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GOAL Project: Developing Technology Support for Acquisition of Self Direction Skill

Majumdar, Rwito

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GOAL
DAPER(-   -   -   )

The GOAL introduced a data-driven approach for measuring and adaptively supporting self-directed skills following the proposed DAPER process. The technical foundation paves way for further research using student's learning and physical activity data.

GOAL project achieved to build a platform to collect learning and physical activity data of learners. Based on the user's reading behaviours and physical activity logs the system supported a DAPER (data collection - analysis - planning - execution monitoring - reflection) model to train for self-direction skills. Our need analysis highlighted the necessity of improving self-direction skills in learners both at school and university levels. The features required in the technology platform was refined over two design iterations. The initial data collected is a first of its kind dataset of learner's attribute from beyond daily learning activity context. Based on that we proposed data-driven models to measure their analysis and planning skills. It was also used to understand students self-directed learning behaviours.

social informatics, learning analytics

GOAL Self-directed Learning Learning Analytics DAPER model Quantified Self Wearable trackers Self Direction Skills

For the 21st century learner, self-direction skill is crucial for developing both intellectual abilities and maintaining one's healthy lifestyle. While there are technology supports for specific self-regulated learning tasks and health monitoring, research is limited on how to support development of the meta-skill of Self-Direction itself.

(Purpose)

This work bridges Learning Analytics (LA) and Quantified-Self (QS) research to enable technology support for self-directed activities of learners. It proposed DAPER (Data-Analyze-Plan-Execution Monitoring-Reflect), a data-driven Self-Direction skill execution and acquisition model (see Figure 1.).
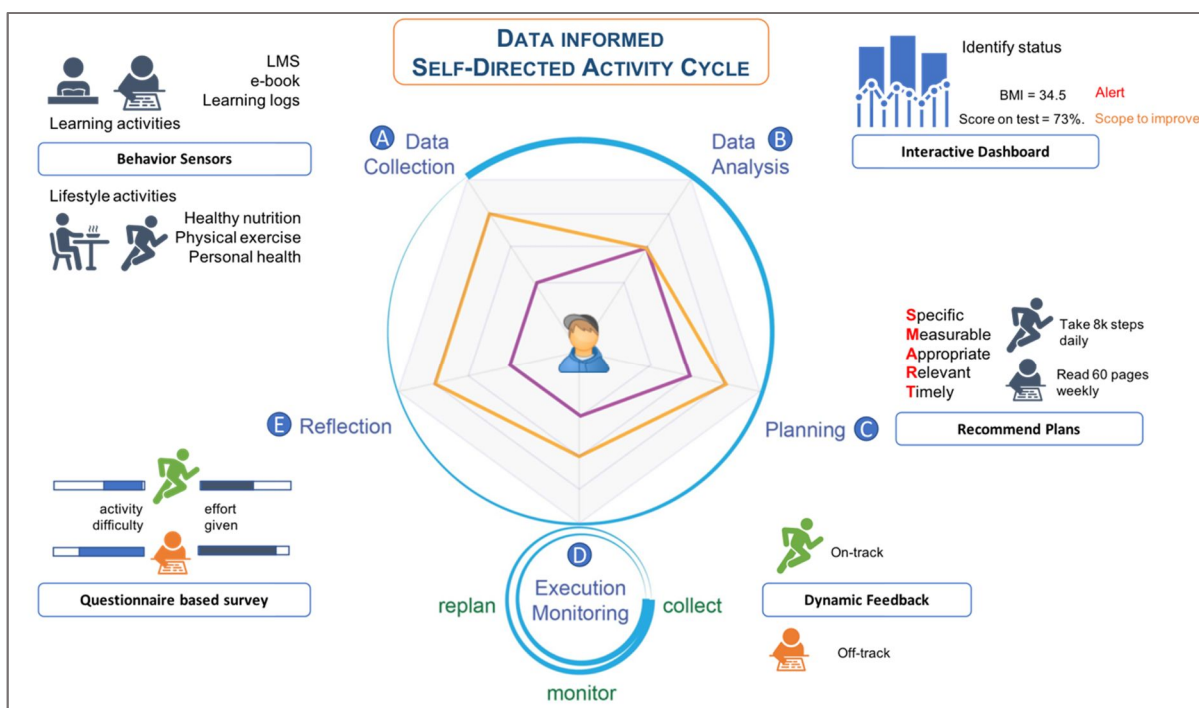

Figure 1. DAPER model of Self-direction Skill execution and acquisition.

