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Whole College Approach Project

Report on WCA Pilot
(April 2021 – August 2022)

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Contents

1. Introduction

This report reviews the first full cycle of the WCA Project (Pilot A), including the four phases: Discovery; Planning, Intervention and Review. The report begins with the background to the project and an overview of the plan for the first year of the WCA Pilot. These sections are followed by a summary of the WCA activity that took place, the research methodology and the findings, before drawing conclusions about the impact and future development.

2. Background

The Whole College Approach (WCA) Project began in April 2021 as an additional strand of the CfEM programme, following the publication of the Nuffield-funded Mathematics in Further Education Colleges project (MiFEC; Noyes & Dalby 2017-20). MiFEC evidenced broad agreement from a cross-section of staff in England's FE colleges that mathematics is important and that students with low attainment should be improving their mathematics skills, but there was also evidence that:

- Students can receive inconsistent messages, explicitly and implicitly, about the need to engage with mathematics.
- Combinations of strategic or operational approaches can produce variations in students' experiences and sometimes hinder their participation or progress.

Colleges were keen to make improvements to their mathematics provision but often tried to borrow ideas from other organisations without careful consideration of the suitability of strategies that had been implemented in very different college contexts.

The WCA project operationalised key findings from MiFEC and was framed by well-established theoretical ideas about systems thinking, organisational learning and complex change. It had an overarching aim *to improve the understanding, planning and implementation of Whole College Approaches for mathematics in large FE colleges,* and the following objectives:

- To translate the MiFEC and other related 'whole organisation' research into practice;
- To build sector knowledge about WCAs;
- To develop, pilot and research the use of WCA self-assessment tools;
- To develop, pilot and research mechanisms to support practitioners in the development and use of a WCA;
- To produce stand-alone resources for improvement in a WCA to mathematics;
- To produce case studies of the implementation of WCA in the FE college context.

3. Project overview

The WCA Project comprised:

1. A structured ***Programme*** to guide and support colleges through a development process, which was supported by professional development (PD) and other resources (e.g. self-assessment tasks, meetings with a critical friend, feedback).
2. College-led ***Interventions*** that were developed, implemented and reviewed by individual colleges in their own contexts;
3. An iterative formative ***Evaluation*** process informed by data from observations, surveys and interviews. The WCA Project assumed the *theory of change* model at the end of this report (see *Figure 3*).

The original expectation was that 6-8 of the Centres for Excellence would participate in the WCA Project. Centres were invited to submit an Expression of Interest (EoI) in May 2021, in which they

identified a problem or area for improvement that they wanted to address and named members of their proposed college WCA team. The formation of this team, with appropriate cross-college representation is a key feature of the WCA approach. The call for Expressions of Interest generated responses from thirteen (of 21) Centres. Following discussions with ETF, the decision was made to accept all these colleges initially but offer the opportunity to opt out after the initial PD event in May, before CfEM Centre Action Plans were finalised. At this point, three of the colleges withdrew to focus on other priorities, leaving a group of ten.

4. WCA Programme

The WCA Programme (2021/22) was designed in four phases.

1. **Discovery phase** (May-July 2021): WCA colleges established a cross-college team to lead their WCA intervention. These teams engaged in three Self-Assessment (SA) tasks with the support of their critical friend (UoN) to explore the context of their problem, assess the current situation and identify possible affordances and constraints.
2. **Planning phase** (July-October 2021): WCA college teams built on the outcomes of their self-assessment to better define the problem they intended to solve. They identified the interlinked issues, affordances and constraints, and developed a focussed action plan, with support from their critical friend.
3. **Intervention phase** (October 2021-May 2022): WCA college teams implemented their intervention, reviewed progress at intervals with their critical friend and developed a short interim report. There were also opportunities for discussion with other WCA pilot colleges.
4. **Review phase** (June-July 2022): Each college evaluated their intervention and developed a short report of their work. These were used to inform the research and longer-term plans for the project.

The events and activities in the four phases of the project are summarised in the *Table 1* below, including the aims of each meeting or event and the main activities. Due to Covid restrictions, many of these meetings and events were held online and the activities were therefore designed for this situation. Later in the year, meetings with colleges were held face-to-face where possible.

