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How Team Innovative Work Behaviour Unfolds under Top-Down, Incremental Change in Education: A Longitudinal Case

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Abstract Sustainable educational innovation requires teams that demonstrate Team Innovative Work Behaviour (TIWB). Although TIWB is often described as iterative and fluid, little is known about how it unfolds over time within teacher teams. This longitudinal qualitative case study examined TIWB in a team involved in a top-down, incremental curriculum redesign in higher education. Over eight months, 19 recorded team meetings were analysed using a codebook based on five TIWB dimensions, complemented by interpretive depth cues such as counter-argumentation and collective sense-making. TIWB followed a predominantly linear pattern aligned with the project phases, with one nested design subcycle emerging around assessment development during implementation. Idea generation and idea realization occurred frequently, whereas opportunity exploration and idea sustainability, especially external dissemination, were rare. The structured, top-down context and incremental nature of the innovation plausibly contributed to these patterns.
These findings offer a fine-grained view of how TIWB unfolds in practice and underscore the importance of stimulating sustainability-oriented behaviours from the start so that innovations are not only implemented but also sustained over time. The study provides practical guidance for strengthening sustainability within teams, including early agreement on design criteria, clearer dissemination roles, and reflective moments during meetings.

Keywords Team Innovative Work Behaviour, curriculum redesign, sustainability, higher education, top-down innovation, qualitative case study

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1 Introduction

In recent years, education has undergone significant transformations in response to global societal and technological changes. The increasing demand for lifelong learning, rapid digitalization, and evolving labour market requirements are reshaping how education is designed and delivered (International Commission on the Futures of Education, 2021). Higher education institutions, in particular, are transitioning from traditional teacher- and subject-centred approaches toward student-centred and competence-based learning (Zitter & Hoeve, 2012). This transition is driven by the need to prepare students for a highly dynamic and uncertain professional landscape, where adaptability and innovation are key to success (Schleicher, 2018).

Moreover, major disruptions, such as the COVID-19 pandemic, have exposed vulnerabilities in existing educational structures and highlighted the urgent need for innovation in teaching and learning practices (Zhao & Watterston, 2021). To address these challenges, education systems must embrace continuous innovation (OECD, 2019). Scholars emphasize that innovation should not be seen as an isolated process but as an integral part of an organisation's core activity (Corbo, Reinholz, Dancy, Deetz, & Finkelstein, 2016; Drucker, 2001). However, research also suggests that innovation in education depends not only on individual efforts but also on collaborative processes within teams (Schippers, Scheepers, Peterson, 2015; Tjosvold & Wisse, 2009).

Teacher teams, often interdisciplinary, play a central role in fostering innovation in educational settings (Jaskyte, Hunter, & Mell, 2024). Given the scale and complexity of contemporary educational challenges, fostering innovation at the team level is essential (Kamp, van Veen, & de Vries, 2014). Teachers must engage in collective problem-solving, experiment with new pedagogical approaches, and continuously refine their practices to ensure that innovations are both effective and sustainable (Widmann & Mulder, 2018). Intensive social interaction and complementary expertise of team members encourage teachers to move beyond routine tasks into more knowledge-intensive processes (Ahmad & Sajid, 2024).

However, team-based innovation is not always straightforward. Its success depends on how teams engage in collective learning and research-driven collaboration (Meijer, de Jong, & Oolbekkink-Marchand, 2021). Team characteristics include (1) the long-standing individualism of teachers, (2) relatively small innovation projects typically limited to one academic year, and (3) stable team composition (Widmann & Mulder, 2018). Research suggests that such collaborative innovation processes contribute not only to student learning but also to teachers' professional development (Arkenbout, Zitter, & Poortman, 2019).

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A typical example of innovation in education is the design or redesign of a course or programme. These innovations aim to enhance teaching and learning processes, improving effectiveness and quality, and sometimes reducing costs. While such projects may be new to a specific teaching team, the innovative ideas may already exist elsewhere. Both radical innovations and incremental innovations are increasingly common in higher education (Koeslag- Kreunen, Van den Bossche, Van der Klink, & Gijselaers, 2020). Yet, some teams navigate these innovations more effectively than others. Team Innovative Work Behaviour (TIWB) explains this variation by emphasising that innovation requires coordinated team-based actions rather than individual effort (Thurlings, Evers, & Vermeulen, 2015).

We understand TIWB broadly as the collaborative activities through which teams identify opportunities, generate ideas, promote promising directions, and work toward implementing and sustaining innovations. Several phases of the innovation process have been identified: opportunity exploration, idea generation, idea promotion, and idea realization (Janssen, Schoonebeek, & Looy, 1997; Kleysen & Street, 2001). Lambriex-Schmitz, Van der Klink, Beausaert, Bijker, and Segers (2020a) further differentiate criterion-based implementation and learning-based communication within idea realization and introduce a fifth phase, idea sustainability, comprising internal embedding and external dissemination (see Table 1).

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Table 1

Phases of Team Innovative Work Behaviour (Lambriex-Schmitz et al., 2020a)

Opportunity Exploration	Paying attention to trends and developments in order to recognize problems and opportunities for innovation.
Idea Generation	Generating novel and useful ideas for products, services or processes.
Idea Promotion	Seeking sponsorship for the ideas among colleagues and supervisors, keeping them informed about the ongoing process, negotiating with key persons about permissions, funding and facilitation.
Idea Realization	Differentiates between Criterion-Based Implementation and Learning-Based Communication. Criterion-Based Implementation emphasizes the assessment of the progress of the innovation based on criteria. Learning-Based Communication stresses the importance of information sharing and reflection on innovation development and individuals' professional development.
Idea Sustainability	Differentiates in external dissemination, which is focused on networking and broader distribution of the innovative idea and internal embedding, where the innovation is anchored in the organisational system.

