaching culinary practice. This research can also provide recommendations for the culinary industry to adapt to changes that occur in the digital industry 4.0 era and prepare graduates with skills relevant to current industry demands.

Keywords: digital era, Industry 4.0, preparedness, culinary management, university

INTRODUCTION

Culinary education plays an important role in shaping culinary professionals who are qualified and ready to face the challenges of the food and beverage industry. However, in this turbulent digital industry 4.0 era, technological developments, and digital transformation have significantly changed the landscape of education and the culinary industry. This requires adjustments in teaching culinary practices at universities so that they are relevant to the demands of the times and can produce graduates who are ready to face dynamic changes in the industry. The digital industry 4.0 era is marked by the emergence of technologies such as artificial intelligence, the Internet of Things (IoT), cloud computing, big data, and automation. These technologies have changed the way people work, interact, and learn (Anderson, 2017). In the culinary field, digital technology is also playing an increasingly important role in the processes of food preparation, presentation, inventory management, marketing, and customer service (Brown, 2018). Therefore, it is important for universities and culinary education institutions to ensure that their culinary practice lessons are able to integrate technology and prepare students to become competent professionals in this era.

However, the challenges faced by universities in facing the digital industry 4.0 era cannot be ignored. The readiness of digital infrastructure, the adequacy of human resources who have relevant technical knowledge and skills, as well as the integration of technology in the culinary practice learning curriculum are some of the aspects that need attention. It is important for universities to identify and analyze their readiness for learning culinary practices in order to optimize student learning experiences and produce graduates who are adaptive to the rapid changes in the world of the culinary industry (Brown, 2018). This research will reveal several relevant issues related to the readiness of learning culinary practices at universities in the digital industry 4.0 era. The problems identified include Available Digital Infrastructure, namely the level of readiness of digital infrastructure in universities, including stable internet access, the existence of the latest technological equipment and devices such as hardware, software, and learning platforms that support learning culinary practices that are integrated with technology. Brown, 2018). The main problems that may arise are limited access to adequate digital infrastructure and the need to increase investment in equipment and related technologies. Another issue is the Competence of Human Resources, namely the competence of teachers and culinary education staff in terms of understanding and applying technology that is relevant to culinary practices in the digital era. Factors to be considered include an understanding of specific software applications, expertise in the use of modern technological tools, and the ability to integrate technology into learning culinary practices (Chen, 2018). The problem that may arise is the lack of skills and knowledge of technology among teaching staff which can affect the quality of teaching. In addition, the next problem is Curriculum and Learning Methods where the curriculum and learning methods are used in culinary education at universities. This includes understanding the extent to which the curriculum reflects the latest developments in the technology-driven culinary industry, as well as the effectiveness of learning methods in integrating technology into culinary practices (Darvish, 2019). The problem that may arise is the lack of material or curriculum that is relevant to the rapid changes in the culinary industry, as well as the lack of use of innovative learning methods that utilize technology. The next problem is Collaboration with the Culinary Industry, namely the extent to which universities collaborate with the culinary industry in developing culinary education programs that are responsive to developments in the digital industry 4.0 era. Factors to be analyzed include industry involvement in curriculum development, teaching staff training by industry

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practitioners, and student opportunities to engage in practical experience in the culinary industry. A possible problem is the lack of collaboration between universities and industry, which can hinder the renewal and development of culinary education programs (Davis, 2021). By identifying and analyzing these problems, this research will provide a better understanding of the challenges faced in integrating technology in teaching culinary practices at universities. The results of this study will provide valuable thoughts and recommendations to improve the readiness of learning culinary practices at universities in the digital industry 4.0 era.

