NP	Not planned	Teacher expresses that they had not originally planned on going into teaching after the leaving certificate.	Apply to this expression.	Do not use for not having planned to teach mathematics (see NPM).	"When I came back to Ireland I didn't get a job straight away so I filled in the time by working in different schools Then I did my H. Dip. the following year" [E, 1] Note: Letter refers to interviewee, number refers to page number of transcript.
NPM	Not planned maths	Teacher expresses that they had not originally planned on teaching mathematics.	Apply to this expression.		"If I'm being completely honest, I decided to do the Diploma [for out-of-field teachers] to make myself more employable" [A, 2]
SCH POS	Positive Schooling Experience	Teacher expresses that positive schooling experience and good teachers were influence for going into teaching.	Apply to this expression.	Do not use if comment that they had good teachers, only if the good teaching influenced their want to go into teaching.	"I had some good teachers in school who were a positive influence on me and I thought I could do something similar" [D, 1]
Cost	Cost of Initial Training	Teacher expresses strain of finances as a drawback of initial teacher training course.	Apply to this expression.		"I think the two year course is really valuable, I just think it would be more beneficial in the second year if the fees were slightly less By the time the second year comes around you just got nothing left. It feels crippling" [A, 1]
TTVP	Teacher Training's Value is in Placement	Teacher expresses the value of placement and/or their cooperating teacher (mentor) in moulding his/her practice	Apply to this expression. May double code with MORE PED (see example 2)		Ex 1. "In my opinion one hour of placement is like six hours of learning time in college. You just can't learn that stuff in college" [A, 1] Q: What value did you find in your initial teacher training? A: I didn't really find any, I must say. The only part I enjoyed was the teaching practice. The pedagogy was just not good enough. [C, 1]
Training Val	Values Initial Training	Teacher expresses valuing initial teacher training as integral to becoming a teacher.	Apply to this expression, in regards to overall teacher training. Generally, in response to "Should anyone with sufficient mathematical knowledge be allowed to teach, without or without training?"	Do not apply to expression of valuing placement (see TTVP)	"No, I don't think that just being good at maths qualifies you to be a teacher. I think everyone needs training." [D, 4] "I think training is very important [and] mentoring from training is is very important" [E, 4]
Feedback	Feedback	Teacher expresses "feedback" as important to their training experience.	Apply to this expression. May double code with TTVM.	Do not use for teacher expressing importance of collaboration with colleagues (see COLLAB)	"After classes my [mentor] would give feedback He was a really good teacher so there was a lot to learn from him" [D, 2]

When to Use

When Not to Use

Example

Code

Brief Definition

Full Definition

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example				
PRAC	Practicality	Teacher values professional development in terms of practicality.	Code any time teacher expresses disliking a PD/training for not being practical or for liking PD/training for being practical.		Ex. 1 "The most beneficial thing [from PD] is when they have something specific you can use in class - like a resource or an idea of how to do something - that you wouldn't have seen before or thought of yourself and within 10 minutes you can see the value [in it]." [D, 2] Ex. 2 "Some parts of [initial training] were just rote				
					learning because they were practical [because] they weren't useful to my practice" [B, 1]				
NEW PED	New Pedagogy or Methods	Teacher places value in the opportunity to learn new pedagogy or methods from training or PD.	Any time this value is expressed.	Do not code for if teacher expresses wanting more pedagogy from a course or more professional development focused on pedagogy (see MORE PED)	"The parts I really liked [during initial teacher training] were the pedagogies, I think they are brilliant. When they give you different ways of teaching it is so useful." [B,1]				
MIX PD	Mixed Experiences with Professional Development	Teacher expresses having both positive and negative experiences with professional development.	Any time this is expressed May double code with PRAC (see example)		"[PD] depends on who is running it. I've been to some that are brilliant and there has been on or two given by someone who you can tell hasn't been in the classroom for so many years and they're not giving you practical ways of doing things." [B, 1]				
NEG EX	Negative Experience with Professional Development	Teacher expands on negative experience of professional development	May double code with MIX PD		"[PD] that wasn't worth my time was when we there and someone was at the top of the room and kind of spoke down to you about what to do and then you were given resources. Whereas, I could have went online and downloaded resources." [C, 2]				
MORE PED	More Pedagogy	Teacher expresses that a training programme or PD should have more pedagogy or more of a focus on pedagogy.	May double code with MORE PD		"We had 5 pedagogy workshops and they were really beneficial. They could have maybe worked that in throughout the course as well though, like in our tutorials, that would have been helpful." [A,2]				
LMMP	Less Maths More Pedagogy	Specifically in regards to the Diploma for out-of-field teachers. Each teacher who did or is doing the diploma expressed wish the course had more pedagogy in it.	Apply to this expression.	Use instead of MORE PED in regards to the diploma course.	"Basically what happens on the course [Professional Diploma for out-of-field teachers] is we get a handout of questions and try to do them with the teacher. But then we also have our own assignments to do do every week. Again, because it is a stand in for a college degree But, I think it would be more beneficial to try to do like one 'teaching problem' on the board, and [have the instructor] show us how you would go about teaching this. Instead of trying to do eight really hard sums and you can't really pay attention." [A, 2]				
MORE PD	More Professional Development	Teacher stating that they want more professional development.	Apply to this expression. May possibly be in same statement of a code for MORE PED	Do not use if expressing there should have been more pedagogy in a training or professional	[already did maths pedagogy training in England] "Another reason I am doing the Diploma is for the Project Maths training You know when I came home from England there was nothing out there for				

