

# A Cross-agency project, for Occupational Therapists and Further Education students with language and learning difficulties and disabilities, based on Healthy Eating recipes, undertaken at Lambeth College, south London, using Scratch 2.0 to develop computational thinking, and sequencing skills

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## Abstract

This case-study paper builds on the success of an earlier Healthy Eating project, which was devised with the support of the National Health Service (NHS) in the UK. The fundamental aim of the new project is to develop Further Education (FE) students' awareness of healthy eating, but with the simultaneous development of computer coding skills, using Scratch 2.00. As part of their Life Skills course, students with learning difficulties and disabilities (LLDD) at Lambeth FE College made healthy recipes in their cookery lessons, played related Scratch 2.00 games devised for them by a Year 6 student (aged 10/11), and successfully coded their own versions of these recipes, using Scratch 2.00. The project also illustrates the developing success of the new Computing curriculum in England, as seen in the support materials created for the College by a London primary school pupil. The FE students also developed both spoken and recording skills using a sound-into-text application, while developing their sequencing skills. This on-going project further explored the possible advantages and applications of some of this material for use in the work of Occupational Therapists in Kingston and Richmond, south London.

**Keywords:** cross-agency, learning difficulties, occupational therapists, healthy eating, Scratch 2

## Background: A Visual Learning Project

The broad aim of the original 2007 project (1.) was to create visually accessible Healthy Eating support materials for people with learning disabilities. These educational materials, made using PowerPoint and distributed on DVDs, were then used by local Occupational Therapists (OTs), having been produced by students at the Holy Cross School (for pupils aged 11 to 18 years) in south London, and carefully trialled by Lambeth College FE LLDD students (aged 18 to 24). Holy Cross School students later presented the final drafts of their accessible file formats to the NHS Easy Information Group, in Kingston. This group included specialist learning disability health professionals, and people with learning disabilities.

Year 7 students (aged 11 to 12) added text to the finished recipes in the Korean language, to meet the needs of the large Korean population in and around the Kingston area in south London. The project was published by the *Journal of Assistive Technologies* (2.), in "PRE" by the *National Foundation for Educational Research* (3.), and on-line by MirandaNet, receiving also a grant kindly given for the distribution of the final materials from the Renton Foundation. These materials are still being used over ten years later (as at 2018).

## Developments in the new Scratch 2.00 project

The aim of the earlier project was for the secondary school students to present clear and colourful finished recipes for use by the NHS, working for, and with, Lambeth College FE students. This was accomplished using digital cameras to record the cooking, and the early use of the brilliant Widgit text-with-image word-processor (4.), integrated into PowerPoint files by the Year 7 Holy Cross pupils. However, with the necessary development, from 2014, of computer coding skills in UK schools, Lambeth College's Learning Development Department, under the direction of Lloyd Mead, set out to embrace healthy eating education alongside the development of Scratch coding, using version 2.0 (optional at this age level). This built on the success of an earlier College project using Scratch 1.4 which was presented in Dublin at the IFIP WCCE Conference in 2017 (5.)

In summary, the new project aims were:

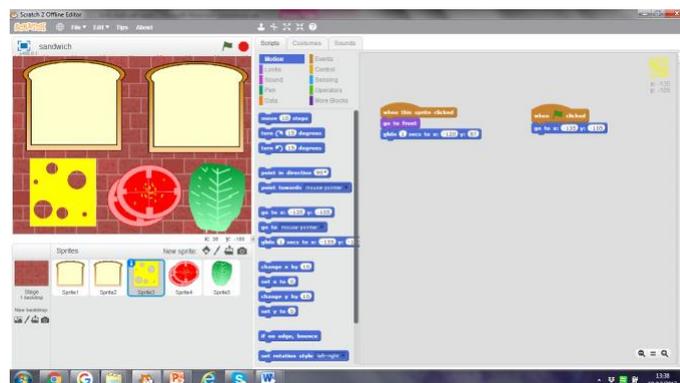
- to continue to develop FE students’ awareness of healthy eating at Lambeth FE College
- to develop the computer coding skills of the Lambeth students, using Scratch version 2.00
- to develop the students’ sequencing skills
- to use new recording devices to support learning during the project
- to explore in what ways this work might be of benefit to Occupational Therapists in Kingston and Richmond

