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Preliminary Design Document
LTEC 6020 – Advanced Instructional Design
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New Unit Topic: Authentic Learning with the Use of AI-Driven Scenarios on Good Sleep Routines and Healthy Sleep Practices

A) **Goals, Objectives, and Scope**

This training addresses the lack of knowledge and inconsistent practices around healthy sleep. By simulating real-life sleep scenarios helps learners identify poor sleep habits and provides personalized strategies to improve sleep quality, ultimately promoting better health and well-being.

a) **Goals:** To enhance learners' understanding of healthy sleep habits and promote the development of healthy sleep practices through AI-driven, scenario-based learning.

b) **Objectives:**
   i) Learners will identify common factors that negatively impact healthy sleep routines, such as lifestyle choices, environmental conditions, and screen time.
   ii) Learners will apply strategies for improving sleep quality in AI-driven simulations of two real-life scenarios (e.g., bedtime routines and managing sleep environments).
   iii) Learners will create personalized sleep routine plans based on the insights gained through the AI scenarios.

c) **Scope:** This unit will include interactive AI simulations focusing on various aspects of sleep routines. It will cover topics such as sleep cycles, the effects of sleep deprivation, environmental influences on sleep, and establishing healthy bedtime routines.

B) **Target Learners**

People may have different views on sleep. Some learners may not see sleep as a priority or may not realize its impact on health. This training addresses this by using everyday examples that make it clear how small changes to sleep routines can lead to better health and well-being. This unit is designed for adult learners, including college students and working professionals, who may struggle to maintain good sleep routines due to busy lifestyles.

a) **Prior Knowledge and Experience**: Learners may have a basic understanding of the importance of sleep but lack detailed knowledge of healthy sleep practices and their impact on health.
b) **Educational Context**: This unit can be part of a broader health and wellness course, a self-help workshop, or a professional development program.
c) **Number Involved**: Designed for a flexible group size, ranging from individual learners to larger cohorts in an online learning environment.
d) **Other Relevant Information**: Learners might have varying sleep patterns, routines, and sleep-related challenges, requiring a personalized approach.

C) **Instructional Approach**

AI simulations make this training interactive and realistic. Learners will make choices in bedtime and sleep environment scenarios and see how those choices affect their sleep. This hands-on approach helps learners experience the impact of their habits and make adjustments in a safe, controlled way. It's based on "authentic learning," which is a method that teaches through real-life situations.

a) The approach will utilize **Authentic Learning** principles, where learners engage in AI-driven scenarios that mimic real-life situations affecting good sleep routines, such as choosing evening activities, managing screen time, and adjusting sleep environments.
b) **AI** will simulate the consequences of different behaviors on sleep quality, offering personalized feedback based on learners' decisions within the scenarios.
c) Learners will be encouraged to make decisions, experience outcomes, and reflect on their sleep habits, promoting a deeper understanding of healthy sleep habits.

D) **Justification for the Approach and References**

Many people struggle to get quality sleep due to busy schedules, lifestyle choices, and environmental conditions. Poor sleep is linked to various health issues, including heart disease, obesity, and mental health problems. This training aims to help learners identify the factors that negatively affect their sleep and adopt strategies to improve it. Through realistic, everyday scenarios, this training will guide learners in integrating healthy sleep habits into their lives in a practical, personalized way.

This training specifically targets busy adults—such as college students and professionals—who often find it difficult to maintain consistent sleep patterns. By utilizing interactive simulations, learners can see how daily choices impact sleep quality and are encouraged to adopt sustainable, healthy sleep habits that fit seamlessly into their unique routines.

The **National Council on Aging (2024)** recommends that adults get at least seven hours of sleep per night. However, **35.5% of American adults** sleep less than this, according to the **United Health Foundation**. Additionally, an estimated **50 to 70 million U.S. adults suffer from a sleep disorder**. Addressing healthy sleep habits through this unit can significantly impact overall health and well-being. Educating individuals on effective sleep practices provides practical, evidence-based strategies to combat widespread sleep deprivation. This unit empowers learners to make small but impactful lifestyle changes that promote better sleep quality.

This unit employs **Merrill's First Principles of Instruction** to create a hands-on and practical learning experience that emphasizes real-life problem-solving, helping learners build lasting sleep habits. These principles are implemented in the following ways:

1. **Real-Life Problem Solving**: Learners engage with realistic scenarios that reflect common sleep challenges, allowing them to practice applying new sleep habits in meaningful situations.

2. **Building on Prior Knowledge**: The unit begins with learners reflecting on their current sleep routines, preparing them to integrate new knowledge with their personal experiences.
3. **Learning Through Examples**: AI-driven simulations demonstrate the impact of specific actions on sleep, offering clear examples of how different choices affect sleep quality.
4. **Practice Through Application**: Learners actively make choices within scenarios, receiving personalized feedback based on their decisions to reinforce learning.
5. **Creating Personal Solutions**: To conclude, learners develop a personalized sleep improvement plan, incorporating the new habits they've learned into their daily routines.

