

The role of technology in the skills and creativity of chefs

Faruk Seyitoğlu ¹, Francesc Fusté-Forné ^{2*}, Serkan Yiğit ³ and Süleyman Engin ⁴

¹ Department of Economics, Management, Industrial Engineering and Tourism, Research Unit on Governance, Competitiveness and Public Policies (GOVCOPP), University of Aveiro, Portugal. Faculty of Tourism, Mardin Artuklu University, Türkiye. Zangador Research Institute. Email: fseyitoglu@ua.pt

² Department of Business, University of Girona, Girona, Catalonia, Spain Email: francesc.fusteforne@udg.edu

³ Department of Gastronomy and Culinary Arts, Faculty of Tourism, Mardin Artuklu University, Türkiye. Email: serkanyigit@artuklu.edu.tr

⁴ Department of Gastronomy and Culinary Arts, Faculty of Tourism, Mardin Artuklu University, Türkiye. Email: suleymanengin@artuklu.edu.tr

*Corresponding author

Abstract

This research note addresses a gap in current research on the role of technology in restaurants, which often focuses on operational benefits and customer experience rather than the experiential impact on chefs. Based on an exploratory qualitative research design using semi-structured interviews with chefs, the study explores how chefs perceive the influence of integrating technological tools in their future practices and the impact on their skills and creativity. The findings provide insights into the facilitative and destructive roles of technology. The paper contributes to the understanding of how and why technology enhances and inhibits human skills and creativity, thus guiding businesses in hospitality about the adoption of technology in restaurants.

Keywords: technology, chef, creativity, restaurant, hospitality, skills, future

Citation: Seyitoğlu, F., Fusté-Forné, F., Yiğit, S. and Engin, S. (2025). The role of technology in the skills and creativity of chefs. *European Journal of Tourism Research*, 39, 3912. <https://doi.org/10.54055/ejtr.v39i.3840>.

Publication history:

Received: 16/07/2024; Revised: 01/08/2024; Accepted: 03/08/2024; Published online: 15/01/2025; Volume date: 01/03/2025

Coordinating editor: Stanislav Ivanov



© 2025 The Author(s)

This work is licensed under the Creative Commons Attribution 4.0 International (CC BY 4.0). To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

1. Introduction

The role of technology in restaurants has become increasingly analysed in recent years (see Cavusoglu, 2019), influencing not only the efficiency of food production (Kimes, 2008) and the customer experience (Pagaldiviti & Roy, 2023) but also the creative processes and skill of chefs (see, for example, Vu et al., 2024). This research note provides insights into how technological tools reshape culinary practices and artistic expression in restaurant kitchens.

The relevance of this study is framed within the rapid integration of advanced technologies in the restaurant sector (Gu et al., 2023). Innovations such as precision cooking equipment (Blutinger et al., 2023), digital recipe databases (Hannon et al., 2024), and kitchen automation systems (Deksne et al., 2021) are common, and they have changed the role of human chefs (McBride & Flore, 2019). In this sense, previous research shows that the adoption of technologies enhances efficiency, consistency, and precision in culinary practices, such as the elaboration of recipes (Califano et al., 2024), and also the behavioural and social dimensions of the customer experiences (Batat, 2021).

While previous studies also show that technological innovations, such as those incorporated in modern culinary techniques, have ‘reskilled rather than deskilled chefs’ (Fraser & Lyon, 2018), the understanding of chefs’ perception and integration of technology will reveal the extent to which these tools will influence their creativity and craftsmanship. Limited attention has been paid to the experiences of chefs regarding how technology affects their creative processes and skills, with studies based on chefs’ creativity in haute cuisine (Norén, 2022) or the development of their technology competency (Vu et al., 2024), which should also contribute towards a dialogue between tradition and innovation. We argue that there is a research gap in analysing the experiential and professional dimensions of future culinary practices and exploring how chefs will negotiate a performance that is highly influenced by technology. Thus, this paper contributes to the existing body of knowledge by providing an analysis of chefs’ perspectives on the role of technology in the future of their profession. Based on the understanding of human chefs as key actors in hospitality and tourism (Mahfud & Lastariwati, 2019), this study offers an understanding of how technological tools will influence the technical (skills) and artistic (creativity) aspects of cooking and how they can support or disrupt human chef’s competencies (Marinakou & Giousmpasoglou, 2022). After this contextual introduction, the paper describes the method, presents the results and the discussion, and finally provides the conclusion and opportunities for future research.

