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TAISTY

Development and testing of the TAISTY training model (incl. SAMR, TPACK, BLOOM, DIGCOMPEDU)

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

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progressively enhance the learning process, from basic substitution to the creation of entirely new learning experiences.

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** categorizes 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.

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- **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.

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.

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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, 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

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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.

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. The full lesson plans will be included in the **Pedagogical Guidelines**, while the TAISTY Training Model focuses on the strategic application of technology and pedagogy.

Lesson Plans: Brief Summaries and Learning Outcomes

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

- **Objective**: Understand the cultural significance of marination and apply marination and simmering techniques.
- **Learning Outcomes**:
    - Students will demonstrate proficiency in marination techniques, applying them to enhance flavor and texture in pork dishes.
    - They will analyze the impact of the Maillard reaction on flavor development, using AI to simulate changes based on cooking methods.
- **Framework Alignment**:
    - **SAMR**: AI is used at the Modification level to simulate different marination effects, allowing students to explore the chemical interactions between ingredients.

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- **DIGCOMPEDU**: Students enhance digital skills by using AI to explore marination effects and chemical interactions, fostering analytical and experimental proficiency in culinary processes.
- **BLOOM**: Students engage in applying and analyzing concepts through guided experimentation.

Recipe 2: Anari Cheese (Cheese from Whey)

- **Objective**: Learn how to make Anari cheese from whey, focusing on sustainability.
- **Learning Outcomes**:
  - Students will understand the curdling process and use AI to analyze different whey-to-cheese conversion ratios.
  - They will appreciate the cultural significance of reducing food waste through sustainable practices.
- **Framework Alignment**:
  - **SAMR**: At the Augmentation level, AI assists in predicting yield from various curdling techniques.
  - **DIGCOMPEDU**: Students develop digital literacy through hands-on use of AI for problem-solving.
  - **BLOOM**: Critically assess the sustainability of the cheese-making process and evaluate the role of AI in improving the precision and predictability of yield calculations. Students use AI insights to design an optimized curdling technique for maximizing cheese yield and present findings and cultural insights in a multimedia format to promote sustainable practices.

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

- **Objective**: Master tempering techniques for a smooth Avgolemono soup.
- **Learning Outcomes**:
  - Students will apply tempering techniques and assess the effects of varying temperatures on egg coagulation using AI simulations.
  - They will understand the emulsifying properties of eggs, creating a creamy soup while maintaining its cultural authenticity.
- **Framework Alignment**:
  - **SAMR**: At the Modification level, AI aids students in visualizing the tempering process, predicting coagulation points.

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- **DIGCOMPEDU**: Students build digital literacy through AI tools that visualize tempering processes, enabling precise understanding of temperature impacts on ingredient interactions.
- **BLOOM**: Focuses on creating and evaluating by experimenting with ingredient interactions.

Recipe 4: Halloumi (Traditional Cypriot Cheese)

- **Objective**: Learn to make Halloumi and understand the coagulation process.
- **Learning Outcomes**:
  - Students will apply cheese-making techniques and use AI to explore variations in texture based on curd-cutting methods.
  - They will reflect on the unique qualities of Halloumi in Mediterranean cuisine.
- **Framework Alignment**:
  - **TPACK**: Integrates technology (AI simulations), pedagogy (hands-on learning), and content (cheese-making).
  - **DIGCOMPEDU**: Students utilize **digital tools** to experiment with cheese-making techniques, analyzing curd texture variations via AI simulations, supporting innovation and hands-on learning.
  - **BLOOM**: Encourages **creating** and **evaluating** by testing different cheese-making techniques.

Reecipe 5: Koupepia (Cypriot Stuffed Grape Leaves)

- **Objective**: Learn the techniques of filling and rolling grape leaves.
- **Learning Outcomes**:
  - Students will develop skills in filling preparation and rolling techniques, using AI to model different rolling strategies for consistency.
  - They will explore the cultural role of Koupepia in Mediterranean cuisine.
- **Framework Alignment**:
  - **SAMR**: AI assists in the **Augmentation** phase by simulating grape leaf rolling techniques for better uniformity.
  - **DIGCOMPEDU**: Students enhance their **digital literacy** by using AI tools to model and refine rolling techniques, improving consistency and efficiency in a hands-on culinary context.
  - **BLOOM:** Assess the uniformity and quality of rolled Koupepia using AI-generated metrics and reflect on how AI contributes to improving traditional culinary skills. Students design a workflow that integrates AI

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insights to achieve consistent Koupepia rolling and prepare a presentation or demonstration showcasing the process and cultural importance of Koupepia.

