

Can vocational subjects, such as Catering, improve manual dexterity?



Wirral Metropolitan College



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Introduction

This project set out to see if the skills needed for catering can be shown to improve the manual dexterity of the students taking the course. Could their manual dexterity be shown to improve after several sessions? Could this also be true for dyspraxic students?

Hand eye co-ordination is a skill which is essential in everyday life, from picking up an object to putting it down again, from putting a key in a lock to wiring a plug, and is key to many professions as diverse as nurse and decorator.

Manual dexterity, along with the ability to focus visually on tiny details, has been a key determiner within human evolution. The ability to manipulate objects and think about the consequences of this has led to the creation and design of technology on which modern day society is based. Hand eye co-ordination is still an important skill within modern day society. Carol Ward, Professor of Pathology and Anatomical Sciences at Missouri University states, "What we can do with our hands, the way we manipulate objects and use tools and technology, shape all of who we are as a species and how we adapt to the world." (Ward, C. as cited by Helmy, H. in interview for KBIA.) The human brain has disproportionately large sensory and motor centres associated with the hand and also a disproportionately large area associated

with the eye. Professor Valero-Cuevas has looked at the biological, neurological and mechanical features of fingertip dexterity. “Our data suggests that specialized neural circuitry may have evolved for the hand (explaining) the disproportionately large sensory and motor centres associated with hand function ... (and)why it takes young children years to develop fine finger muscle co-ordination... and why (it) is so vulnerable to disease and ageing...” (Valero-Cuevas, F. 2008, p.2)

Dexterity, or the speed of co-ordinated hand movement, is considered an important aspect of development. Children are carefully monitored from an early age in their development of manual dexterity through skills such as drawing and bead threading. Some children have difficulties with such tasks as throwing, catching, and writing. Several websites, such as therapystreetforkids.com and ot-mom-learning-activities.com “, offer advice and activities for improving children’s dexterity. Children who experience particular difficulties may be referred to an occupational therapist for a programme of activities. Hand activities and function are central to the role of occupational therapy. They use activities to improve co-ordination. Cup stacking became popular in America for children to improve hand eye co-ordination and a study showed that after a five week period “significant improvements were noted for both hand eye co-ordination and reaction time” (Edermann, B. Et al. 2004, p.1). Handwriting is still an important skill for recording and communicating ideas. This is a taught skill that has been widely studied.

Manual dexterity is needed not just for the completion of everyday tasks but also for several professions, including dentists. A dentist must have “very fine motor control and possess excellent hand eye co-ordination. If you aspire to a career as a dentist you should engage in deliberate activities through which you can develop manual dexterity skills that are transferrable to the practice of dentistry.” (Vice Provost for Undergraduate Education, Indiana University, 2007). Playing a musical instrument, such as a flute or guitar, jewellery or miniature model making are cited as suitable activities to develop dexterity.

Dexterity is also required for texting and for some online gaming. Gamers were found to have better hand eye co-ordination than non-gamers by J.L. Griffith, (1983) as cited in Dangerfield, M. 2013. These results may have been due to people with good hand eye co-ordination becoming gamers. Now varied apps are available, chosen specifically to improve reaction time, precision and accuracy (20 Apps That Improve Hand Eye Co-ordination, 2013). This project set out to explore if catering skills could also improve manual dexterity.

Students on the college courses work at many levels, from degree courses to skills for life programmes at entry level. The ethos of the college is to provide courses suitable to as many and diverse students as possible. Catering courses are from supported entry level to more advanced courses, with a range of levels of dexterity required. Addressing improvement in these skills, in practical settings, could impact on the quality of life for the students.

Some students at college still have very poor hand eye co-ordination and manual dexterity. These are skills which are used extensively in the practical aspects of the catering courses. This project sought to show that the emphasis on practical skills on the catering course improved the individual dexterity of students. The aim was to show the ability to improve a general, valuable skill as well as particular, practical skills. The project was based on a premise that improving this skill will make students more confident and improve many aspects of their life.

In recent years a detailed assessment of speed of handwriting (DASH) has been developed. It contains five subtests, one of which has been used in this project as a test of dexterity as it is a “purer measure of perceptual –motor competence...uncontaminated by anything related to language,” (Barnett, A. 2007, p. 15-16). This dexterity subtest was chosen as it had been standardised on students up to age 24years 11months. It required speed and accuracy of hand movement and was not dependent on language skills. The data could be used to see if the group or individuals showed any change on the retest (hopefully improvement).

The dexterity test used in the project may also give an indication as to how well students will do on the course. It may also show that an individual has improved although they still seem to be struggling in relation to their peers.

A teaching session was videoed to discuss and reflect on the session with the teacher involved. This reflective method is advocated by Professor Andrew Pollard who suggests this “is a means for improving teaching, learning and standards...(and)...provides a vehicle for innovation and professional renewal... (and can)... drive pragmatic improvement... (and)... support development that becomes embedded in high quality teaching and learning for the long term” (Pollard, A. 2014). The tutor involved felt this could be an unobtrusive way to observe, analyse and discuss the teaching and learning in a positive way. Later it was also decided to offer the students the opportunity to watch the recording, so that they too could comment.

