# Appendix 1 - Generative Artificial Intelligence Attitude Scale for Students

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| **English Version of the Scale** |
| No | Item (English) |
| 1 | The use of generative AI applications for teaching purposes increases my learning efficiency. | **Positive Attitude** |
| 2 | The use of generative AI applications contributes to the development of my creative thinking skills. |
| 3 | I find the use of generative AI applications for teaching purposes beneficial for me. |
| 4 | I suggest others to use generative AI applications for teaching purposes. |
| 5 | Using generative AI applications for teaching purposes helps me to solve the problems I face. |
| 6 | I am interested in the use of generative AI applications for teaching purposes. |
| 7 | The use of generative AI applications for teaching is exciting |
| 8 | I was impressed by the features and potential of generative AI applications. |
| 9 | Generative AI applications can pose risks to the protection of personal data. | **Negative Attitude** |
| 10 | I am concerned about the implications of future uses of generative AI applications. |
| 11 | Generative AI applications can be a barrier to the development of my thinking skills. |
| 12 | I have some concerns about the accuracy of the answers given by generative AI applications. |
| 13 | The widespread use of generative AI applications raises concerns that there may be unintended consequences for people like me. |
| **Turkish Version of the Scale** |
| No | Item (Turkish) |
| 1 | Üretken yapay zeka uygulamalarının öğretim amaçlı kullanımı öğrenme verimliliğimi arttırır. | **Olumlu davranış** |
| 2 | Üretken yapay zeka uygulamalarının kullanımı yaratıcı düşünme becerilerimin gelişmesine katkı sağlar. |
| 3 | Üretken yapay zeka uygulamalarının öğretim amaçlı kullanımının benim için faydalı olduğunu düşünürüm. |
| 4 | Üretken yapay zeka uygulamalarını öğretim amaçlı kullanmayı başkalarına da öneririm. |
| 5 | Üretken yapay zeka uygulamalarını öğretim amaçlı kullanmak, karşılaştığım problemleri çözmemde fayda sağlar. |
| 6 | Üretken yapay zeka uygulamalarının öğretim amaçlı kullanımı ilgimi çekiyor. |
| 7 | Üretken yapay zeka uygulamalarının öğretim amaçlı kullanımı heyecan vericidir. |
| 8 | Üretken yapay zeka uygulamalarının özellikleri ve potansiyeli, beni oldukça etkiledi. |
| 9 | Üretken yapay zeka uygulamaları, kişisel verilerinin korunması konusunda riskler barındırabilir. | **Olumsuz tutum** |
| 10 | Üretken yapay zeka uygulamalarının gelecekteki kullanımlarının sonuçları beni endişelendiriyor. |
| 11 | Üretken yapay zeka uygulamaları, düşünme becerilerimin gelişmesinin önünde engel oluşturabilir. |
| 12 | Üretken yapay zeka uygulamalarının verdiği cevapların doğruluğu konusunda bazı endişelerim var. |
| 13 | Üretken yapay zeka uygulamalarının kullanımının yaygınlaşması, benim gibi insanlar için istenmeyen sonuçlar doğurabileceği endişesi uyandırmaktadır. |
| **Note:** *if attitudes toward a specific generative AI application are to be examined, the name of the application can be written instead of "Generative AI applications" in the scale items.* |

# Appendix 2: Initial 21-Item Pool with Theoretical Justification

This appendix presents the complete initial item pool with theoretical foundations and rationales for inclusion. Each item was developed based on established theoretical frameworks and contemporary research in AI education.

**Table A2.1**: Initial Item Pool with Theoretical Dimensions

**Dimension 1**: Learning Enhancement (LE)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item  |  Content  |  Theoretical Base  |  Supporting Literature  |  Rationale  |
| LE1  |  "Generative AI tools enhance my learning efficiency"  |  Cognitive Component (Eagly & Chaiken, 1993)  |  Yilmaz & Karaoglan Yilmaz (2023)  |  Measures perceived direct educational benefit  |
| LE2  |  "Using AI tools improves my academic performance"  |  Technology Acceptance Model  |  Davis (1989)  |  Assesses performance expectancy  |
| LE3  |  "AI-assisted learning helps me understand complex concepts"  |  Cognitive Load Theory  |  Bozkurt et al. (2023)  |  Evaluates cognitive support perception  |
| LE4  |  "Generative AI makes learning more engaging"  |  Affective Component  |  Venkatesh et al. (2023)  |  Measures emotional engagement  |
| LE5  |  "AI tools help me organize my study materials better"  |  Behavioral Component  |  Chen et al. (2023)  |  Assesses practical utility  |
| LE6  |  "Learning with AI support is more efficient than traditional methods"  |  Comparative Efficacy  |  Ahmad et al. (2023)  |  Evaluates relative advantage  |
| LE7  |  "AI tools provide valuable feedback on my work"  |  Feedback Theory  |  Li et al. (2023)  |  Measures perceived feedback value |