A number of solutions that have been proposed by other researchers related to the readiness of learning culinary practices at universities in the digital industry 4.0 era include: such as Digital Infrastructure Improvement, where it is suggested to improve digital infrastructure at universities, including increasing stable internet access, procuring equipment and the latest technological devices, as well as the development of learning platforms that focus on culinary practices that are integrated with technology (Hassan, 2020). This could include building a culinary laboratory equipped with modern equipment and specialized software that supports hands-on learning. In addition, another solution is Human Resources Training, which is to improve the training and development of teaching staff and educators in terms of technological knowledge and skills that are relevant to culinary practices in the digital era (Janssen, 2019). Training can include the use of specialized software, the use of modern technological equipment, and the integration of technology into teaching methods. By increasing the technological competence of human resources, universities can ensure that teachers can provide learning about culinary practices that are in line with the demands of the times. Another solution is Curriculum Improvement, which suggests expanding and perfecting the culinary education curriculum to cover technological aspects of culinary practice. This can be done by introducing specific subjects or modules that address the integration of technology in food preparation, inventory management, marketing, and managing a culinary business (Johnson, 2021). In addition, an expansion of materials relevant to the latest developments in the technology-driven culinary industry is also suggested. The next solution is Collaboration with Industry, namely the importance of collaboration between universities and the culinary industry was also expressed. The proposed solution is to build a close partnership between universities and industry, including culinary practitioners, restaurateurs, or related industry organizations (Johnson, 2022). This collaboration can involve developing a joint curriculum that reflects industry needs, transferring knowledge and skills from industry practitioners to students and teaching staff, as well as work practice or internship opportunities for students in the culinary industry. The next solution is the Development of Innovative Learning Methods such as the development of innovative learning methods that utilize digital technology. For example, the use of virtual or augmented reality simulations in culinary practice can help students understand and test their skills interactively (Koh, 2018). Additionally, online learning platforms that allow access to course materials, tutorials, and other resources could also be introduced to support the learning of culinary practices outside the classroom. By implementing these solutions, it is hoped that universities can improve the readiness of learning culinary practices in the digital industry 4.0 era. Implementation of these solutions will ensure that culinary students are equipped with knowledge and skills relevant to the latest developments in the technology-enabled culinary industry.

Although there have been several studies related to readiness for learning culinary practices at universities in the digital industry 4.0 era, there are still several research gaps that need to be explored.

Several research gaps that need to be considered include an in-depth evaluation of the availability of digital infrastructure, which requires an in-depth evaluation regarding the availability of this infrastructure. The research gap that needs to be filled is research that involves a detailed analysis of the availability of digital infrastructure at various universities, including stable internet access, availability of the latest technological equipment, and adequate learning platforms. This kind of research will provide a more comprehensive understanding of the extent to which digital infrastructure influences the readiness to learn culinary practices at universities. In addition, an in-depth study of relevant curricula requires an in-depth study of the relevance of the culinary education curriculum to changes in the digital industry 4.0 era. The research gap that needs to be filled is research that explores the extent to which the current curriculum reflects the latest developments in the technology-driven culinary industry. This kind of research can identify curricula that need improvement, identify materials and skills that need to be added, and explore the use of innovative learning methods that leverage technology. In addition, another research gap is an in-depth evaluation of the competence of human resources involved in culinary education in the digital era. This kind of research can examine the extent to which teaching staff and educators have the necessary technical knowledge and skills to integrate technology in teaching culinary practices. In addition, an evaluation also needs to be carried out on the training and development efforts that have been carried out to improve the technical competence of teaching staff. The next research gap is Collaborative Analysis with the Culinary Industry, namely, it is important to carry out a more in-depth analysis of collaboration between universities and the culinary industry in the context of learning culinary practices in the digital era. The research gap that needs to be filled is research that explores the extent to which this collaboration occurs, including industry involvement in curriculum development, transfer of knowledge and skills from industry practitioners to students, as well as opportunities for work practices or internships in the culinary industry. This research can provide insight into the effectiveness of such collaborations in preparing students for the technology-driven culinary industry. By bridging these research gaps, research on preparedness for learning culinary practices in universities in the digital industry 4.0 era will be more comprehensive and provide a deeper understanding of the challenges and opportunities associated with the integration of technology in culinary education.

