

Development of online courses on a method of coding education for K12 teachers in Japan.

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THE OPEN UNIVERSITY OF JAPAN

Keywords:

- online education
- coding education
- registration system
- teacher education

Industrial development and informatics education in Japan

ICT change

- Development of Information and Communication technologies change our daily life.
- Our social system is depending on software not hardware.



Nissan LEAF 

すべてが驚き。

航続距離をさらに延ばした
“e+” 登場。

●62kWh/バッテリー搭載車

WLTC 

JC08 

458km 570km

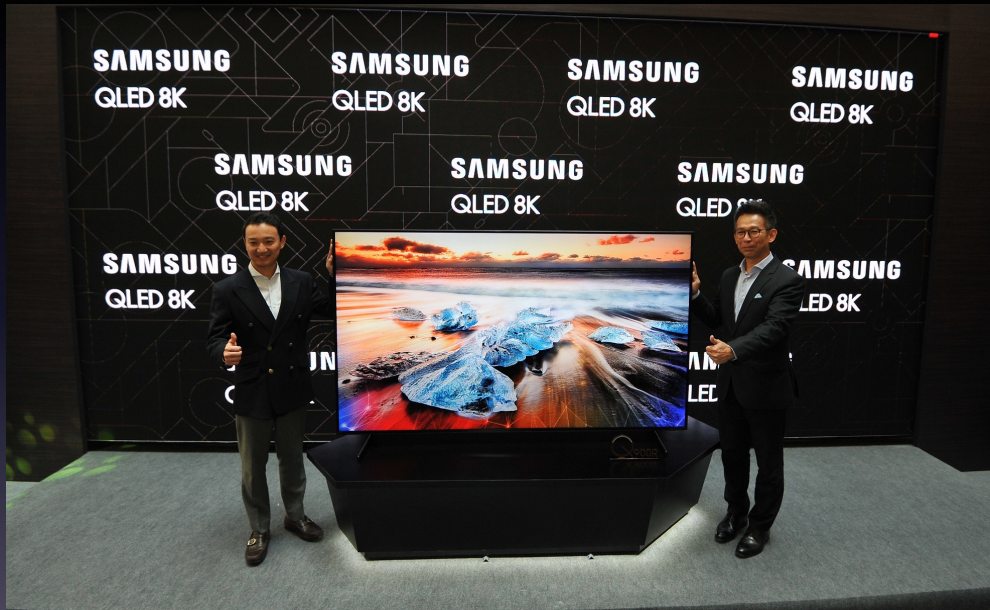
NISSAN  INTELLIGENT MOBILITY



Nissan LEAF from Japan



Nikon D5600 from Japan



TV from Korea



Smart phone from Asian Countries



PC from many countries(including Japan)

In 20th century

- Japan accounts for a large share of the world in automobiles and cameras.
- In the past decades, there were many Japanese products in television, radio, audio, and computers.
- Many of these products are made in China, Korea, and Taiwan.

Old age in Japan

- Especially, many Japanese over the age of 60 don't want to incorporate ICT into their lives
- because they believe Japan succeeded in the 20th century without the help of ICT.



Poor ICT make Japan as..

	1960-1970	1980-2010	2019
Japan	Developping heavy industr.	ICT revolution	
Developping countries		Developping ICT revolution	

Many Japanese think “ICT is unnecessary!”

Japan's informatics education and utilizing ICT in school

Incorporating coding education

- So many governments are adopting the way of write software into school curriculum.
- Incorporating coding education into elementary school is important.

Poor ICT Education make Japan as..

- The author believes that one of the reasons for this situation is that Japanese information education was not rich.
- Japan's information education lags behind other Asian countries.

Historical reason

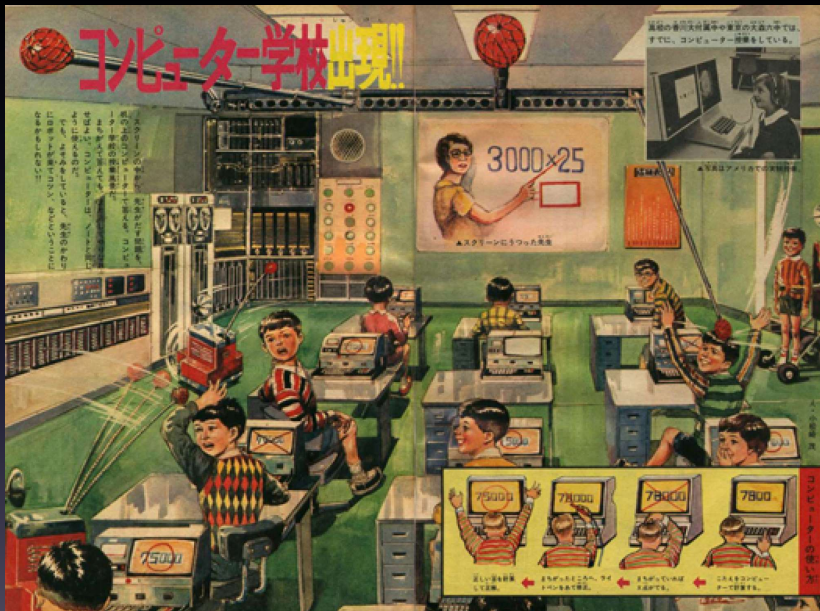
- On incorporating CS and ICT education, level is affected by the overlapping period in the development of information and communication technology, ICT, and the country's economic development.