Phase	Main events	Aims	Planned activity
Discovery	PD event 1	The aims of the event were to: • introduce the project, intervention, tools, research and clarify expectations; • start collaborative working in WCA teams; • encourage sharing of ideas with other colleges.	**Self Assessment 1 (Context)** The activity provided a scaffolded approach to working together. Each college team explored features of their college and developed a shared understanding of the unique context in which their WCA project would take place.
	Meetings with individual WCA college teams (1)	The aims of these meetings with each WCA college team were to: • complete Self-Assessment 2 • introduce and commence work with Self-Assessment 3.	**Self-Assessment 2 (Climate)** Individual participants completed the SA2 questionnaire. The results were used to stimulate discussion about issues relevant to WCA such as existing processes and culture. **Self-Assessment 3** Teams worked together on tasks that built on SA1 and SA2

			to develop a better understanding of the problem they intended to address and connected issues.
	Submission of SA3 Tables 1&2.	The aim of completing and submitting these tables was to: • summarise ideas from WCA team discussions about the problem and what needs to be considered in an action plan; • to receive constructive feedback from UoN as 'critical friends' to inform development of an action plan.	WCA teams summarised their work from SA3 and used the feedback from UoN to review ideas and prepare draft action plans.
Planning	Submission of draft action plans	The aim of the draft was to: • summarise current thinking about actions to address their target problem; • outline proposed plans for feedback from peers.	WCA teams developed a draft action plan. They presented this to other colleges at PD event 2 for feedback before finalising.
	PD event 2	The main aims of the event were for WCA teams to: • work together collaboratively to review and refine their WCA action plans; • engage in peer review and discussion with other WCA teams; • integrate appropriate ways of evaluating impact into WCA action plans; • identify issues and support needs; • gain additional knowledge and confidence to complete their WCA action plans.	UoN presented a summary of progress, with prompt questions for peer review and introduced some key ideas useful for review of WCA action plans. Colleges met in pairs or small groups to peer review each other's action plans. They then met as a team to consider feedback and refine their plan.
	Submission of action plans (final version)	Each WCA college provides a summary of their proposed actions.	UoN provided written feedback on action plans and discussed this with college teams at their next meeting.
Intervention	Meetings with individual WCA college teams (2)	The aims of these meetings were to review action plans, talk through the feedback and discuss early progress with the intervention.	UoN acted as a critical friend and asked questions to stimulate new thinking. WCA teams used the feedback to review ideas and prepare for the Planning Phase.

	Interim reports from colleges	The aim of these reports was to provide a short reflective summary of experiences to date, highlighting key moments in the process.	UoN used these to inform the research and to form questions for discussion in the following meetings with individual colleges.
	Meetings with individual WCA college teams (3)	The main aims of these meetings were to review progress with individual colleges and provide feedback.	UoN acted as a critical friend and asked questions to stimulate new thinking. WCA teams used the feedback to review ideas and adapt action plans where appropriate.
	PD event 3	The main aims of the event were for WCA team members to: • Gain a broader understanding of WCA approaches by sharing experiences with those in similar roles from other colleges; • Reflect and review progress with their intervention as a college team; • Identify priorities and/or possible amendments to their own college intervention by engaging in peer review and discussion with other WCA teams; • Identify issues and support needs.	Peer groups met those with similar roles in different colleges to discuss their experiences. Pairs of college teams then met to present short summaries of their work and act as 'buddy' colleges to question and review.
Review	Meetings with individual WCA college teams (4)	The main aims of these meetings were to review progress with individual colleges and make any changes to action plans.	UoN acted as a critical friend and asked questions to stimulate new thinking. WCA teams used the feedback to review ideas and adapt action plans where appropriate.
	Final WCA event (2022)	The main aims were for WCA leads and the UoN WCA team to collaboratively: • review WCA achievements this year and what has been learned; • widen understanding of the whole range of WCA interventions by sharing experiences; • share draft plans for continuation projects and the 2022/23 WCA programme.	UoN presented WCA Interim Report 2 for discussion. Group discussions were held about what college interventions had achieved and what had been learned. UoN presented guidance for discussion about scaling and extending influence. Colleges shared and discussed their proposals for continuation projects and revisions to the WCA programme.

	Final reports from colleges (2021/22)	The aim of these reports was to summarise WCA activity for the college, evaluate the impact and reflect on what has been learned.	UoN used these to inform the research and evaluation of the ilot , and the revision of the WCA programme for new colleges in 2022/23 and legacy resources.

Table1: Summary of WCA project (Pilot A) planned activity.

In summary, participating colleges in the WCA project (Pilot A) were expected to:

- form a cross-college WCA team that would meet regularly;
- explore a self-identified problem or area for improvement;
- develop an intervention and WCA action plan to address the problem;
- implement, review and evaluate the impact of the action plan;
- work with the resources and guidance provided by UoN;
- participate in meetings with UoN to review progress;
- participate in professional development events run by UoN;
- participate in research led by UoN to give feedback on the resources and process.