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
				development session. Only if explicitly state wanting more PD.	maths teachers who weren't in those workshops 6 years ago It's madness they haven't got anything to provide us with . People want professional development." [B, 4]
PD Change	Professional Development as Changing Practice	When a teacher refers to a professional development experience as changing their practice.	Apply as expressed.		"This was the first year I did this because last year I received an in-school in-service in algebra the guy was really good And he was telling us to introduce algebra through patterns which was something I had never done previously. It worked really well and there are loads of good resources on projectmaths.ie" [C, 8]
COLLAB	Collaboration	Teachers in these interviews frequently brought up valuing collaboration or discussion with their colleagues, with others in PD, and with their students during constructivist activities.	Apply this to any time a teacher expresses valuing collaboration.	Do not use in reference to collaboration from Lesson Study (see LS)	Ex. 1 "Sometimes you go into an inservice and the most helpful thing you find is actually from someone sitting next to you" [C, 3]
TOO NEW	Too many new things	When a participant commenting on disliking "experimental" teaching or new styles of teachign; or feels that too many new approaches have been brought in	Apply to this expression		"I think there seems to be a greater emphasis [in teacher training today] on using new techniques. I'd be a bit wary of too much of that" [E, 1]
OPEN	Open Minded	Teacher displaying and openness to new approaches as well as their students displaying an openness	Apply to this expression Also displaying an openness to upcoming JC reform (see ex. 2)		Ex. 1. "So, I think with the first and second years if I continue with this [constructivist] model that I'm doing with them, when they are in 6th year then they'll be a lot more open to group work and things like that and see feel confident for the exam" [C, 3] Ex. 2. "I have no problem if 10% [of the new maths junior certificate] is for problem solving but not reflecting on how they problem solved. Because if it turns into an english piece that's not really helping [with] maths. But, I'm open to hear about it and interested to see how they do it." [C, 7]
MINDSET	Mindset	The importance of a positive, growth mindset is well documented (Boaler, 2016).	Code for anytime a teacher makes specific reference to working on changing students mindsets or the importance of their mindset towards maths.		Ex. 1 "I am very much in the mind of trying to create a positive attitude in the classes rather than not [especially because I have weak classes] so it's very much about changing their mindset on maths" [A, 3] Ex. 2 " They just wanted me to show them how to do everything, and it really took ages to get them to finally get into their heads 'You can do this yourself.' It did take a month or two but finally we are at that point where we have that set up now and they know I'm not just going to give them answers. But it definitely takes effort, and it's their mindset that