Poor ICT Education make Japan as..

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Many Japanese think “**ICT education** is unnecessary!”

Former ICT education in Japanese education



Computer School in future(S. Komatsuzaki, 1969)

Educational Reform in Japan

- MEXT – Japanese Ministry of Education, Culture, Sports, Science and Technology
- In 1998, MEXT published a revised National Syllabus for K-12 education on CS and ICT

In high school,

- Since 2003, all high school students must learn “informatics” as a mandatory subject.
- The student who studied ICT in high school in 2003 was a first year high school student and was 16 years old and currently 32 years old.

ICT education in Japanese university

In Japanese University,

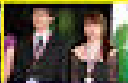
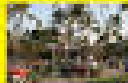
- Students have been educated for more than 10 years until high school.
- Many universities require ICT classes / courses for new students
- Many Japanese students need to improve their MS Office skills
- Many freshmen think coding is too difficult.

世界大会は、 スポーツだけじゃない。

累計受験者数 240万人超のマイクロソフト・オフィス・スペシャリスト (MOS/MAS)。この認定試験で、ワードもしくはエクセルを受験するとエントリー可能。学生の留学活動に有利。日本代表に選出されると、アメリカ・ユタ州・パークシティで開催される決闘地に出場し、世界の学生たちと競えるのだ。パソコンスキルで世界No.1を目指せ、
競技種目は、ワードとエクセル。求ム！日本代表。

Microsoft Officeスペシャリストの資格を証明するマイクロソフト認定試験のエントリー！
<http://mc.odyssey-com.co.jp/contest/>

Microsoft Officeスペシャリストの資格を証明するマイクロソフト認定試験のエントリー！
Microsoft Officeスペシャリストの資格を証明するマイクロソフト認定試験のエントリー！
Microsoft Officeスペシャリストの資格を証明するマイクロソフト認定試験のエントリー！
Microsoft Officeスペシャリストの資格を証明するマイクロソフト認定試験のエントリー！



Microsoft Office 世界学生大会 2010

「世界中のみんなへ。」(下略) 正式名称: マイクロソフト・コミュニケーションズ

Microsoft Officeスペシャリストの資格を証明するマイクロソフト認定試験のエントリー！
Microsoft Officeスペシャリストの資格を証明するマイクロソフト認定試験のエントリー！
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For future teachers,

- This is the same situation for university students who want to become future teachers.
- Current teachers in Japan are studying MS Office during their university days
- After becoming a teacher, they are devoted to teaching MS Office.
- They think they are not good at coding.

Coding in Educational Reform by the Japanese Government

Recentry reform

- Several years ago, the Japanese government began reforming information education for K-12 schools and university. The following contents are newly added to the learning contents.
- Coding, Data science, The characteristics of artificial intelligence, Information design.

From 2020, coding will be mandatory

- to learn in elementary school.
- From 2022, data science will be mandatory for studying in high school.
- Artificial intelligence will be an important subject in university in these few years.



Serious Problem is...

- In Japan, many teachers work...



Serious Problem is...

- In Japan, many teachers work...



- but few teachers can teach ICT.



About The Open University of Japan

The Open University of Japan (OUJ)

- Japan wide broadcasting satellite and internet.
- the offline lectures, classroom sessions, are provided at 57 'study centers'

regular education of OUJ

- OUJ has both regular and non-regular courses.
 - Regular courses include older students who retired their vocation, working students of recurrent education.
 - OUJ has bachelor's, master's and doctoral courses.

In regular education, –2015

- Testing schedule is not flexible.
- Number of Testing sites is up to 100.
- use paper textbook
- Only two (Apr 1 and Oct 1) to entering day
- OUJ didn't accept any credit card.



In regular education, 2016–

- OUJ launched Online course
 - Testing schedule is flexible.
 - send assignments from students PC at home.
 - PDF educational contents.
- Only two (Apr 1 and Oct 1) to entering day
- OUJ didn't accept any credit card.



non-regular — Extension Course of OUJ

Extension Courses

- This is called “campus ex”.
- extension course students are looking for useful skills and knowledge, not credit.
- Therefore, those students do not need to take a strict exam.