(Method)

To support synchronize-visualize-analyze multisource data regarding learners' learning and physical activities, we developed the GOAL (Goal Oriented Active Learner) system. Figure 2 gives the system architecture of the system.
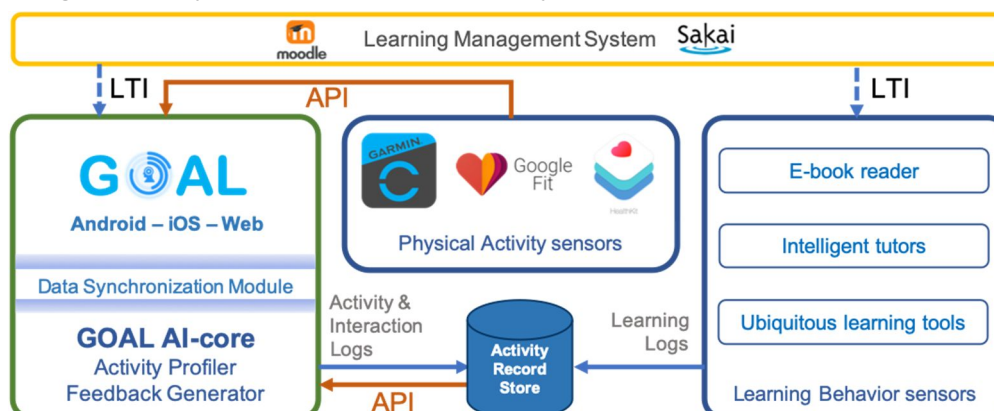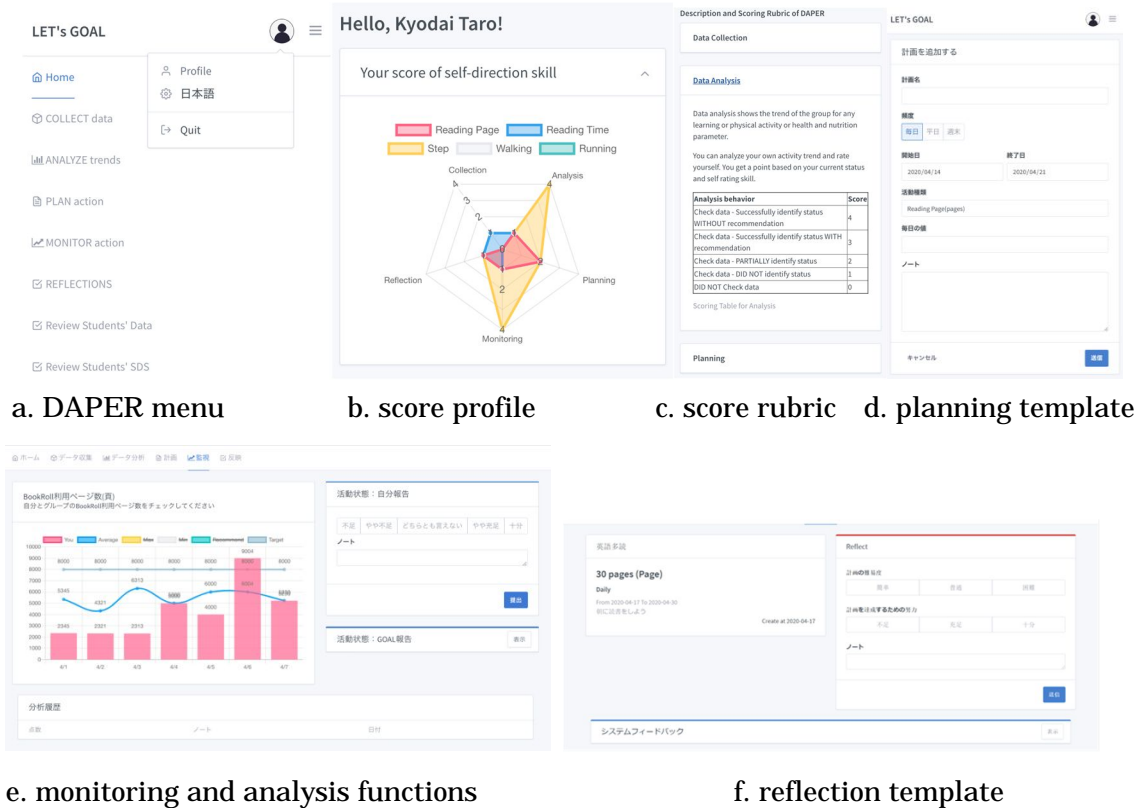

Figure 2. System Architecture of the GOAL system.