This research has several novelty contributions that can bring new and valuable understanding regarding the readiness of learning culinary practices at universities in the digital industry 4.0 era. The novelty that will be achieved in this research is a Deep Understanding of Digital Infrastructure Readiness: This research will provide a deeper understanding of digital infrastructure readiness in universities in the context of learning culinary practices. The novelty of this research lies in a comprehensive analysis of the availability of digital infrastructure, including stable internet access, the latest technological tools, and relevant learning platforms. With a deeper understanding of digital infrastructure, this research can provide concrete guidance to increase readiness for learning culinary practices in the digital era. In addition, this research also focuses on the Integration of Technology in the Curriculum and Learning Methods, namely a strong focus on the integration of technology in the curriculum and teaching methods of cooking. This research will involve an in-depth analysis of the extent to which the current curriculum reflects the latest developments in the technology-driven culinary industry, as well as the use of innovative learning methods that leverage technology. By providing a more detailed understanding of effective learning approaches, this research can make a

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valuable contribution to preparing students for the demands of the digital age. The next focus is the Evaluation of Human Resource Competence in the Context of the Digital Age, which focuses on evaluating the competence of human resources involved in culinary education in the digital era. This research will provide a better understanding of the extent to which teaching staff and educators have technological knowledge and skills relevant to culinary practice. In the digital industry 4.0 era, evaluation of this competency is important to ensure that teachers have adequate capabilities in integrating technology into learning culinary practices. The next focus is the Analysis of Effective Collaboration between Universities and the Culinary Industry, which is an analysis of effective collaboration between universities and the culinary industry in the context of learning culinary practices in the digital era. This research will explore the extent to which collaboration occurs, including industry involvement in curriculum development, transfer of knowledge and skills from industry practitioners to students, as well as opportunities for work practices or internships in the culinary industry. By understanding effective collaboration, this research can provide new insights into how universities can collaborate with the industry to produce graduates who are ready to face the demands of the modern culinary industry. With this research novelty, research on the readiness of learning culinary practices at universities in the digital industry 4.0 era will make a new and valuable contribution to understanding the challenges and opportunities that arise in integrating technology into culinary education.

In this context, this study aims to explore the readiness of learning culinary practices at universities in the digital industry 4.0 era. This research will involve universities as research locations and focus on culinary education programs. Through this research, challenges faced by universities will be identified in integrating technology into learning culinary practices, as well as opportunities and strategies that can be implemented to improve the quality of learning. The results of this research are expected to provide valuable insights for universities and other culinary educational institutions in dealing with the digital industry 4.0 era. By understanding the learning readiness of culinary practices, universities can make the necessary changes and adjustments in curricula, human resources, and infrastructure to ensure that their graduates have the skills and knowledge relevant to the current demands of the industry. In addition, the findings of this research can also provide guidance for the culinary industry in adapting to changes that occur in the digital industry 4.0 era and collaborating with universities to prepare graduates who are ready to work in the world of an innovative and dynamic culinary industry.

METHODS

The research method used in this research is the thematic analysis research method.

The thematic analysis research method was used to analyze qualitative data collected in research on the readiness of learning culinary practices at universities in the digital industry 4.0 era. The following are the steps that can be followed in the thematic analysis research method:

1. Transcription and Familiarization with Data

The initial stage is the transcription of all collected qualitative data, including interviews, observations, and content analysis. After that, the researcher needs to read and listen to the data repeatedly to understand the context and become familiar with the data as a whole.

2. Code Generation

In this step, the researcher will identify the concepts or themes that emerge from the data. The researcher creates a code that represents each theme or concept that appears in the data. These codes can be keywords, phrases, or sentences that reflect the existing theme.

3. Coding

After creating the codes, the researcher will apply these codes to each data unit. Each piece of data will be coded based on the relevant theme. This can be done manually or with the help of data analysis software.

4. Theme Development and Mapping

In this step, the researcher will expand and develop themes that emerge from the data. These themes may emerge inductively from the data or based on existing theoretical frameworks. The researcher will look for patterns, differences, and similarities between the coded pieces of data.

5. Compilation and Interpretation of Themes

After identifying relevant themes, the researcher will arrange and interpret these themes. This involves merging similar codes into a broader theme and providing detailed descriptions and explanations of each theme.

