TAISTY

Pedagogical guidelines for using AI in culinary trainings

Partners

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Introduction

The integration of Artificial Intelligence (AI) in education is revolutionizing how teachers and students interact with learning materials. The **TAISTY Training Model** is designed to guide culinary teachers in using AI technologies, such as ChatGPT, to create engaging, interactive, and pedagogically sound lessons. This training model synthesizes key educational frameworks, including **SAMR**, **TPACK**, **BLOOM's Taxonomy**, and the **DIGCOMPEDU** (Digital Competence Framework for Educators), to provide a structured approach to AI integration.

The goal of this model is to help educators develop competencies in using AI for culinary training, ensuring that teachers can effectively apply these technologies to enhance both theoretical and practical aspects of their lessons. By aligning AI tools with sound pedagogical practices, this model empowers teachers to create more personalized, motivating, and interactive learning environments.

Framework Overview

This section presents an overview of the four educational frameworks that serve as the foundation of the TAISTY Training Model: **SAMR**, **TPACK**, **BLOOM's Taxonomy**, and **DIGCOMPEDU**. These frameworks guide the integration of AI into the curriculum and ensure that its application is not just a technological addition but a meaningful enhancement of the learning process.

SAMR Framework

The **SAMR Model** (Substitution, Augmentation, Modification, Redefinition) is a framework designed to help educators assess and implement technology into their teaching. The model outlines four stages of technology integration:

- **Substitution**: Technology acts as a direct replacement for traditional tools, with no functional change. For example, using a chatbot like ChatGPT to answer basic culinary theory questions instead of textbooks.
- **Augmentation**: Technology replaces traditional methods with added functionalities. In culinary training, this could involve using AI to enhance recipe development by suggesting ingredient substitutions based on dietary needs or preferences.
- **Modification**: Technology allows for significant task redesign. An example would be students working collaboratively with AI to simulate real-time cooking scenarios, receiving instant feedback on their techniques and presentation.
- **Redefinition**: Technology enables tasks that were previously inconceivable. In a culinary classroom, AI could assist in creating entirely new dishes by analyzing global culinary trends and suggesting innovative combinations of ingredients and techniques.

The SAMR framework helps teachers understand how AI can progressively enhance the learning process, from basic substitution to the creation of entirely new learning experiences.

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TPACK Framework

The **TPACK Model** (Technological Pedagogical Content Knowledge) emphasizes the intersection of three critical knowledge areas: **Content**, **Pedagogy**, and **Technology**. In the context of culinary training, this framework guides teachers on how to integrate AI technologies in a way that enhances both the content (culinary knowledge) and pedagogy (teaching methods).

- **Technological Knowledge (TK)**: Teachers need to understand how AI tools like ChatGPT function and how to incorporate them into their lessons. For example, teachers can use AI to create personalized learning experiences, allowing students to interact with a chatbot to explore different cooking methods or nutritional concepts.
- **Pedagogical Knowledge (PK)**: This refers to the teacher's understanding of how students learn and how to create effective instructional strategies. In AI-enhanced culinary training, this could involve designing lesson plans that use AI for interactive cooking demonstrations, allowing students to practice virtually before entering the kitchen.
- **Content Knowledge (CK)**: This is the teacher's expertise in culinary arts. AI tools can be used to deepen content understanding by providing real-time insights into global culinary trends, ingredient substitutions, or dietary information.

The intersection of these three areas ensures that AI integration is not just about using technology but about enriching both the teaching process and the content delivered.

Bloom's Taxonomy

The **Bloom Taxonomy** categorises educational goals into cognitive levels of complexity and specificity, providing a framework for structuring learning objectives. In the TAISTY Training Model, AI tools can be aligned with these levels to promote deeper learning in culinary training.

- **Remembering**: AI tools can help students recall basic culinary terms or procedures, such as asking ChatGPT to explain the steps in making a soufflé.
- **Understanding**: AI can assist students in explaining or summarizing cooking techniques or recipes.
- **Applying**: AI-enhanced lessons can allow students to apply their knowledge by generating personalized recipes based on ingredients they have on hand.
- **Analyzing**: AI tools can help students break down complex cooking processes, such as analyzing the steps involved in fermentation or the science behind flavor pairing.
- **Evaluating**: Students can use AI to evaluate different cooking techniques, comparing traditional methods with modern innovations introduced by AI-generated recipes.
- **Creating**: AI enables students to create new dishes by combining ingredients in unique ways or inventing novel cooking techniques.

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DIGCOMPEDU Framework

The **Digital Competence Framework for Educators (DIGCOMPEDU)** is a comprehensive tool that helps teachers assess and improve their digital competencies. For the purposes of the TAISTY Training Model, this framework will guide educators on how to enhance their digital teaching practices, particularly in the use of AI tools within culinary education.