## Scratch 2.0 materials created to support the project

### 1. A sandwich-making game using Scratch

In order to provide the Lambeth College students with useful introductory stimulus materials, and to show a simple example of computer coding using Scratch 2.00, Beth Mead, a year 6 pupil (aged 11 years) at a south London primary school devised, unaided, an introductory healthy eating sandwich-making game specifically for them. The compulsory National Curriculum in Computing in the UK is clearly working. This game showed how a sandwich, simply animated using Scratch 2.00, could be assembled, using a small number of healthy ingredients. The simple coding that she devised (**Figure 1.**) was then used in two ways:

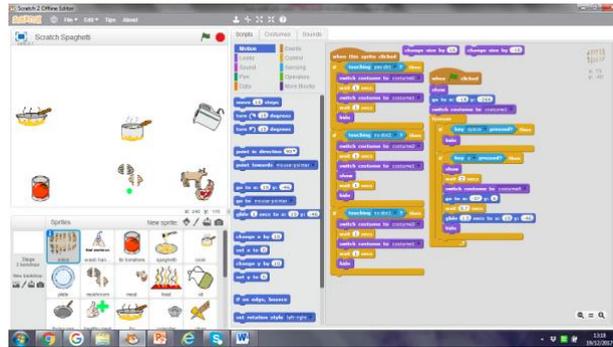
1. as exemplar material by Lloyd to show introductory Scratch 2.00 coding to his College students, and
2. to create an opportunity for the students **to change** the ingredients in order to make their own individual sandwiches, for example by substituting the lettuce image for cucumber, as an alternative healthy ingredient.



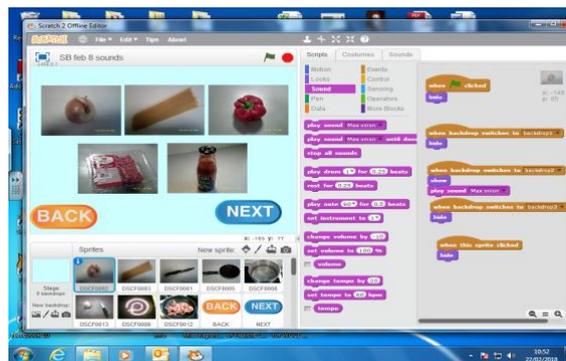
**Figure 1.** Scratch 2.00 “Sandwich”: an introductory coding support file

### 2. A Spaghetti Bolognese recipe

As the College students would be working in their cookery lessons with Lloyd on making their own Spaghetti Bolognese dish, based on the original NHS 2007 PowerPoint version, Beth further devised a Scratch 2.00 shell file recipe for them. This was left deliberately incomplete, so that the students, building on their previous skill in choosing ingredients for their sandwich, could decide what should finally go into their spaghetti recipe: onions, mushrooms, carrots, red peppers, for example. The students would therefore have to make their own decisions about the inclusion of these ingredients, as well as building on the coding template provided by the file. While this process began using the Widgit word-processing images, (**Figure 2.**) the Lambeth students later photographed the preparation and cooking stage of their recipes, and photographs were used instead. (**Figure 3.**)



**Figure 2.** Spaghetti recipe support file with Widgit images



**Figure 3.** Students' own photos here replace the Widgit images

Beth also helpfully added the Back and Next "buttons" above, to support the Lambeth students in navigating their way through their photos.

### 3. A Shopping Game

Finally, Beth created a Shopping Game for the Lambeth students. This game was designed for use on an Interactive Whiteboard to stimulate discussion about the pricing options of the various ingredients needed for making their own Spaghetti Bolognese recipe. These options included several discussion points.

Should money be spent on:

- more expensive lean beef, or on a cheaper, but less-healthy, beef product? (Taste versus cost and health)
- Organic or inorganic onions, and carrots? Does the possible health benefit justify the additional cost of organic foods?
- Tinned, tinned with juice, or fresh tomatoes? Which do you choose, within the constraints of a budget?