The catering course is practical and relies on hand eye co-ordination for such tasks as chopping, measuring, slicing, pouring, serving, presenting etc. In a kitchen setting, where sharp blades are used and surfaces and substances can reach high temperatures, lack of these skills, can have consequences. The skills are specifically taught to the students who practise them during practical sessions. Could these skills improve for all students, including those with dyspraxic tendencies?

Method

The initial intention was to use the DASH subtest for manual dexterity to test and re test a group of catering students. Interviews and questionnaires were used to investigate how motivated they were and how much they were likely to practise. As this was a small scale action research project it evolved throughout its running time.

The first dexterity test was at the beginning of the second term and the end test in the third term. Although the timescale was quite short improvements had been shown by studies on a comparable timescale (e.g. Edermann, 2004). The first group to be given the dexterity test were a group of Level1 catering students who had begun six months earlier. Fourteen students signed the consent form, of these ten had individual plans, including three students with dyspraxic tendencies. One student asked to drop out of the dexterity test part of the research, therefore only results from their questionnaires are included (i.e.13 results for dexterity tests, 14 for questionnaires.) Some questions were open ended, but others offered only categories for respondents so that the data could be presented by pie chart.

At the first meeting with group 1 the action research project was explained, with opportunities for them to ask questions. Information and consent forms were given out. They completed the DASH dexterity subtest to measure hand-eye co-ordination the next week and a questionnaire to ascertain their motivation towards the course and how much they were likely to practise or use the skills at home.

At this point a suggestion was made to video a lesson for reflective discussion. The research plan was therefore amended through discussion with colleagues to identify a second group who had just started. This was a group of mature students (over 19yrs). This was not a control group, rather an additional group. The project was explained and they signed the consent forms and also media consent forms. Six of them completed both the DASH dexterity test and retest 10 weeks later. They were also given questionnaires at the beginning and at the retest time.

Knife skills were identified as needing careful hand eye co-ordination and a video was made using a fixed camera of that teaching session. The video was used as an unobtrusive way to record the session. It was agreed with the students that sound would not be recorded. The teaching and learning techniques shown on the video were discussed later at a meeting of the tutors concerned. The teachers were interviewed to see if they had adapted their teaching techniques due to the research and also which students they felt were the most adept students and who had struggled on the course.

The dexterity test was repeated with both groups after 12 weeks for group 1 and after 10 weeks for group 2. The groups were given a second questionnaire/ interview to find out if they felt they had improved their speed, confidence or dexterity through the course.

Students from the group involved in making the recording were given the opportunity to watch part of the video footage and discuss it.

Administering and marking the DASH graphic sub test (referred to throughout this report as 'dexterity test' see appendix 1):

Students were given the record sheets and the guidelines for filling them in were explained to them using the script in the DASH manual. A4 size visual aids were also used. The students then practised the first row of crosses. These were checked with each student to make sure they understood the instructions. The group were then given one minute to complete as many crosses as possible. When marking the record sheets the guidelines were strictly adhered to. This meant that some students whose work looked neat sometimes had large numbers of incorrectly placed crosses, while other students whose work looked very haphazard had kept to the guidelines and had many accurate crosses. The same procedure was used on the retest.

Results

The first set of results just look at group1 as there was a wider spread (range) of scores in this group with several individuals facing difficulties. The group were younger (17 to 19 years) and they had two and a half days catering teaching a week compared to just one day for the other group.

T1 Table to show the results of the dexterity test and retest for Group 1 (The group was of younger students many of whom faced some difficulties.)

Group 1	First Dexterity test			12 week gap	Second dexterity test			Difference in percentage accuracy	Difference in total crosses marked accurately
Student	Accurate crosses	Total crosses	Percentage correct		Accurate crosses	Total crosses	Percentage correct		
1	33	61	54%		17	80	21%	-33%	-16
2	35	38	92%		83	84	99%	+7%	+48
3	20	47	43%		50	53	94%	+51%	+30
4	38	43	88%		42	42	100%	+12%	+4
5	23	35	66%		17	43	40%	-26%	-6
6	33	36	92%		21	24	88%	-4%	-12
7	24	38	63%		10	71	14%	-49%	-14
8	37	44	84%		49	51	96%	+12%	+12
9	19	19	100%		22	25	88%	-12%	+3
10	26	31	84%		32	32	100%	+16%	+6
11	11	71	15%		26	62	42%	+27	+15
12	33	34	97%		40	40	100%	+3	+7
13	11	47	23%		36	54	67%	+44%	+25
KEY		Students who showed a positive change in scores							
Student scoring over 95 %									

The dexterity test lasted one minute so individual students completed different numbers of crosses (column 3 total crosses). The percentage of correctly placed

crosses to total number of crosses placed was found for each student (column 4 percentage correct).

