📚 Key Studies & Findings

1. **Wagner & Walstad, "The Effects of Financial Education on Short-term and Long-term Financial Behaviors"**
    - They find that financial education programs often **fail to move short-term behaviors** (paying bills on time, paying off credit cards) even when knowledge increases. GFLEC
    - In other words, knowing the concepts doesn't reliably change what people do immediately.
2. **Meta-analysis: "Financial Education Matters: Testing Effectiveness Across 76 Randomized Experiments" (Kaiser, Lusardi, Menkhoff, Urban, et al.)**
    - While it shows positive effects on knowledge and behavior, the behavioral effects are **much smaller** than gains in knowledge. Finra Foundation+1
    - Many programs' behavioral impacts decay over time, indicating short-lived change.
3. **"Is School-Based Financial Education Effective? Immediate and Long Effects"** (Experiment in Peru)
    - Gains in financial literacy were significant immediately post-intervention, but **sustained behavior change was modest** and weaker over time. OUP Academic
4. **"Financial Literacy: An Overview of Practice, Research, and Policy" (Federal Reserve)**
    - Authors conclude that teaching financial literacy in the abstract is largely ineffective unless tied to real, actionable tasks and follow-up. Federal Reserve
5. **Behaviorally Informed Financial Education Program (de Bruijn et al.)**
    - This paper argues that simply increasing knowledge is insufficient. They design a program combining motivational & behavioral change theories, implying traditional methods lack those elements. PMC
6. **"The Problem(s) with Financial 'Literacy'" (ASPPAnet commentary)**
    - Compilation of 200+ studies showing that even large instruction efforts often have negligible long-term behavioral effects (20+ months later). ASPPA
7. **"Financial Literacy and the role of numeracy"**
    - This study found interventions to increase financial literacy are often ineffective in changing actual behavior—suggesting a disconnect between knowledge gain and behavior. ScienceDirect
8. **"Quantifying the Causal Effect of Financial Literacy Courses on Financial Health" (Frees, Gangal, Shaviro, 2024)**
    - This more recent work finds positive average treatment effects on a composite "financial health" metric, but acknowledges the **magnitude of effect is relatively small**.

🔍 **Why Traditional Instruction Struggles**

- **Knowledge-behavior gap**: Many studies find people can recall concepts but fail to *apply* them consistently in real life.
- **Attrition / decay over time**: Behavioral changes fade without reinforcement, especially when instruction is one-off.
- **Lack of emotional or experiential engagement**: Traditional classes are passive; people don't internalize habits.
- **One-size-fits-all design**: Programs often ignore differences in context, motivation, culture, and attention spans.
- **No feedback loops or reinforcement mechanisms**: Without iterative practice or feedback, behavior rarely changes permanently.

✅ **Takeaway for FinLitX**: These studies justify why a new modality — immersive, multi-sensory, reinforced over time — is necessary. Traditional financial literacy is often *necessary but not sufficient*. To move from knowledge → behavior → habit, you need **experience, emotion, and reinforcement** — exactly what a 4D immersive approach offers.