2. Methodology

As part of a more comprehensive study on the role of technology in the future of restaurants, this research note delves into a novel topic. It explores the role of technology in the skills and creativity of chefs. An exploratory qualitative research design was adopted to achieve this purpose, which helps explore new and emerging issues in a field (Wilhelmy & Köhler, 2022). This research used the semi-structured interview technique to gather data from 27 chefs working for different restaurants in Türkiye between June and September 2023 (see Appendix 1).

The research sample was selected using a combination of purposive and snowball sampling techniques. The interviews (see the interview questions in Appendix 2) were conducted in various formats to accommodate the participants’ schedules and locations, including face-to-face and through different online platforms (Zoom, Google Meet, WhatsApp, Facetime, etc.). All the interviews were transcribed into a Microsoft Word document for data analysis.

The data was analysed using the content analysis method proposed by Miles and Huberman (1994), a three-stage process that includes reduction, display, and conclusion verification. The raw data was initially filtered to identify statements relevant to the study’s objectives. Then, the participants’

responses were examined multiple times to identify and categorise themes and sub-themes. Two experienced human coders independently conducted this process using qualitative research design. The two coders independently identified categories, themes, and sub-themes from the data. After discussing the identified categories, themes, and sub-themes, the authors finalised the findings, ensuring the reliability and validity of our results, which are enhanced through direct quotes from the participants.

3. Findings and discussion

The data analysis shows that chefs' skills and chefs' creativity are discussed based on two main themes, including the facilitative and destructive roles of technology (see Figure 1). The related direct quotations are also presented by indicating the chefs' numbers. For the quotes, 'C' refers to a participating chef.