The percentage of correctly placed crosses to total number of crosses placed was found for each student on the retest (column 8). Any change in percentage accuracy was shown, improvements as a positive number and downward change as a negative number (column 9). The change in the total amount of crosses executed between the test and retest was shown in column 10. Students who scored over 95% have been highlighted in yellow to show they were working at a high rate of accuracy.

The students in group 2 were more accurate in their first test scores, half of them getting 100%, leaving no room for improvement on the retest.

T2 Table showing the mean, mode median and range for the percentage accuracy scores for group 1 and group 2 on the test and re-test

Group 1	Mean	Mode	Median	Range
Test	69	84	84	85
Retest	73	100	88	86
Group2				
Test	94	100	98.5	20
Retest	95	100	97.5	22

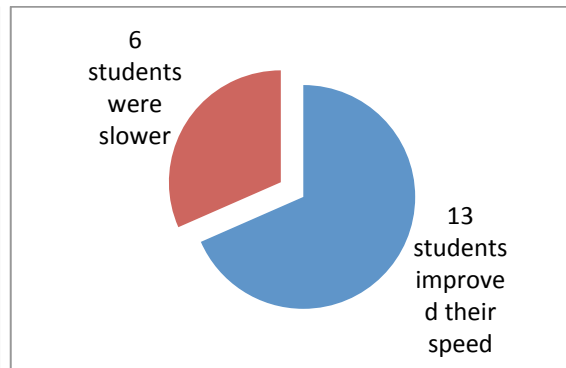
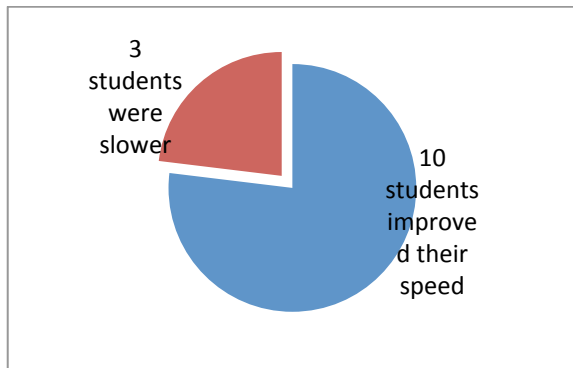
The mean and the median scores on the first test show that group 2 were already operating at a higher standard of accuracy than group 1. Group 1 improved their percentage accuracy on the re-test, but the mean and median values were still at a lower percentage accuracy than group 2 had at the start. The table shows that group 1 had the most scope to improve and did improve; therefore the results from group 1 have been given first.

In group 1 the majority of individuals improved their speed of action, i.e. the total number of crosses they made in the minute on the test and the re-test. This showed that they were working quicker, but not necessarily accurately. In catering speed is important, but so is presentation which requires accuracy.

P1 To show how the speed of execution changed from test to retest for -

Group 1

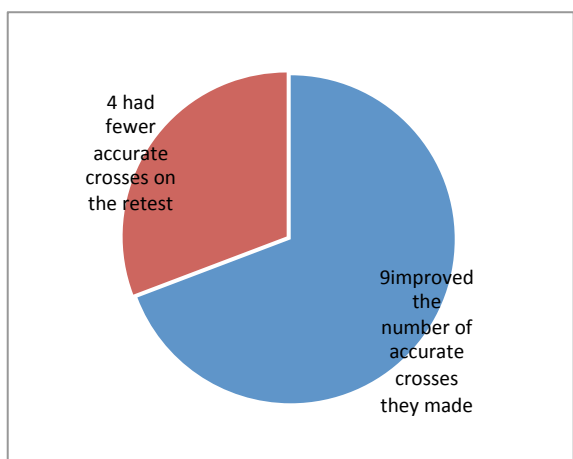
Both groups



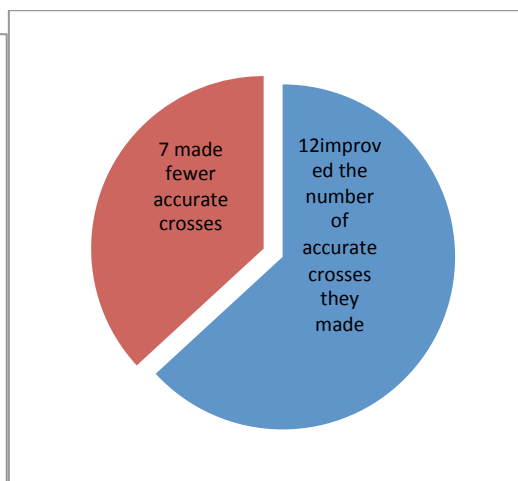
Also the majority of students in group 1 improved their number of accurate crosses on the retest

P2 To show how number of accurate crosses marked by students changed from test to retest for :