There was also an expectation that college WCA teams would have at least one meeting per term with their UoN critical friends. In addition, WCA leads attended short online monthly meetings with UoN to report on progress, discuss the next stages of the project and give feedback.

4.1 Self-assessment

This was a key element of the WCA Programme. Three self-assessment tasks were completed by colleges during the Discovery Phase, with support from their critical friend, to explore the college context, climate and a self-identified problem or area for improvement in their mathematics provision. The self-assessment tasks used in 2021/22 were later revised in the light of the research findings and the (post-Covid) change to face-to-face meetings but the aims and approach remained similar.

4.2 Professional development

The WCA Programme was originally designed with four professional development events for all WCA college team members. After funding was extended and all the 10 colleges opted to continue with WCA into a second year, the fourth event was replaced by an additional online meeting for WCA leads in July 2022 to review the pilot year and commence planning for 2022/23.

4.3 Key concepts

The Whole College Approach is built on a set of key concepts. These underpin the WCA Programme and are outlined below.

WCA involves a process of organisational change, through which student learning of mathematics becomes a shared responsibility and all staff are actively involved in a collaborative effort to improve students' understanding of mathematics. The diagram below shows the stages of this development.

Figure 1: The Whole College Approach

The WCA programme's Self-Assessment task 2 explored the starting position of a college on this continuum, using the perspectives of staff in different roles within the organisation. This informed an analysis of the college's existing strengths and weaknesses with respect to a WCA.

The development of an active and collaborative cross-college team to lead a WCA intervention, with appropriate representation of staff in different roles, was an important element of the WCA programme, designed as a first step to creating a more collaborative culture across the whole college. A key feature was the cross-college composition of this team with appropriate horizontal representation (mathematics and vocational) and vertical (teacher, middle manager, senior leader). Colleges were asked to include:

- a member of their Senior Leadership Team
- a manager with responsibility for mathematics
- a vocational manager
- a vocational teacher
- a mathematics teacher.

The self-assessment tasks were used to develop a culture within this team of openness, critical thinking, collaboration and active participation, irrespective of role or seniority.

The **CHIME framework** (see *Figure 2*) highlights five key concepts that are fundamental to a WCA. The framework assumes that an effective WCA is 1) contextualised, 2) holistic, 3) interconnected, 4) multidimensional, and 5) evaluative. WCA teams used these concepts in the self-assessment tasks and referred to them throughout the project.

Contextual	Context matters. A WCA to mathematics must take into account the particular features of the college, in addition to external factors (national and local) that frame the implementation of mathematics policy and practice in FE.
Holistic	Colleges are complex systems of people and processes with the whole being *more than the sum of the parts.* Understanding the big picture, and the relationships between the parts and the whole, is key to a WCA
Interconnected	There are many connections in a college system. Causes and effects are not always simple, and change can be unpredictable. WCA interventions can fail if the interactions between processes (and people) are not well understood.
Multidimensional	WCA problems have multiple dimensions, and these are perceived and understood from different points and angles of view. Valuing such diversity can aid understanding and the planning of improvement for mathematics.
Evaluative	Understanding and improving a WCA for mathematics requires effective data generation and information exchange. It is important to develop a culture of self-assessment, critical inquiry, evidence-building and collective analysis.

Figure 2: Overview of the CHIME framework

The WCA is fundamentally a process of organisational change, in which both the formal and informal working of the organisation need considering. Colleges were asked to consider the formal systems and processes of the college and the organisational behaviours associated with people and culture in their self-assessment, planning and implementation.

5. College WCA interventions

Colleges designed their own interventions after using the self-assessment tasks in the Discovery Phase to explore the context, climate and area for improvement initially identified. During this time, colleges revised their initial project aims and re-focussed their ideas before action-planning. *Table 1* shows the

area that each college decided to focus on after self-assessment, and the approaches used in their action plans. There are two important points to note here:

1. Most colleges revised their initial ideas in the Discovery Phase. The self-assessment tasks helped colleges explore beyond the surface problems to identify the causes and contextual influences. As a result, the area they decided to focus on was not always the one they had originally identified.
2. Although colleges often identified similar problems, they adopted different approaches to suit the varied contexts in which they were working. For example, colleges identified that poor student attendance at mathematics lessons was a common problem that contributed to poor achievement, but sometimes the issues with attendance were with the systems used, whilst in other colleges it could be traced to cultural behaviours, such as mathematics and vocational staff rarely communicating.