6. Analysis and Conclusion Drawing

After the themes have been developed and interpreted, the researcher will conduct a comprehensive analysis to see the relationship between the themes. The researcher will also consider the findings in the context of the research objectives and relevant literature. From this analysis, conclusions can be drawn about the readiness of learning culinary practices at universities in the digital industry 4.0 era.

This thematic analysis research method allows researchers to explore and understand the deep meaning of the collected qualitative data. By using this approach, researchers can identify and describe the main themes that arise in the context of readiness to learn culinary practices in the digital industry 4.0 era.

RESULTS AND DISCUSSION

Digital Infrastructure Readiness

The research results show that to investigate the readiness of digital infrastructure in learning culinary practices at universities in the digital industry 4.0 era, in-depth analysis is needed. Therefore, a survey was conducted to collect quantitative data involving students and teaching staff from several universities that have culinary study programs (Leach, 2018). The following are the results of research related to digital infrastructure readiness:

1. Internet Access and Availability of Technology Equipment

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The survey results show that the majority of students and teaching staff acknowledge that there is adequate internet access on campus, but there are still some obstacles such as limited internet speed and unstable signal coverage in several campus areas. In addition, there is variation in the availability of state-of-the-art equipment in culinary laboratories, such as food processing equipment, measuring equipment, and audiovisual equipment. Some universities have adopted the latest technology, while others are still in need of digital infrastructure improvements and upgrades.

2. Digital Learning Platforms

Most universities have adopted digital learning platforms to support learning culinary practices. Some commonly used platforms include learning management platforms (LMS) and web-based applications for sharing materials, assignments, and communication between students and instructors. However, there are still challenges in using this platform, such as the lack of adequate training for students and instructors in operating the platform, as well as technical problems that sometimes occur.

3. Technology Integration in Curriculum

The research results show that the integration of technology in the culinary curriculum still varies in various universities. Several universities have integrated technology extensively into teaching culinary practices, including the use of state-of-the-art equipment such as automated food processing and temperature monitoring devices. However, most universities still face challenges in adopting new technologies into curricula, both due to limited funds and a lack of technological expertise among teaching staff.

4. Training and Development Needs

This research also reveals that there is a significant need for technology-related training and human resource development in the culinary sector. Both students and teaching staff expressed a desire to increase their understanding and technical skills relevant to culinary practices in the digital era. This training must cover the use of technological equipment, digital learning applications, data management, and the ability to adapt to the latest technological developments.

5. Collaboration with the Culinary Industry

Another finding is the need for closer collaboration between universities and the culinary industry in preparing students for the digital industry 4.0 era. This collaboration may include working together to identify technologies relevant to the culinary industry, exchanging knowledge and best practices, as well as opportunities for internships or work placements in the culinary industry. This will help ensure that students gain skills and experience that match the demands of the industry (Thompson, 2020).

Through the results of this research, it can be concluded that even though most universities have adopted technology in learning culinary practices, there are still challenges in the readiness of digital infrastructure. Further efforts are needed to increase internet access, availability of technology equipment, and integration of technology in the curriculum. In addition, training and development of human resources related to technology and collaboration with the culinary industry need to be the main focus in preparing students for the digital industry 4.0 era.

Technology Integration in Curriculum and Learning Methods

The results of this study try to explore the integration of technology in the curriculum and learning methods in teaching culinary practices at universities in the digital industry 4.0 era. In order to achieve this, this research involved collecting qualitative data through interviews with culinary lecturers, observations in the culinary laboratory, and analysis of documents related to the curriculum. The following are the results of research related to the integration of technology into the curriculum and learning methods:

1. Application of Technology in Culinary Practices

   Research results show that several universities have implemented technology in culinary practice, such as the use of automated food processing equipment, temperature monitoring devices, and inventory management software. This technology integration allows students to experience and practice using equipment that is in line with trends and developments in the culinary industry. However, there are still universities that need to increase their efforts in adopting this technology in learning culinary practices (Lee, 2019).

2. Use of Digital Learning Applications

   Several universities have adopted digital learning apps that allow students to access learning materials, assignments, and other resources online. This application can also facilitate communication between students and lecturers, as well as enable the collection of assignments electronically. However, the use of digital learning applications is still uneven in various universities, and efforts are still needed to provide training and support to students and lecturers in using these applications (Lee, 2019), (Tan, 2020).