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E) **Learning Resources and Activities**

To make the training engaging and easy to follow, visuals will be added, like charts or graphics, showing the impact of poor sleep and the benefits of healthy habits. Additionally, the use of bullet points to highlight important ideas making it easier for learners to quickly understand key concepts and terminology.

a) **AI-Driven Scenarios**: Simulations of common challenges to sleep habits, such as managing evening screen time, choosing bedtime routines, and optimizing sleep environments.

Activity 1: Pre-Bedtime Routine Simulation

Goal:
To help learners understand how their actions and choices in the hours leading up to bedtime can influence the quality of their sleep.
Description:
Learners will engage in an **AI-driven simulation** where they make decisions related to their pre-bedtime routine. The simulation will present a series of choices they need to make 2–3 hours before bed. These choices may include:

- **Food and beverage consumption**: Learners will decide whether to eat a large meal, snack lightly, or consume caffeine or alcohol.
- **Physical activity**: Learners will choose between relaxing activities such as light stretching, a walk, or more intense exercise. The AI will simulate how different levels of activity affect sleep readiness.
- **Shower or bath temperature**: Learners will select between different shower temperatures and duration (e.g., hot, warm, cold), receiving feedback on how each option impacts the body's ability to cool down for sleep.
- **Media consumption**: The simulation will offer options for using media, such as watching TV, browsing social media, or reading a book. The AI will adjust sleep quality feedback based on the timing and type of media chosen.

Feedback Mechanism:
As learners make their selections, the AI will simulate the **impact of these choices** on their ability to fall asleep and achieve deep, restorative sleep. Learners will see immediate feedback, such as:

- **Estimated time to fall asleep** based on food or caffeine choices.
- Tips for **adjusting their routine** for better sleep quality.

Reflection:
At the end of the simulation, learners will reflect on their decisions by answering questions such as:

- *What pre-bedtime choices do you think had the greatest impact on your sleep quality?*
- *How could you adjust your evening routine to improve sleep readiness?*

Activity 2: Bedtime Environment Optimization Simulation

Goal:
To help learners create an ideal sleep environment by adjusting variables related to the bedroom setup and sleeping conditions.
Description:
Learners will interact with an AI-driven scenario focused on the **immediate bedtime environment**. They will make decisions about:

- **Room temperature**: Learners will choose the ideal room temperature (e.g., warm, cool, cold), with feedback provided on how temperature impacts sleep stages.
- **Lighting**: They will experiment with different levels of lighting, including complete darkness, nightlights, or using electronics in bed. The AI will demonstrate how light exposure (especially blue light) impacts melatonin production and sleep onset.
- **Bedding and pillows**: The simulation will offer options for bedding materials (e.g., cotton, silk) and different types of pillows (e.g., firm, soft), showing how comfort levels affect sleep quality.
- **Clothing choices**: Learners will select what to wear to bed (e.g., pajamas, athletic wear, or sleeping without clothes), with AI feedback indicating how these choices affect body temperature regulation and sleep comfort.

- **Sleeping position**: Learners will experiment with various sleeping positions (e.g., on their back, side, stomach), learning how different positions influence comfort and breathing during sleep.

Feedback Mechanism:

Based on learners' choices, the AI will generate personalized feedback on how well their **sleep environment supports healthy sleep**. This may include:

- Suggestions for adjusting **room temperature** based on external factors (e.g., climate, time of year).
- Insights on how **lighting levels** can be adjusted to improve melatonin production and sleep efficiency.
- A **comfort score**, which helps learners assess how bedding, sleeping position, and clothing choices affect their overall comfort and ability to sleep through the night.

Reflection:

Learners will reflect on their decisions by answering questions such as:

- *How did your choices around your sleep environment affect the quality of your sleep?*
- *What changes would you make to your bedroom setup to create the best conditions for sleep?*

b) **Guided Reflection**: After each scenario, learners will reflect on their choices and receive personalized feedback from the AI system.

Reflection on decision-making: After each scenario, learners will engage in guided reflection, where the AI system prompts them to **evaluate their choices**. This process encourages learners to **critically analyze** why they made certain decisions and how those decisions impacted their sleep habits.

- The system will use **data collected from the scenarios** (e.g., simulated sleep scores, time to fall asleep, frequency of waking) to provide learners with **personalized feedback**. This feedback will highlight areas for improvement, such as reducing screen time or adjusting their environment to promote relaxation.
- Learners will also receive **suggestions for alternative actions** they could have taken, fostering a growth mindset and encouraging them to experiment with different strategies in future scenarios.

