

TITLE: THE IMPACT OF CONTEXTUALISING FUNCTIONAL SKILLS MATHS IN EARLY YEARS

Tips on Contextualising Resources using AI



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INTRODUCTION

The use of Artificial Intelligence (AI) enables teachers/tutors to develop contextualised resources for different teaching scenarios. Software such as ChatGPT or education specific platforms such as TeacherMatic are becoming more prevalent as teaching staff look to make more efficient use of their time whilst still supporting their learners and specific learning needs. Providers involved in our project used TeacherMatic to support the delivery of the bespoke contextualised teaching to their apprentices between the baseline and final assessments.

Tutors of all sectors can use AI to tailor lessons to meet individual needs, adapting the pace and complexity based on the apprentice's understanding and progress. Contextualised maths focuses on practical, real-world problems relevant to the apprentices' sector. AI can generate scenarios that reflect actual tasks they will face in their careers, making learning more engaging and applicable.

AI tools are designed to cater to different learning styles and abilities, making maths teaching more accessible for all apprentices, including those with additional learning needs. AI can support tutors to introduce new perspectives and increase the complexity of tasks to challenge apprentices effectively.

The Use of AI in Apprenticeships

Using these resources can allow for practical applications in the apprentices' occupations or everyday life to be integrated into the lessons. Examples of common apprenticeship occupations where AI could be used to develop contextualised maths resources:

- **Accounts Assistant** – practice preparing budgets, calculating expenses, and analysing variances between budgeted and actual figures.
- **Adult care Worker** – practice creating realistic care plans that involve calculations for medication dosages, meal planning (nutritional needs), and scheduling care routines based on individual patient needs.
- **Chef** – resources that involve creating menus based on dietary requirements, incorporating maths for portion sizes, nutritional calculations, and pricing.
- **Customer Service** – create scenarios for apprentices to practice handling customer inquiries, including calculating shipping costs, processing returns, and managing discounts or promotions.
- **Data Analyst** – learners analyse data trends related to market research or sales performance, statistical concepts and their applications.
- **Electrician** – calculating load requirements for circuits or determining the best wire gauge for specific installations.
- **Engineering Technician** – create projects where apprentices calculate loads, stress analysis, or material requirements, applying maths in practical engineering contexts.
- **Pharmacy Assistant** – calculating dosages, and converting units (e.g., mg to g)
- **Motor Vehicle Service and Maintenance Technician** – calculate repair

costs, including parts and labour.

- **Teaching Assistant** – incorporate maths concepts through interdisciplinary projects, such as using statistics in science experiments or budgeting for school events.

AI should only be used to create teaching resources by qualified teachers and tutors who can evaluate, and challenge AI developed resources and where required, make adaptations. While AI can provide personalised learning, it may lack the empathy and understanding that tutors offer. Building rapport and social skills can be compromised if interaction is primarily with AI. Therefore, AI shouldn't be used to teach but can be used to develop teaching resources.

Tutors should learn the basics and experiment with software before using AI developed resources on learners. Tutors can review introductory courses or watch tutorials on AI concepts and tools relevant to education. Specific software such as TeacherMatic, provides guides and other resources to support tutors. Alongside other tutors, the effectiveness of AI created resources, their impact on learner engagement and understanding should be evaluated regularly.

How To Prompt AI

Whilst TeacherMatic has a licence cost there are low-cost alternatives such as ChatGPT which are not designed specifically for teachers and tutors but can be utilised. By asking the relevant prompts and querying responses teaching resources can be made bespoke to your learners. The following example used ChatGPT.

Prompt (1):

"I want to create a maths lesson for chef apprentices that develops their skills pricing ingredients and produce portion sizes that means they make a profit on every meal created."

ChatGPT Response (1):

Creating a math lesson for chef apprentices focused on pricing ingredients and portion sizes is a great idea! Here's a structured lesson plan to help them understand how to calculate costs and ensure profitability in their meals.

Lesson Plan: Pricing Ingredients and Portion Control for Profitability.