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

- **Objective:** Understand the preparation of Pourgouri Pilaf, with an emphasis on skill-building in precise measurement, timing, and sequencing during recipe execution.
- **Learning Outcomes**:
    - Students will demonstrate proper techniques for cooking bulgur wheat and pasta to achieve desired texture and flavor.
    - Reflect on the cultural significance of Pourgouri Pilaf within Mediterranean cuisines.
- **Framework Alignment**:
    - **SAMR:** Use interactive video tutorials for demonstrations of cooking techniques, enhancing **understanding** the steps involved in the recipe and the purpose of each ingredient.
    - **DIGCOMPEDU**: Students develop **digital competence** by engaging with interactive tutorials to master cooking techniques and refine their ability to sequence tasks, leveraging technology to enhance precision and culinary skills.
    - **BLOOM**: Encourages the **application** and **analysis** by recipe preparation and comparison with similar grain-based dishes.

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

- **Objective:** Learn to create a fusion pizza combining Cypriot and Italian culinary traditions, with Halloumi, coriander, olives, onions, and cherry tomatoes as key ingredients.
- **Learning Outcomes:**
    - Students will apply pizza-making techniques and use AI to explore variations in crust texture, topping distribution, and flavor combinations.
    - They will reflect on the role of Halloumi and Mediterranean flavors in enhancing a classic Italian dish.
- **Framework Alignment:**
    - **TPACK:** Integrates technology (AI simulations for flavor pairing and topping arrangement), pedagogy (hands-on cooking and experimentation), and content (fusion cuisine principles).

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- **DIGCOMPEDU** Students utilize digital tools to enhance creativity and problem-solving by leveraging AI for flavor pairing, crust texture analysis, and optimal topping arrangement, fostering deeper engagement with technology in a culinary context.

- **BLOOM:** Encourages **creating** (designing pizza recipes) and **eva**luating (assessing flavor and texture outcomes).

Recipe 8: Lemon Sorbet

- **Objective:** Understand the balance between acidity and sweetness in sorbet-making, learning how stabilizers like rice starch and inulin improve the texture of the dessert. Students will develop skills in emulsifying, controlling temperature, and churning the sorbet to achieve the desired consistency. They will also gain an appreciation for the importance of using fresh ingredients to enhance flavor and will learn the delicate process of creating a smooth and well-balanced sorbet.

- **Learning Outcomes:**
  - **Students will** demonstrate proficiency in making lemon sorbet, successfully balancing acidity and sweetness.
  - **They will** apply temperature control and emulsification techniques to ensure the desired sorbet texture and consistency.
  - **Students will** understand the role of stabilizers, such as rice starch and inulin, in improving the texture of the sorbet and preventing ice crystals.
  - **They will** evaluate their sorbet for flavor balance and texture, reflecting on how the ingredients interact in the final product.

- **Framework Alignment:**

  - **SAMR**: AI tools help monitor and maintain precise temperature control during the syrup preparation and churning process, enhancing the accuracy of the recipe.

  - **BLOOM**: Students apply knowledge of flavor balancing, temperature control, and emulsification through hands-on preparation of the sorbet. Students analyze the effects of stabilizers on texture and the role of acidity and sweetness in achieving the perfect sorbet.

  - **DIGCOMPEDU**: Students use AI tools to enhance their digital literacy in the kitchen, such as monitoring temperature and adjusting ingredient proportions for flavor consistency.

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

- **Objective:** Understand the principles of making gelato, including the importance of stabilizers and balancing flavors with unique ingredients like extra virgin olive oil. Students will practice emulsification techniques, proper temperature control for gelato, and slow-roasting for confit tomatoes. Additionally, they will develop an appreciation

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for how savory ingredients, such as olive oil and confit cherry tomatoes, can enhance the flavor profile of desserts and create innovative sweet-savory pairings.