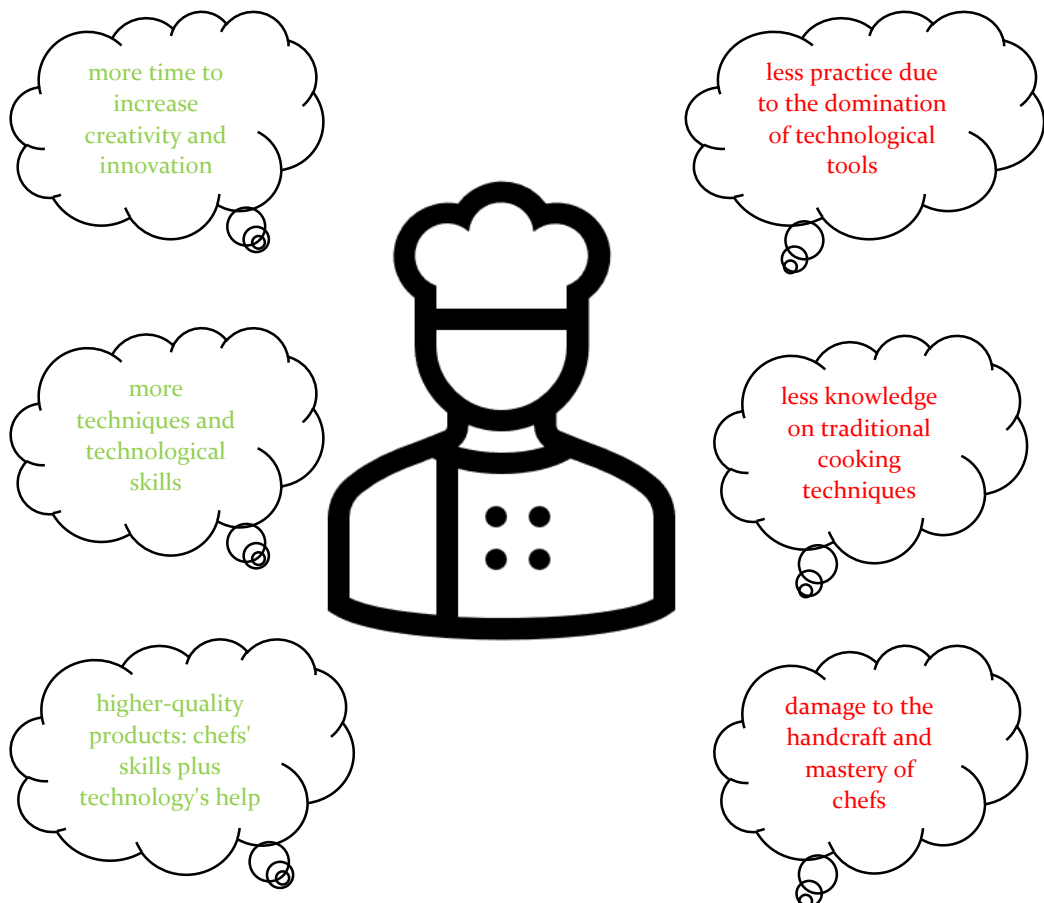


Figure 1. The influence of technology on the skills and creativity of chefs (facilitative roles are displayed in green and destructive roles in red)

3.1. Chefs' skills

According to the chefs who participated in this research, using technology in restaurant kitchens will play both facilitative and destructive roles in shaping chefs' skills in the future.

Facilitative roles

The facilitative roles of technology on the chefs' skills emerged (i) to help chefs upgrade their vocational skills by getting rid of time-consuming tasks and saving time, (ii) to support chefs' skills to produce better products, and (iii) to help chefs improve their skills in using technological tools.

Participants (C2, C4 and C25) think that thanks to technological tools in restaurant kitchens, chefs will upgrade their vocational skills, stressing that chefs will get rid of time-consuming tasks and save time for working on their developments. They also think that technology and this opportunity will contribute to the training of chefs' skills (Vu et al., 2024). C2 purports, "I think that chefs can save time, which is one of the biggest factors, with the technology they use in the kitchen, and spend their remaining time developing their professional skills to higher levels... For this reason, I think technology will contribute to training more skilled chefs... So, chefs can save time thanks to using technological tools in the kitchen, raise their professional skills and improve themselves further."

Several participants (C5, C6, C10, C15, C17, C20 and C24) believe that technology facilitates skills in producing better products. They stress that when chefs' skills merge with technology's help, better products can be produced because technology helps create higher-quality dishes in terms of taste and visual aspects (see, for example, Fusté-Forné, 2021). In this aspect, C10 explains that some technological tools, such as convection ovens, help cook dishes in a way that is tastier and more balanced than regular ovens. C20 states that technological tools can make some ideas of chefs possible in the kitchen. However, without such supportive technological tools, chefs may be unable to use their skills to make things happen. Eventually, one of the participants (C22) indicated that using technology in the kitchen would help chefs improve their skills in using technological tools. He adds that in the future, engagement with technology, knowledge about technological tools, and the technological skills of chefs will be determinants of hiring chefs.

Destructive roles

The destructive roles of technology on the chefs' skills are revealed (i) to damage the handcraft of chefs as it will decrease the chance of practising, (ii) to cause chefs to forget about traditional cooking techniques, (iii) to end the mastery of chefs in specific cooking, and (iv) to surpass chefs' skills in many tasks.