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
					needs to be changed. But once you get there, it's really rewarding" [B, 2]
BEHAVE	Behaviourist	Evidence of behaviourist model of teaching.	When a teacher explains model of teaching and it is expressed as primarily a behaviourist model.		"I usually start off with a simple example on the board. Then I have them do a simple example. Then we do a little board work. Then I set them some problems. And I go around an check on them" [A, 3]
CONSTRUCT	Constructivism	Describe using constructivist teaching approaches and/or creating a constructivist classroom.	Apply when expressed.		""Sometimes I start the class by put a question up on the board and they work on it and I have them figure out how many ways they can find the same solution. They work in different groups. It works really well for some topics"" [C, 3]
PW	Pair Work	Describe using or valuing having students work in pairs, esp. Desk pairs.	Apply when expressed.	Not in reference to collaboration (COLLAB) or Group work (GW)	" I like having them work in pairs a lot, discussing the maths." [D, 3]
GW	Group Work	Describe using group work.	May double code with constructivism.	Do not use if expressing no using group work (see NGW)	"I did group work there a week or two with the sixth years and actually they did well in it but I think the brighter ones at the end of the class were thinking "I didn't do maths today" because they weren't sitting down just using their calculator" [C, 3]
PEER	Peer-to-Peer learning	Teachers express value of having students learn from one another.	May double code with Pari work or group work		Ex. "I would never have my classroom silent like you have to hear a pin drop. Because you know they [the students] benefit so much from discussion with their peers" [D, 4]
NGW	No group work	Teacher expresses not using or valuing group work.	Apply when expressed		Q: To what degree if any do you use group work? A: I don't tend to use group work. I don't mind though if they talk to each other when doing work I have set for them. [E, 3]
LEV / BE	Level of Class and Behaviour of Class	Teacher expresses level and/or behaviour of class as determining what methodology to use or as a barrier to using constructivism.	Apply when expressed	Do not use if teacher specifically says LEV or BE is a reason for using traditional model. Use LEV/ BE TRAD	Ex. 1. Q: how would you describe your classroom model? A: It would depend on my class group. [C, 3] Ex. 2. "The ability and the students behaviour in the classroom [influence how I run the class]. You have to be so flexible to the kind of crowd you have in the room Group work is tough [when the students] are so weak If you let them off they can just go rogue and get so lost that they have get completely disheartened." [A, 3]
ACTIVE	Active Classroom	Teacher's expression shows that he/she values having students actively involved in doing work during class (even if not specific constructivist activities)	Apply when expressed, but if specific constructivist activity, e.g. problem solving, code CONSTRUCT		Ex. [after discussing pairwork] "I do try to get them to be active in the classroom because there is no point in me standing up at the top of the room for the whole class, they don't get anything out of that." [B,

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
					3]
SUB	Substitution level of SAMR	The substitution level of the SAMR model is "when the tool acts as direct substitute with no functional change" (Puentedura, 2006)	Apply if teacher describes use of ICT at substitution level May double code with GEOGEBRA		"I would use the smartboard to use the notebook software. I write notes on the smartboard and they are saved. I would use geogebra a fair bit. I use it for graphing." [E, 3]
GEOGEBRA	Graphing software	Geogebra or Desmos. Teacher's express using graphing software as their use of ICT in the classroom.	May double code with VISUAL		"I use [ICT] a lot in terms of graphing software. Like use Desmos a lot Not to find an answer but to get visual understanding." [D, 4]
MIXED METH	Mixed Methodology	Teachers express and/or value balancing the methods they use in their classroom.	Apply as expressed.		"I really try to use a range of different methodologies I don't think it's fair to always ask the kids to work in groups for example I don't thin there is one best [teaching method]. I think if you cakeep it as varied as possible then that is best for everyone" [D, 3]
CHANGE	Changed Practice or Mindset	When a teacher expresses changing to a more constructivist mindset, changing their practice especially through PD or Training. Also can be noting the change of culture from Project maths [ex. 2]	Apply as expressed.		Ex. 1 "I'd say when I finished my leaving certificate really pictured myself as the more traditional teache like how I was taught in school. Because it worked; did work. But then it was my training in England that really set me off. They are brilliant for their new teaching. I don't have the same resources here as I did in England but I can still make the constructivism work. England really did teach me about so many different teaching styles. So I guess I didn't always see myself as more of a coach but now I see it definitely works." [B, 2] Ex. 2 "I think there is a big generational difference too, like someone walking into the classroom over 3 wouldn't have any concept of active learning. Even myself, I'm 33, and when I went to school it was very much everyone sat in a desk and we all looked at the board and we took our notes and we did our questions and literally every subject felt like that. That's why I'm doing my thesis [for the out-of-field teacher Professional Diploma] on active learning. I need to know more" [A, 4]
CONTROL	Giving up Control	When a teacher expresses a change in role in creating the constructivist classroom and / or the giving up of control that is often associated with constructivist teaching approaches.	Apply as expressed. May double code with CONSTRUCT (as example does)		"Sometimes you come into a classroom [doing problem solving] and you only get step one done be from the kids actually getting step one themselves rather than you telling them how to get to step 5 the learn a lot more from that and I think as a teacher yo have to give up control there and be comfortable wi it It's very different to the traditional kind of