Group1

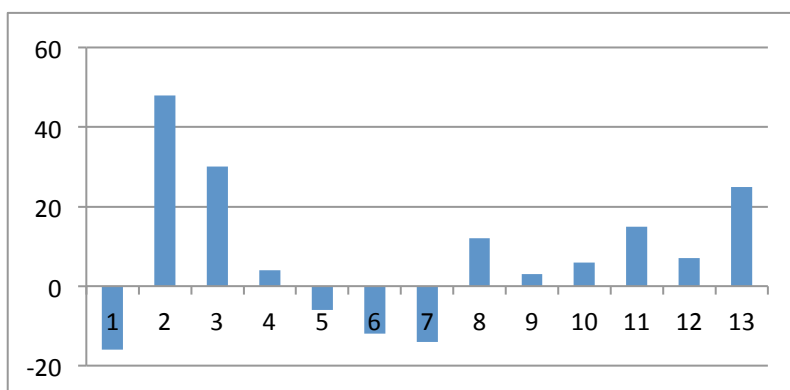


Both groups



B1 A graph to show the change in number of crosses accurately marked by group 1 from the first dexterity test to the second test

Difference in number of accurate crosses



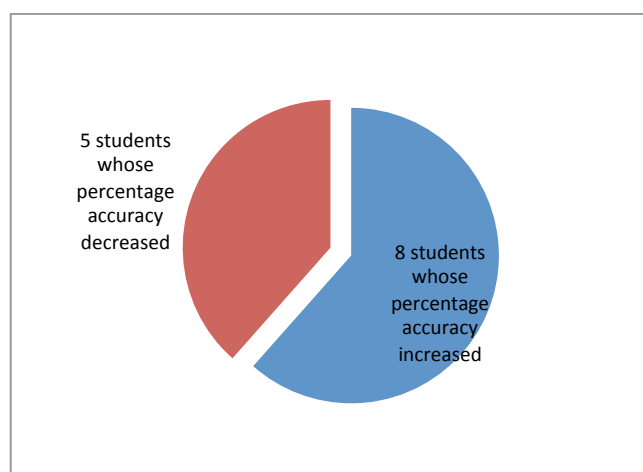
The graph shows that not only were there more students who improved their number of accurate crosses, but also the three largest changes in scores were all improvements.

The individual students in group 1

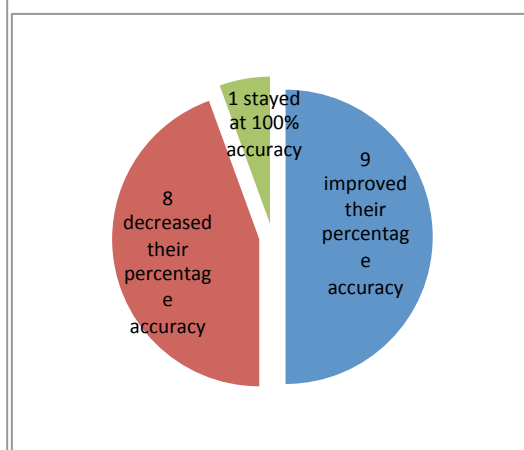
Also the majority of students in group 1 improved the *percentage* of accurate crosses they made. These students were not only working quicker, but also more accurately, (see data table below).

P3 To show the change in percentage accuracy for students from test to retest for

Group1

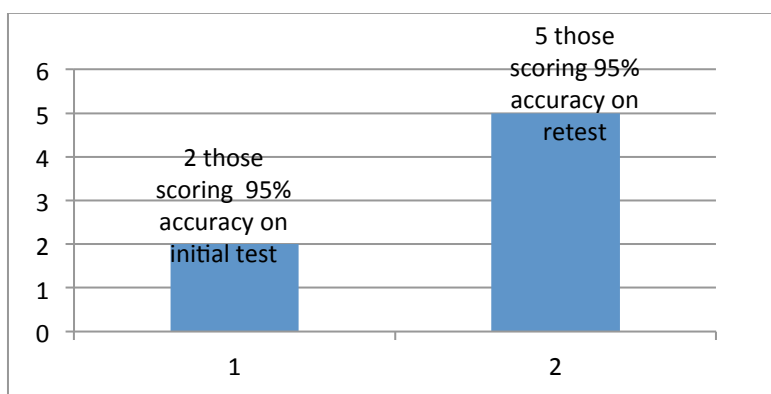


Both groups



There were more students who were performing extremely well in the retest than in the initial test in group 1. Looking at those who scored over 95% is another way of showing how the accuracy of individuals had improved.

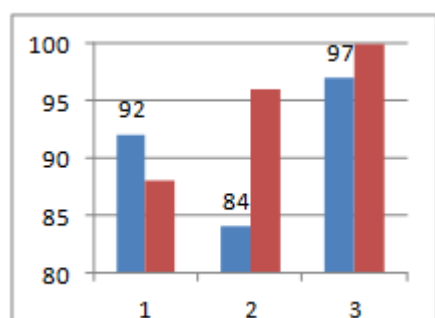
B2 Chart showing students in group 1 scoring 95% accuracy or over



This shows that the number of students in group 1 who were working with a high level of accuracy (95% or above) had increased. The number in group 2 working at this level of accuracy stayed the same between the test and the retest.