Although TIWB has been studied before, most research uses cross-sectional, survey-based methods (Widmann & Mulder, 2018), which overlook the possibility that innovation phases may be iterative or fluid (Dyer & Nobeoka, 2000; Singh, 2005). Moreover, survey studies typically collect individual data, neglecting the social and interactive nature of TIWB. To address these gaps, this study examines all phases of TIWB, including idea sustainability, using a qualitative, longitudinal approach. We analyse team interactions in a teacher team working on an incremental innovation project to investigate how TIWB unfolds across innovation phases and whether it proceeds iteratively, fluidly, or linearly.

This study addresses the following research questions:

1. Which team innovative work behaviours emerge within the different phases of the innovation project?
2. Do these behaviours proceed in an iterative, fluid, or linear manner?

Using a case study of a teacher team redesigning a course at a Dutch university, we examine how TIWB develops over time. The study aims to provide insights into how team collaboration contributes to the success and sustainability of educational innovations and to uncover plausible mechanisms explaining why specific TIWB phases dominate under the conditions of a top-down, incremental curriculum redesign. By adopting an explanatory process-tracing approach, we illuminate how contextual conditions shape the unfolding of TIWB over time.

2 Theoretical background

2.1 Team Innovative Work Behaviour

Widmann, Messmann and Mulder (2016, p. 432) defined Team Innovative Work Behaviour (TIWB) as 'the sum of all physical and cognitive work activities teams carry out in their work context to attain the necessary requirements for the development of an innovation'. This conceptualisation builds on the definition of individual innovative work behaviour (Messmann & Mulder, 2012), which is grounded in organisational psychological models describing innovation as a two-phase process consisting of a creative phase and an implementation phase (Amabile, 1996; West, 2002).

In line with this conceptualisation, TIWB includes processes of innovation development that can be categorised as either team creative behaviour (TCB) or team implementation behaviour (TIB). TCB encompasses contributions related to opportunity exploration, such as recognising pressing problems and needs for improvement, as well as activities related to idea generation, including recognising starting points and formulating possible solutions. TIB involves contributions related to idea promotion, such as dividing responsibilities within

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the team and securing support from stakeholders, and activities related to idea realization, including experimenting with prototypes and refining the innovation for routine use (Widmann et al., 2016).

Similarly, other scholars define team innovative behaviours as the set of activities that teams undertake to create, develop, and implement new ideas. Litchfield, Karakitapoğlu-Aygün, Gumusluoglu, Carter, and Hirst (2018) note that team innovative behaviours directly involve creating, developing, and implementing ideas to accomplish the team's work (p. 353). For teams to be innovative, team members must generate creative ideas, and critically evaluate them to select those worth developing further (Amabile, Conti, Coon, Lazenby, & Herron, 1996). With respect to implementation, Nijstad, Berger- Selman, and De Dreu, (2014) emphasise that innovations require implementation and not only idea generation. Factors that stimulate creativity do not necessarily stimulate implementation (e.g., Bledow, Frese, Anderson, Erez, & Farr, 2009; West, 2002). In the same vein, Le Blanc, González-Romá, and Wang (2021) underline that TIWB includes implementation, following Amabile's (1988, p. 126) definition of innovation as "the successful implementation of creative ideas."

Although the aforementioned definitions acknowledge that TIWB involves all team activities leading to the development and application of innovative ideas, they all lack a dimension referring to the final phase of the innovation cycle. Fix, Rikkerink, Ritzen, Pieters, & Kuiper, (2021) observed that many educational innovations struggle to maintain sustainability: they flourish briefly and then fade in the everyday hustle and bustle of the school. This reflects a lack of attention to the final phase of innovation. West and Farr (1989) label this phase the stabilisation phase, and Fullan (2007) refers to it as the continuation phase.

Aligning with these perspectives, we add a sustainability dimension comprising external dissemination (networking and broader distribution of the innovative idea) and internal embedding (anchoring of the innovation in the system) (Lambriex et al., 2020a). We therefore extend the definition of TIWB proposed by Widmann et al. (2016) by including sustainability. This results in the following definition:

Team Innovative Work Behaviour (TIWB) is the sum of all physical and cognitive work activities teams carry out in their work context to attain the necessary requirements for the development and sustainable implementation of an innovation.

Regarding the object of innovation, this refers to 'the application of new ideas, processes, products, and procedures within work teams' (Le Blanc et al., 2021,

p. 334). Concerning the level of innovativeness, innovations only need to be new to the unit of adoption, what is innovative in one setting may be routine in another (Anderson, De Dreu, & Nijstad, 2004).

Innovations vary from incremental adjustments (minor changes in practices or technology) to radical transformations involving greater risk and broader organisational impact (Dewar & Dutton, 1986; Tellis, Prabhu, & Chandy, 2009).