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
					approach" [C, 6]
LS	Lesson Study	When a teacher expresses value of Lesson Study, including as changing practice or being able to collaborate with peers.	Apply as expressed.		"I found the lesson study I did with projectmaths.ie to be way more beneficial than any pedagogy I did in the degree. I was more hands-on And you know it is all well and good looking online and seeing things but you just need time to talk to other teachers and brainstorm and throw ideas around" [C, 2]
UNSURE	Unsure of Impact of PM	When a teacher expresses being unsure of the success of implementation of Project Maths or if it is working or questions the degree of success.	Apply as expressed.		Ex. 1 "I'm not really sure [how the implementation of Project Maths] is doing I think they just had such a hard task to tell like all these teachers in the country 'sorry we are changing what you have done for the last twenty years and it's hard for them not to think 'oh what i have done is bad' because this is the new way now." [D, 5] Ex. 2. "I don't know how much of a difference there is in many classrooms. I think a lot of the time maths may still be taught in the traditional approach and then it comes to the end of a section and the teacher is like 'Now we solve some problem solving questions.' [C, 6]
CULTURAL VIEW	Shares How Culture Sees Maths	When a teacher shares how they perceive society views mathematics.	Apply as expressed.		"I think as time has gone on people have bought more into [Project Maths] from going to training days and talking together. I think it's changed. Because the first year I went to workshops (2012) everyone was very negative. But now if you went and asked people, even people who have been teaching for a long time, they can see the benefits" [D, 5]
RESOURCES	Resources for Teaching	When a teacher mentions the importance of resources or resources they use	Apply as expressed Same sentence may double code (see example)	Do not use for mentioning textbook, use TEXTBOOK or projectmaths. le use PM WEB	"I suppose [my planning] varies and whatever resources I have for the topic I try to use a range of methodologies" [D, 3]
VISUAL	Visual (Conceptual) Understanding	Teacher expressing valuing visual understanding or importance of visual understandings.	Apply as expressed for either phrases: "Visual understanding" or "Conceptual understanding" May double code, but if mention visualising code.		"[Project Maths] is about getting away from rote learning. Let's consider the exponential function like in school I just learned what I needed to do to solve it I didn't think about what it was, what it looked like I think there is more of an emphasis on trying to visualise maths and really understand it." [B, 3]
TRAD	Traditional Model		Use ONLY if mentioning		"My fallback is the traditional model by which I mean