OUJ launched new courses

- OUJ has started a coding course for school teachers.

The extension course of the Open University of Japan is different from the regular course as follows.

Difference in regular and extension

- Flexible start time
- Payment by credit card
- Diversification of test locations
- Digital course certificate

About two new
extension courses

OUJ produced two courses

- (A) Introduction of incorporating coding education to elementary school
- (B) Teaching Method of Scratch Coding

(A) Introduction of incorporating coding education to elementary school

- three 45-minute video materials.
- Goals
 - Learn the history and current state of how information education has been implemented in Japanese elementary schools.
 - Understand the necessity and purpose of coding education in elementary school.



Opening title of "Introduction of incorporating coding education"

(B) Teaching Method of Scratch Coding

- Eight 45-minute online materials.
- Lecture on how to learn Scratch, a coding environment created by Professor Mitchel Resnick, director of Lifelong Kindergarten Group at MIT (Massachusetts Institute of Technology) Media Lab.



Testing

- Participants will see these video materials for research and take a CBT exam at a company site outsourced by OUJ.
- There are over 100 venues in Japan, and participants can take tests for several days.
- The evaluation does not use IRT.



今回は小学校で学んだ後、中学校や高校では
どのような情報教育プログラミング教育が行われるかについて

Yoshida Aoi, Abe Kazuhiro, and Ito Kazunari

Contents

- Introduction to Scratch
- Code Examples of Scratch
- Coding technique of Scratch
- How to facilitate a Scratch learning studnet at elementary school.
- Teachers understand the need to actively continue lifelong learning.

Scratch 3.0.0 (64bit) ファイル 編集 デューストリアル

micro:bit

値: -59

ボタン A が押されたとき

Hello! を表示する

右 方向の傾き

99

が押されたとき

ずっと

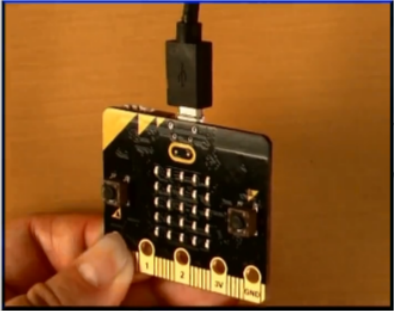
10 歩動かす

傾けてクリックすると

micro:bit by Scratch

24:37 / 25:48

micro:bit



ようこそ、辰己 丈夫さん！

マイページでは受験申請や各種履歴の確認、受験者情報の変更を行うことができます。

受験申請

- 携帯電話（スマートフォン）/タブレット端末からの予約操作は、動作保証外となります。
- Cookieを受け取れないと、予約が正常に完了しません。事前に設定を「訪問したWebサイトを許可」以上にしてお申込みください。

下記の試験の受験申請を行ってください。

対象試験	Scratchプログラミング指導法
受験申込期間	2019年7月22日 15時00分 ～ 2020年3月22日 23時59分
試験実施期間	2019年7月22日 ～ 2020年3月25日
変更・キャンセル可能期限	受験日の3日前まで可能
お申込み状況	お申込みされていません

お申込み

2. 「Scratchプログラミング指導法」

オンライン講座受講受付中

受講受付中！

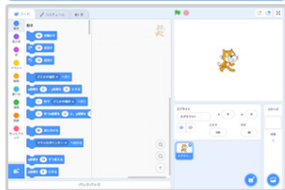
「小学校プログラミング教育 導入編」のオンライン講座修了者を対象に、ビジュアルプログラミング言語の一つである「Scratch」を用いて、実際にプログラミングを体験しながら、プログラミングについて学び、小学校の授業内での活用方法などを学びます。なお、講座の修了には、試験会場にて試験を受けていただきます。自由な時間で予約ができ、全国260箇所以上で受験可能です。修了者には修了証を交付します。

SCRATCH

Scratchとは

……マサチューセッツ工科大学メディアラボのライフロンギンダーガーテングroupによってデザイン・開発されたプログラミング環境。命令の書かれた「ブロック」を組み合わせることで、アニメーションやゲームなどの様々なプログラムを作り、アイデアをかたちにすることができる。

かんたんな命令ブロックを組み合わせて…



結果がアニメで見えるため理解しやすい!!



Schedule for future course

- Coding education will start at junior high schools in 2021 and high schools in 2022.
- OUJ will create these additional training classes for teachers of junior high and high schools

I expect that

- OUJ will also offer flexible course registration times, CBT tests, IBT tests, credit card payments, and digital certificate issuances
- not only more extension courses in regular classes, but also existing courses are expected to be operated with this system.