2.2 Team Innovative Work Behaviour as an iterative and/or fluid process

Innovation was long conceptualised as a linear process in which teams move sequentially from opportunity exploration to idea generation, idea promotion and idea realization. From the early 2000s onward, however, scholars increasingly described innovation as a multiphase iterative process, in which earlier phases may be revisited through feedback loops (Lubart, 2001; Dorenbosch, Engen, & Verhagen, 2005). More recently, research has added that innovation processes can also be fluid, meaning that boundaries between phases become blurred and activities from different phases co-occur within the same interaction episode (Widmann, Mulder, & König, 2019; Widmann & Mulder, 2018). In this study, we treat these concepts as analytically distinct: *iteration* concerns temporal recurrence (e.g., A → B → C → A), whereas *fluidity* refers to the permeability of phase boundaries and simultaneity of behaviours.

In educational settings, innovation processes are not only important for producing new practices but also have developmental value for employees and teams. Collaborative work on an innovation often leads to shared reflection, knowledge exchange and professional growth (Evers, Kreijns, Van der Heijden, & Gerrichhauzen, 2011; Messmann & Mulder, 2012). These developmental dynamics underscore the importance of understanding not only which innovative behaviours occur, but how their sequencing unfolds over time.

Although scholars propose that TIWB may show iterative or fluid patterns (Widmann et al., 2016; Widmann & Mulder, 2018), most empirical studies rely on cross-sectional, individual-level surveys, which offer limited insight into the temporal unfolding of team-level interaction processes. Longitudinal studies that directly observe TIWB as a social-interactive phenomenon remain scarce (Widmann & Mulder, 2018). Our study addresses this gap by examining, without a priori assumptions, whether TIWB unfolds iteratively, fluidly, or predominantly linearly within the contextual conditions of a top-down, incremental curriculum redesign.

Finally, earlier research highlights that team characteristics and interaction patterns shape how TIWB emerges. Differences in expertise, informal

leadership roles, and variation in design experience influence how teams engage in exploration, idea generation and shared decision-making (Koeslag-Kreunen et al., 2020; Litchfield et al., 2018; Meijer et al., 2021). These dynamics affect whose ideas are taken up, how critical feedback circulates and how reflective dialogue develops (Lambriex-Schmitz et al., 2020b). Recognising TIWB as a social-interactive process therefore requires attention to role distribution, coordination and the heterogeneity of contributions within teams. These insights inform our interpretation of TIWB patterns observed in this case study.

3 Methodology and methods

3.1 Methodological positioning

We adopted an explanatory process-tracing approach, commonly used in single-case qualitative research, to gain in-depth insight into how Team Innovative Work Behaviour (TIWB) unfolds over time within a specific innovation context (Gerring, 2004; Beach & Pedersen, 2019). This approach is particularly suited to examining temporal sequences and identifying underlying mechanisms that link contextual conditions, such as a top-down assignment, predefined deliverables, and an incremental scope, to observed patterns of team behaviour.

Within this explanatory logic, our aim was not to establish statistical causal effects or generalisable causal relationships. Rather, we focused on understanding how and why specific TIWB behaviours emerged and clustered across project phases, thereby avoiding confusion between causal inference and causal explanation. This approach justifies our focus on the temporal unfolding of interactions, the content of team discussions, and the interpretive analysis of how specific behaviours cluster and recur across phases. Building on this explanatory orientation, we applied an in-depth case study design.

To answer the research questions, we followed a teacher team that collectively designed and implemented a curriculum innovation in higher education throughout its innovation process in this exploratory longitudinal case study. We chose the case study approach for four reasons. First, our study is exploratory rather than confirmatory. Second, we aim to make descriptive rather than causal inferences. Third, we seek to deepen our understanding of the TIWB process rather than focus on breadth and generalizability. Fourth, we aim to gain insights into plausible explanatory mechanisms rather than causal effects (Gerring, 2004). This approach allows us to investigate team behaviour in all its complexity as the team progresses through the various project phases during team meetings in a real-life setting (Willis, 2008). The unit of analysis was at the team level (Yin, 2014). The analysis codes used in this study are provided in the appendix.

3.2 Data sources and ethical considerations

The data for this study consisted of audiotapes of recorded team meetings in which teachers collaboratively designed, developed, and implemented the module. Because these recordings contain identifiable information, the raw data cannot be made publicly available but may be obtained from the corresponding author upon reasonable request. All participating team members provided written informed consent, and all procedures complied with institutional ethical guidelines and GDPR standards.

3.3 Case context and team characteristics

The innovation project concerned a top-down, incremental curriculum redesign mandated by the university board. Although the innovation was prescribed top-down, the teacher team retained considerable autonomy over specific design and assessment decisions within the module. The team was responsible for designing, developing, and implementing a first-year module in the domain of communication sciences.

The composition of the team varied slightly across phases but consistently included several subject-matter teachers and the module coordinator. One member contributed educational design expertise, and another was responsible for scheduling. The latter's operational insights frequently shaped discussions about feasibility and workload. Most teachers had prior experience contributing to the development of other modules within the programme, resulting in varying levels of curricular design and assessment expertise. Informal role patterns also emerged during meetings, such as coordinative behaviours and expertise-driven contributions.

This contextual information is important for interpreting the observed TIWB patterns. The top-down assignment, incremental scope, differences in design and assessment experience, and changes in team composition likely contributed to the limited opportunity exploration, the largely linear pattern of innovation, and the minimal attention to external dissemination.

These team characteristics and role patterns therefore appear to have reinforced the effects of the top-down, incremental nature of the project.

