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Moodle Enhancement with VUI etc. for Realizing Safety Education in Child Safety, Chemical Experiments and Emergency Nursing Fields

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Summary (1/3)

- We intend to develop a safety education system
- To prevent serious accidents by providing education

- Safety education in 3 fields :
  - Child injury prevention
  - Environmental safety engineering (e.g., chemical laboratory safety)
  - Emergency nursing

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Summary (2/3)

- For the safety education, how should

  Moodle + learning contents

  be enhanced and designed ?

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Summary (3/3)

- Enhancement :
    - Moodle += Voice User Interface   (half completed)
    - Moodle += Chatbot type interface   (half completed)
    - New Moodle Analytics models   (in planning stage)
    - Moodle += Engine to estimate learners' state
      (in planning stage)
- Design outcomes:
    - Outcome 1 : **Knowledge** of the risks
    - Outcome 2 : **Skills** to deal with the risks
    - Outcome 3 : **Positive attitude** to prepare for the risks

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Safety education for preventing accidents

- Several disastrous accidents around the world
- Physical preventive measures are important
- Also, educating people and professionals will prevent such accidents

- Right now, we focus on safety education in :
  - Child injury prevention
  - Environmental safety engineering (e.g., chemical laboratory safety)
  - Emergency nursing

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Child injury prevention

- Injuries during childhood are the leading cause of death around the world and are a major health problem for children.
- When a child sustains injury, people are likely to accuse the parents of being careless.
- Parents are blamed if they fail to prevent their children's injury, even though they have little opportunity to learn about child injuries and the preventive measures available based on scientific knowledge.

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Environmental safety engineering

- In research institutions such as universities, accidents caused by chemicals frequently occur.
- Some researchers and students are not aware of the risks and they do not have an opportunity to learn more.
- Appropriate procedures stipulated by law are not well known or are not always followed by experimenters even though they are known.
- Extensive and effective environmental safety education is required.

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Emergency nursing

- It is said that the "preventable trauma deaths" that could have been prevented by appropriate measures exceeded 30% of the total trauma deaths in 2005.
- It is a critical task to construct a trauma medical care system for emergency medical care and improve the skills of the medical staff.
- To give emergency care to patients in cooperation with doctors, further improvement in clinical inference of nurses is necessary.

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Three stages of safety education

- Robert M. Gagné's classifications of learning outcomes :
  - "verbal information", "intellectual skills", "attitude", etc.
- In safety education, each person should:
  - 1 : Know the risks
  - 2 : Be skilled to deal with the risks
  - 3 : Have a positive attitude to prepare for the risks
- Safety education is **not completed if one has** the knowledge and the skill, but **no positive attitude**.

(exception : #3 is less relevant in the field of emergency nursing education)
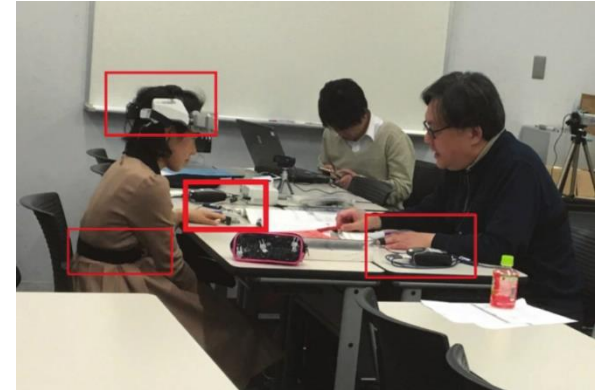
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Moodle enhancement (half completed)

- Provide active and proactive interactions with the users by enhancing Moodle UI and features :

- A Voice User Interface (VUI) enables "learning through interactions by voice or sound", and "starting to talk to learners from the LMS side" via smart speakers.

- A chatbot interface gives learning by interactions through SNS

Moodle enhancement (in planning stage)

- A Moodle Analytics model to enable proactive instructions and interventions to learners in our safety education.

- An engine to estimate the mental state of a learner based on the learning logs and the user's biological information (such as brain waves and respiration) enables adapting Moodle behavior according to the estimated mental state.

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Our research project website

https://kmkst.cica.jp/

教育で防ぎ得た重大事故を防ぐ
能動的LMSを軸とする安全教育システムの実現

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