Activity 3: Creative Expression: Sleep Environment Design Challenge

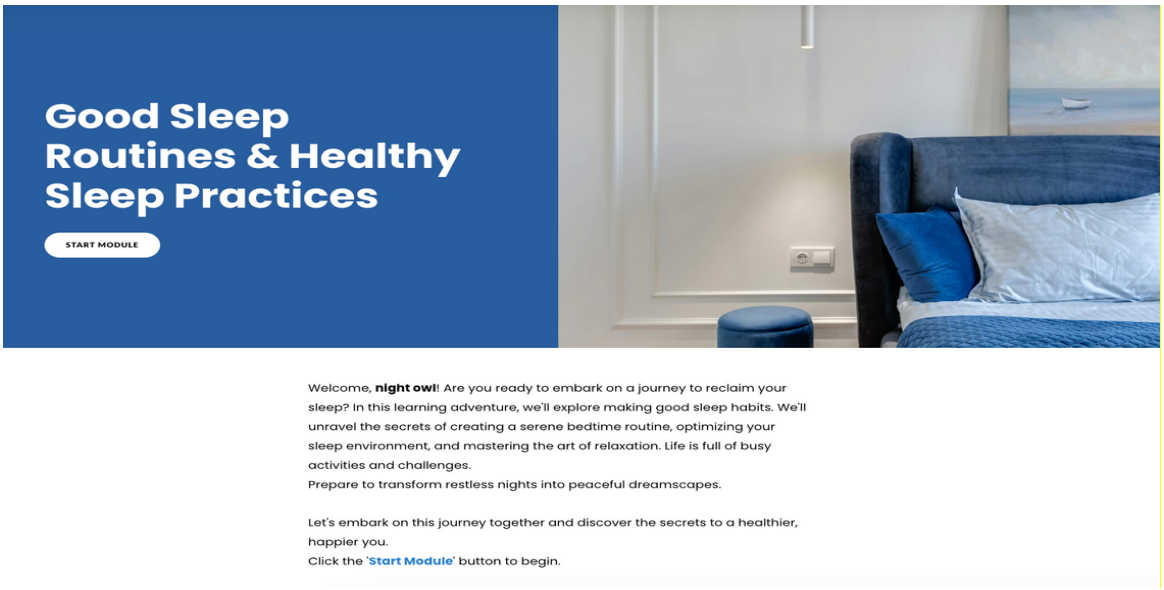
Problem-Based Learning: Students are tasked with designing an optimal sleep environment. Research and Design: They research factors like lighting, temperature, noise, and clutter. They create blueprints or models of their ideal bedroom.

Presentation and Evaluation: Students present their designs to the class, explaining their choices and justifying their decisions**.**

c) **Resource Library**: Articles, videos, and tools on sleep habits best practices, the science of sleep, and its impact on overall well-being.

Comprehensive Learning Resources: The resource library will provide learners with a range of materials designed to **complement their learning** in a self-paced eLearning module created in Articulate RISE 360. This will include:

Figure 1



Articles: A curated collection of articles that explain the **science of sleep**, covering topics such as the stages of sleep, the role of circadian rhythms, and the health implications of sleep deprivation. These articles will be concise and written for learners at varying levels of prior knowledge.