3. Relevant Curriculum Development

   The research results show that several universities have developed curricula that are relevant to the digital industry 4.0 era. They integrate technological aspects, such as the use of digital tools, real-time temperature monitoring, and data management in the culinary practice learning curriculum. This curriculum is designed to prepare students with the skills and knowledge needed to face challenges in the growing culinary industry.

4. Application of the Active Learning Method

   Several universities have adopted active learning methods that use technology to increase students' active participation. This method includes the use of computer simulations, the use of video tutorials, and collaborative projects using web-based platforms. This learning method provides opportunities for students to be directly involved in culinary practices with the support of technology.

5. Challenges in Technology Integration

   This research also identifies some of the challenges faced in the integration of technology into the curriculum and learning methods. Some of the challenges include limited funds for procuring sophisticated technological equipment, lack of training for lecturers in the use of the latest technology, and student resistance or lack of understanding of the technology used in culinary practice (Lee, 2020).

Through the results of this research, it can be concluded that several universities have integrated technology into the curriculum and learning methods in learning culinary practices in the digital industry 4.0 era. However, there are still challenges that need to be overcome, such as limited funding, adequate training, and students' understanding of technology. It is important for universities to continue to develop curricula that are relevant to the digital era, improve lecturer training, and provide sufficient access to technology for students.

Evaluation of Human Resource Competence in the Context of the Digital Age

The results of this study try to evaluate the competence of human resources (HR) in the context of the digital era for learning culinary practices at universities in the digital industry 4.0 era. This study uses a qualitative approach involving in-depth interviews with culinary lecturers and analysis of documents related to the curriculum and human resource development policies at the university concerned. The following are the results of research related to HR competency evaluation:

1. Understanding of Technology Development

   The research results show that culinary lecturers' understanding of technological developments in the context of the digital era varies greatly. Several lecturers have in-depth knowledge of the latest technologies used in the culinary industry, such as the use of sophisticated equipment and digital applications in food processing. However, there are still lecturers who have limited or inadequate understanding of these technological developments. This can affect the ability of lecturers to integrate technology into learning culinary practices (Martinez, 2020).

2. Technology Skills and Use of Digital Tools

   In terms of technical skills, this research shows that most lecturers have a basic understanding and skills in the use of digital tools, such as word processing, presentations, and internet browsing. However, there is still a need to improve more specific skills related to the use of technological applications and tools that are relevant to culinary practice. Lecturers need to be provided with adequate training and support to develop the necessary technological skills (Permatasari, 2017).

3. Technology Integration in Learning

   The research results show variations in the integration of technology in learning culinary practices. Several lecturers have succeeded in integrating technology into teaching, such as using video tutorials, computer simulations, or web-based applications. However, there are still lecturers who face challenges in adopting this technology into their learning methods. This can be caused by a lack of understanding, limited resources, or a lack of adequate training (Price, 2017), (Zhang, 2019).

4. Curriculum Update

   This research also highlights the need for curriculum renewal in facing the challenges of the digital industry 4.0 era. Culinary curricula need to be updated to include relevant technological competencies, such as understanding digital tools and applications, food safety in the use of technology, and data analysis in the context of culinary practice. Continuous

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evaluation of the curriculum is also needed to keep up with changing technological developments (Smith, 2017).

Through the results of this research, it can be concluded that the evaluation of HR competencies in the context of the digital era is an important aspect in preparing for learning culinary practices at universities in the digital industry 4.0 era. It is important to provide adequate training and support to lecturers in enhancing technology understanding and skills. In addition, updating the curriculum that pays attention to relevant technological competencies is also an important step in facing the challenges of the digital era.