Objective:

By the end of this lesson, apprentices will be able to:

1. Calculate the cost of ingredients per portion.
2. Determine appropriate portion sizes to maintain profitability.
3. Create a pricing strategy that ensures profit on meals.

Materials Needed:

- Worksheets with ingredient lists and prices.
- Calculators.
- Sample recipes.
- Chart paper and markers.
- Whiteboard and markers.

Lesson Duration:

1.5 to 2 hours

Lesson Outline:

Introduction (15 minutes)

- Discussion: Why is cost control important in a kitchen? Discuss profit margins, food costs, and how they affect a restaurant's bottom line.
- Engagement: Ask apprentices to share experiences where they noticed prices affecting their meal choices.

Part 1: Understanding Ingredient Costs (30 minutes)

1. Activity: Provide a list of common ingredients with their prices (e.g., flour, meat, vegetables).
2. Calculations:
Teach them how to calculate the cost per unit (e.g., per gram, ounce, or serving).
 - Example: If 1 kg of chicken costs \$10, what is the cost per 100g?
 - Practice: Apprentices work on calculating costs for different ingredients using the worksheet.

Part 2: Portion Sizes and Costing (30 minutes)

1. Explaining Portion Sizes:
 - Discuss standard portion sizes for different types of meals (appetizers, main courses, desserts).
 - Explain how to determine the ideal portion size based on cost and customer satisfaction.
2. Calculating Cost per Portion:
 - Example: For a recipe that uses 500g of meat costing \$10 and serves 5 portions, calculate the cost per portion.
 - Practice: Apprentices calculate the cost per portion for various recipes provided on the worksheets.

Part 3: Pricing Strategy (30 minutes)

1. Markup and Profit Margin:
 - Introduce concepts of markup (e.g., a 30% markup on the cost) and desired profit margins.
 - Example: If the total cost of a meal is \$5, what should the selling price be for a 30% markup?
2. Group Activity:
 - Divide apprentices into small groups and give them a sample recipe with ingredient costs.

- Each group calculates the cost per portion and decides on a selling price that ensures a profit, taking into account the desired markup.

Conclusion (15 minutes)

- Presentation: Each group shares their pricing strategy and explains their reasoning.
- Discussion: Reflect on what they learned about balancing quality, portion sizes, and profitability.

Homework Assignment (Optional)

- Assign apprentices to create a simple recipe and calculate the total cost and suggested selling price based on their desired profit margin.

Assessment:

- Observe participation in group activities and discussions.
- Review the worksheets to assess understanding of calculations.
- Provide feedback on the homework assignment.

This lesson plan should help chef apprentices develop essential math skills while also understanding how to make their meals profitable.

ChatGPT has produced a reasonably detailed lesson plan for a group of learners. However, on reflection the initial prompt could have provided more detail for ChatGPT because the lesson is only 45 minutes, it is for one learner and the learner is dyslexic. Furthermore, the measurements referred to in the lesson plan are used in the United States. Therefore, clarification is needed in the next prompt.

Clarifying Prompt (1)

Please can the lesson plan be recreated using the following adaptations:

The lesson should be for a maximum of 45 minutes, for one learner who has dyslexia, and any measurements or prices referred to should reflect the United Kingdom.

ChatGPT Response (2):

Lesson Plan: Pricing Ingredients and Portion Control for Profitability

Objective:

By the end of this lesson, the learner will be able to:

3. Calculate the cost of ingredients per portion using UK prices.
4. Determine appropriate portion sizes to ensure profitability.

Materials Needed:

- Simplified worksheets with clear formatting.
- Calculators.
- Sample recipes with ingredient costs. (in pounds)
- Visual aids. (charts, images of ingredients)

Lesson Duration:
45 minutes.

Lesson Outline.

Introduction (5 minutes)

- Discussion: Briefly explain why cost control is important in a kitchen. Use visual aids to illustrate points, making it easier to follow.
- Engagement: Ask the learner about their experience with pricing or portion sizes in cooking.