The DIGCOMPEDU framework is divided into six areas:

1. **Professional Engagement**: Teachers should use AI tools to enhance communication with colleagues, students, and stakeholders. For example, they could collaborate using digital platforms like Microsoft Teams or SharePoint to share AI-enhanced lesson plans and discuss innovative teaching methods.
2. **Digital Resources**: Educators need to be proficient in sourcing, creating, and sharing digital resources. In culinary training, teachers could use AI to create interactive cooking guides or video tutorials. They can also use AI to gather resources on emerging food trends and dietary considerations.
3. **Teaching and Learning**: This area focuses on integrating AI into the learning environment. AI tools can provide students with real-time feedback, personalize learning experiences, and simulate real-world cooking scenarios. Teachers can use AI to tailor lessons to the individual needs of their students, enhancing engagement and learning outcomes.
4. **Assessment**: AI tools can assist in the assessment of students by automating certain processes, such as grading quizzes or providing feedback on cooking techniques. Teachers can also use AI to create formative assessments that adapt to students' performance, providing a more personalized learning experience.
5. **Empowering Learners**: AI can be used to empower students to take more control of their learning. For example, AI chatbots can help students explore new cooking methods or recipes at their own pace, giving them the autonomy to experiment and learn outside the classroom.
6. **Facilitating Learners' Digital Competence**: Teachers are responsible for helping students develop their own digital skills. Through the use of AI in culinary training, students will gain experience using digital tools for research, recipe creation, and cooking simulations, which are essential skills in the modern digital landscape.

The DIGCOMPEDU framework ensures that AI integration in culinary training not only enhances teaching practices but also helps students build valuable digital skills that will benefit them beyond the classroom.

Learning Outcomes

The learning outcomes of the TAISTY Training Model are focused on both teachers and students, ensuring that AI integration benefits all participants in the educational process. These outcomes align with the frameworks discussed (SAMR, TPACK, BLOOM,

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DIGCOMPEDU) and are designed to guide the practical implementation of AI tools in culinary education.

Learning Outcomes for Teachers

1. **Understanding AI Tools**: Teachers will develop a solid understanding of how to use AI tools like ChatGPT to enhance lesson planning, teaching, and assessment in culinary training.

2. **Framework Application**: Teachers will be able to apply the SAMR, TPACK, BLOOM, and DIGCOMPEDU frameworks to their teaching practices, ensuring that AI integration is both pedagogically sound and aligned with curriculum goals.

3. **Creating AI-Enhanced Lesson Plans**: Teachers will create and test AI-enhanced lesson plans that incorporate technology into practical culinary training, such as using AI to simulate cooking processes, analyze recipes, or offer personalized feedback.

4. **Facilitating Ethical AI Use**: Educators will understand the ethical implications of AI use in the classroom, including issues related to data privacy, bias in AI systems, and ensuring that AI tools are used to enhance, not replace, human decision-making in teaching.

5. **Developing Digital Competence**: Teachers will improve their own digital skills, learning how to navigate AI tools and digital platforms, and how to teach these skills to their students.

Learning Outcomes for Students

1. **Engaging with AI**: Students will develop the ability to engage with AI tools to enhance their culinary education. For example, they will learn how to use AI to explore new recipes, analyze food trends, and receive personalized feedback on their cooking techniques.

2. **Applying Digital Skills**: Students will improve their digital literacy, learning how to interact with AI and other digital resources to research ingredients, create innovative recipes, and solve culinary problems.

3. **Critical Thinking and Problem-Solving**: By using AI tools, students will enhance their critical thinking and problem-solving abilities. AI will allow them to simulate cooking scenarios, evaluate different culinary techniques, and experiment with creative approaches to cooking.

4. **Understanding Ethical AI Use**: Students will gain an understanding of the ethical considerations surrounding AI, such as data privacy and the responsible use of technology in culinary and other industries.

5. **Collaboration and Communication**: AI tools can foster collaboration among students by allowing them to work together on AI-enhanced cooking projects, share insights, and provide peer feedback through digital platforms.

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Integrating AI into Culinary Training: ChatGPT as a Teaching Tool

As part of the TAISTY project's commitment to supporting digital pedagogy, we have developed two instructional videos demonstrating how educators can effectively use ChatGPT to enhance teaching and training. These videos provide step-by-step guidance on how to access and use ChatGPT, generate AI-assisted culinary recipes and practices for prompts in education.

The videos are available on TAISTY website and YouTube channel (@tAIstyproject) with Italian and Greek subtitles to ensure accessibility for a wider audience.

- Video 1: ChatGPT for Teachers & Trainers – Ialian Subtitles

  Link: ricetta ravioli ripieni con patate e carciofi, suggerita da chatgpt

- Video 2: ChatGPT for Teachers & Trainers – Greek Subtitles

  Link: Cypriot Afelia recipe with sub in Greek

These videos serve as a practical resource for chefs, educators exploring AI-powered tools in their teaching methodology.

Practical Applications and Lesson Plans

In this section, we will showcase how the frameworks (SAMR, TPACK, BLOOM, DIGCOMPEDU) are applied through AI-enhanced lessons in culinary education. The lesson plans outlined below demonstrate the practical use of AI tools like ChatGPT to enrich learning experiences and foster collaboration among students.