Firstly, chefs (C1, C3, C8, C14, C15, C18, C19, C23, C24, C25) point out that technology will damage the handicraft of chefs as it will decrease their chances of practising. In this regard, C1 clarifies, "The use of technology in kitchens also negatively affects the skills of chefs. For example, we chop onions with our own hands. However, nowadays, after these tasks are automated with the help of technological devices, we lose our manual dexterity as we get used to it. In other words, in the future, we may forget many of the handicrafts and skills we used to do or the dishes we used to cook. Because, with the help of technology, they could be automated, and since we no longer do them, we will lose our skills...Technological devices prevent us from practising. So, we will not be able to do our practical skills the same way in the future... Yes, this situation will cause us to lose our skills..." C3 and C8 add that technological intervention in restaurant kitchens may cause low-skilled chefs in the future due to the lack of practical experience.

Additionally, the study's interviewees maintained that the increasing use of technology in restaurant kitchens will cause chefs to forget about traditional cooking techniques (C10), mastery of chefs in specific cooking will end (C12), and technological tools will surpass chefs' skills in many tasks (C13). One of the participants explained, "We are trying to carry forward many of the cooking techniques we have tried in the past, but I think the old cooking techniques will be forgotten as technology develops and

technological tools are increasingly applied in restaurant kitchens. In my opinion, chefs will decline in terms of skills in the future..." (C10).

The results contribute to expanding previous research that investigated the role of technology in deskilling chefs (Caprani, 2016). For example, a study found that the introduction of technology decreased culinary chefs' skills (Fraser & Lyon, 2018). The study revealed that technological equipment led to a situation where chefs had to learn the basics and adapt to new skills. As a result, chefs consider technology as both helpful and disruptive, and it will also change the traditional role of human chefs (McBride & Flore, 2019). Many chefs expressed concerns that modern technology could be harmful to the skill development of young chefs, as they might not learn the essential traditional skills that were considered important by many.

3.2. Chefs' Creativity

According to the participants, technology in the kitchen also plays both facilitative and destructive roles in chefs' creativity.

Facilitative roles

Most of the interviewees agreed that technology in the kitchen would contribute to chefs' creativity by providing more time for research and development (C2, C4, C10, C12, C17, C18, C20, C21, C22, C23, C24, C26 and C27) and more techniques for creative dishes (C5, C7, C8, C9, C10, C12, C17, C18, C20, C21, C22, C23, C24, C26 and C27). Participants advocate that as technological tools in restaurant kitchens can be used for time-consuming tasks, human chefs will also have more time to think, practice, and research. In this aspect, although to the best of our knowledge, there is no empirical verification of chefs' creativity in the literature, a previous study indicates that benefiting from technological tools for time-consuming tasks can help restaurant employees focus on more critical tasks to provide high-quality services (Seyitoğlu et al., 2023). Moreover, chefs believe that technology supports creativity in restaurant kitchens because, thanks to technological tools, chefs can use more techniques for creative dishes. The study of Ruiz et al. (2013) supports this result by revealing that chefs' application of technology in culinary recipes enhances creativity by introducing new textures and flavours. The chefs who participated in this research also indicate that chefs must know how to benefit from technology to be creative, which means that the skills of using available technology play a critical role in this aspect. In this line, it is stressed in the literature that understanding new technologies is one of the leading indicators of the idea-generation process of creativeness for chefs (Şener & Ulu, 2024). Finally, one of the participants (C18) conveyed that technology contributes a lot, especially in terms of aesthetics and design, which are the two important aspects of creative dishes (Roque et al., 2018), as also reported in the previous section.

For instance, C4 states, "Chefs who use technological tools will have less work to do in the kitchen or will complete their tasks in shorter periods. In other words, thanks to technology, a chef who spends 3-4 hours a day on preparation can devote those 3-4 hours to creativity, research and R&D studies and can better develop himself in terms of creativity".