3.4 Setting and sample

The study was conducted at a university in the Netherlands that had recently introduced a new educational model for all bachelor's and master's programmes. This model replaced multiple smaller, standalone courses with integrated, multidisciplinary modules in which a project forms the backbone of the curriculum (Visscher-Voerman & Muller, 2017). Lectures and tutorials were

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explicitly connected to the project, and students collaborated in project teams under the guidance of a tutor.

Within this model, teacher teams, typically consisting of two to ten teachers, were responsible for designing, developing, and delivering each module. Although the new educational model was mandated by the university board, teams retained considerable autonomy over specific design choices (e.g., assessment formats, distribution of tasks, and pedagogical emphasis), resulting in noticeable variation in how modules were structured across programmes.

Against this institutional background, we followed one teacher team throughout the full innovation trajectory. In total, 19 team meetings were audiotaped, transcribed, and analysed, covering a period of approximately eight months. Each meeting lasted around 90 minutes, with small natural variation across sessions, and attendance ranged between 8 and 11 teachers depending on availability and task responsibilities.

3.5 Coding scheme *(see Appendix)*

The main codes of the coding scheme were developed on the basis of the definitions of the dimensions of IWB: opportunity exploration, idea generation, idea promotion, idea realization, i.e., criterion-based implementation and learning-based communication and idea sustainability i.e. internal embedding and external dissemination. After the main codes were described, the subcodes were developed (see Table 4 for the main and subcodes). For that purpose, the questionnaire developed by Lambriex et al. (2020a) was used. Three researchers of the research team interdependently clustered items of the questionnaire into subcodes. Differences regarding the sub- coding were discussed until consensus was reached. This resulted in a draft coding scheme which was then discussed and adopted on the basis of a discussion with the entire research team, consisting of six researchers.

3.6 Coding procedure

The 19 transcripts and the coding scheme were imported into the qualitative analysis software Atlas.ti (version 1.6.0 for Mac). Segments were highlighted only when they concerned the work of designing, developing, or implementing the new educational module. Contributions that focused solely on practical conditions (e.g., timetables, scheduling of the meetings, or logistical arrangements) were excluded, as they did not reflect innovative work behaviour.

The coding process followed three rounds (Cohen, Manion, & Morrison, 2000). First, the first author and a trained coder independently identified meaningful segments in two transcripts. All selected segments had to relate to TIWB.

After agreement was reached on the identification procedure, the first author continued segment selection for the remaining 17 transcripts.

Second, the first author coded all meaningful segments (n = 1990) using the full coding scheme. An independent coder, trained in the use of the scheme, coded 40 meaningful segments for each of the three phases (design and development, implementation, evaluation), yielding a total of 120 segments. Coding differences were discussed until consensus was reached, which led to several refinements of the coding scheme (e.g., merging subcodes and adding missing nuances).

Third, a double-blind coding round was conducted to assess interrater reliability. In total, 10% of all meaningful segments (200 segments) were randomly selected across all project phases. For the design and development phase and the implementation phase, three meetings were randomly selected, with 25 segments drawn from each meeting (75 segments per phase). For the evaluation phase, which consisted of one meeting only, 50 segments were randomly selected. Discrepancies were discussed until full agreement was reached.

This procedure resulted in good overall interrater reliability, with a Cohen's kappa of 0.80 for the entire double-blind coding process. Kappa values for the individual phases are presented in Table 2.

Table 2

Overview of the course design project

Project phase	Number of meetings and weeks	Total number of team members involved	Double blind coding (total 10%, 200 segments)	Cohen's Kappa Main code	Cohen's Kappa Sub code
Project startup: Design and develop	11 meetings 19 weeks	4 women, 4 men	75 segments 3x 25 segments meeting 7, 9, 1	0.64	0.73
Execution phase: Implementation	7 meetings 15 weeks	4 women, 5 men	75 segments 3x 25 segments meeting 12, 18, 16	0.67	0.69
Project completion: Evaluation	1 meeting 1 week	4 women, 7 men	50 segments 1x 50 segments meeting 19	0.70	0.78
Total project	19 meetings 35 weeks		200 segments	0.82	0.80

3.7 Data analysis

We analysed the coded segments to identify patterns in the prevalence, sequencing, and clustering of TIWB behaviours within and across project

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phases. This included examining both the distribution of codes per phase and the temporal unfolding of behaviours in relation to the project timeline.

In addition to reporting the frequency of coded segments, we incorporated qualitative depth cues to capture the interpretive richness of team interactions. These depth cues included (a) the presence of counter-argumentation or critical questioning, indicating conceptual elaboration; (b) refinement of earlier ideas, signalling iterative reasoning; (c) explicit articulation of criteria or underlying assumptions; and (d) evidence of collective sense-making, such as jointly developing or adjusting a solution. These interpretive markers were used to complement the quantitative overview of coded segments and allowed us to evaluate not only how often behaviours occurred, but also the extent to which discussions reflected deeper cognitive engagement within and across project phases.

4 Results

The results are presented in three steps: (1) an overview of the prevalence of each TIWB dimension, (2) patterns across the three project phases, and (3) findings for each TIWB dimension in detail.

4.1 TIWB dimensions: An overview

Where relevant, we draw on these interpretive depth cues to clarify the qualitative nature of team interactions within each TIWB dimension.