Figure 3 the interface of the system respectively.

a. DAPER menu   b. score profile   c. score rubric   d. planning template

e. monitoring and analysis functions   f. reflection template

Figure 3. Interface and functions in GOAL system.

Our novel approach used data from learners own daily life to provide a context to exercise self-direction skills. The system tracks the learner's activities and interactions to define their self-direction strategy and measure their skills in each phase of DAPER (see Figure 3).
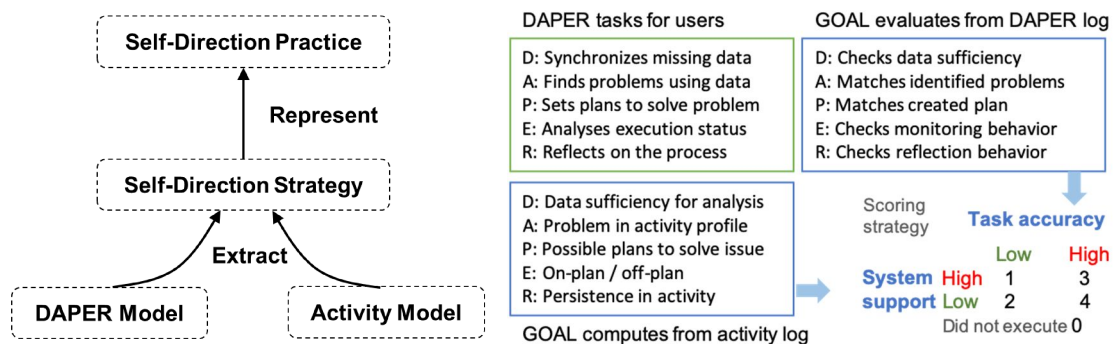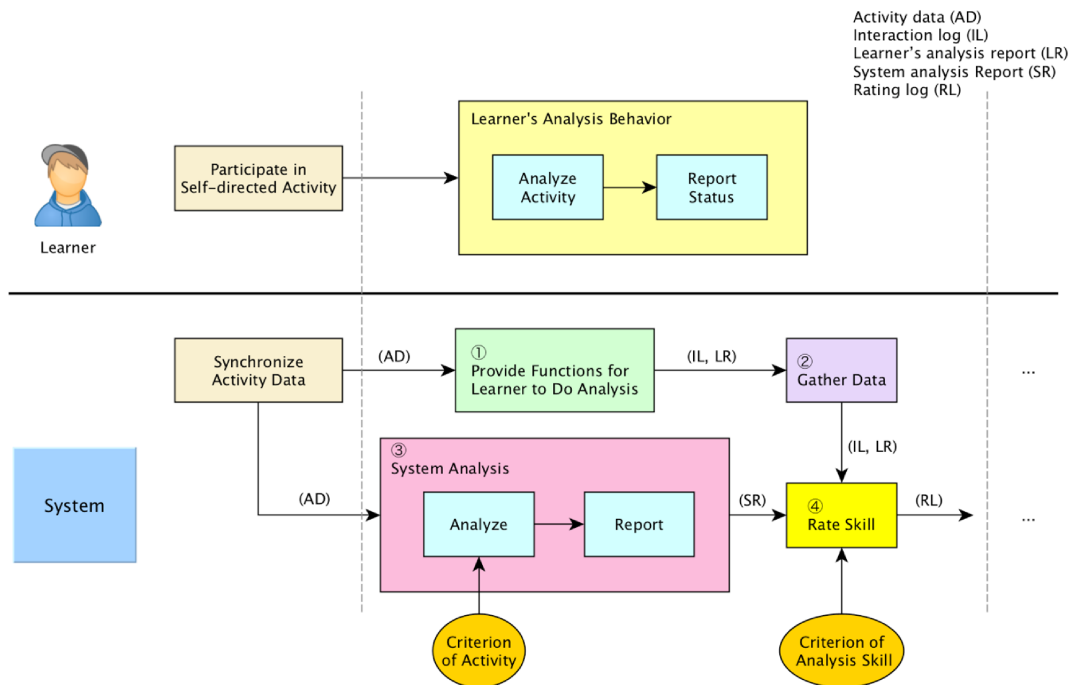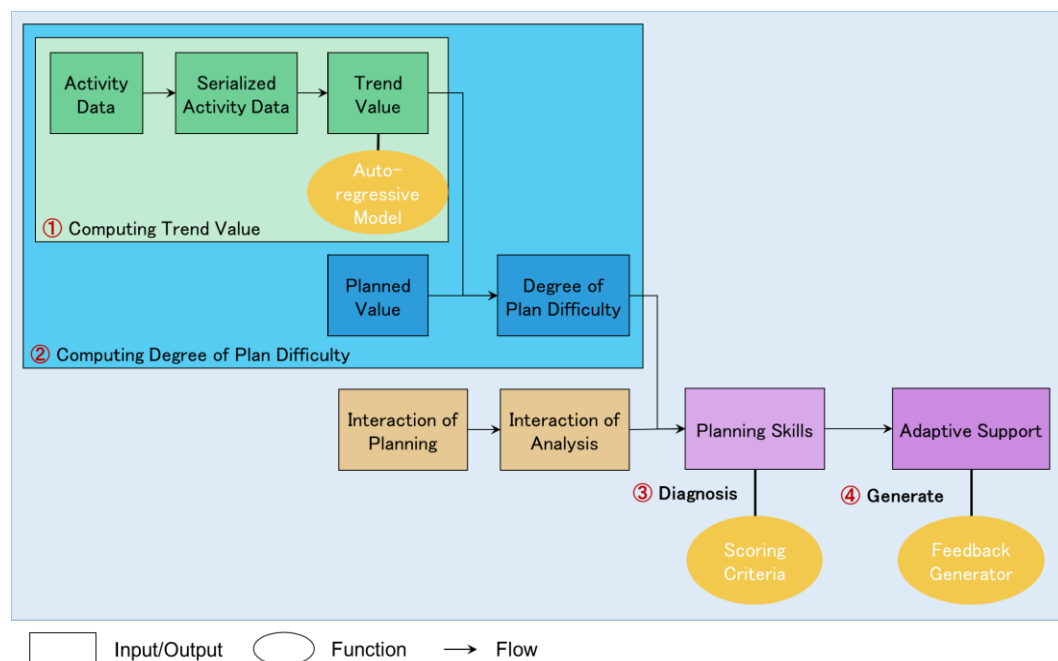