Destructive role

Although most chefs think that technology is facilitative in chefs' creativity in restaurant kitchens (which is also supported by previous research such as a study by Şener and Ulu, 2024), five of them (C1, C3, C14, C19 and C25) believe that technology is destructive in this regard and claim that technology in restaurant kitchens prevents chefs from thinking about creative ideas. They clarify that using technological tools will eliminate the feelings and motivations toward thinking about creative ideas (C3, C19, C25) and will eliminate the balance of thinking and practising (C25) because if chefs only think and

technological tools do the most, the creativity may not be developed (C25). The direct quotations corroborate this: “The increased use of technology in restaurant kitchens definitely negatively affects the creativity of chefs. When you cook, something may instantaneously happen, which is inspiration. So, for example, when you cook a dish, you may be inspired by creative ideas depending on your mood at that moment... How should I say, for example, you know something today, your motivation, that mood can be reflected in cooking... But let us say you work with robot chefs. Your motivation to be creative may decrease... So I think it will impact. Because there are some dishes that we only come up with based on what we feel at that moment and whatever motivation we have at that moment. But when it is robotic or high technology, it will definitely be different.” (C3). As creativity is a core dimension in culinary innovation (see Hu, 2010), while some chefs see technologies as potential inhibitors of creative thinking, previous research shows this will be critical depending on the type of dining experiences (see Norén, 2022 in relation to haute cuisine).

4. Conclusion

Previous literature does not contain a study on the role of technology in chefs' skills and creativity and its future impact based on the chefs' perspectives (see Figure 1). This is crucial to understand the changing roles of human chefs in a dynamic hospitality and tourism sector, as well as their technical and artistic relation with technology. From a theoretical perspective, this research contributes to understanding the relations between technology adoption, skill acquisition and creative development of chefs. Results show that through technological advancements, chefs will improve their technological skills and vocational work, enabling them to produce higher-quality dishes because technological adoption will create more time for chefs to learn techniques to enhance their creativity (for example, taste and visual aspects). While these factors facilitate the chef's work, technology will also surpass chefs' skills and reduce the craftsmanship of chefs, which may decrease the practice and the know-how of traditional recipes, anticipating a reduction of the mastery of chefs if they do not find a balance between tradition and innovation.

Based on the results, this research note shows that it is crucial that technology enhances rather than hinders the culinary creative process and the improvement of a chef's competencies. Technology must become an avenue to foster the conditions towards creative expression and skill development in a dynamic context between established practices and new possibilities, in other words, a dialogue between traditional techniques and modern tools. In this sense, this research has significant practical implications. The results reveal how chefs perceive technologies in their future practice, and this perception informs the implementation of technology according to their specific needs and preferences to enhance the successful integration of technology into their daily practices at restaurants. This should not undermine the importance of traditional skill development, which is vital to maintaining the culinary traditions that form the culinary knowledge obtained from past generations. Future research should consider the technological changes and differences between technological innovations (for example, Artificial Intelligence or robot chefs). Future studies could also expand on this research with chefs from different countries and explore the long-term effects of technology on culinary skills and creativity. This could be based on the sustained use of technology and its influence on chefs' and customers' experiences.

Appendices

Appendix 1. Profile of Chefs

Gender	Age	Current Position	Industry Experience (Years)
Male	25	Chef	7
Male	44	Sous Chef	22
Male	28	Chef	5
Male	45	Chef de Cuisine	25
Male	37	Chef de Cuisine	19
Male	52	Executive Chef	34
Male	45	Executive Chef	27
Male	49	Executive Chef	32
Male	53	Executive Chef	35
Male	29	Chef de Cuisine	11
Male	45	Chef de Cuisine	26
Male	43	Executive Chef	20
Male	52	Executive Chef	34
Male	52	Executive Chef	33
Male	53	Executive Chef	35
Male	38	Executive Chef	20
Male	44	Executive Chef	24
Male	34	Executive Chef	14
Male	42	Executive Chef	23
Male	47	Executive Chef	29
Female	34	Pastry Chef	12
Male	33	Executive Chef	15
Male	47	Executive Chef	10
Male	57	Executive Chef	35
Female	50	Executive Chef	22
Male	42	Chef de Cuisine	24
Female	44	Chef	10

Appendix 2. Interview Questions

- 1- What do you think about the role of technology in the future of chefs?
- 2- Do you think there is a relationship between the use of technology in the kitchen and chefs' skills?
Will the high level of technology in the kitchen affect the skills of chefs?
- 3- Would using a high level of technology in the kitchen result in fewer skilled chefs in the future?
- 4- Do you think there is a relationship between technology in the kitchen and the creativity of chefs?
Will the high level of technology in the kitchen affect chefs' creativity?