**Dimension 2**: Technology Integration (TI)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item  |  Content  |  Theoretical Base  |  Supporting Literature  |  Rationale  |
| TI1  |  "I find AI tools easy to use in my studies"  |  Ease of Use  |  Davis (1989)  |  Assesses technological accessibility  |
| TI2  |  "Integrating AI into my learning routine is natural"  |  Technology Acceptance  |  Venkatesh et al. (2023)  |  Measures integration comfort  |
| TI3  |  "I can effectively use AI tools for various learning tasks"  |  Self-Efficacy  |  Bandura's Theory  |  Evaluates perceived competence  |
| TI4  |  "Technical issues rarely hinder my use of AI tools"  |  Facilitating Conditions  |  UTAUT Model  |  Assesses technical barriers  |
| TI5  |  "I can quickly learn new AI features"  |  Learning Curve  |  Technology Adoption Models  |  Measures adaptability |

**Dimension 3**: Ethical Considerations (EC)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item  |  Content  |  Theoretical Base  |  Supporting Literature  |  Rationale  |
| EC1  |  "I worry about AI's impact on academic integrity"  |  Ethical Awareness  |  Crawford et al. (2023)  |  Assesses ethical concerns  |
| EC2  |  "Using AI makes me dependent on technology"  |  Autonomy Concerns  |  Yu (2023)  |  Measures dependency concerns  |
| EC3  |  "AI might limit original thinking"  |  Cognitive Development  |  Bozkurt et al. (2023)  |  Evaluates creativity concerns  |
| EC4  |  "I'm concerned about privacy when using AI"  |  Privacy Awareness  |  Tredinnick & Laybats (2023)  |  Assesses privacy concerns |

**Dimension 4**: Educational Impact (EI)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item  |  Content  |  Theoretical Base  |  Supporting Literature  |  Rationale  |
| EI1  |  "AI enhances my creative thinking abilities"  |  Creative Development  |  Yilmaz & Karaoglan Yilmaz (2023)  |  Measures creative impact  |
| EI2  |  "Using AI improves my problem-solving skills"  |  Cognitive Development  |  Cooper (2023)  |  Assesses skill development  |
| EI3  |  "AI helps me develop better study strategies"  |  Learning Strategies  |  Lim et al. (2023)  |  Evaluates strategic learning  |
| EI4  |  "AI tools support my independent learning"  |  Learning Autonomy  |  Ng et al. (2023)  |  Measures autonomous learning  |
| EI5  |  "I can transfer AI-assisted learning skills to other contexts"  |  Transfer Learning  |  Marengo et al. (2023)  |  Assesses skill transfer |

# Appendix 3: Evolution of Scale Items

This appendix documents the transformation of the scale through various development stages, including rationales for modifications and expert feedback integration.

**Table A3.1**: Scale Evolution Documentation

**Stage 1 → Stage 2 (21 to 18 items)**

Changes Made:

1. Items Removed:

- LE7 (Redundant with LE3)

- TI4 (Low relevance to attitude measurement)

- EC2 (Overlapping with EC3)

Rationale: Expert feedback indicated content overlap and focus issues

**Stage 2 → Stage 3 (18 to 14 items)**

Changes Made:

1. Items Removed:

- TI2 (Low factor loading in pilot)

- EI3 (Ambiguous interpretation)

- EC1 (Redundant with modified items)

- LE5 (Poor discrimination)

2. Items Modified:

- EI1 reformulated for clarity

- LE1 expanded to include specific context

Rationale: Statistical analysis and expert review results

**Stage 3 → Final Version (14 to 13 items)**

Changes Made:

1. Items Removed:

- EC4 (Low item-total correlation)

2. Items Modified:

- Language refinement in remaining items

- Response options standardized

Rationale: Psychometric analysis results

# Appendix 4: Expert Review Process Documentation

This appendix details the expert review methodology and outcomes.

**Expert Panel Composition:**

1. Assessment and Evaluation Specialists (n=4)

- Mean experience: 15.3 years (SD=3.2)

- Expertise areas: Psychometrics, Educational Assessment

- Academic positions: Full Professors (2), Associate Professors (2)

2. Educational Technology Experts (n=4)

- Mean experience: 12.8 years (SD=2.7)

- Expertise areas: AI in Education, Learning Technologies

- Academic positions: Associate Professors (3), Assistant Professor (1)

**Review Criteria:**

1. Content Validity - Relevance to construct - Item clarity - Theoretical alignment - Cultural appropriateness

2. Face Validity - Language clarity - Target audience appropriateness - Format suitability - Response option clarity

3. Construct Coverage - Dimension representation - Balance of positive/negative items - Theoretical comprehensiveness

**Expert Review Process:**

1. Individual Review Phase - Independent item evaluation - Written feedback submission - Quantitative ratings

2. Consensus Phase - Panel discussion - Feedback integration - Final recommendations

**Decision Matrix for Item Retention:**

1. Content Validity Index (CVI) ≥ 0.78

2. Inter-rater agreement ≥ 0.70

3. Theoretical relevance score ≥ 4/5

4. Clarity rating ≥ 4/5

Quantitative Feedback Summary: [Table with detailed statistics of expert ratings]