There were also three students with dyspraxia in group 1. The chart below shows the changes in their percentage accuracy between test and retest. Two of these three dyspraxic students improved their accuracy.

B3 Chart to show changes in percentage accuracy for the three students with dyspraxia.



Comparing these scores to the table T1 above it can be seen that all these scores over 80% were in the higher half of the group. The student whose percentage accuracy decreased had dyspraxia and ADHD.

Students who scored over 95%

Students who are already showing a high accuracy percentage (95% or above) have very little room to improve. It can be seen from the table T1 above that more students scored over 95% on the retest (five compared to two on the first test). This shows that the number of students who were working with a high level of accuracy (95% or above) had increased.

T3 Table to show the results of the dexterity test and retest for Group 2

	First Dexterity test			10 week gap	Second dexterity test			Difference in percentage accuracy	Difference in crosses marked accurately
	Accurate crosses	Total crosses	Percentage correct		Accurate crosses	Total crosses	Percentage correct	change in percentage accuracy	
21	43	43	100		66	67	99	-1	+23
22	34	35	97		45	45	100	+3	+11
23	46	59	80		56	72	78	-2	+10
24	41	41	100		37	37	100	0	-3
25	24	24	100		21	22	95	-5	-1
26	34	39	87		28	29	96	+9	-5
Key	Over 95%	Students who improved							

It can be seen that the students in this group all started at 80% or higher accuracy. Two improved their accuracy (22 and 26), two were quicker, but slightly less accurate (21 and 23) and two were slower (24 staying at 100% accurate and 25

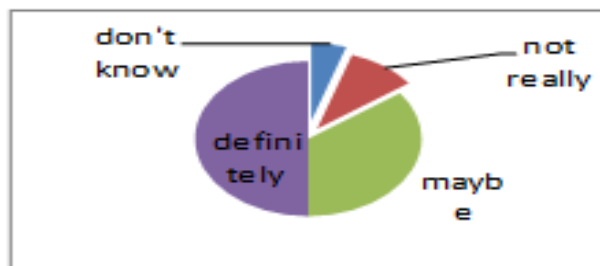
making one slip). The amount of change was further for those who improved their speed than those who slowed down.

Did the students feel that they had improved?

In the second questionnaire students were asked if they felt they were quicker at preparing food since taking the course. Twenty sets of results were used as one student in group 1 did not want to be included in the dexterity test but was happy to fill in the questionnaires.

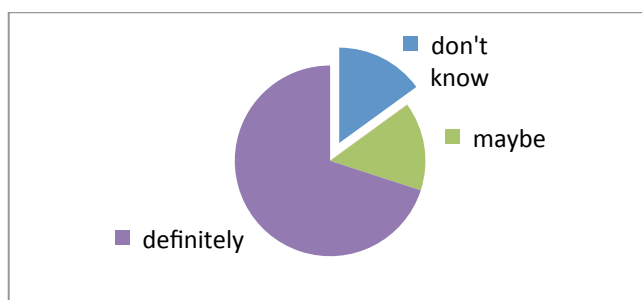
The charts below show the responses of the students in both groups. Only two students felt they were not quicker at preparing food.

CH 1 Chart to show whether students felt they were quicker at preparing food since taking the course



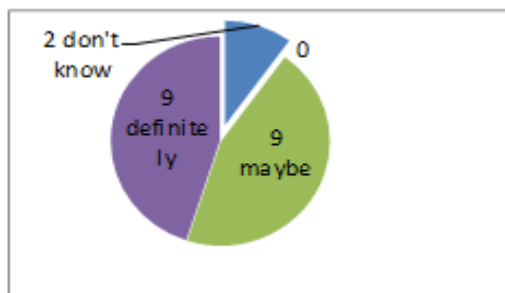
Students were asked how competent/confident they felt about preparing food

CH2 Chart to show how competent/confident students felt about preparing food since taking the course.



The chart shows that most students felt their confidence had 'maybe' or 'definitely' increased.

CH3 Chart to show whether the students felt their general dexterity had increased since taking the course.



This chart shows that most students felt that their general dexterity 'may have' or 'definitely' had improved.

Interviews with the tutors

The tutor who taught the session which was recorded reported that he found it useful. He was able to observe the students more closely and watch how each of them approached the tasks. He was also able to discuss different aspects of the lesson with the catering manager and get his insights. The part he found most helpful was that it had made him feel more confident. He explained that when teaching he was sometimes unsure if he was "getting it right", but being able to observe himself he could look objectively at the learning and teaching and this had increased his confidence.

One discussion during the video concerned how the students gripped the knives. Most students placed their index finger down the back of the knife at the beginning of the video, but through the video they had all changed their grip to the one demonstrated by the tutor.