In terms of the prevalence of the TIWB, our data show that *idea generation* is most common (1087 quotes). This is followed by behaviours from the *idea realization* dimension (criterion- based implementation, 411 quotes, learning-based communication, 339 quotes). Behaviours related to *idea promotion* and *internal embedding* of idea sustainability are observed several times (85 and 60 quotes, respectively). Behaviours that fit with *opportunity exploration* and *idea sustainability external dissemination* are rare (7 and 1 quote, respectively). In terms of the time spent on the TIWB, we look at the number of meetings for each of the TIWB dimensions per project phase (design and development, implementation and evaluation). During the total project period, the team had 19 sessions. In the first phase, design and development, most quotes focused on *idea generation* (11 sessions, 920 quotes). Relatively fewer quotes were on *idea promotion* (10 sessions, 82 quotes) whereas *opportunity exploration* was only occasionally observed (4 sessions, 7 quotes). In this design and development phase, little attention was paid to *idea realization* (4 sessions, 10 quotes). Behaviours that match the *idea sustainability* dimension were not observed (see Table 3).

Table 3

Meaningful units per meeting and TIWB dimension

Meeting Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		Design and development									Implementation									Evaluation
TIWB dimensions																				
OE						4				1	1	1								
IG		74	141	99	124	157	76	87	112	89	70	34		35						
IP		2	4		20	5	14	8	11	11	5	2		3						
IRCBI													48	61	20	50	40	41	19	129
IRLBC					1	1				7	1		35	24	36	55	58	52	30	38
ISIE													4	1		13	7	2	1	32
ISED														1						

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During the second phase of the project, the implementation of the new module, *idea realization learning- based communication* and *idea realization criterion-based implementation* were observed in all 7 sessions (292 and 302 quotes). Other behaviours that were detected in this implementation phase were *idea generation* (1 session, 35 quotes), *idea promotion* (1 session, 3 quotes), *idea sustainability internal embedding* (6 sessions, 28 quotes) and *idea sustainability external dissemination* (1 session, 1 quote).

In the third phase (evaluation phase, 1 meeting) of the project, three dimensions of TIWB were observed: *idea realization* (criterion- based implementation, 129 quotes), *idea realization* (learning- based communication, 38 quotes) and *idea sustainability* (internal embedding, 32 quotes).

Table 4

Overview of the number of codes and subcodes per TIWB dimension

Main code	Number of quotes	%	**Sub code**	Number of quotes
Opportunity Exploration	7	0.35	General discussion on current situation and detecting opportunities for innovation	7
Idea Generation	1087	54.6	Critical analysis of the current situation	511
			Suggest ideas in terms of content, assessment, and collaboration	576
Idea Promotion	85	4.2	Promoting ideas	73
			Promoting practical application	12
Idea Realization Criterion Based Implementation	411	20.7	Critical evaluation	231
			Implementation related idea generation	165
			Implementation related idea promotion	8
			Defining criteria	7
Idea Realization Learning Based Communication	339	17.0	Reflection on innovation process	32
			Inform about the process	275
			Strategy development	11
			Ask for input for possible solutions	21
Idea Sustainability Internal Embedding	60	3.0	Analysis and discussion of results	20
			Improvement	28
			Embedding	10
			Professional development	2
			Inform about the process and the results	0

Opportunity Exploration (OE), Idea Generation (IG), Idea Promotion (IP), Idea Realization Criterium- Based Implementation (IRCBI), Idea Realization Learning- Based Communication (IRLBC), Idea Sustainability Internal Embedding (ISIE), Idea Sustainability External Dissemination (ISED)

Main code	Number of quotes	%	Sub code	Number of quotes
Idea Sustainability External Dissemination	1	0.05	Networking	1
			Scaling up - expand	0
			Communicating about gaining (results and benefits)	0
Total	**1990**	**100%**		

4.2 Findings per TIWB dimension

Opportunity exploration
As Table 4 shows, opportunity exploration, recognising trends, developments, or opportunities for innovation, was observed only rarely (seven segments). When this behaviour did occur, it mainly concerned raising critical notes about the newly introduced educational philosophy, the assessment-related inconsistencies it created, and the practical problems arising from it. For example, one teacher noted that "the way in which test data is drawn up and the module deals with whether or not a resit is taken […] is causing confusion among students" (5:176).

Building on this observation, the team reflected that such inconsistencies extended beyond their own module and stressed the importance of applying resit policies more consistently across programmes. They then shifted the focus to their own responsibility, emphasising that, regardless of institutional ambiguity, they wanted to communicate clearly to students how resits would be organised within their course. This discussion soon transitioned into idea generation, in which the team explored concrete solutions for scheduling and designing resits in their own module.

Idea generation
Most quotes (1087) were linked to idea generation, which refers to generating novel and useful ideas for products, services, or processes. Two types of behaviours were dominant: (1) *critical analysis* of the current situation (511 quotes) and (2) *suggesting concrete ideas* that offered possible directions or solutions for improving content, assessment, or collaboration (576 quotes). Although these suggestions often took the form of practical solutions, they still reflected idea generation because they concerned proposing and elaborating ideas rather than implementing them. In most cases, analytical reflections triggered the formulation of such solution-oriented ideas, resulting in short problem–solution sequences within the idea generation phase. *Illustrating such critical analysis*, one teacher questioned whether students "also start thinking about the why question […] maybe they should know this earlier?" (1:16). *This reflection directly prompted a solution-oriented idea*, with another teacher

suggesting that “in the first or second week, the theory line will also have to communicate seeking information […] we could even put that in the first opening lecture” (1:17).