Project focus (SA3)	Main actions (action plan)
To improve communication links between maths staff and vocational programme of study staff.	Improve attendance through approaches that are better connected and co-owned between the maths department and curriculum faculties. Develop a culture where maths is seen as 'everyone's business' and there is a collaborative, consistent and confident approach to: • Promoting the value of maths skills across the curriculum • Curriculum delivery models • Attendance protocols and interventions • CPD and staff development.
To improve the engagement of 16-18 year olds with mathematics in vocational areas, with particular attention to Engineering and Construction, and the following aspects: • Motivation and aspirations • Prior learning experiences • Clear links to vocational learning	A member of the college maths team and a vocational teacher: • Observe each other's sessions • Each identify where maths may be explored, developed and discussed in their sessions. • Highlight these on the maths scheme of work • Hold follow up workshop sessions with colleagues.
To improve use of the intervention log and follow-up actions to establish a consistent and well communicated approach to improving attendance to GCSE maths across one vocational area. To develop activities and events inside and outside the classroom that improve maths staff- student relationships. To use tools such as the motivation and engagement toolkit to develop a common language amongst vocational and maths when supporting GCSE students.	• Sample student's attendance and intervention logs from last year and run a case study of a group of students with initial attendance issues this year. • Develop a flowchart of actions for tutors and teachers. • Identify main tutors for each maths group. • Organise joint meetings. • Identify, plan and support a range of joint activities and events for students. • Provide training for vocational staff on mastery approaches being used in GCSE maths. • Develop a common use of the Growth Zone model across departments.
To improve communication systems with the aim of reducing any barriers between the maths department and cross college	• Review current access to student data for maths.

teams, and therefore further develop the support network of the students with the aim to improve attendance and achievement.	• Consider the impact of available data post-merger and how data can be collated effectively. • Identify current challenges and successes in data management. • Develop collaboration between MIS and Maths/English Department. • Review experience at all levels throughout the project to identify timely intervention or plan next steps.
To improve attendance and achievement of higher grades in maths. To engaging learners actively in maths throughout their study programme.	Create a new role and recruit staff to: • help students and staff identify and understand where maths is generated and get a better understanding of practical mathematics. • work closely with vocational staff to see where the links are to Maths in their vocational sessions. Arrange for maths staff to observe some vocational sessions to identify more links. Arrange staff training and collaborative meetings to share good practice, etc.
To make maths visible and ensure maths is embedded throughout the curriculum at all levels. To promote mathematical fluency across the wider college by embedding maths-focussed activities into all courses.	• Introduce 9 Core Skills across the college. • Organise whole staff training sessions. • Arrange department-based support sessions. • Maths staff go into other lessons and support the teachers in the delivery of maths. • Provide training on the courses delivered by the Maths Department so staff are aware. • Set up a staff 'maths' working party to meet half termly.
Develop a shared responsibility for attendance and better communication between maths (and English) and vocational teams. Work with the construction team to address engagement and motivation, common teaching strategies, attendance monitoring processes, a common attitude to maths and the language of maths used in construction and maths classes.	• Review current attendance policy and procedures. Agree the systems and ensure information is communicated to all staff. • Meet with Quality team to review the disciplinary process. • Review the progression process to include the English and maths team. • Work with the timetabling team to improve systems and communication to teams. • Highlight key learning opportunities on maths and Construction schemes of work and develop one scheme between the subjects. • Survey students on their attitudes to maths and reasons for not attending.
To improve attendance at maths sessions. For students to adopt a growth mindset towards maths in order to improve engagement and motivation,	• Develop deeper understanding of how learners' perceptions and attitudes to maths impact on attendance. • Develop greater understanding of how learners' attitude to maths can be improved when mindset strategies are applied across the whole of the learners' study programme.

	• Widen the sharing of current good practice which has improved learner attitude and attendance at maths sessions. • Increase communication and collaborative working between the curriculum areas and maths team. • Develop a process to feed into induction so learners benefit from early collaboration between maths and curriculum. • Develop a process so attendance data by curriculum area can be effectively shared and monitored.
To improve communication links between the maths team and vocational staff with reference to: • Student attendance for maths • Student progress • Embedding of maths topics related to the vocational programme. • Formation of communication links, with named maths teachers attending programme of study team meetings.	• Generate attendance report. • Assign a maths link person to each vocational area (selected areas) • Share schemes of work and discuss common areas of maths. • Maths staff assist in the planning of embedding. • Review attendance sanctions. • Plan a programme of meetings by WCA team for effective discussion and follow up of actions.
To embed the concept of a study programme throughout the college, with a focus on methods and lines of communications as well as the systems being used.	• Clarify roles and improve communication • Improve accuracy of data and standardise use of systems in place. • Embed Maths awareness into the Tutorial Programme. • Develop a 'Maths Champion' within each vocational area • Raise students' awareness of the sickness reporting policy

Table 2: Focus and summary of interventions by colleges

6. Research methodology

The research was carried out using a mixed methods approach designed to generate both quantitative and qualitative data throughout the Programme. It was important to understand the process, the effectiveness of the tools used and the intermediary effects on college teams as they worked through the different phases.

