

UX: Web Touch Component for Self-Learners of Japanese Katakana Script

Ing. Andrea Kanóczová | Ing. Michaela Bačíková, PhD.



The problem and motivation

- Katakana is **challenging** for learners from **phonemic alphabet** background¹ due to limited **practice opportunities**² and visually **similar characters**³.
- The **touch component** addresses this by promoting **regular practice**, enhancing **recognition**, and maintaining learner **motivation**.



Applied solution

- Handwriting-based learning** improves memory and recognition through active **motor engagement**.
- Stroke accuracy is verified by calculating the **Fréchet Distance (FD)** and **Shape Context (SC)** between **user strokes** and **template strokes**.
- Support features include **difficulty levels**, **letter** and **pronunciation recognition**.



Evaluation methods satisfaction

Parameter	FD method	SC method
User satisfaction	56.6%	72%
Reported difficulties	77%	58%
Mismatch with perception	Yes, frequent	None reported
Demotivation	Reported	None reported
Overall suitability	Lower	Higher



User testing feedback

- Users expressed a need for **additional challenge** beyond writing, noting **monotony** after 16 letters per **digital** and **pen-and-paper exercises**.
- Strong **satisfaction** was reported for interactive exercises using **selection**, **comparison**, and **audio inputs**.
- High **interest** was shown in **stroke mistake summaries** and an **onboarding lesson**.
- The **evaluation threshold** of **25 px** for writing **precision** using **FD** was perceived as **strict**.
- SC disparity tolerance** of **0.15** was considered reasonable, with similarity perceived as **adequate**.



Results and application

- Developed a **modular component** supporting **script learning** through **writing** and **recognition**.
- Achieved a **SUS score** of **83/100**.
- Flexible design** supports diverse **teaching methodologies**.
- Currently focused on **Katakana**, but extendable to other **scripts**.



References

- [1] N. Yiitolu and M. Reichelt, "L2 writing beyond English".
- [2] B. S. Handini, "Teacher's difficulties in teaching japanese writing system (sakubun)".
- [3] O. Udeshika, "A study on use of katakana letters by learners of japanese as a foreign language".