Figure 4. Extracting and scoring self-direction skill through GOAL system

(Result)

The system used the above approach to diagnose and rate analysis and planning skills (Figure 4a. and 4b. respectively).

4a. Framework for Analysis Skill Measurement and Relation to Learner's Behavior

4b. Framework for Modeling Self-Planning

In this period of funding, GOAL system was designed, developed and was introduced to more than 80 university students for initial studies. Further preparations are made to introduce it to junior high and high school levels with initial pilot data collected from 91 students. Detailed results of the studies are available in the peer reviewed publications related to this project.

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Rwitajit Majumdar, Yuan Yuan Yang, Huiyong Li, Gokhan Akapinar, Brendan Flanagan, Hiroaki Ogata
GOAL: Supporting Learner's Development of Self-Direction Skills using Health and Learning Data
26th International Conference on Computers in Education (ICCE2018), pp. 406-415, 2018.11.29
2018

Huiyong Li, Rwitajit Majumdar, Yuan Yuan Yang, Gokhan Akapinar, Brendan Flanagan, Hiroaki Ogata
Practice-Based Self Direction: A Conceptual Framework
International Conference on Learning Analytics and Knowledge. Tempe, USA March 2019
2019

Rwitajit Majumdar, Arzu Akapinar, Gokhan Akapinar, Brendan Flanagan and Hiroaki Ogata
LAView: Learning Analytics Dashboard Towards Evidence-based Education
International Conference on Learning Analytics and Knowledge. Tempe, USA March 2019
2019

Rwitajit Majumdar, Arzu Akapinar, Gokhan Akapinar, Brendan Flanagan and Hiroaki Ogata
Learning Analytics Dashboard Widgets to Author Teaching-Learning Cases for Evidence-based Education
International Conference on Learning Analytics and Knowledge. Tempe, USA March 2019
2019