References

- Batat, W. (2021). How augmented reality (AR) is transforming the restaurant sector: Investigating the impact of "Le Petit Chef" on customers' dining experiences. *Technological Forecasting and Social Change*, 172, 121013. <https://doi.org/10.1016/j.techfore.2021.121013>
- Blutinger, J. D., Cooper, C. C., Karthik, S., Tsai, A., Samarelli, N., Storvick, E., ... & Lipson, H. (2023). The future of software-controlled cooking. *npj Science of Food*, 7(1), 6. <https://doi.org/10.1038/s41538-023-00182-6>
- Califano, G., Zhang, T., & Spence, C. (2024). Would you trust an AI chef? Examining what people think when AI becomes creative with food. *International Journal of Gastronomy and Food Science*, 100973. <https://doi.org/10.1016/j.ijgfs.2024.100973>
- Caprani, O. (2016). Robot-supported food experiences. In *Cultural Robotics: First International Workshop, CR 2015, Held as Part of IEEE RO-MAN 2015, Kobe, Japan, August 31, 2015. Revised Selected Papers* (Vol. 9549, p. 107). Springer. <https://link.springer.com/book/10.1007/978-3-319-42945-8#page=112>
- Cavusoglu, M. (2019). An analysis of technology applications in the restaurant industry. *Journal of Hospitality and Tourism Technology*, 10(1), 45-72. <https://doi.org/10.1108/JHTT-12-2017-0141>
- Deksne, L., Kempelis, A., Sniedzins, T., & Kozlovskis, A. (2021). Automated System for Restaurant Services. *Information Technology and Management Science*, 24. <https://itms-journals.rtu.lv/article/view/itms-2021-0003>
- Fraser, S., & Lyon, P. (2018). Chef perceptions of modernist equipment and techniques in the kitchen. *Journal of culinary science & technology*, 16(1), 88-105. <https://doi.org/10.1080/15428052.2017.1333935>
- Fraser, S., & Lyon, P. (2018). Chef perceptions of modernist equipment and techniques in the kitchen. *Journal of culinary science & technology*, 16(1), 88-105. <https://doi.org/10.1080/15428052.2017.1333935>
- Fusté-Forné, F. (2021). Robot chefs in gastronomy tourism: what's on the menu?. *Tourism Management Perspectives*, 37, 100774. <https://doi.org/10.1016/j.tmp.2020.100774>
- Gu, Q., Li, M., & Huang, S. (2023). An exploratory investigation of technology-assisted dining experiences from the consumer perspective. *International Journal of Contemporary Hospitality Management*, 35(3), 1010-1029. <https://doi.org/10.1108/IJCHM-02-2022-0214>
- Hannon, B., Kumar, Y., Li, J. J., & Morreale, P. (2024). Chef Dalle: Transforming Cooking with Multi-Model Multimodal AI. *Computers*, 13(7), 156. <https://doi.org/10.3390/computers13070156>
- Kimes, S. E. (2008). The role of technology in restaurant revenue management. *Cornell Hospitality Quarterly*, 49(3), 297-309. <https://doi.org/10.1177/1938965508322768>
- Mahfud, T., & Lastariwati, B. (2019). Chef's competency as a key element in food tourism success: A literature review. *Geo Journal of Tourism and Geosites*, 26(3), 1057-1071. <https://doi.org/10.30892/gtg.26329-417>
- Marinakou, E., & Giousmpasoglou, C. (2022). Chefs' competencies: a stakeholder's perspective. *Journal of Hospitality and Tourism Insights*, 5(1), 205-229. <https://doi.org/10.1108/JHTI-06-2020-0101>
- McBride, A. E., & Flore, R. (2019). The changing role of the chef: A dialogue. *International Journal of Gastronomy and Food Science*, 17, 100157. <https://doi.org/10.1016/j.ijgfs.2019.100157>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. SAGE Publications. [https://books.google.es/books?hl=en&lr=&id=U4lU_-wJ5QEC&oi=fnd&pg=PR12&dq=Miles,+M.B.,+%26+A.M.+Huberman,+A.M.+\(1994\).+Qualitative+Data+Analysis.+SAGE+Publications.&ots=kGUA-FTVXT&sig=M--lh_jtAG55_wja0qoU5XDScWo&redir_esc=y#v=onepage&q=Miles%2C%20M.B.%2C%20%26%20A.M.%20Huberman%2C%20A.M.%20\(1994\).%20Qualitative%20Data%20Analysis.%20SAGE%20Publications.&f=false](https://books.google.es/books?hl=en&lr=&id=U4lU_-wJ5QEC&oi=fnd&pg=PR12&dq=Miles,+M.B.,+%26+A.M.+Huberman,+A.M.+(1994).+Qualitative+Data+Analysis.+SAGE+Publications.&ots=kGUA-FTVXT&sig=M--lh_jtAG55_wja0qoU5XDScWo&redir_esc=y#v=onepage&q=Miles%2C%20M.B.%2C%20%26%20A.M.%20Huberman%2C%20A.M.%20(1994).%20Qualitative%20Data%20Analysis.%20SAGE%20Publications.&f=false)
- Norén, B. (2022). *A chef's role within the creative process in haute cuisine restaurants*. Örebro Universitet. <https://www.diva-portal.org/smash/get/diva2:1698756/FULLTEXT01.pdf>