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
			using the traditional model sometimes		a bit of exposition and pair work with the textbook" [D, 3]
TRAD ALL			Use if mention tradition model as primary methodology		
OLD TRAD			Use if mention specifically using traditional model with leaving certs		
TRAD TOPIC			Use if mention some topics or a topic requires the traditional model		"It does really depend on the topic. Sometimes you just have to sit them down and practice" [C, 3]
LE / BE TRAD			Use if level of class or behaviour is cause for using traditional model		
COVERAGE			Use if refer to pressure of coverage as why they are using traditional model or as a barrier to using constructivist approaches		 "It's probably more the time demands, of trying to cover the course, of the job that leads you down one way [traditional] than another" [D, 3] " And I think that is because of a mixture of the group and the restraint of the syllabus and trying to get it done" [C, 3] → also code this for LEV/BE TRAD
EXPECT	Student Expectations	Use anytime a teacher expresses concern for student expectations, especially in reference to exam preparation			
EX FOC	Exam Focused Classroom	Use when teacher expresses the exam as focusing / determining their classroom activities.			"The textbook is my main resource and having the solutions is quite helpful. I also think it's better to get them doing papers sooner rather than later, have them practising all along" [E, 4]
TEXTBOOK		Use Anytime Textbook as resource is mentioned	Will double code		"My main resource for teaching algebra is the textbook What we do is we bring in patterns first and we talk about patterns. So we have them come up with a rule. Then we do the algebra chapter. And that order came from the project maths trainings because they really emphasised patterns" [E, 7]
PM WEB	Project Maths website	Use any time ProjectMaths.ie is referenced as a resource			See example below.
PHONE		Use anytime student phones or school ipads are used in the classroom as a resource			See example below.

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
DIFF		Teacher expresses one of the values of constructivist teaching approaches as differentiation.	Apply as expressed.		"I use a lot of resources on the project maths website and I am able to use the school ipads. So the kids can work through the activities at their own pace. It's good for differentiation because some of them only get a few parts done but some get more." [C, 5]
REWARD	Rewarding or Enjoyment	When teacher expresses constructivism as being rewarding or enjoyable.	Apply as expressed.		Ex. 2 " They just wanted me to show them how to do everything, and it really took ages to get them to finally get into their heads 'You can do this yourself.' It did take a month or two but finally we are at that point where we have that set up now and they know I'm not just going to give them answers. But it definitely takes effort, and it's their mindset that needs to be changed. But once you get there, it's really rewarding" [B, 2] "I have always been interested in using a mix [of methods]. I'm even more interested in it now because my younger groups have really bought into it [constructivism]. So, it encourages me to do more because I actually see them enjoying it. I love when I can hear the kids chatting about what we did the previous day and they're actually talking excitedly about maths" [C, 4]
APPLY	Applying Mathematics to Real World	Teacher feels that Project Maths means applying mathematics to the real world.	Apply as expressed.		" I personally like it [Project Maths]. That's probably coming from my Physics background as well, a in Physics would really be the practical application of maths." [C, 5]
PM UND	Project Maths - Understanding	Teacher feels that Project Maths means an increased focus on understanding mathematics.	Apply as expressed.		"Let's consider the exponential function like in school I just learned what I needed to do to solve it. I didn't think about what it was, what it looked like I think [in Project Maths] now there is more of an emphasis on trying to visualise and understand it. So on that side I am happy." [B, 3]
PM PS	Project Maths - Problem Solving	Teacher connects Project Maths with a focus on or with using problem solving.	Apply as expressed.		"I like the problem solving [that came in] with Project Maths Now the actual technical maths ability has reduced a little bit." [C, 5]
LIT	Literacy Skills	Teacher notes the stress of the literacy demands of Project Maths on some students			"I would just say one thing about the literacy Like I've got two lads in this 5th year class, they are very, very good, but they've got dyslexia and sometimes they don't even know what the question is saying But, I do think they will get there with it more practice needed." [B, 3]
GOOD IDEA	Project Maths as a Good Idea	Many of the teachers referred to Project Maths as a "good idea"	Use if teacher ver baitem says "Project maths is a		