Appendix: Lesson Plans

The appendix contains lesson plans, which are referenced throughout the guidelines. These lesson plans incorporate AI tools into culinary training and align with the educational frameworks discussed. The following lessons are included:

- **Afelia (Cypriot Pork Marinated in Red Wine and Coriander)**: AI-assisted recipe creation and flavor balancing.
- **Anari Cheese (Making Cheese from Whey)**: Using AI to enhance traditional cheese-making techniques.
- **Avgolemono (Greek-Cypriot Lemon and Egg Soup)**: AI-guided tempering techniques for mastering complex emulsifications.
- **Halloumi**: AI-enhanced processes for creating traditional Cypriot cheese.

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- **Koupepia (Cypriot Stuffed Grape Leaves)**: AI-guided rolling techniques and flavor profile analysis.
- **Pourgouri Pilaf (Bulgur Wheat and Pasta Pilaf):** AI-enhanced processes for creating pourgouri pilaf.
- **Fusion Pizza (Cypriot-Italian Style with Halloumi):** AI-creation of fusion pizza
- **Lemon Sorbet:** AI-assisted temperature monitoring and flavor balancing to create the perfect sorbet with a smooth texture and refreshing taste.
- **Olive Oil Gelato with Confit Cherry Tomatoes and Basil:** AI-supported techniques for balancing savory and sweet flavors, ensuring a creamy gelato with optimal texture and a unique pairing of tomatoes.
- **Pizza Margherita with Semi-Whole Wheat Flour:** AI-enhanced dough hydration and baking time monitoring for creating a perfectly balanced pizza with a crisp crust and fresh toppings.
- **Rabbit with Modica Dark Chocolate:** AI-guided simmering and flavor enhancement for achieving the ideal savory-sweet balance in this traditional Sicilian dish with a rich chocolate-infused sauce.
- **Risotto with Mackerel Bites and Wild Fennel:** AI-assisted broth absorption and timing for a creamy risotto, paired with mackerel and fennel to elevate flavors and textures.
- **Sardine and Potato Cake with Poppy Seed Velouté:** AI-supported frying and sauce preparation to ensure crispy cakes and a smooth velouté with a perfect poppy seed infusion.
- **Potato and Artichoke Ravioli with Lamb Ragù, Rosemary and Artichoke Chips (Fusion Recipe):** AI-guided pasta and ragù preparation to create a harmonious dish with balanced textures and flavors, enhanced by artichoke chips for garnish.

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Qualification Model Guide for Cypriot Recipes

Recipe 1: Afelia (Cypriot Pork Marinated in Red Wine and Coriander)

- **SAMR**:
    - **Substitution**: AI provides basic recipe instructions, replacing traditional written recipes.
    - **Augmentation**: AI enhances marination suggestions as per trainer or student input with information like time, temperature, and flavor variations.
- **TPACK**:
    - **Technology**: AI is used to assist in processes, offering adjustments based on ingredient inputs.
    - **Pedagogy**: Students practice marination techniques by interacting with AI.
    - **Content Knowledge**: Focus on traditional Cypriot marination and flavor balancing.
- **BLOOM**:
    - **Remembering**: Recall essential marination steps (e.g., seasoning, simmering) with AI prompts.
    - **Applying**: Apply AI-generated advice to adjust marination times and ingredient proportions.
    - **Analyzing**: Analyze AI feedback on marination effects (e.g., wine acidity and coriander flavor intensity).
- **DIGCOMPEDU**:
    - **Digital Resources**: Students develop digital skills by interacting with AI to enhance traditional marination techniques.
    - **Teaching and Learning**: AI supports personalized learning, offering variations based on student input.

Recipe 2: Anari Cheese (Making Cheese from Whey)

- **SAMR**:
    - **Augmentation**: AI offers suggestions as per trainer or student input during the cheese curdling process, optimizing heat and ingredient ratios.
- **TPACK**:
    - **Technology**: AI is used to guide students after input in curdling whey for cheese-making.

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- **Pedagogy**: Hands-on practice with AI tools to refine traditional Cypriot cheese-making techniques.
- **Content Knowledge**: Focus on sustainability through repurposing whey into Anari cheese.

- **BLOOM**:
  - **Applying**: Use AI guidance to properly curdle the whey and control temperature for Anari cheese.
  - **Evaluating**: Students evaluate the cheese's texture and taste based on AI feedback.

- **DIGCOMPEDU**:
  - **Assessment**: AI helps in assessment creation to get feedback whether students achieve the correct cheese texture and consistency.

Recipe 3: Avgolemono (Greek-Cypriot Lemon and Egg Soup)

- **SAMR**:
  - **Modification**: AI offers suggestions as per trainer or student input practicing tempering eggs without curdling them, enhancing their understanding of the delicate process.

- **TPACK**:
  - **Technology**: AI assists in guiding students through tempering and emulsification techniques.
  - **Pedagogy**: Students follow AI feedback to master the balance between lemon acidity and the smoothness of the soup.
  - **Content Knowledge**: Focus on traditional Cypriot soups and emulsification.