Another point raised was whether left handed students benefitted from having a demonstrator who was right handed person stood opposite them.

As the students had taken part in the video the students present at the ending session were given the opportunity to watch it. This was a group of mature students. They watched part of the video they were in and all of them commented on their own performance. They all found it helpful, with such comments as "100% helpful". The main feeling was that when preparing food in the kitchen there was a continual time pressure, particularly when paying clients were waiting; being able to watch themselves as an observer without the pressures of being in the situation, allowed them to notice points in their own behaviour, for themselves. Noticing for yourself changes that need to be made is more powerful than being told by another.

When asked to name students who were doing well on the course both tutors named students who scored over 95% accuracy on the dexterity test.

Conclusion

What happened on the dexterity test and retest...

This project investigated whether students improved their manual dexterity, or hand eye co-ordination. In catering speed is important, but so is presentation which requires accuracy. Therefore the improvement looked for was in accuracy. On the dexterity test it was calculated from accurate marks as a percentage of attempts made. An improvement in speed as well was an added bonus, however speed with no accuracy could be classed as a hindrance. The two groups of students started at different levels of accuracy. The students in group 2 were older and were already working at a higher level of accuracy as shown in T2. The average accuracy score for group 2 was higher at the start than group 1 had reached at the end. The mode for group 2 was 100, with all scores clustered near this, (range 20, 22). Group 1 began with a lower mode of 84, but had reached a mode of 100 on the retest. They had a much wider range of scores covering a diversity of abilities (range 85, 86).

In group 1 the majority of individuals improved their speed of action, which was the total number of crosses they made in the minute on the test and the retest, as shown in P1. The results in P2, above, show that, in general, the students had also improved their percentage of accurate crosses showing they had also improved their precision of working, with the largest changes being improvements, as shown by B2. In group 1 there were also more students who were working at a high level of accuracy (95% or above) than on the initial test as shown by B2 above.

Group 1 had an unusually high number of students who were facing difficulties. Such students can take longer than others to develop their hand eye co-ordination. There were three students who had dyspraxia, one of whom also had ADHD (Attention Deficit Hyperactivity Disorder). The two who had dyspraxia showed an improvement in both the quantity of the crosses marked (students 8 and 12 on B1) and in the precision of marking (percentage of accurately placed crosses (B3). This indicated that some dyspraxic students had been able to improve.

In interview the tutors said that it was the lack of listening and the lack of concentration which were the main barriers for learning. Dexterity and hand eye co-ordination does depend on the processing and careful integration of information relayed to and from the hand and eye. With time and practise muscle memory can allow exact repetition of movements, however when learning new skills concentration is required for accuracy. This is particularly the case when a new skill is being learned and before muscle memory has developed. An important factor in how well the students did on the test was their ability to concentrate and focus on the task. Tutors felt that those who were 100% accurate would make better chefs even if they were a little slow, because of their attention to detail. Once an individual is accurate, speed can come with practise. Those who lacked concentration and did not listen to the advice given were the ones who would struggle as they would not give enough attention to the task in hand. One student who took the first dexterity test completed the most crosses (91), but was the least accurate with a percentage accuracy of 2%

(the result is not included in the results tables as the student did not take the second dexterity test, or finish the course).

The results suggest that there is a general trend of improvement in dexterity for the younger group of students; however this should be treated with caution for several reasons:

Firstly the time between the test for dexterity and the retest was relatively short, twelve weeks for group 1 and ten weeks for group 2. The number of students in the groups was small and therefore it is difficult to generalise the results.

Secondly the sample of students in each group was not representative of students taking a catering course. Group 1 had an unusually high number of students facing a range of difficulties; group 2 was composed of mature students, the majority of whom were more motivated and started with better hand –eye co-ordination than those students in group 1.

It could also be argued that hand eye co-ordination will improve through maturation (as in the difference between the younger and older students) and that the results were just from the natural course of maturation.

The dexterity test given in the test and re-test situation was exactly the same and so there could have been a practise effect resulting in better scores on the re-test. The dexterity test was used in the hope of showing an improvement in a general skill. It is usually accepted that most skills improve through practise and the assumption was that students would be practising their hand eye co-ordination in many tasks on the course.

A group on a course which did not have the same practical content, relying heavily on manual dexterity, (such as counselling course?) could have been used as a control group during the time of the project. They would have had less emphasis on hand eye co -ordination and therefore less practise, but still the same amount of time for maturation. Their scores could have indicated whether the trend of improvement was due to practise and focus or maturation.

The test for dexterity was a two dimensional test (pen and paper), whereas tasks performed in catering are three dimensional with real objects. There was a suggestion to use a practical measure, such as slicing a carrot, as the test and retest. However the DASH subtest was chosen as it was standardised (although this aspect has not been explored), is exactly the same for each person and can be repeated exactly. It was also used as the intention was to show any improvement in general dexterity rather a particular task, (although the DASH subtest is itself a particular task.)