Rwitajit Majumdar	
Supporting Data-Driven Decision Making by Learners and Teachers	
26th International Conference on Computers in Education (ICCE2018)	
2018	

Rwitajit Majumdar, Ivica Boticki., Hiroaki Ogata	
International Workshop on Technology-Enhanced and Evidence-Based Education and Learning	
International Conference on Learning Analytics and Knowledge. Tempe, USA March 2019	
2019	

Yuan Yuan Yang	
A System to Support People's Learning and Health By Promoting Their Self Direction Skills.	
Program for Leading Graduate Schools	
2018	

Huiyong Li and Yuan Yuan Yang	
LET s GOAL: Towards Goal Oriented Active Learner.	
ICT Innovation at Kyoto University	
2019	

Rwitajit Majumdar, Jayakrishnan Madathil Warriem, Hiroaki Ogata	
How Technology supports Learning at Scale and Evidence-based Education	
9th IEEE International Conference on Technology for Education (T4E) 2018	
2018	

Rwitajit Majumdar, Huiyong Li, Yuan Yuan Yang, Gokhan Akapinar, Brendan Flanagan, Hiroaki Ogata	
Adaptive Support for Acquisition of Self-direction Skills using Learning and Health Data	
International Conference on Advanced Learning Technologies (ICALT) 2019	
2019	

Huiyong Li, Yuan Yuan Yang, Rwitajit Majumdar, Gokhan Akapinar, Brendan Flanagan, Hiroaki Ogata	
Modeling Self-Planning and Promoting Planning Skills in a Data-Rich Context	
27th International Conference on Computers in Education (ICCE2019), pp. 300-305, 2019.12.5	
2019	

Yuan Yuan Yang, Rwitajit Majumdar, Huiyong Li, Gokhan Akapinar, Brendan Flanagan, Hiroaki Ogata	
Measuring Analysis Skill in Data-informed Self-directed Activities.	
27th International Conference on Computers in Education (ICCE2019), pp. 335-343, 2019.12.2	
2019	

Hiroyuki Kuromiya, Rwitajit Majumdar, Jayakrishnan Madathil Warriem and Hiroaki Ogata	
Data-driven Validation of Pedagogical Model - A Case of Blended LCM Model	
10th IEEE International Conference on Technology for Education (T4E) 2019	
2019	

Rwitajit Majumdar, Hiroyuki Kuromiya, Chifumi Nishioka, Jayakrishnan Madathil Warriem and Hiroaki Ogata	
Technology-enhanced and Evidence-based Education: experience sharing and the road forward	
10th IEEE International Conference on Technology for Education (T4E) 2019	
2019	

Gokhan Akapinar, Alice Mei Rong Chen, Rwitajit Majumdar, Brendan Flanagan, Hiroaki Ogata	
Exploring Student Approaches to Learning through Sequence Analysis of Reading	
International Conference on Learning Analytics and Knowledge. Frankfurt, Germany March 2020	
2020	

Brendan Flanagan, Rwitajit Majumdar, Atsushi Shimada, Hiroaki Ogata	
The 2nd Workshop on Predicting Performance Based on the Analysis of Reading Behavior	
International Conference on Learning Analytics and Knowledge. Frankfurt, Germany March 2020	
2020	

Rwitajit Majumdar, Hiroyuki Kuromiya, Kiriko Komura, Brendan Flanagan, Hiroaki Ogata
LA Platform in Junior High School: Trends of Usage and Students Performance
International Conference on Learning Analytics and Knowledge. Frankfurt, Germany March 2020
2020

Rwitajit Majumdar, Huiyong Li, Yuan Yuan Yang, Gokhan Akapinar, Brendan Flanagan, Hiroaki Ogata
Oh! Another Deadline: Cohort Analysis of Learner's Behaviors in Self-Directed Tasks
International Conference on Advanced Learning Technologies (ICALT) 2020
2020

Brendan Flanagan, Rwitajit Majumdar, Gokhan Akapinar, Hiroaki Ogata
The Relationship between Student Performance and Reading Behavior in Open eBook Assessment.
International Conference on Advanced Learning Technologies (ICALT) 2020
2020

Huiyong Li and Yuan Yuan Yang
LET's GOAL:
ICT Innovation at Kyoto University
2020

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GOAL Website
https://sites.google.com/view/letsgoal
LET Research Unit
http://www.let.media.kyoto-u.ac.jp/