- **BLOOM**:
  - **Applying**: Apply AI suggestions to temper eggs at the right temperature without coagulation.
  - **Evaluating**: Evaluate the smoothness of the soup based on AI-generated recommendations.

- **DIGCOMPEDU**:
  - **Teaching and Learning**: AI helps students perfect tempering techniques and avoid common mistakes, offering personalized feedback.

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Recipe 4: Halloumi (Traditional Cypriot Cheese)

- **SAMR**:
    - **Augmentation**: AI offers suggestions as per trainer or student input in curd-cutting and pressing techniques for Halloumi production.
- **TPACK**:
    - **Technology**: AI tools guide through output to avoid curdling, guiding students through each step of the Halloumi-making process.
    - **Pedagogy**: Students input and then receive instant AI feedback to ensure they achieve the right texture and flavor balance.
    - **Content Knowledge**: Focus on traditional Halloumi-making, using AI to enhance precision.
- **BLOOM**:
    - **Understanding**: Understand the role of curd cutting and pressing through AI-led simulations.
    - **Creating**: Experiment with different pressing methods to explore texture variations.
- **DIGCOMPEDU**:
    - **Digital Resources**: AI serves as a digital assistant, helping students refine Halloumi-making through interactive feedback.

Recipe 5: Koupepia (Cypriot Stuffed Grape Leaves)

- **SAMR**:
    - **Augmentation**: AI offers guidance as per student or trainer input on rolling techniques and the balance of flavors in the filling.
- **TPACK**:
    - **Technology**: AI assists in analyzing and adjusting rolling techniques, ensuring consistency in filling and flavor.
    - **Pedagogy**: Students receive feedback on their rolling and ingredient choices through AI, refining their practical skills.
    - **Content Knowledge**: Focus on mastering the preparation and rolling techniques for Koupepia.
- **BLOOM**:
    - **Applying**: Apply AI recommendations to achieve consistency in rolling the grape leaves.
    - **Analyzing**: Analyze how ingredient proportions impact flavor balance using AI.

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- **DIGCOMPEDU**:
    - **Empowering Learners**: AI helps students perfect rolling techniques and balance flavors, offering personalized feedback.

Recipe 6: Pourgouri Pilaf (Bulgur Wheat and Pasta Pilaf)

- **SAMR**:
    - **Augmentation**: AI suggests as per student or trainer input for timing and flavor adjustments during the cooking of the pilaf.
- **TPACK**:
    - **Technology**: AI helps guide students through traditional techniques for preparing pilaf.
    - **Pedagogy**: AI offers feedback on flavor development, helping students improve their culinary techniques.
    - **Content Knowledge**: Focus on mastering traditional pilaf preparation using technology to refine timing and flavor adjustments.
- **BLOOM**:
    - **Applying**: Use AI feedback to adjust seasoning and cooking times for perfecting pilaf.
    - **Evaluating**: Assess AI suggestions for enhancing the final dish's flavor profile.
- **DIGCOMPEDU**:
    - **Assessment**: AI provides assessments on flavor adjustments and helps students refine their cooking techniques.

Recipe 7: Fusion Pizza (Cypriot-Italian Style with Halloumi)

- **SAMR**:
    - **Augmentation**: AI suggest as per student or trainer input for combining Cypriot and Italian ingredients, such as halloumi, coriander, olives, onions, and cherry tomatoes, in adjusting cooking times for optimal crust texture.
- **TPACK**:
    - **Technology**: AI analyses ingredient proportions with real-time feedback on achieving the desired dough consistency.
    - **Pedagogy**: Students learn to combine Cypriot and Italian ingredients, with AI offering personalized adjustments.
    - **Content Knowledge**: Focus on mastering the art of combining traditional Cypriot flavors (e.g., halloumi) with Italian techniques (e.g., thin-crust pizza-making).

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- **BLOOM**:
    - **Creating**: Encourage experimentation with AI suggestions to enhance unique ingredients or techniques inspired by both cuisines.
    - **Evaluating:** Assess AI suggestions while students assess the outcomes of their creations by evaluating flavor balance, crust texture, and overall presentation. Students critically reflect on areas for improvement and success in achieving a harmonious fusion of the two culinary traditions.

- **DIGCOMPEDU**:
    - **Empowering Learners**: AI assists students to achieve the desired texture and flavor balance by offering step-by-step feedback and adapting recommendations based on user input.

Qualification Model Guide for Italian Recipes

Recipe 1: Lemon Sorbet

- **SAMR**:
    - **Modification**: AI tools help monitor and maintain precise temperature control during the syrup preparation and churning process, enhancing the accuracy of the recipe.
- **TPACK**:
    - **Technology**: AI is used to assist in processes, offering adjustments based on ingredient inputs.
    - **Pedagogy**: Students practice marination techniques by interacting with AI.
    - **Content Knowledge**: Focus on traditional Cypriot marination and flavor balancing.
- **BLOOM**:
    - **Remembering**: Recall essential marination steps (e.g., seasoning, simmering) with AI prompts.
    - **Applying**: Apply AI-generated advice to adjust marination times and ingredient proportions.
    - **Analyzing**: Analyze AI feedback on marination effects (e.g., wine acidity and coriander flavor intensity).
- **DIGCOMPEDU**:

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- **Digital Resources**: Students develop digital skills by interacting with AI to enhance traditional marination techniques.
- **Teaching and Learning**: AI supports personalized learning, offering variations based on student input.