So the game that Beth devised offered alternatives for class discussion, against a limited budget (using the Scratch countdown facility), including the costs and the value of ingredients, set against the needs of a healthy diet.

### Sequencing skills for College students and OT clients

An important element, both for the College students and for the Kingston and Richmond OT clients, is the development of the students' sequencing skills. This common ground was discovered during Paul's first visit to the College. In order to support the development of computer coding skills, Lloyd devised a simple sequencing method involving printed photos of the process of making their Spaghetti Bolognese. These photos, taken during the group's own practical cookery lessons at the College, were printed and laid out on tables in the ICT

room, and the students were asked to place these into categories, such as the ingredients, the cookery tools, and the cooking method. This preliminary activity would be vital, later, when the students came to develop the same sequencing skills, but within the context of the computer coding activities in Scratch.



**Figure 4.** A sequencing activity at Lambeth FE College, prior to coding work

Paul immediately saw how closely this process matched the needs of his own OT clients, and the group busily set about organising the photos together. This information was then photographed once again, and placed on the College server, so that the students, while engaged in their coding, could access the sequences that they had developed for themselves.

The materials on the Lambeth College Moodle consisted, by now, of:

- Beth's introductory coding support materials in Scratch (sandwich game, spaghetti recipe template, and shopping game)
- photos of the FE students working on their recipes in the cookery room
- sequencing support photographs, by the students themselves
- and to these would later be added the completed Scratch coding work of the College students.

At present, this material is only accessible to Lambeth College students, but we are working on this.

## Using Mobile Devices

Occupational Therapists, like Paul, frequently visit clients in their homes, and some clients are able to receive publicly-funded android tablets to support their needs. It is obvious that access to the increasingly extensive support materials developed at the College, including the Scratch recipes, and the sequencing files, would be beneficial to OTs in their home-support work. Indeed, the OT group currently uses a recently produced commercial support program that is remarkably similar to the earlier Healthy Eating project as published on MirandaNet in 2007. It is possible that this program could be replaced by the new open-source project work of the Lambeth students. Accordingly, Paul set about the task of seeing just how straight-forward running Scratch 2.0 on tablets or a smart phone might be. He concluded that while Scratch 2.0 can, in theory, be downloaded successfully onto both smart phones and tablets, the technical complexity of the task is far more than most busy Occupational Therapists would wish to undertake. Accordingly, our recommendation is for OTs to wait until August 2018 for the HTML5 version of Scratch to be released. It does not yet have an official title, but is likely, rather unsurprisingly, to be called Scratch 3.

At this future point, we plan to create another range of healthy recipes, devised using Scratch 3, while also using the Scratch 2.0 materials created so far by this year's team, with other teaching groups within the College.

## Using speech-to-text recording

Some of our FE students have writing difficulties, and, as part of this project, we were keen to find appropriate solutions to this. So, as well as using the sound recording option in Scratch to record the students' commentaries on their own work, rather than adding printed text, we found two other ways of obviating this problem.

### 1. Phone App

This can be found on many smart phones, and it was used in the classroom to record the responses of the students about the work as they were doing it. Some of their commentary was then imported directly into the final project report.

### 2. Google

One student uses the Google speaking App to save her from writing things out, and so she also added her responses to her Scratch project using this facility.

We found that all of these facilities (the Scratch voice-over, the phone app, and the Google app) helped the students both to save time, and to develop confidence in speaking and listening, throughout the project.

## The Future

From September 2018, we plan to develop this cross-agency Healthy Eating project further, with the new HTML5 version of Scratch. This will include teaching the next cohort of Lambeth students how to use Scratch 3, as well as developing a wider range of recipes for easy download onto phones and tablets, for use in the workplace by Occupational Therapists. We already know that the 2007 PowerPoint materials have been very successful in this regard.

While we still have far to go with the project, we feel that the Lambeth College students have made a very useful and enthusiastic start, and are already using the program to support the learning of others in the wider community.

## References

1. For a full on-line account of this earlier cross-agency project, see: [http://www.mirandanet.org.uk/resources/healthy\\_eating.htm](http://www.mirandanet.org.uk/resources/healthy_eating.htm)
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