Both the test and the retest of the dexterity are “snapshots”, that is they give the performance at that particular moment under those circumstances. The

circumstances can be influenced by many outside factors such as motivation, mood, attention and many other issues.

Students' perceptions

From the questionnaire it appeared that most students believed that they had improved their speed (CH1) ,felt more confident with catering tasks (CH2) and most felt that their general dexterity either may or definitely had improved (CH3) none marking "not really" for either of the latter two.

They also found watching even a short part of the video helpful as they could observe themselves and the situation without the pressures which are around them when working in a practical time-pressured situation.

Implications for the college

This research shows that a practical course may be able to improve the general dexterity of students who are still struggling with this vital life skill. This is a possible benefit which can be highlighted to students who are contemplating taking a catering course. However part of the hand eye co-ordination is the processing and focus of attention. Students facing these difficulties may need to have higher levels of concentration and motivation to benefit fully from the course.

Using video for students to reflect on their own performance was perceived as useful by the students. When working in the kitchen students are in a particularly time pressured environment, watching the video gives them the ability to observe themselves in a more relaxed way. As they can be more relaxed they can be more self-critical, hopefully leading to more self-management in future sessions. Tutor sessions or one to one sessions could incorporate time to review video of students in the practical situation. This would depend on the tutor's judgement, but is certainly an area which may be worth further investigation. Students reflecting on video recording could be considered as e learning.

It would appear that tutors also may benefit from being able to reflect on their performance when they are observing themselves as recorded on video.

Further research

- 1 Investigate the manual dexterity over a longer period of time, looking at trying to improve concentration
- 2 Look at use of video, possibly on mobile phones, as memory aid and reflective tool.

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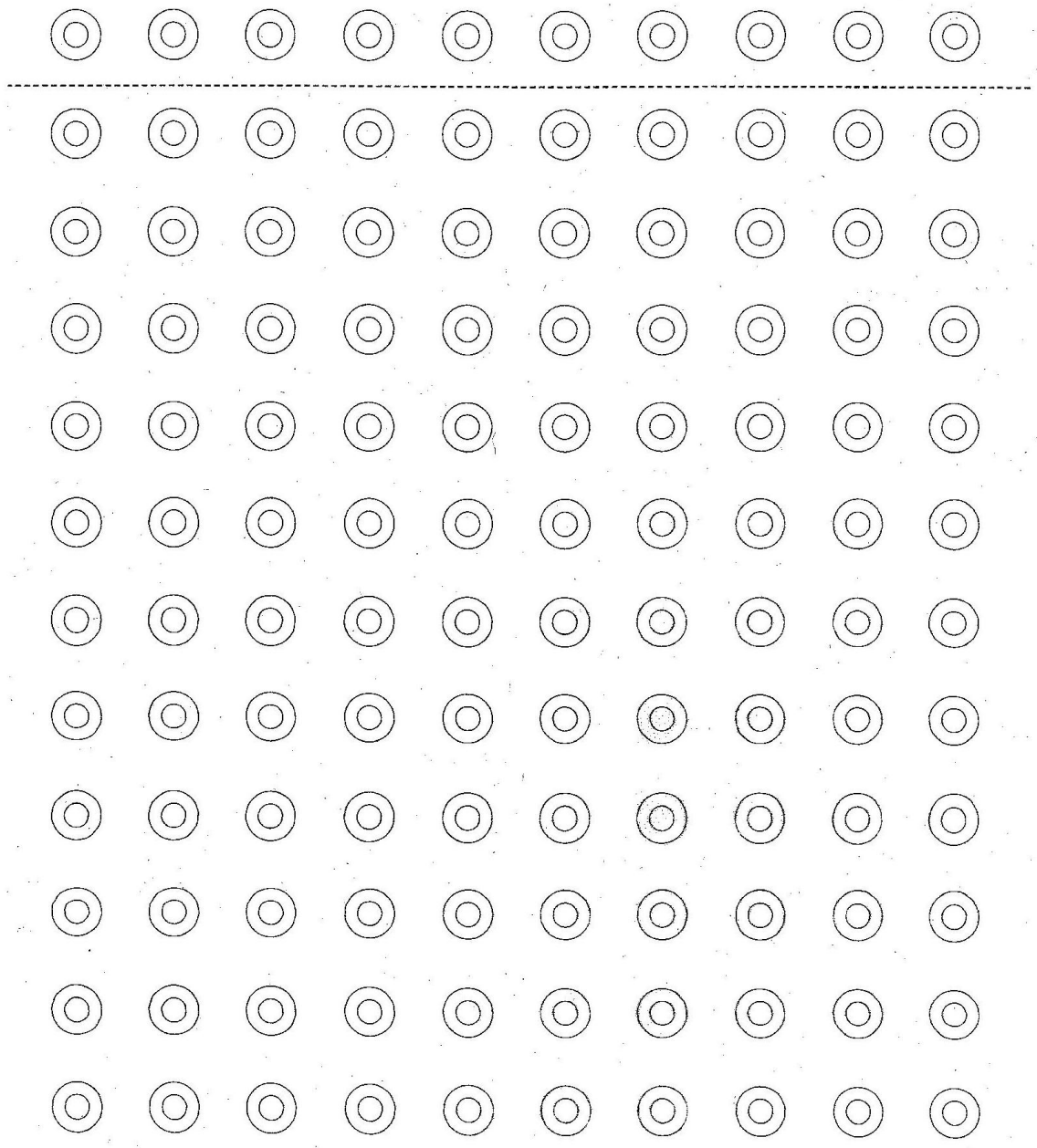
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Appendix