Recipe 9: Olive Oil Gelato with Confit Cherry Tomatoes and Basil

- **SAMR**:
  - **Modification**: AI assists in adjusting ingredient proportions and monitoring emulsification and churning times to ensure the ideal gelato texture and consistency.
- **TPACK**:
  - **Technology**: AI assists with monitoring churning time and texture, ensuring the gelato reaches the desired smoothness without over-processing.
  - **Pedagogy**: Students experiment with savory ingredients in desserts, learning how to balance the unique combination of olive oil and tomatoes in the gelato.
  - **Content**: Understanding how emulsification works in gelato and how different ingredients interact to create complex flavors.
- **BLOOM**:
  - **Application**: Students apply their knowledge of emulsification and slow-roasting techniques in hands-on activities, enhancing their culinary skills.
  - **Analysis**: Students analyze the interaction between savory olive oil and sweet gelato, as well as the flavor enhancement from confit tomatoes.
- **DIGCOMPEDU**:
  - Students engage with AI tools to optimize ingredient ratios and cooking times, enhancing their digital literacy in culinary practices while learning how technology supports creative cooking techniques.

Recipe 10: Pizza Margherita with Semi-Whole Wheat Flour Dough

- **SAMR:**
  - **Modification:** AI assists in adjusting dough hydration levels and kneading times to ensure the correct consistency, enhancing the dough-making process.
- **TPACK**:
  - **Technology**: AI helps monitor dough hydration levels and baking time to achieve the perfect crust texture.
  - **Pedagogy**: Students apply dough-making techniques while learning about fermentation and the science of yeast, kneading, and proofing.
  - **Content**: Emphasizes the importance of traditional Italian ingredients and techniques in making the perfect pizza dough, balancing the nutrition of semi-whole wheat flour with a crisp crust.
- **BLOOM:**
  - **Application:** Students apply their knowledge of dough techniques and topping preparation through hands-on cooking, enhancing their skills in pizza-making.

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    - **Analysis:** Students analyze the impact of semi-whole wheat flour on dough texture and flavor, as well as the role of high heat in achieving the ideal pizza crust.
- **DIGCOMPEDU:**
    - Students use AI tools to optimize ingredient ratios, proofing times, and baking parameters, fostering digital literacy while enhancing the efficiency and precision of their pizza-making process.

Recipe 11: Risotto with Mackerel Bites and Wild Fennel

- **SAMR**:
    - **Modification**: AI can assist in monitoring the rice's absorption rate and suggest when to add the next ladle of broth to ensure optimal creaminess and texture.
- **TPACK:**
    - **Technology:** AI assists in monitoring the rice's absorption rate and suggests optimal times to add broth, ensuring a creamy risotto consistency.
    - **Pedagogy:** Hands-on stirring and monitoring techniques allow students to understand how slow absorption and constant stirring contribute to the creaminess of risotto.
    - **Content:** Focus on the traditional Italian risotto-making process, combined with innovative ingredients like mackerel and wild fennel to create a balanced dish.
- **BLOOM**:
    - **Application**: Students apply their knowledge of risotto techniques, pesto preparation, and fish handling through hands-on cooking, gaining practical skills.
    - **Analysis**: Students analyze how wild fennel and mackerel interact with the risotto base, understanding how these ingredients contribute to the dish's flavor and texture balance.
- **DIGCOMPEDU**:
    - Students use AI tools to optimize the cooking process, such as adjusting broth additions and ensuring proper pesto consistency, enhancing their digital literacy in managing cooking tasks and timing.

Recipe 12: Risotto with Mackerel Bites and Wild Fennel

- **SAMR**:
    - **Modification**: AI can assist in monitoring the rice's absorption rate and suggest when to add the next ladle of broth to ensure optimal creaminess and texture.
- **TPACK:**
    - **Technology:** AI assists in monitoring the rice's absorption rate and suggests optimal times to add broth, ensuring a creamy risotto consistency.

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    - **Content:** Focus on the traditional Italian risotto-making process, combined with innovative ingredients like mackerel and wild fennel to create a balanced dish.
- **BLOOM**:
    - **Application**: Students apply their knowledge of risotto techniques, pesto preparation, and fish handling through hands-on cooking, gaining practical skills.
    - **Analysis**: Students analyze how wild fennel and mackerel interact with the risotto base, understanding how these ingredients contribute to the dish's flavor and texture balance.
- **DIGCOMPEDU**:
    - Students use AI tools to optimize the cooking process, such as adjusting broth additions and ensuring proper pesto consistency, enhancing their digital literacy in managing cooking tasks and timing.