- **Learning Outcomes:**
  - **Students will** demonstrate proficiency in emulsifying ingredients and achieving the desired gelato texture using olive oil as a key flavor element. **They will** apply slow-roasting techniques to prepare confit cherry tomatoes, enhancing their natural sweetness and flavor.
  - **Students will** understand how savory ingredients can complement sweet desserts and create unique, innovative flavor pairings. **They will** evaluate the final dish for balance in texture, flavor, and the integration of both savory and sweet components.

- **Framework Alignment:**

  - **SAMR**: AI assists in adjusting ingredient proportions and monitoring emulsification and churning times to ensure the ideal gelato texture and consistency.

  - **BLOOM**: Students apply their knowledge of emulsification and slow-roasting techniques in hands-on activities, enhancing their culinary skills. 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

- **Objective:** understand the principles of dough-making, focusing on the use of semi-whole wheat flour to enhance the texture and flavor of pizza. Students will practice kneading, proofing, and shaping the dough, as well as topping and baking the pizza to achieve an authentic Pizza Margherita. They will develop an appreciation for the importance of ingredient quality, especially in traditional pizza-making techniques, and the role of high heat in creating the perfect pizza crust.

- **Learning Outcomes:**
  - **Students will** demonstrate proficiency in kneading and shaping dough, applying techniques to achieve a smooth, well-hydrated dough. **They will** understand the importance of proofing in developing dough texture and elasticity, ensuring the proper rise for a light and airy pizza crust.
  - **Students will** apply topping techniques to create a balanced Pizza Margherita, achieving an even distribution of sauce, mozzarella, and basil. **They will** evaluate the final pizza, focusing on dough texture, crust crispness, and flavor balance between the ingredients.

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- **Framework Alignment:**

    - **SAMR**: AI assists in adjusting dough hydration levels and kneading times to ensure the correct consistency, enhancing the dough-making process.

    - **BLOOM**: Students apply their knowledge of dough techniques and topping preparation through hands-on cooking, enhancing their skills in pizza-making. 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: Rabbit with Modica Vanilla Chocolate

- **Objective:** learn about the unique flavors of Sicilian cuisine, specifically how Modica chocolate can be combined with savory ingredients like rabbit to create a rich, complex sauce. Students will practice key culinary techniques such as searing, braising, and balancing savory-sweet flavors. They will also develop an appreciation for the use of local ingredients in Sicilian dishes, and understand how unique ingredients like Modica chocolate enhance the depth of flavor in traditional recipes.

- **Learning Outcomes:**
    - **Students will** demonstrate proficiency in searing and braising techniques, achieving the proper browning and flavor development in rabbit. **They will** understand how the addition of Modica vanilla chocolate can enrich a savory sauce, creating a balanced savory-sweet profile.
    - **Students will** learn to incorporate unique Sicilian ingredients like olives, capers, and vinegar to build complex, balanced flavors in a dish. **They will** evaluate the final dish, reflecting on the interplay of savory and sweet components and how the chocolate contributes to the overall flavor depth.

- **Framework Alignment:**

    - **SAMR:** AI can assist in monitoring cooking times and temperature, helping to achieve optimal flavor development without over-browning or overheating the chocolate.

    - **BLOOM:** Students apply their knowledge of searing, braising, and balancing flavors through hands-on cooking, enhancing their skills in savory-sweet combinations. They also analyze how each ingredient, from chocolate to vinegar, contributes to the overall flavor profile, understanding how these components interact to create balance.

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- **DIGCOMPEDU:** Students use AI tools to optimize ingredient proportions and monitor cooking stages, improving their digital literacy in managing cooking processes and ensuring the right timing for flavor development.

Recipe 12: Risotto with Mackerel Bites and Wild Fennel

- **Objective:** understand the combination of seafood and herbs in Italian risotto, specifically how wild fennel enhances the flavor and texture of mackerel. Students will practice risotto-making techniques, including balancing flavors, creating a pesto with wild herbs, and incorporating delicate ingredients like fish. They will also develop an appreciation for traditional Italian cooking methods and the use of fresh, local ingredients to enhance the natural flavors of the dish.