In addition to the data generation methods listed in *Table 3*, notes were taken by the researchers at every meeting with college WCA teams.

A case study approach was used to examine the processes of team and intervention development in four contrasting colleges, using data from individual interviews with college WCA team members, college reports, and field notes. The interviews were transcribed and analysed using NVivo using an iterative process of coding to identify themes that were then used to carry out a cross-case analysis.

The research aimed to explore to what extent, and how, the WCA project concepts, tools and approaches support improvement processes for mathematics in GFECs, and how these might be improved. These broad aims were investigated using the following specific research questions:

1. How useful is the CHIME framework in aiding understanding of the WCA project concepts and approach?

2. How effective are the self-assessment tools in operationalising WCA concepts in context?
3. How well do the WCA self-assessment tools develop a climate of collaborative, critical inquiry in the project team and more widely?
4. To what extent and how does peer support from a buddy college support WCA planning and implementation?
5. How useful and necessary is the support of an external 'critical friend'?
6. How do any moderating factors influence the implementation of the WCA Programme and Interventions?
7. How effectively are WCA teams supported to undertake formative and summative evaluation of change projects?

The research also aimed to generate data for the relevant Key Performance Indicators (KPIs) agreed in advance for the WCA project.

Method	Date	Participants	Responses
Survey 1	Oct 2021	WCA team members	26
Survey 2	June 2021	WCA leads	10
Focus group 1	July 2021	WCA leads	11
Focus group 2	July 2022	WCA leads	10
Interview 1 (case studies only)	Nov 2021	WCA team members	15
Interview 2 (case studies only)	June/July 2022	WCA team members	12
College self-assessment results	July-Sept 2021	All colleges	10
College action plans	Oct 2021	All colleges	10
College interim report	Jan 2022	All colleges	10
College final report	July 2022	All colleges	10

Table 3: Research methods and data sources

7. Research findings

The findings from the research are presented in two sections. First, we explain the key points related to the WCA programme (2021/22) and secondly, we summarise findings about college WCA interventions. It should be noted that both elements were affected by the Covid pandemic since restrictions on face-to-face meetings and travel were in place for much of this time.

7.1 WCA Programme

The research showed that the WCA programme was effective as a means of guiding and supporting colleges through a process of organisational change. Colleges were positive about ways in which they had made improvements to the student experience of mathematics, but also recognised important cultural changes and an increased capacity to make further improvements because of their participation in the WCA programme. In this section we report first on three elements of the programme (the critical friend, self-assessment and professional development) where clear messages emerged from the analysis, followed by two aspects where there was evidence of a moderating effect on college interventions.

The critical friend

Colleges reported that the support and guidance given by their *critical friend* had been a key factor in their success. The role that emerged was however more than might be expected of a typical critical friend. Colleges explained that having an external facilitator to work through the self-assessment tasks with them was an important early step. An impartial facilitator was able to stimulate honest conversations, encourage collaboration, challenge assumptions and guide college teams towards a clearer view of what the real problems were. Furthermore, college teams benefitted from the advice and guidance of an unbiased professional with a wide understanding of different FE colleges and organisational change processes.

Through meetings with their critical friend and feedback on the documents they submitted, colleges reported that their thinking was challenged. They found the interaction and feedback to be an effective means of support that helped them review and refine their analysis of the problem and develop action plans with more focussed and appropriate interventions. It was widely agreed that this was a key element of the WCA programme.

The schedule of meetings and submissions also provided a useful framework that helped keep colleges 'on track' with their WCA plans. Without the external prompting and support of a critical friend, and some accountability, most colleges were agreed that it would have been difficult to sustain their WCA work throughout the year.