Part 1: Understanding Ingredient Costs (15 minutes)

1. Ingredient Cost Calculation:
 - Provide a list of ingredients with prices in pounds (e.g., chicken £5/kg, potatoes £1/kg).
 - Example Calculation: "If 1 kg of chicken costs £5, what is the cost per 100g?"
 - Write calculations step-by-step on the board, using clear and large fonts.
2. Practice:
 - Give the learner a worksheet with a few ingredients and prices. Ask them to calculate the cost per portion using the same example.

Part 2: Portion Sizes and Costing (15 minutes)

1. Explaining Portion Sizes:
 - Discuss common portion sizes in a straightforward way (e.g., main courses typically around 150-200g of protein).
 - Use images to represent portion sizes visually.
2. Calculating Cost per Portion:
 - Example: For a recipe using 500g of chicken costing £5 that serves 5 portions, how much does each portion cost?
 - Work through the calculation together, writing it out clearly.
3. Practice:
 - Provide a sample recipe with total ingredient costs. Ask the learner to calculate the cost per portion.

Conclusion (10 minutes)

- Recap: Summarize what has been learned about pricing and portion control.
- Discussion: Ask the learner how they can apply this knowledge in their cooking.
- Visual Aids: Leave them with a simple reference sheet outlining key points.

Assessment:

- Monitor understanding through conversation and the worksheet.
- Offer positive feedback to build confidence.

This condensed lesson plan is designed to accommodate the learner's needs, making math accessible and engaging while ensuring they grasp the essentials of pricing and

portion control.

We can see that lesson length has been reduced, refers to one learner and the units reflect UK measurements. However, it's not clear how it has been adapted for the dyslexic learner. Therefore, a further prompt was required.

Clarifying Prompt (2)

Clarify how the lesson plan supports a dyslexic learner.

ChatGPT Response (3)

Here's how the lesson plan is tailored to support a learner with dyslexia:

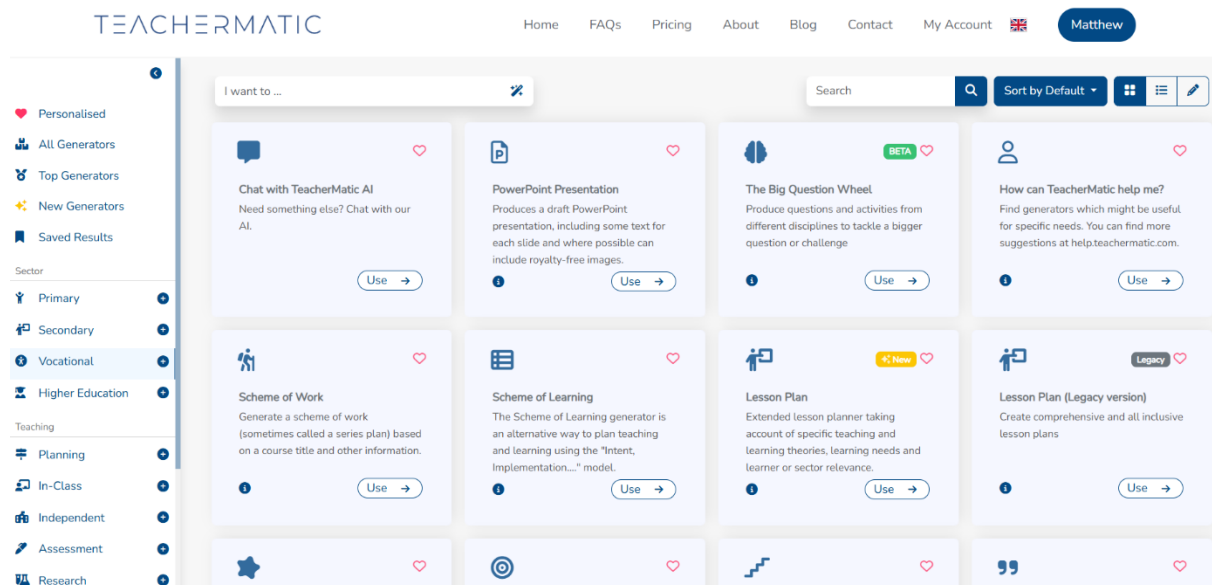
Support Strategies for a Dyslexic Learner