- **Learning Outcomes:**
  - **Students will** demonstrate proficiency in preparing risotto, focusing on the correct timing for adding broth and achieving a creamy texture. **They will** learn to balance the flavors of fish, fennel, and Parmesan, incorporating wild fennel pesto to elevate the dish.
  - **Students will** understand how to handle delicate ingredients like mackerel to ensure they remain tender and flavorful in the risotto. **They will** evaluate the final dish, reflecting on how the combination of seafood, herbs, and cheese creates a harmonious and flavorful risotto.

- **Framework Alignment:**

  - **SAMR:** 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.

  - **BLOOM:** Students apply their knowledge of risotto techniques, pesto preparation, and fish handling through hands-on cooking, gaining practical skills. They also 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

- **Objective:** understand how Mediterranean ingredients like sardines, potatoes, and poppy seeds combine to create a flavorful and balanced dish. Students will practice techniques for forming savory cakes, preparing a velouté sauce, and achieving a smooth texture balance between the cakes and sauce. Additionally, they will develop an appreciation for locally sourced ingredients and the versatility of combining different flavors in a cohesive Mediterranean dish.

- **Learning Outcomes:**

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- **Students will** demonstrate proficiency in forming and cooking savory cakes, achieving the right balance between potato creaminess and sardine richness. **They will** learn how to prepare a smooth velouté sauce, incorporating poppy seeds to enhance flavor and texture.
- **Students will** understand how to balance the savory depth of sardines with the mildness of potatoes, and how the velouté complements the cakes. **They will** evaluate the final dish, reflecting on how the flavors of the sardine cakes and velouté work together in harmony.

- **Framework Alignment:**

  - **SAMR:** AI can assist in monitoring cooking times for the cakes, ensuring they are evenly browned and cooked through without overcooking or burning.

  - **BLOOM:** Students apply their knowledge of cooking techniques like forming cakes, preparing sauces, and balancing flavors through hands-on practice. 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 (Fusion Recipe)

- **Objective:** understand the use of traditional Italian ingredients like lamb, rosemary, and artichokes in pasta dishes, and how these flavors combine to create a balanced, flavorful dish. Students will practice essential techniques such as preparing ravioli dough, shaping and filling the ravioli, simmering a meat ragù, and frying chips for garnish. They will also develop an appreciation for Italian culinary traditions, focusing on fresh, local ingredients and the slow-cooking methods that enhance the depth of flavor in this dish.

- **Learning Outcomes:**
  - **Students will** demonstrate proficiency in ravioli dough preparation, including proper kneading and resting techniques to achieve the right texture. **They will** learn how to create a balanced ravioli filling by combining potatoes, artichokes, and Parmesan, ensuring the right consistency and flavor.
  - **Students will** master the art of slow-cooking a lamb ragù, understanding how to build depth of flavor through simmering and deglazing techniques. **They will** develop skills in frying artichoke chips, ensuring even cooking for a crisp, flavorful garnish.
  - **Students will** evaluate the final dish, reflecting on how the ravioli, ragù, and chips complement each other in terms of flavor, texture, and presentation.

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- **Framework Alignment:**
    - **SAMR:** 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.
    - **BLOOM:** Students apply their knowledge of traditional pasta-making, simmering techniques, and garnishing skills through hands-on practice, refining their culinary techniques. 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.

Testing and Feedback Mechanisms

For the TAISTY Training Model to be effective, it must be rigorously tested and refined based on real-world classroom applications. This section outlines the process for testing the training model and gathering feedback from both educators and students.

Testing in Pilot Schools

The TAISTY Training Model will be tested in pilot schools in **Italy** and **Cyprus**, focusing on the following areas:

- **Lesson Delivery**: Teachers will use AI tools integrated with the lesson plans to deliver culinary training. They will monitor how well AI supports the learning process (e.g., providing feedback, aiding in decision-making).
- **Student Engagement**: Students will be asked to interact with AI tools during hands-on activities, assessing how AI enhances their ability to apply culinary techniques and solve problems.
- **Learning Outcomes**: Educators will assess whether the expected learning outcomes are achieved, particularly in areas such as digital literacy, problem-solving, and cultural understanding.