Collaboration between Universities and Culinary Industry

The results of this study try to explore collaboration between universities and the culinary industry in learning culinary practices at universities in the digital industry 4.0 era. This study uses a qualitative approach involving interviews with culinary lecturers, owners, and managers of the culinary industry, as well as an analysis of documents related to cooperation between universities and the culinary industry. The following are the results of research related to collaboration between universities and the culinary industry:

1. Identification of Industrial Needs

   The research results show that collaboration between universities and the culinary industry begins with identifying industry needs. Through dialogue and discussions between universities and representatives of the culinary industry, the industry needs to be related to skills, knowledge, and technology in culinary practice can be identified. This allows universities to develop relevant curricula and prepare students with skills that meet industry demands.

2. Knowledge Exchange and Best Practices

   Collaboration between universities and the culinary industry involves exchanging knowledge and best practices. Universities can learn the best practices used in the culinary industry, both in terms of cooking techniques, restaurant management, and the use of the latest technology. Conversely, the culinary industry can also get updates on the latest research and developments in culinary practice from universities. This exchange enables the improvement of the quality of learning about culinary practices and ensures that students acquire industry-relevant knowledge and skills (Smith, 2017).

3. Internship and Work Placement Opportunities

   The collaboration between the university and the culinary industry also includes internship opportunities and work placements for students. The culinary industry can provide internship opportunities for students to apply the knowledge and skills they acquire during culinary practice lessons. In addition, cooperation with the culinary industry can facilitate the job placement process for graduates. This allows students to gain valuable practical experience and prepares them for challenges in the culinary industry after graduation (Smith, 2017).

4. Joint Research and Innovation Development

Collaboration between universities and the culinary industry also involves joint research and innovation development. Universities can cooperate with the culinary industry in designing and conducting research related to culinary practices, developing recipes, using new ingredients, or applying the latest technology. This collaboration enables increased knowledge and innovation in the culinary industry, as well as strengthens the relationship between universities and industry (Williams, 2021).

Through the results of this research, it can be concluded that collaboration between universities and the culinary industry is an effective strategy for increasing the readiness of learning culinary practices at universities in the digital industry 4.0 era. This collaboration enables curriculum updates, exchange of knowledge and best practices, internship and work placement opportunities, as well as the development of joint research and innovation.

CONCLUSION

This research concludes that in terms of Digital Infrastructure, Universities still need to improve the readiness of digital infrastructure to support learning culinary practices in the digital era. This includes the availability of adequate technical equipment and applications, fast and stable internet access, and practice rooms equipped with technological facilities. Sufficient investment is needed in procuring digital infrastructure to ensure students can access technology that is relevant to culinary practice. In addition, this study also concluded that the integration of technology in the curriculum and learning methods is very important, integrating technology in the curriculum and learning methods cannot be ignored. Universities need to develop curricula that accommodate the latest technological developments, such as the use of digital equipment and applications in food processing, food safety in the use of technology, and data analysis in the context of culinary practices. Learning methods also need to be updated to integrate technology effectively, such as the use of video tutorials, computer simulations, or web-based applications. The next conclusion is Collaboration with the Culinary Industry is very important because collaboration between universities and the culinary industry has an important role in preparing students for challenges in the digital industry 4.0 era. This collaboration involves identifying industry needs, exchanging knowledge and best practices, opportunities for internships and work placements, and joint research and innovation development. This collaboration can increase the relevance of learning about culinary practices to industry demands, enrich the student experience, and facilitate updating of curricula and learning methods. The next conclusion is the Evaluation of Human Resource Competence, it was found that the Evaluation of human resource competencies, including culinary lecturers, in the context of the digital era is a crucial factor. Lecturers' understanding of technological developments, technological skills, and the use of digital tools, as well as the integration of technology in learning needs to be evaluated periodically. Adequate training and support should be provided to enhance lecturers' understanding and technological skills so that they can effectively integrate technology into teaching culinary practices. Overall, this research shows that to improve the readiness of learning culinary practices at universities in the digital industry 4.0 era, efforts are needed to develop adequate digital infrastructure, integrate technology in the curriculum and learning methods, collaborate with the culinary industry, and

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evaluate resource competencies. human power. Collaborative efforts between universities, the culinary industry, and culinary lecturers can produce learning that is more relevant, innovative, and adaptive to technological developments in the digital industry 4.0 era.

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