A striking observation was that idea generation also emerged during the implementation phase, specifically in relation to the design of the formative and summative tests. Although the lessons were already being delivered (project phase 2), the assessment design process was still ongoing. This created a separate design trajectory in which all innovative behaviours reappeared but shifted over time. In session 13, the team therefore initiated a new micro-sequence of idea generation, focused on determining the number, structure, and form of the tests, followed by idea promotion and subsequently idea realization. This resulted in a linear design-and-implementation subcycle nested within the broader project timeline, reflecting how the assessment component lagged behind other elements of the redesign and required late-stage ideation to ensure coherence within the module.

Idea promotion

Eighty-five quotes were linked to idea promotion, referring to seeking sponsorship for generated ideas among colleagues and supervisors, keeping others informed about the ongoing process, and negotiating with key stakeholders about permissions, funding, and facilitation. Most promotion behaviours (73 quotes) focused on presenting and strengthening the appeal of generated ideas within the team, while a smaller number (12 quotes) concerned promoting their practical application.

These behaviours occurred almost exclusively during the design and development phase. *Illustrating how teachers promoted the promise of a newly generated idea*, one team member emphasised that the proposed assignment created “a very nice ending […] combining new media aspects that all went through Facebook with the so-called old media, mass media” (1:77). By framing the idea as an appealing synthesis of theoretical concepts and a widely recognisable case, the teacher encouraged colleagues to adopt and support the proposed direction.

Only three promotion behaviours emerged during the implementation phase (session 13), all of which related to promoting the evolving design of the formative and summative tests. In line with the nested assessment subcycle described earlier, these promotion activities served to align colleagues around test design choices that were still under development while lessons were already being taught.

Idea realization criterion based implementation

A considerable number of behaviours (411 quotes) were linked to criterion-based implementation, which refers to critically evaluating the progress of

the innovation and suggesting improvements based on observed difficulties or criteria. Two behaviours dominated this dimension: *critical evaluation* (231 quotes) and *implementation-related idea generation* (165 quotes). In most cases, these behaviours followed one another in short evaluation–solution sequences.

Illustrating such critical evaluation, a teacher expressed concern about students' limited opportunities for focused study time, noting that "I do not think they are really against the new system; the issue is that so many things are mandatory and they do not have the space to truly sit at home and learn for a day" (13:61). *This evaluation immediately triggered a solution-oriented proposal*, when another teacher suggested, "You can indeed just say that in the next module we will give lectures for three weeks and then do a project for two weeks […] then they can focus slightly more on one thing. Now it is all mixed up" (13:62).

Only a small number of quotes related to promoting implementation ideas (8 quotes) or defining explicit criteria (7 quotes). Across these interactions, small iterative micro cycles emerged: earlier design decisions were re-evaluated based on implementation problems, after which new ideas were proposed to adjust or refine these decisions. This pattern was particularly visible in session 13, where the nested assessment subcycle created a concentrated cluster of evaluation-solution sequences as the team worked to align test design with the already ongoing lessons.

Idea realization learning- based communication

During twelve meetings, learning-based communication was observed frequently (339 quotes), indicating the importance of information sharing, clarification, and joint reflection during the implementation of the module. The most dominant behaviour was *informing others about the process* (275 quotes), in which teachers updated colleagues on lesson progress, aligned materials, and clarified how specific activities should be executed. These interactions often consisted of questions and requests for clarification such as "How do I do it? How do you do it? How exactly are we going to do this?", reflecting the team's need to coordinate lesson delivery and instructional details.

Illustrating such information sharing, one teacher explained the expectations for an upcoming assignment, noting that "it is just a practical presentation […] you come with your draft, because everything is finished then, with your video, and you present it as if it is already for real, and it is commented on by experts and by your own group" (9:124). This type of clarification helped ensure that all teachers communicated consistent instructions to students and were aligned in their expectations.

In addition to information exchange, the team also engaged, though to a lesser extent, in *reflection on the innovation process* (32 quotes), *asking for input about possible solutions* (21 quotes), and *strategy development* (11 quotes).

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These less frequent behaviours typically occurred when teachers encountered mismatches between the intended design and the realities of implementation, prompting them to request feedback, reconsider previous decisions, or adjust instructional strategies.

Idea sustainability internal embedding

Behaviours related to internal embedding, anchoring the innovation within the organisational system, were observed primarily during the evaluation phase (session 19, 32 quotes) and, to a lesser extent, during implementation (phase 2). Four types of behaviours were visible: implementing improvement actions, analysing results, embedding the innovation structurally, and engaging in professional development.

The dominant behaviour was *implementing improvement actions* (28 quotes), as teachers worked to refine or optimise solutions that had already been put into practice. *Illustrating such improvement-oriented behaviour*, one teacher noted that "there should be instructions for students explaining exactly how to do that" (16:128), signalling the team's effort to standardise elements of the module that had proven ambiguous in practice.

A second focus involved *collecting and analysing results* (20 quotes), such as interpreting student evaluation data or examining test outcomes to assess whether implemented ideas were effective. As one teacher observed, "while some students recognize the added value, this is not reflected in the work they submit" (19:147), highlighting a mismatch between perceived and demonstrated learning outcomes.