Data Collection and Feedback

The testing phase will be supported by a data collection process to evaluate the success of the model:

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- **Surveys**: After each lesson, teachers and students will complete surveys designed to capture their experience using AI tools, focusing on ease of use, effectiveness, and perceived impact on learning.
- **Observation**: Teachers will observe how students engage with the AI tools during lessons, noting any challenges or benefits in real-time.
- **Expert Review**: An external evaluator will review the implementation process, focusing on the alignment of the training model with the SAMR, TPACK, BLOOM, and DIGCOMPEDU frameworks.

Continuous Improvement

Based on the feedback collected from testing, the training model will be continuously refined:

- **Teacher Workshops**: Teachers will participate in workshops to review the feedback, share insights, and discuss potential improvements to the lesson plans and AI tools.
- **Model Adjustments**: Changes will be made to the model based on practical classroom experiences, such as enhancing AI tool functionality or modifying learning outcomes to better fit student needs.
- **Final Evaluation**: At the end of the pilot phase, a final evaluation will be conducted to assess the overall success of the TAISTY Training Model in achieving its objectives.

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Analysis of TAISTY Project Needs Survey for Teachers/Educators

This survey reveals several important insights into teachers' experience with technology and their perceptions of AI in culinary education:

Teaching Experience:

- **73%** of respondents have more than 5 years of teaching experience, showing that the majority are highly experienced educators; **9%** have 3-5 years, 1-3 years, or less than 1 year of experience each.
- **Conclusion**: The training model should consider that most teachers are seasoned professionals, so the focus should be on introducing new AI tools without overcomplicating the transition.

Use of Educational Technologies:

- **73%** of respondents use educational technologies occasionally, while **27%** use them regularly.
- **Conclusion**: Although many teachers have experience using technology, it is not a regular part of their teaching. The training model should focus on making AI tools easy to integrate more consistently into everyday practice.

Importance of AI in Culinary Education:

- 50% of respondents find AI very important, with another 50% considering it quite important and neutral.
- **Conclusion**: There is strong support for AI integration, indicating that teachers recognize the potential of AI to enhance their teaching, even if they have yet to use it frequently.

Familiarity with Virtual Assistants:

- **50%** of respondents are not very familiar with virtual assistants, while 40**%** are somewhat familiar and only 10% very familiar.
- **Conclusion**: A large percentage of educators lack familiarity with AI tools for culinary applications. Introductory training will be necessary.

Perceived Advantages of AI:

- **60%** of respondents believe AI offers more variety in recipe creation, while **30%** think its main advantage is greater efficiency and **10%** accuracy.

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- **Conclusion**: Teachers see AI's primary benefits in generating diverse recipe options and improving workflow. These should be key focal points in training materials.

Challenges of Using AI:

- **60% of respondents** identified **understanding AI** as a challenge, and 50**%** cited access to **technological resources**.
- **Conclusion**: The training model should address both AI literacy and provide accessible, user-friendly tools that don't require advanced technology.

Interest in AI Training:

- **50%** of respondents would prefer specific AI training, with 40**%** interested only if required and 10% find it not necessary.
- **Conclusion**: There is significant interest in receiving AI training, meaning that tailored workshops and hands-on sessions will likely be well-received.

Impact on Student Learning:

- **40%** of respondents believe AI will improve student learning a lot, with 60**%** thinking it will help moderately **and a little**.
- **Conclusion**: Educators expect AI to have a substantial positive impact on student learning outcomes, further supporting the development of AI-driven lesson plans.

Attendance at AI Workshops:

- **50%** of respondents have never attended workshops on AI in education, while 30% attended only once and 20% multiple times.
- **Conclusion**: Professional development opportunities should be created to fill this gap in training.

AI for Student Assessment:

- **50%** of respondents think AI can improve assessment processes moderately, while **40%** believe it can improve them a lot **and 10% can impove them a little**.
- **Conclusion**: There is potential for AI to assist in assessment, such as automating feedback on student performance during practical lessons.

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Use of AI Platforms:

- **50%** of respondents have never used AI platforms, while 30% use them occasionally and 20% regularly.
- **Conclusion**: There is a clear need to introduce AI tools into the classroom, as most teachers have not yet integrated them into their practice.