Recipe 13: Sardine and Potato Cake with Poppy Seed Velouté

- **SAMR**:
    - **Modification**: AI can assist in monitoring cooking times for the cakes, ensuring they are evenly browned and cooked through without overcooking or burning.
- **TPACK:**
    - **Technology:** AI helps with precise temperature control while frying and ensuring the velouté remains smooth and lump-free.
    - **Pedagogy:** Students apply frying techniques for the cakes and learn the critical steps in making a velouté sauce, focusing on texture and consistency.
    - **Content:** Understanding the balance of rich and mild flavors in Mediterranean cuisine and how poppy seeds enhance the velouté's flavor.
- **BLOOM**:
    - **Application**: Students apply their knowledge of cooking techniques like forming cakes, preparing sauces, and balancing flavors through hands-on practice.
    - **Analysis**: Students analyze how the sardine-potato mixture and velouté sauce interact to create a balanced dish and assess how each ingredient contributes to the overall flavor.
- **DIGCOMPEDU**:
    - Students use AI tools to optimize cooking processes, such as adjusting heat levels for the cakes and ensuring the velouté sauce remains smooth, enhancing their digital literacy in the kitchen.

Recipe 14: Potato and Artichoke Ravioli with Lamb Ragù, Rosemary, and Artichoke Chips

- **SAMR:**

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    - **Modification:** AI can assist in monitoring simmering times and suggest adjustments to ensure the ragù doesn't reduce too quickly, helping to maintain the right consistency for the sauce.
- **TPACK**:
    - **Technology**: AI assists in ensuring the proper cooking times for both the ragù and ravioli, optimizing heat levels for even cooking.
    - **Pedagogy**: Students practice pasta-making and slow-cooking techniques, learning how to balance the delicate texture of ravioli with the hearty flavors of the lamb ragù.
    - **Content**: Focus on the traditional Italian combination of lamb and rosemary in ragù, and how artichokes can be used to add flavor and texture to both the ravioli and as a garnish.
- **BLOOM:**
    - **Application:** Students apply their knowledge of traditional pasta-making, simmering techniques, and garnishing skills through hands-on practice, refining their culinary techniques.
    - **Analysis:** Students analyze how the combination of lamb, rosemary, and artichokes enhances the flavor profile of the ravioli, understanding how each component contributes to the overall dish.
- **DIGCOMPEDU:**
    - Students use AI tools to optimize the cooking process, such as adjusting cooking times and temperatures for both the ragù and the artichoke chips, enhancing their digital literacy in the kitchen and supporting precision in cooking.

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Analysis of TAISTY AI recipes scenario

AI Recipe Evaluation Questionnaire

In this evaluation survey respondents had to evaluate 14 recipes from Italy and Cyprus: Anari, Afelia, Avgolemono, Pourgouri, Koupepia, Halloumi, Fussion Pizza, Lemon sorbet, Olive Oil Gelato with Confit Cherry Tomato, Pizza Margherita with Semi-Whole Wheat Dough, Rabbit with Modica Dark Chocolate, Risotto with Mackerel Bites and Wild Fennel, Sardine and Potato Cake with Poppy Seed Velouté, Fusion recipe

1. How easy was it to follow the recipe?

☐ Very easy ☐ Quite easy ☐ Neutral ☐ Somewhat difficult ☐ Very difficult
Comments: [Space for comments about the ease of following the recipe.]

2. Did the recipe instructions feel clear and organized?

☐ Very clear ☐ Quite clear ☐ Neutral ☐ Somewhat unclear ☐ Very unclear
Comments: [Space for suggestions to improve clarity and organization.]

3. Did the recipe instructions feel clear and organized?

☐ Completely accurate ☐ Mostly accurate ☐ Neutral ☐ Somewhat inaccurate ☐ Very inaccurate
Comments: [Space to describe issues, if any, with measurements.]

4. Were the ingredient measurements accurate?

☐ No difficulty ☐ Minor difficulty ☐ Neutral ☐ Moderate difficulty ☐ Significant difficulty **Comments:** [Specify which ingredients were challenging to find or use.]

5. Did you have any difficulty finding or using the ingredients?

☐ Excellent ☐ Great ☐ Neutral ☐ Somewhat disappointing ☐ Very disappointing
Comments: [Feedback on the flavor and texture of the dish.]

6. How was the final taste of the dish?

☐ Matched the estimated time ☐ Slightly longer ☐ Neutral ☐ Somewhat shorter ☐ Very inaccurate
Comments: [Suggestions for improving preparation or cooking time accuracy.]

7. Did the preparation and cooking time match what was suggested?

☐ Extremely efficient ☐ Quite efficient ☐ Neutral ☐ Somewhat wasteful ☐ Very wasteful
Comments: [Feedback on ingredient efficiency and waste.]

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8. Did the recipe use ingredients efficiently (e.g., minimal waste, sustainable options)?

☐ Exceptional ☐ Very appealing ☐ Neutral ☐ Somewhat unappealing ☐ Very unappealing
Comments: [Suggestions to improve plating or presentation.]

9. How visually appealing was the final dish?

☐ Yes ☐ Maybe ☐ No C**omments:** [What would encourage you to reuse this recipe?]