Self-assessment tasks

Colleges agreed that the self-assessment activities were an important element of the programme and that the time spent on these was very worthwhile. In particular:

- SA1 was a useful to start the group thinking about the context in which they were working and its contextual affordances and constraints. It also helped develop good relationships within the team and was non-threatening for teams that were unused to collaboration.
- SA2 was valued because it stimulated rich, purposeful discussion about the problems they wanted to address and demonstrated the value of different perspectives of the same problem. The activity functioned best when all WCA team members had completed the pre-meeting questionnaire. They needed the *critical friend* to facilitate the discussions and offer expert advice, even though written documentation was provided.
- SA3 was a useful activity to explore the problems further but normally needed more time than had initially been anticipated. WCA teams often completed additional work on the SA3 tasks after the meeting with their *critical friend*, but it may have been better to spread the SA3 work over two meetings with UoN. Teams generally needed more guidance on the mapping task and found it hard to work on this collaboratively online. Most teams also needed additional guidance on the use of the CHIME framework in SA3. Teams benefitted from engaging in some productive struggle with complex ideas during this task, but they engaged more quickly when more time was spent first on the example provided in the documentation.

It should be noted that some of the issues might have played out differently with face-to-face meetings and with more time to spend with WCA teams on-site. Several colleges commented that developing relationships and collaboration between team members was important and that this was easier when meetings were face-to-face.

Professional development

Attendance at the professional development events was variable with some colleges able to attend as a full WCA team and others only represented by one or two team members. All these events were held online due to Covid, which restricted the activities that could be offered. There were some mixed views on the value of these professional development events within the overall programme. The first events

were used to commence the self-assessment process and, although these were viewed by colleges as valuable tasks, doing these at an online event was not ideal. Some colleges could not bring their full WCA team to the event due to other commitments and found it easier when meetings were held with colleges individually. WCA leads would have preferred more training themselves before events or meetings for the whole team commenced.

Participants in the second and third events generally valued the opportunity to meet with other WCA team members, especially those in similar roles. Team members enjoyed hearing about other WCA interventions and taking part in 'peer review' sessions to discuss draft action plans with another college.

Project readiness

Some colleges found it challenging to get started, which was partly due to the relatively quick introduction of this new CfEM strand and its timing at the end of a very difficult Covid-impacted academic year. The post-examinations period (June/July) was unusually busy for colleges, with reduced opportunities for planning initiatives such as WCA. The research showed however that there were other reasons why some colleges were able to move ahead more quickly than others and that the notion of 'WCA-readiness' is important. There was evidence that the following factors were influential.

- The experience of the WCA team lead and their position in the organisation had an impact on how easily team members were recruited and meetings arranged.
- The existing culture in the college affected how readily team members and others engaged.
- The extent of pre-project collaboration between team members affected how quickly the team commenced effective working together. It was easier when team members already knew and trusted one another.
- The engagement and commitment of a senior leader was important to ensure the WCA project could move forward.
- The constitution of the team was crucial. It was important "to get the right people in the room" including enthusiastic and reliable 'early adopters', and vocational representation.

Stability

During the project, most colleges experienced unexpected challenges that affected their WCA work. In some colleges the challenges were disruptive and took time to overcome, especially when it affected WCA team membership, or other people involved in the intervention, or the systems they were working with. Colleges with stability in their WCA team membership and in the college generally found it easier to move forward. The following changes usually made it difficult for colleges to make progress and sometimes led to temporary inertia.

- College reorganisations made staff less keen to be involved in a new initiative.
- Changes of role due to reorganisation or meant new relationships had to be developed to implement action plans.
- Changes in team membership meant that responsibilities sometimes changed, and the group needed to develop new relationships. New members who had not worked through the self-assessment tasks had to be update and integrated into the culture and ways of working of the team.
- College mergers affected staff roles and sometimes the systems that WCA teams were working with in their intervention.

There is no best time to start a WCA project but to give the greatest chance of starting strongly and moving forward quickly, there must be a good level of **WCA project-readiness** and ***stability*** in both the college and WCA team. It is also important to consider the normal planning cycle in the college so there is sufficient time to develop any interventions that are linked to fixed points in the college year (e.g. enrolment, induction).

7.2 College WCA interventions

The problems stated on colleges' initial Expressions of Interest (EOIs) ranged from quite broad areas that they were finding challenging to tightly specified problems where there was a high level of confidence about both the nature of the problem and potential solutions. In most colleges, there was considerable change during the Discovery Phase in both the team's perception of the problem and their ideas about how to tackle the issues.

In the following sub-sections, the most common problems or areas for improvement identified in college WCA action plans are summarised. These highlight some important themes that have emerged from the analysis about developing a WCA.

Attendance at mathematics sessions

Attendance was identified as an area for improvement by all colleges and has emerged as an important element to explore when developing a WCA. All ten colleges included some actions intended to improve student attendance with mathematics into their plans. Their actions have varied according to their current situation but have recognised that sustainable organisational change involves a cultural shift or change in the behaviour of the people involved as well as an effective system.