Less frequently, teachers discussed how implemented ideas could be structurally anchored within the broader organisation (10 quotes), for example by aligning assessments or procedures with other modules. In rare cases (2 quotes), teachers also reflected on the professional development needed to sustain and further integrate the innovation.

Idea sustainability external dissemination

During all recorded meetings, only one instance of external dissemination was observed (session 13). This behaviour involved *networking*, participating in an external meeting where the innovation theme was discussed, with the aim of gaining inspiration and exchanging ideas with others. *Illustrating this networking activity*, one teacher explained: "on […] March there is a meeting, but she did not want a very large delegation from us there, what we were planning now. So my proposal is that [name], [name] and I go there on […] March" (13:4).

Apart from this single networking moment, no other forms of external dissemination were observed. In particular, the team did not engage in any activities related to *upscaling* or *communicating about gains, results, or benefits*, two behaviours included in the coding scheme but coded as zero in this project. This indicates that the innovation remained internal to the team and

was not shared beyond the programme.

Together, these findings outline how the TIWB dimensions unfolded across the phases of the project; the implications of these patterns are discussed in the next section.

5 Discussion

The aim of this longitudinal case study was to gain insight into how team innovative work behaviour (TIWB) unfolds over time and which TIWB dimensions are expressed during different phases of a curriculum innovation project. We examined (1) which TIWB behaviours emerge within each project phase and (2) whether these behaviours occur in an iterative, fluid, or linear manner. By using a longitudinal qualitative approach, this study contributes to existing research by showing how TIWB develops in real-time team interactions and by including idea sustainability as a fifth phase in the innovation process.

5.1 Team innovative work behaviour during the different phases of the innovation project

The findings show that the first project phase, *design and development*, was dominated by idea generation behaviours, both critical analysis and the generation of new ideas. These two forms of idea generation frequently followed one another in short cycles: an idea triggered critical questioning, or critical questions prompted new ideas. The ideas mainly concerned organising and planning the course, designing learning activities, and developing tools. Several of these ideas were also promoted among team members, although discussions about how these ideas could be practically applied were less common. This is noteworthy because attention to practical application can strengthen support for innovations and facilitate successful implementation (Fullan, 2010).

In contrast, opportunity exploration occurred only rarely. This limited presence may relate to the top-down character of the innovation project: the educational philosophy and overall module structure were predetermined by the university board, leaving little room for teachers to explore fundamentally different directions. Although the team retained autonomy over specific design and assessment choices, the broader contours of the innovation were fixed, which likely constrained opportunity exploration. When innovations are centrally designed, teachers may experience limited ownership and involvement, two elements known to be essential for successful innovations (Waslander, 2007; Deci & Ryan, 2000). Okoth (2016) argues that teachers involved in top-down innovation projects need an informed understanding of the broader rationale underpinning the envisioned innovation, including the educational theory, conceptual foundations, and intended goals. Discussing this rationale early in the process may enable teachers to develop a shared understanding and stimulate more proactive exploration of (alternative) ideas.

During the second phase, *implementation*, two idea realization behaviours were dominant: learning-based communication and criterion-based implementation. Learning-based communication occurred most frequently and mainly involved informing team members about the progress of lessons, aligning content, and clarifying expectations. Only limited attention was paid to reflecting on the innovation process itself or discussing long-term innovation strategies. Criterion-based implementation was also clearly visible, particularly through the interplay between critically evaluating emerging problems and generating ideas to address them.

Importantly, the idea generation observed here differed from idea generation in the design phase: rather than developing new or creative directions for the module, idea generation during implementation focused on finding quick, practical solutions to problems that emerged during daily work. These solutions were therefore reactive rather than exploratory.

However, explicit criteria for making such decisions were rarely defined. As a result, some of the proposed solutions did not fully align with the project's overarching vision and goals. *For example*, in response to concerns about students' workload and ability to combine project tasks with theoretical components, one teacher suggested reducing theoretical activities to create more time for project work. Although this addressed an immediate implementation issue, it conflicted with the intended learning goals and the competence-based educational vision guiding the redesign.

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In line with this, other idea realization behaviours, such as *seeking input from others about possible solutions*, *strategy development*, and *implementation-related idea promotion*, were detected only rarely. Their limited presence suggests that while teachers actively addressed emerging problems, more structured collaborative decision-making was largely absent during this phase.

Behaviours related to idea sustainability were only sporadically observed during the implementation phase, indicating that long-term embedding and professional development received limited attention while the innovation was being enacted.

In the third phase, *evaluation*, the dominant behaviours again related to implementation, particularly refining and executing lessons within the new course. Less attention was paid to learning-based behaviours (e.g., asking for input or reflecting on the innovation process) and internal embedding (e.g., professional development or informing others about outcomes). External dissemination behaviours, including networking, upscaling, or communicating results and benefits, were not observed. Although the team had autonomy within the module, this autonomy did not extend to shaping the broader direction or visibility of the innovation, which likely contributed to the minimal engagement in external dissemination. Overall, these findings indicate that relatively little attention was paid to behaviours that support sustainable

implementation, despite their importance for achieving lasting innovation (Fullan, 2010; Krijgsman et al., 2022; Van de Ven, 1986).

5.2 How team innovative work behaviours proceeds across the project

On the basis of the results of this study, it can be concluded that the TIWB dimensions appeared largely in a linear sequence, corresponding with the three phases of the innovation project: design and development, implementation, and evaluation. Each phase was dominated by the TIWB dimensions theoretically associated with that stage: idea generation in the design phase, idea realization in the implementation phase, and a combination of realization and internal embedding in the evaluation phase.