AI's Ability to Tailor Student's needs:

- 50% of respondents think AI can tailor student's needs a lot, while 20% a little and 30% moderately.
- **Conclusion:** For student's needs AI's potential in increase curiosity and needs, which aligns with the goal of using AI lesson plans based on student's needs.

AI's Ability to Tailor Teaching:

- **50% of respondents** think AI can tailor teaching **a lot**, and **30%** believe it can help **moderately and 20% a little**.
- **Conclusion**: Educators see AI's potential in personalizing student learning, which aligns with the goal of using AI to adapt lesson plans based on student needs.

Concerns About AI Impact on Employment:

- **50%** of respondents are moderately concerned about AI's impact on employment, with 20% either very concerned and 10% slightly concerned and 20%not concerned at all.
- **Conclusion**: This mixed response suggests that while some educators are worried about AI replacing jobs, others view it as an enhancement. The training should emphasize that AI supports teachers rather than replaces them.

AI's Impact on Student Interest:

- **40%** of respondents believe AI will increase student interest a lot, with 30% thinking it will do so moderately and 30% a little.
- **Conclusion**: AI is seen as a strong motivator for students, which should be leveraged in the development of engaging, AI-supported lesson plans.

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Analysis of TAISTY Project Expected Potential of AI in Culinary Training

This survey explores culinary experts' specific perceptions of AI's potential in culinary education, focusing on their experiences with advanced technologies.

Experience with Educational Technologies in Culinary Training:

- 75% of respondents have not used educational technologies, while 25**%** have some experience.
- **Conclusion**: Most teachers do not have experience with educational technology in the culinary field, making it essential for the training model to start from basic AI integration techniques.

Use of AI for Recipe Creation:

- 100% of respondents have not used AI for recipe creation.
- **Conclusion**: This shows a significant gap in practical AI usage, indicating a need for introducing AI tools for culinary tasks like recipe generation and modification.

Belief in AI's Effectiveness:

- 100% of respondents believe AI can enhance the effectiveness of culinary training.
- **Conclusion**: There is universal agreement on AI's benefits, so the training model should demonstrate specific AI applications that improve teaching and learning processes.

Positive Experiences with Advanced Technologies:

- 100% of respondents have had positive experiences with other advanced technologies.
- **Conclusion**: This suggests a generally favorable view of technological integration, which will help ease the transition to AI adoption.

Interest in AI Workshops:

- 100% of respondents are interested in attending AI workshops.
- **Conclusion**: There is clear demand for professional development on AI, so offering workshops should be a priority for the TAISTY project.

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Difficulties with Traditional Educational Technologies:

- **1**00% of respondents find difficulties with traditional educational technologies.
- **Conclusion**: Educators need support with technology integration, suggesting that AI tools should be user-friendly and easily adaptable to existing teaching methods.

AI for Personalizing Student Learning:

- 100% of respondents believe AI can personalize student learning.
- **Conclusion**: Teachers see AI as a valuable tool for customizing lesson plans to suit individual student needs, which should be a central focus of the training model.

AI Training:

- 100% of respondents have not received formal training on using AI in culinary education.
- **Conclusion**: The lack of AI-specific training emphasizes the importance of creating accessible, structured training sessions that cater to the needs of educators.

AI's Role in Understanding Culinary Concepts:

- 100% of respondents believe AI can help students better understand culinary concepts.
- **Conclusion**: The training model should include clear examples of how AI can be used to enhance students' comprehension, such as through interactive simulations and feedback mechanisms.

Familiarity with Latest AI Technologies:

- 75% of respondents are not familiar with the latest AI-supported technologies and 25% familiar.
- **Conclusion**: This reinforces the need for AI literacy training, ensuring teachers are up to date with the newest tools and platforms.

AI and Student Interest:

- 100% of respondents believe AI can increase students' interest in culinary training.
- **Conclusion**: AI is viewed as a powerful tool for student engagement, which aligns with the project's goal to motivate students using innovative, AI-driven methods.

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Use of Data Analysis Tools:

- 75% of respondents have not used data analysis tools to improve their training and 25% used data analysis tools.
- **Conclusion**: While data analysis tools have potential, most educators have not integrated them into their teaching. The training model could incorporate data analytics for tracking student progress.

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