Responses of AI Recipe Evaluation Questionnaire

This survey reveals several important insights from the scenario testing in Italy and Cyprus with technology to check quality of prompting and quality of results by result and taste.

1. Ease of Following the Recipe

- **Distribution of CY Responses**: 46.2% of responses find it very easy to follow the recipe, 30.8% somewhat easy, 15.4% neutral and 7.7% somewhat easy.
- **Conclusion**: The majority (77%) of users found the recipes easy to follow (*Very easy* or *Somewhat easy*). However, the remaining 23% indicate that some recipes could be further simplified or clarified to improve accessibility.
- **Distribution of IT Responses:** 57.1%: Very easy, 28.6%: Quite easy, 14.3%: Neutral
- **Conclusion:** 85.7% of users found the recipes easy to follow (Very easy or Quite easy). However, the remaining 14.3% indicates that some recipes could be further simplified or clarified to improve accessibility.

2. Clarity and Organization of Instructions

- **Distribution of CY Responses**: 69.2% of responses very clear, 23.1% somewhat clear and 7.7% clear.
- **Conclusion**: Most users found the instructions clear (*Very clear*: 69.2%), but about 31% experienced some level of confusion. Enhancing the organization and detail of instructions could address these concerns.
- **Distribution of IT Responses:** 57.1%: Very clear, 14.3%: Quite clear, 28.6%: Clear
- **Conclusion:** The majority of users found the instructions clear (Very clear: 57.1%), but around 42% experienced some level of confusion. Improving the organization and details of the instructions could help address these issues.

3. Ingredient Measurements Accuracy

- **Distribution of CY Responses**: 92.3% of responses were accurate and 7.7% inaccurate.

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- **Conclusion**: Ingredient measurements were overwhelmingly accurate. The single inaccuracy (for *Avgolemono*) should be reviewed to maintain consistency.

- **Distribution of IT Responses:** 100%: Accurate

- **Conclusion:** The ingredient measurements were found to be completely accurate.

4. Difficulty Finding or Using Ingredients

- **Distribution of CY Responses**:84.6% of responses find it no difficulty and 15.4% find difficulty
- **Conclusion**: Most users (85%) did not encounter difficulties sourcing ingredients. Addressing the issues raised for specific recipes (*Avgolemono* and *Fusion*) could improve accessibility further.

- **Distribution of IT Responses:** 100%: No difficulties

- **Conclusion:** No difficulties were reported in sourcing the ingredients.

5. Final Taste of the Dish

- **Distribution of CY Responses**: 38.5% of responses rated as excellent and 61.5% as great.
- **Conclusion**: All recipes received positive ratings for taste, with no negative feedback. While *Great* ratings dominate, efforts could focus on elevating recipes to achieve more *Excellent* responses.

- **Distribution of IT Responses:** 100%: Excellent

- **Conclusion:** All recipes received overwhelmingly positive ratings for taste, with no negative feedback reported.

6. Preparation and Cooking Time Accuracy

- **Distribution of Responses**: 92.3% of responses rated as matched and 7.7% as did not match.
- **Conclusion**: Preparation and cooking times were accurate for nearly all recipes, except for one outlier (*Pourgouri*). Further testing can address this inconsistency.

7. Ingredient Efficiency (Minimal Waste and Sustainability)

- **Distribution of Responses**: 100% rated efficient
- **Conclusion**: All recipes were praised for their efficient use of ingredients, emphasizing sustainability and minimal waste. This aspect is a strong point of the recipes.

8. Visual Appeal of the Final Dish

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- **Distribution of CY Responses**: 23.1% of responses rated the visual appeal of the final dish as exceptional, 61.5% very appealing and 15.4% good.
- **Conclusion**: The majority of dishes were rated as visually appealing, with a notable proportion (23.1%) achieving *Exceptional* appeal. Improvements in plating or presentation could elevate more dishes to *Exceptional* status.

- **Distribution of IT Responses:** 57.1%: Exceptional, 28.6%: Very appealing, 14.3%: Appealing

- **Conclusion:** Most dishes were rated as visually appealing, with a significant portion (57.1%) achieving an "Exceptional" level of appeal. Improvements in plating or presentation could elevate more dishes to "Exceptional" status.

9. Willingness to Use the Recipe Again

- **Distribution of Responses**: 84.6% of responses were Yes and 15.4% No.
- **Conclusion**: Most users would reuse the recipes, with only two exceptions (*Avgolemono* and *Anari*). Refining these recipes to address user concerns could increase their likelihood of being reused.

Overall Conclusion

The recipe-testing initiative demonstrated strong results, with participants commending the recipes for their taste, accurate measurements, ingredient efficiency, and overall user-friendliness. Most respondents found the recipes easy to follow, with clear instructions and accessible ingredients, though some minor improvements in clarity and organization could further enhance usability. The recipes achieved high marks for preparation time accuracy, sustainability, and visual appeal, with notable praise for the minimal waste involved. Most participants expressed a willingness to reuse the recipes, underscoring their overall success.