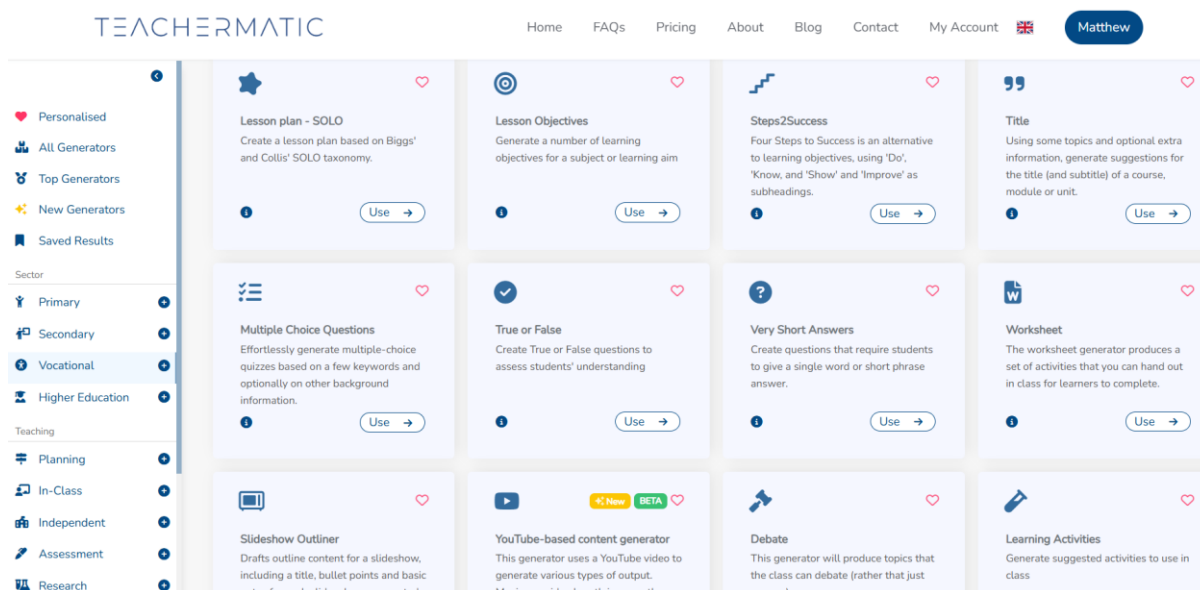
1. Simplified Worksheets:
 - Use clear, uncluttered formats with larger fonts and high contrast. This helps improve readability and reduces visual stress.
2. Step-by-Step Instructions:
 - Break down calculations into clear, sequential steps. This helps the learner follow along without feeling overwhelmed.
3. Visual Aids:
 - Incorporate images and charts to illustrate portion sizes and pricing concepts. Visual representations can aid understanding and retention.
4. Oral Communication:
 - Emphasize verbal explanations and discussions rather than relying solely on written instructions. This accommodates the learner's strengths in auditory processing.
5. Interactive Practice:
 - Engage the learner in hands-on activities and calculations. This active participation reinforces learning and makes it more memorable.
6. Positive Feedback:
 - Provide encouragement and constructive feedback throughout the lesson. This builds confidence and motivation.
7. Flexible Pacing:
 - Allow for extra time if needed to ensure the learner comprehends each section before moving on. This helps alleviate pressure and enhances understanding.
8. Reference Materials:
 - Supply a simple reference sheet summarizing key points. This serves as a quick

guide for the learner to refer back to later.

In summary, free tools such as ChatGPT can provide a lesson plan and suggest resources, but you still need to create those accompanying resources. Furthermore, responses are in a text format so would need copying to create specific resources.

Software such as TeacherMatic can create specific resources in addition to lesson plans. The two screenshots below show some of the resource types that can be generated:





Software such as TeacherMatic can not only provide an outline lesson plan but will also generate the separate teaching resources referred to in the lesson plan enabling the user to develop a holistic lesson. Over 300 teachers have helped create over 70 generators only a fraction of which are shown above.

Challenges

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