- Pagaldiviti, S. R., & Roy, B. K. (2023). The future of restaurants: How technology is changing the way we dine out. In *Impactful Technologies Transforming the Food Industry* (pp. 63-74). IGI Global. <https://www.igi-global.com/chapter/the-future-of-restaurants/329477>
- Roque, J., Guastavino, C., Lafraire, J., & Fernandez, P. (2018). Plating influences diner perception of culinary creativity. *International Journal of Gastronomy and Food Science*, 11, 55-62. <https://doi.org/10.1016/j.ijgfs.2017.11.006>
- Ruiz, J., Calvarro, J., Sánchez del Pulgar, J., & Roldán, M. (2013). Science and technology for new culinary techniques. *Journal of culinary science & technology*, 11(1), 66-79. <https://doi.org/10.1080/15428052.2013.755422>
- Şener, E., & Ulu, E. K. (2024). Culinary Innovation: Will the Future of Chefs' Creativity be Shaped by AI Technologies?. *Tourism: An International Interdisciplinary Journal*, 72(3), 340-352. <https://doi.org/10.37741/t.72.3.4>
- Seyitoğlu, F., Atsız, O., & Acar, A. (2023). The future of restaurant labour: evidence from the US restaurants. *Current Issues in Tourism*, 1-18. <https://doi.org/10.1080/13683500.2023.2280150>
- Vu, O. T. K., Alonso, A. D., Bressan, A., Tran, L. N., & Nguyen, T. T. (2024). The development of “chefs’ innovative cooktop”: A creative self-efficacy and open innovation perspective. *International Journal of Hospitality Management*, 118, 103664. <https://doi.org/10.1016/j.ijhm.2023.103664>
- Wilhelmy, A., & Köhler, T. (2022). Qualitative research in work and organizational psychology journals: Practices and future opportunities. *European Journal of Work and Organizational Psychology*, 31(2), 161-185. <https://doi.org/10.1080/1359432X.2021.2009457>