

Title	心理的要因を再現したフィッシングメール判別訓練アプリケーションの開発
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Citation	
Issue Date	2026-03
Type	Thesis or Dissertation
Text version	author
URL	https://hdl.handle.net/10119/20541
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Development of a Phishing Email Detection Training Application Simulating Psychological Factors

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In modern society where the Internet is widely used, phishing attacks have been increasing rapidly, and the growing sophistication of attack methods through generative AI suggests this threat will expand further. To counter phishing, it is essential for users to develop the ability to identify phishing emails themselves; however, existing organization-oriented training services require significant cost and dedicated personnel, leaving learning opportunities for individuals limited. Moreover, conventional approaches tend to focus on technical knowledge and do not adequately address the psychological impact that phishing emails exert on users or the shifts in mental state arising from users' own environments.

This research classifies the psychological factors influencing phishing email judgment into three categories — personal, environmental, and external stimulus factors — and develops a simulated-experience training application that reproduces them. Users engage in a scenario spanning approximately one year as fictitious university students, handling both legitimate and phishing emails in an integrated environment where appropriate judgment and action are required. The scenario design incorporates sender-user relationships, task-based scoring, time constraints, and temporal concentration of email delivery to reproduce the environmental and external stimulus factors. An automatic content generation mechanism powered by the Claude 3.5 Haiku API was implemented, and an iframe structure was adopted to reproduce the page-transition experience encountered in actual phishing attacks.

To evaluate educational effectiveness, a between-subjects experiment was conducted with ten participants divided into an experimental and a control group. A Mann–Whitney U test on pre- and post-test response quality revealed no statistically significant difference between the groups. However, post-training questionnaire results showed that the experimental group responded more positively regarding the difficulty of handling emails, suggesting that the temporal concentration of email delivery through scenario design exerted a measurable effect. Log analysis further confirmed that many participants actively checked email source information, indicating that the training environment promoted more thorough analytical behavior. Future work should address increasing the number of participants to improve experimental reliability, implementing a scenario design interface, and further optimization of the LLM model.