In addition to these findings, the scenario testing revealed the positive impact of AI-supported recipes on digital skills. Teachers and trainers found that incorporating AI in recipe design and execution significantly enhanced their ability to leverage digital tools effectively. This integration also fostered the development of media skills among students, as they engaged with technology to improve their understanding of culinary techniques and presentation.

The overwhelming support for the recipes, coupled with the benefits to digital and media skills, highlights the potential of AI-powered tools to enhance educational and culinary experiences. Addressing specific feedback regarding certain recipes and further refining aspects such as clarity and presentation will ensure even greater user satisfaction and learning outcomes.

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Ethical Guidelines for AI Use in Culinary Education

As AI becomes more prevalent in education, it's crucial to ensure that its use is ethical and aligned with responsible practices. These guidelines cover key ethical considerations for integrating AI into culinary education:

Data Privacy

- **Student Privacy**: AI tools may collect personal data from students. It is essential to ensure that this data is securely stored and used solely for educational purposes. Educators must familiarize themselves with privacy policies associated with the AI tools they use.
- **Transparency**: Teachers should communicate clearly with students and parents about how data will be used and safeguarded. Students must be made aware of the information being collected and its purpose.

Avoiding Bias in AI

- **Algorithmic Bias**: AI tools may inadvertently perpetuate biases based on their training data, leading to unequal treatment of students. Teachers must critically evaluate the content produced by AI tools to ensure inclusivity.
- **Cultural Sensitivity**: When using AI-generated content (e.g., recipes), educators should ensure that the results respect cultural diversity and do not reinforce stereotypes or inappropriate assumptions.

Ethical Use of AI in Decision-Making

- **Teacher's Role**: AI should be used to support, not replace, the teacher's judgment. AI tools can provide feedback and suggestions, but educators should maintain their role as the final authority on grading, assessments, and instructional strategies.
- **Transparency of AI Processes**: Teachers must explain to students how AI works, including its strengths and limitations, to promote a clear understanding of its role in education.

AI and Student Empowerment

- **Encouraging Critical Thinking**: AI should be used as a tool to promote critical thinking rather than as a shortcut to answers. For example, instead of providing final answers, AI can guide students in thinking through problem-solving steps.
- **Avoiding Over-reliance**: Students should be encouraged to use AI as a complement to their own skills and knowledge rather than relying on it for all tasks.

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Practical Use of AI in Culinary Training

Incorporating AI into Lesson Plans

The following section outlines how AI can be seamlessly integrated into culinary training. These practical applications will help educators implement AI tools in the classroom to improve both teaching and learning experiences.

Tools for Recipe Creation

- **Virtual Assistants**: AI-powered virtual assistants like ChatGPT can help students generate recipes based on available ingredients or dietary restrictions. Students can interact with the AI to understand the logic behind recipe creation, allowing them to learn about food pairings and substitutions in real time.
- **Real-Time Feedback**: AI tools can provide feedback

AI-Enhanced Cooking Simulations

Simulation of Cooking Techniques: AI tools can simulate the preparation of complex dishes.

Fusion Dishes: AI can suggest global recipes or fusion dishes by combining ingredients from different cuisines. This helps students experiment with new flavors and techniques, fostering creativity in the kitchen.

Learning Scenarios

Here are examples of learning scenarios where AI can enhance the educational experience:

- **Recipe Development**: Students work with AI to create recipes for a set of ingredients, simulating real-world challenges like food waste reduction or adapting recipes to dietary restrictions.
- **AI as a Sous-Chef**: AI helps students during live cooking sessions, providing guidance on timing, temperatures, and sequencing tasks (e.g., when to add specific ingredients during a cooking process).

Evaluation and Feedback Tools

To ensure the effectiveness of AI in culinary education, evaluation forms and feedback tools are necessary. This section outlines methods for assessing both student performance and the impact of AI integration.

AI Tool Evaluation

Educators should regularly evaluate the AI tools used in the classroom to ensure that they are providing accurate, unbiased, and helpful feedback. Key evaluation points include:

- **Accuracy of AI Feedback**: Does the AI provide reliable suggestions or corrections?
- **User Experience**: Is the tool easy to use for both students and teachers?

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- **Cultural Sensitivity**: Does the AI produce content that is respectful of different culinary traditions and cultural contexts?

Student Assessment

Teachers could use both AI-based assessments and traditional methods to evaluate student progress. The following templates will help track learning outcomes:

- **Formative Assessments**: AI can help provide ongoing feedback during practical sessions, allowing students to adjust their techniques in real time.
- **Summative Assessments**: Final evaluations should combine AI-generated feedback with teacher assessments to ensure a comprehensive view of student performance.

Learning Outcomes Tracking

- **Personalized Progress Reports**: AI tools can be used to generate individualized reports based on each student's interaction with the technology, tracking their learning progress in areas such as creativity, recipe development, and application of cooking techniques.
- **Culinary Skill Development**: AI-generated feedback on hands-on tasks, such as preparing dishes or planning menus, can be combined with instructor feedback to provide a detailed picture of student competency.

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