- A1..... Dexterity Test from DASH 17+
- A2.....Student consent form
- A3.....Student media consent form
- A4.....Student information sheet
- A5.....Student Questionnaire
- A6.....Chart of group 1 difficulties



Name: _____ Age: _____ Date: _____



A2

PARTICIPANT CONSENT FORM

To be completed by the participant

<ul style="list-style-type: none">— I have read the information sheet about this study— I have had an opportunity to ask questions and discuss this study— I have received satisfactory answers to all my questions— I have received enough information about this study— I understand that I am / the participant is free to withdraw from this study:<ul style="list-style-type: none">✓ At any time (until such date as this will no longer be possible, which I have been told)✓ Without giving a reason for withdrawing— I understand that my research data may be used for a further project in anonymous form, but I am able to opt out of this if I so wish, by ticking here. <input type="checkbox"/>— I agree to take part in this study	
Signed (participant)	Date
Name in block letters	
Signature of researcher	Date
This project is supervised by: Claire Collins, Claire Collins Consultancy Ltd.	
Researcher's contact details (including telephone number and e-mail address): Heather McGouran, 0151 551 7493, heather.mcgouran@wmc.ac.uk Tony Boustead, 0151 551 7014, tony.boustead@wmc.ac.uk	



Wirral Metropolitan College

Consent Form

Consent To Use Media For Advertising Purposes

Name:	
Course:	
Email:	
Phone:	
Address:	
Date of birth:	
Quote: (about your time at Wirral Met)	“ ”
Future career aspirations: (or further education)	

Declaration: I, the undersigned authorise Wirral Metropolitan College to permit the use and display of my photograph and quotation provided, in any publication, multimedia production, display, advertisement or world-wide-web publication. I agree that Wirral Metropolitan College may use my name, likeness or biographical information as supplied by me. I release and forever discharge Wirral Metropolitan College, its agents, officer and employees from any claim and demands arising out of or in connection with the use of said photograph / image / quotations, including but not limited to, any claims for invasion of privacy or defamation.

Accepted and Agreed

Signature of Student: _____ **date:** _____

Signature of Witness: _____ *date:* _____

Signature of Parent or Guardian: _____ *date:* _____

(When informed consent is required and participant is under 16 years, parent or guardian signature is required.)

Can learning cooking skills improve manual dexterity?

Do you think that catering students will get better at some of the practical skills involved in cooking such as chopping, slicing and pouring? Do you think that their general manual dexterity might improve? We think it will. We would like to show this in a small research project.

Aim

- To see if the skills needed for catering will improve the manual dexterity of the students.

What will students be asked to do?

- Students will do a one minute test at the beginning and the end of the programme
- They will also answer short questionnaires
- Photographs/video may be taken of some students with their permission

Do all students have to take part?

- Some students are being asked if they will take part. No student has to take part.

Will the results be anonymous?

- All the information will be made anonymous.

How long will it last?

- March until June 2014

Who is doing the research?

This project is supervised by: Claire Collins, Claire Collins Consultancy Ltd.
Heather McGouran, 0151 551 7493, heather.mcgouran@wmc.ac.uk Tony Boustead, 0151 551 7014, tony.boustead@wmc.ac.uk

A5

Student Questionnaire

1 Which parts of the course have you enjoyed most?

2 What do you feel you have learned from the course so far?

3 Do you use a larger variety of ingredients since doing the course?

Not really	Don't know	maybe	definitely

4 Has the course changed the way you cook at home?

Not really	Don't know	maybe	definitely

5 Do you think you are quicker at preparing food now?

Not really	Don't know	maybe	definitely

6 Do you think you are more competent/ feel more confident preparing food now?

Not really	Don't know	maybe	definitely

8 do you feel your general dexterity has improved?

Not really	Don't know	maybe	definitely

A6 Chart of difficulties faced by students in group 1 as referred to on their individual learning plans

student	Short term memory difficulties	Learning difficulties (comprehension)	Concentration/listening	Physical diffs	ADHD	dyspraxia	dyslexia
A	y	y					
B		y					
C		y	y				
D				y			
E			y		y	y	
F			y			y	y
G		y					
H	y		y			y	
I	y	y					