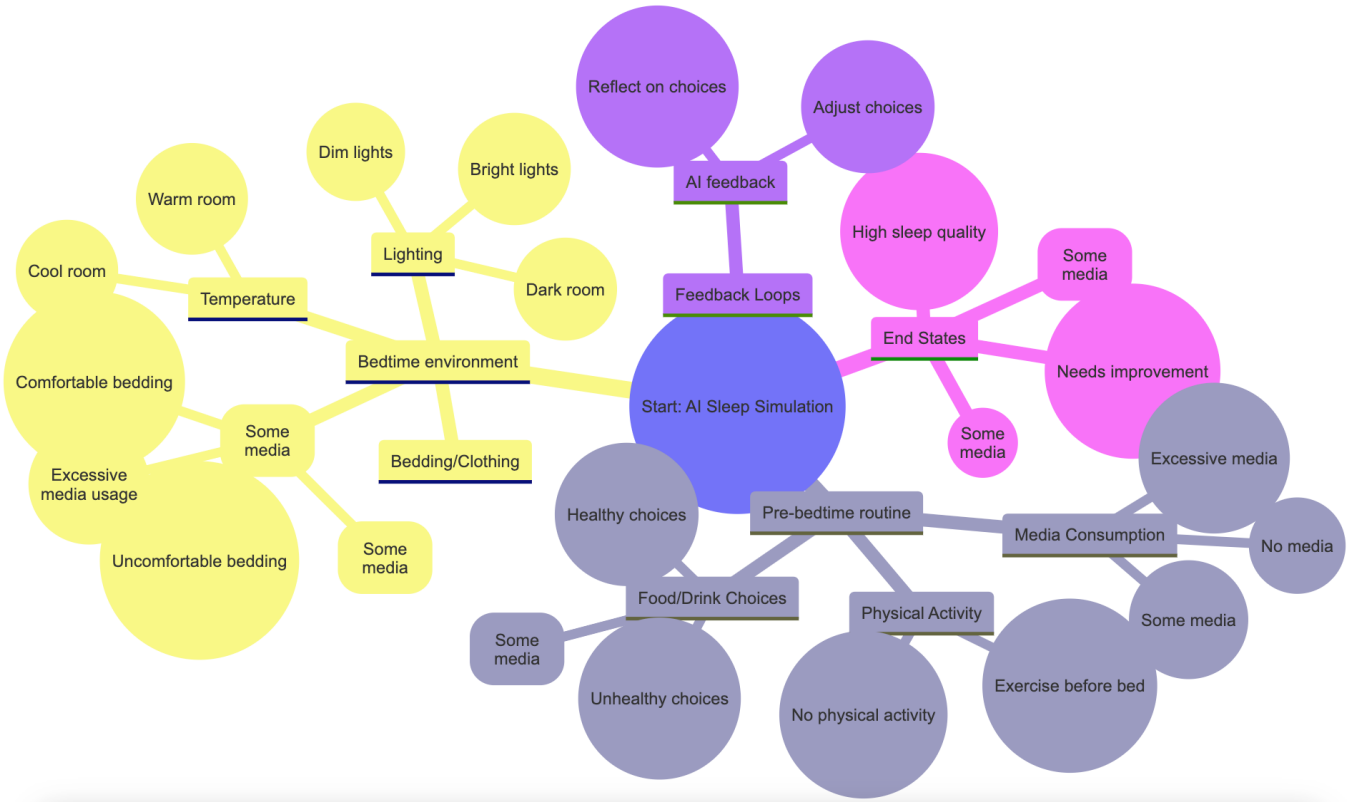
Videos: Short, engaging videos will illustrate concepts such as the **effects of sleep habits** on mental and physical health. Topics might include the **importance of a consistent sleep schedule**, the **impact of caffeine** on sleep, and **relaxation techniques** to wind down before bed.

Interactive Tools: The resource library will also include interactive tools, such as **sleep tracking apps**, **meditation guides**, and **bedroom environment checklists**. These tools allow learners to track their progress in real life, encouraging them to apply what they've learned in their AI scenarios to improve their own sleep habits.

Case Studies: Real-world examples of individuals or groups who successfully improved their sleep habits through lifestyle changes. These case studies will provide learners with **inspiration** and **practical tips** they can implement.

The resource library will be organized for **easy navigation**, allowing learners to explore topics that are most relevant to their challenges with sleep habits. Learners can also revisit materials after completing scenarios for **further reading** or to prepare for future simulations.

Figure 2



Note: Mindmap displaying the workflows for AI -driven scenarios

F) **Formative and Summative Assessment**

a) **Formative Assessments**: Ongoing AI feedback during scenarios, and self-assessment knowledge checks while learning in the unit. If the unit is developed within a blended learning setting, participation in discussion forums is a possibility.

Evaluation and Assessment

Knowledge Checks:

- At key points during the self-paced section, learners will take a pre and post-quiz for this course. These quizzes will include multiple-choice questions, scenario-based questions, and real-life problem-solving tasks.
- Each quiz will have an adaptive component, where incorrect answers lead to targeted feedback and opportunities for remediation through additional resources or re-engaging with specific aspects of the simulation.

b) Practical Application of Knowledge:

Learners will be evaluated on their ability to apply sleep habits principles in the design challenge vision board.

c) Final Project:

The final assessment will require learners to create and submit a comprehensive sleep habits plan. This plan will be graded based on its alignment with best practices in sleep habits, its feasibility, and the degree to which the learner has demonstrated personalization based on their unique sleep challenges.

b) **Summative Assessment**: A couple of creative ways to collectively assess the knowledge learned about sleep habits and healthy sleep habits could be the sleep habit challenge, a reflection journal, or a peer presentation.

Feedback Process

1) Real-Time AI Feedback: Throughout the learning process, the AI will provide real-time feedback to learners as they interact with the scenarios. For example, if a learner consistently chooses behaviors that lead to sleep deprivation, the AI will alert them to potential long-term health risks, and suggest alternative choices to improve their sleep quality.

2) Peer and Self-Evaluation: In addition to AI feedback, learners will engage in group discussions, where they can compare sleep plans and provide constructive feedback to each other. This will encourage collaborative learning and allow them to learn from diverse perspectives.

3) Ongoing Support and Resources: After completing the unit, learners will have access to ongoing AI-driven support, where they can input new behaviors or questions about sleep habits and receive tailored guidance. They will also receive customized sleep tips and resources based on their performance and identified areas for improvement throughout the course.