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
			good idea"		
NEG PM	Societal Negativity about Project Maths	Use if participant acknowledges that they understand or feel there are negative views about project maths.			" I know there is a lot of negativity towards it [Project Maths] but I would be positive." [B, 3]
POS PM	Positive Towards Project Maths	If participant displays a positive attitude towards project maths			"I'd be overall quite positive about it [Project Maths]" [D, 4]
NEG PERS PM	Personally negative towards Project Maths.	No teachers were personally negative towards PM.	Sometimes what is not coded for is just as important No evidence from textual data that teachers had negative disposition to Project Maths, just that they recognised other people have been negative.		0
REDUCTION	Reduction in Rigour	Some teachers were concerned about the loss of rigour under Project Maths compared to the old syllabus.			"I like the problem solving [that came in] with Project Maths Now the actual technical maths ability has reduced a little bit." [C, 5] "I think some rigour has been lost" [D, 5]
EXAM DISS					"I think the overall aim of trying to get students to think more themselves is admirable. I think it's better than it was before but unfortunately I think the leaving cert. Exam now is a little harder to get an A but way easier to get a C. So I think you can pick up way too many marks for not doing too much maths in all the papers. I think some rigour has been lost there" [D, 5] "The problem with Project Maths is that they tweaked the exam paper in a big way. They made every question compulsory The exam paper is [now] so much less predictable. That reliability was lost." [E, 5]
FUNCTIONS BASED	Functions-Based Approach to Algebra	The functions based approach begins using patterns and then focuses on how you could express the patterns in general.	Use if the teacher clearly is using a functions based approach by starting with patterns		"This was the first year I did this because last year I received an in-school in-service in algebra the guy was really good And he was telling us to introduce algebra through patterns which was something I had never done previously. It worked really well and there are loads of good resources on projectmaths.ie" [C, 8]
A + O	Apples and Oranges	Some teachers explain the x's and y's by replacing them with apples and oranges or boxes, etc.	Use if teacher explicitly says using "apples and oranges" or "boxes"		"Apples and oranges works brilliant for the x's and y's and the weighing scales [visual] is brilliant for solving equations" [B, 4]

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
			1		
NO PAT	No Patterns	Transformational approach to algebra	Code for teachers do not mention patterns when answering algebra question.		"I start [teaching algebra] very basic Just kind of how the books would introduce it that the unknown item can be anything and it just so happens that as we move through we start calling x and y" [A, 6]
BALANCE	Balancing Equations	Teachers expressed focusing on working with equations as a balance metaphor.	Code for if teachers mention using the "balancing scales" or focusing on balancing when teaching algebra.		"Weigh scales for solving equations is brilliant." [B, 4]
CIC	Common Introductory Course	The CIC has been removed from the new Junior Cycle.	Code for if teachers mention having this knowledge.		"The only reason the CIC came up during my cluster day was because I asked about it. They didn't even highlight that. It wasn't structured into the day. So, first year is now whatever you want it to be, I'm fine with that, but I mean surely that should have been discussed a little" [D, 7]
NO INFO	No Information	There has been little to no information released about the forthcoming changes to Junior Cycle Maths in 2018.			"We are all in the dark" [E, 6] "We don't know anything There's literally nothing online, I've looked. The resources just aren't there and just totally airy fairy" [B, 4]
ANNOYED	Annoyed or Frustrated	Showing annoyance or frustration at the lack of information			"There's no examples of the continuous assessment up yet No examples of the new paper they're really putting it on the long finger saying 'we don't know anything about it yet' and it's coming in september. I just means that they have brought in this idea but haven't thought it through yet So that really frustrates me" [C, 7]
SKEPTICAL	Skeptical or concerned	Showing skepticism or concern about the reform			"None of the concrete questions that people had were answers, they said they couldn't be answered until September which I just don't think is really good enough as we are meant to be implementing it in September I didn't say this but I will quote a teacher who said this after the cluster day, "I wasn't too worried about the new junior cycle but now I am." [D, 6-7]
TOO SOON	Too Soon since PM	Some teachers felt the reform was just coming in too soon after there had just been a reform			"What I do think is that the timing is not good. Like the teachers who have been teaching for awhile, we have just come through the change of PM and to put people through that again just feels over the top" [E, 6]
WANT2PLAN	Want time to plan	Teachers expressed wanting time to plan / get used to new curriculum			"If my students are going to be graded on a reflection of group work I would prefer to be giving them little samples of doing that type of work from 1st year, get them used to it. Rather than in two years time when

Code	Brief Definition	Full Definition	When to Use	When Not to Use	Example
					they have to do it and only being told a few months earlier, "This is what you have to do" [C, 7]
СВА	Continuous Based Assessment		Code for if teacher mentions that they are aware this is coming but have no concrete understanding of what it will entail.		"I went [to the cluster day] and they couldn't answer what the assessments, the CBAs, were going to be like." [D, 6]