Having explored the main issues and current position, some colleges focussed on developing effective systems first to ensure accurate information was available from which attendance issues could quickly be identified. Others prioritised the need for consistency in the actions taken by vocational and mathematics staff, and for better communication between users of the system, including actual conversations.

Clarity about who takes responsibility for which part of this process is a common weakness that colleges see the need to address. By considering the perspectives of staff in different positions and working together on the problem, some colleges have found it easier to develop collective ownership and better understanding of how responsibility can be shared effectively.

Student engagement with mathematics

Engagement was a strong feature of four college action plans but also appeared in several others as a secondary issue connected to student attendance.

Several colleges planned to improve student engagement by strengthening the connections between mathematics and vocational programmes and achieved this in a variety of ways. Colleges explored ways of making stronger curriculum links, often with just one or two vocational areas in 2021/22, with the aim of scaling across other vocational areas in the future. In most cases, colleges started by working together to highlight the mathematics in a vocational course through discussions between at least one mathematics teacher and a vocational teacher, and sometimes informed by observations of each other's lessons. These discussions usually led to making simple links to emphasize the relevance of mathematics, such as: using vocational examples to illustrate the use-value of a topic in mathematics teaching; highlighting applications of mathematics in vocational sessions; or aligning schemes of work so topics are taught in mathematics lessons when there are relevant applications in the vocational course.

Communication

Communication between mathematics and vocational teachers emerged as an important element of WCA from college projects, even though this sometimes only surfaced whilst aiming to address a different issue. For example, colleges that primarily aimed to improve student engagement or attendance commonly reported the importance of improving communication to achieve this, even though it was not originally identified as a target area.

Increased communication between mathematics and vocational teachers for one purpose has also led to improvements in other ways. The process of working together on student attendance, for example,

has led to improved communication about mathematics in the vocational programme or vice versa. In colleges where mathematics and vocational teachers have visited each other's classrooms to explore curriculum connections, students have become more aware that they liaise, and staff have reported a decrease in attendance issues.

Increased discussion, especially between mathematics and vocational teachers, has generally led to better mutual understanding of the issues that they face and how these might be addressed. Discussion such as these have also helped to expose other issues needing attention such as a lack of confidence in some vocational teachers about mathematics.

8. Conclusions

The research evidence shows that the WCA project concepts, tools and approaches were generally effective as a means of supporting improvement processes for mathematics in the participating colleges. Some colleges generated stronger evidence of measurable improvement than others, but the project achieved its main aim, which was to improve the understanding, planning and implementation of Whole College Approaches for mathematics in large FE colleges. The objectives of translating MiFEC and other related 'whole organisation' research into practice; building sector knowledge about WCAs; developing support mechanisms and producing support materials were also achieved.

Our research questions highlighted several elements of the WCA programme for exploration: the CHIME framework, self-assessment tools, peer support and support from a critical friend. The findings indicate that the CHIME framework and self-assessment tools helped colleges develop better understanding of WCA values and their own problems, even though some participants found it took time to grasp the concepts and the purpose of the tasks. The tools were also an effective way of developing a climate of collaboration and critical inquiry in college teams.

The research in Year 1 of the pilot (2021-22) did however indicate several ways in which the process and tools could be further improved, especially in an environment where face-to-face meetings became possible. This led to a revised set of self-assessment tools and a slightly modified process for use with the new colleges joining the programme in 2022/23. There was wide agreement that colleges needed an external and impartial facilitator with good understanding of both organisational change processes and the FE sector to guide them through the WCA processes. Colleges also enjoyed opportunities to meet with other WCA teams and some spoke positively about the peer review process with 'buddy' colleges, but responses were variable. These activities seemed less important to many WCA college team members than meetings with their critical friends.

There were moderating factors, such as college readiness and stability, which affected the implementation of WCA in some colleges. These typically made it more difficult to develop a collaborative working team or implement planned actions. The extra demands on staff due to Covid also had an effect at times, although there were other time pressures too that led to some colleges progressing more slowly than expected.

The CHIME framework highlighted the need for an evaluative approach and colleges were continually reminded in meetings to plan how they would generate relevant data with which they could evidence any impact of their interventions. In general, they reported progress qualitatively and used feedback formatively. Their final reports could however have been better supported with more quantitative data concerning student outcomes. The need for good quality data was emphasised more strongly in 2022/23 and colleges were asked to plan how the impact of their intervention would be evaluated much earlier in the year.

The continuation of funding into 2022/23 has allowed the research to be extended and explore how colleges build on their existing WCA work to scale out across the college and develop a sustainable WCA. It is important to understand how the critical friend can support this type of scaling activity and whether the need for external facilitation changes over time. The extension of the WCA Programme

into 2022/23 has also made it possible to trial revised versions of the development process and self-assessment tasks with a new group of colleges. This gives the WCA Programme a more robust evidence-based for further development.

Findings from the pilot year of the WCA programme indicate that it is an effective means of supporting colleges to bring about sustainable organisational change in the way they organise and manage the student learning of mathematics. There is evidence that interventions developed through this WCA process have led to improvements in student attendance for mathematics and have had positive effects on their learning experiences, although further data is needed from ongoing WCA work to evaluate the impact on other student outcomes.

Appendix: WCA Theory of Change

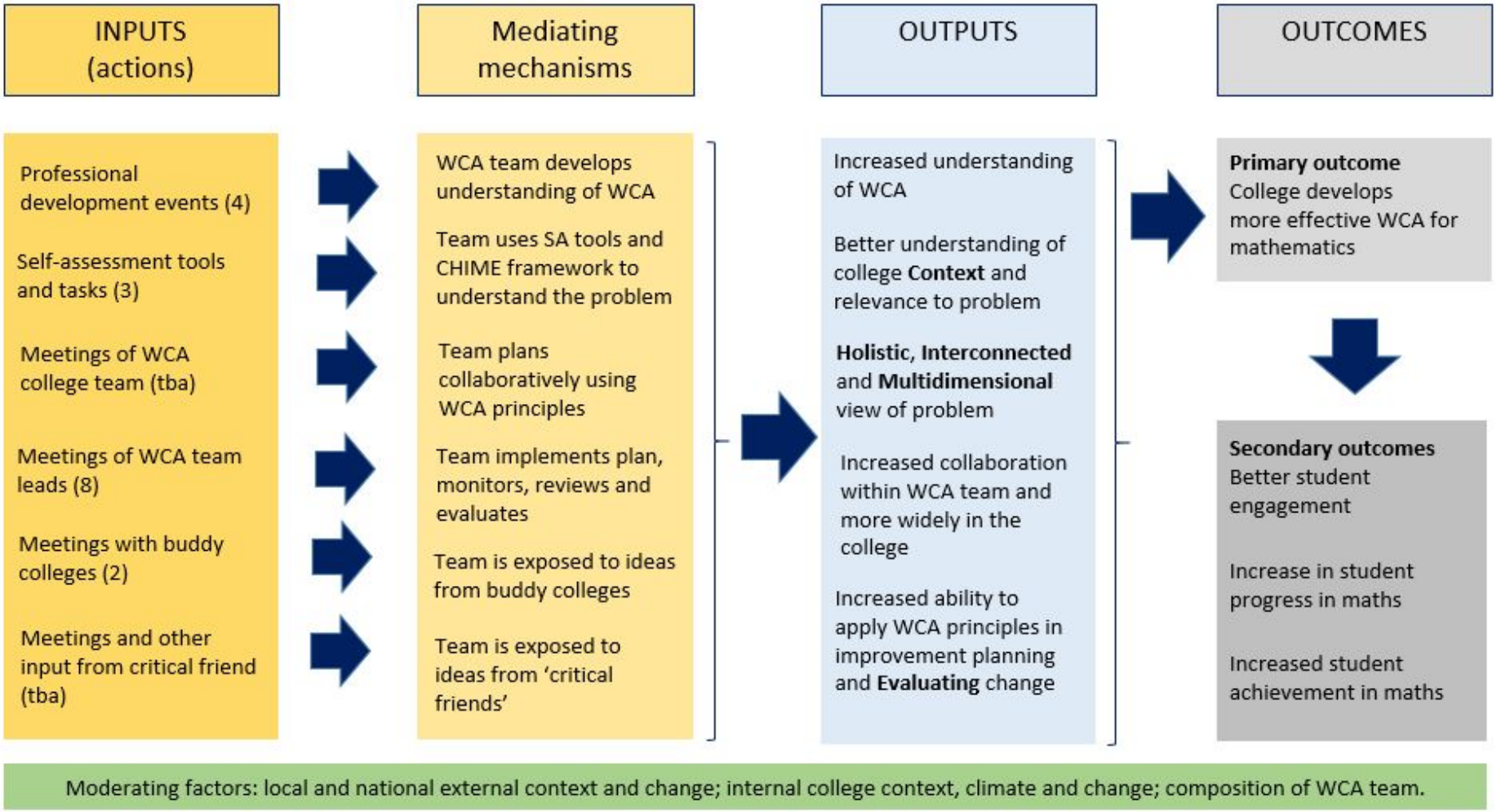

Figure 3: WCA theory of change model