The only exception to this overall linear pattern was the appearance of idea generation during the implementation phase. It is crucial to distinguish between *idea generation* in the design phase and the *implementation-related idea generation* observed elsewhere in the project (Table 4). Implementation-related idea generation consisted of reactive, problem-solving ideas that were generated in response to issues emerging during daily practice. If such reactive solutions are classified as regular idea generation, the overall innovation process appears more iterative.

However, the idea generation observed in session 13 was of a fundamentally different kind. This was not implementation-related idea generation but rather a new instance of genuine idea generation, similar in nature to the creative design work of the first phase. At this point in the project, the formative and summative assessments had not yet been designed, and the team therefore initiated a fresh design cycle specifically for the assessment component.

These ideas concerned the structure, number, and organisation of the assessments, which had received limited attention during the first project phase. As a result, a second, smaller linear sub-process emerged within the broader innovation trajectory: teachers first engaged in genuine idea generation for the assessment design, followed by idea promotion and subsequently idea realization. This nested linear sequence demonstrates that, although TIWB largely followed the project's overall linear progression, additional linear design subcycles can arise for components that were not fully developed earlier in the process.

Finally, idea sustainability behaviours played only a marginal role in the process. Internal embedding occurred almost exclusively at the end of the project, and external dissemination was virtually absent. Because these behaviours did not appear throughout the project but were confined to the final stage, they did not interrupt or reshape the overall linear pattern of TIWB. Instead, their limited presence reinforces the picture of an innovation process that progressed sequentially but lacked continuous attention to long-term anchoring and knowledge sharing.

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5.3 Limitations and suggestions for future research

This study also has several limitations that should be taken into account when interpreting the findings. First, although the longitudinal dataset provided rich insight into the unfolding of TIWB, the audiotapes were limited to scheduled team meetings. As innovative interactions also take place informally, such as spontaneous discussions, knowledge exchange, and ad hoc problem-solving (Gijselaar, Meijer, Brekelmans, & Den Brok, 2022; Perry-Smith & Mannucci, 2017), our data do not fully capture these informal contributions to TIWB. Prior research shows that informal interactions and social networks play a crucial role in innovation and professional learning (Van Waes et al., 2016). Future research could triangulate additional data sources, such as interviews, classroom observations, or document analysis of materials produced during the design and implementation process, and could include digital traces such as logs and emails (Fox & Wilson, 2015) or sociometric badges (Kim et al., 2012) to obtain a more complete picture of teacher interaction patterns.

Second, this study focused on a single teacher team over an eight-month period. While this allowed for an in-depth analysis of TIWB in a real-life setting, cross-validation in a larger sample of teams would strengthen the robustness and generalisability of the findings. Comparative case studies could further clarify which aspects of TIWB are context-specific and which are more broadly applicable across higher education institutions.

Third, organisational culture may have influenced the emergence and sequencing of TIWB. Research shows that goal orientation, innovation orientation, and structured leadership shape teachers' perceptions and implementation of instructional innovations (Zhu & Engels, 2014; Kokt & Makumbe, 2020).

The organisational culture of the university in which this team operated may therefore have shaped the patterns of TIWB observed in this study. Future research could compare teams across institutions or within different schools of the same institution to examine how cultural conditions facilitate or constrain TIWB.

Fourth, this study was conducted in higher education, where innovation dynamics differ from other educational sectors. In vocational education and training (VET) collaboration with industry partners is more direct, providing different external incentives and mechanisms for innovation (De Weerd, Van der Velden, & Van der Rijst, 2021; OECD, 2019). Prior work suggests that such external collaboration can stimulate innovative behaviour (Gessler, 2017). Future research could examine whether similar TIWB patterns are found in other educational contexts where innovation may be driven by different organisational pressures.

Fifth, the innovation studied here followed a top-down trajectory. As discussed earlier, the limited opportunity exploration may be related to the fact

that the innovation was prescribed rather than initiated by the team (Okoth, 2016). Comparative research could explore differences in TIWB between bottom-up and top-down innovation projects to understand how leadership structures and innovation management approaches shape engagement in different TIWB dimensions.

Finally, the innovation project studied here was incremental in nature and closely guided by institutional decisions. Such incremental, top-down innovations typically involve lower levels of uncertainty, which may reduce the need for extensive exploration or experimentation (O'Connor & Rice, 2013). This combination may help explain why opportunity exploration behaviours were limited in this case. Future studies could compare teacher teams involved in incremental versus more radical or emergent innovation projects to examine how the type and structure of innovation shape the emergence of different TIWB dimensions.

5.4 Practical Implications

The findings of this study offer several practical implications for institutions and teacher teams engaged in curriculum innovation. First, the dominance of idea generation in the design phase and idea realization in the implementation phase highlights the importance of explicitly allocating time and space for sustainability from the start of the project. Professional development activities, networking opportunities, and moments for sharing intermediate results can strengthen teachers' understanding of the underlying vision and support the sustainable embedding of innovations (Desimone et al., 2002). Making these behaviours an explicit part of the innovation trajectory, rather than assuming they will emerge organically, may help teams move beyond short-term solution finding.

Second, the nested design subcycle observed for the assessment component indicates that complex elements such as assessment require dedicated design attention early in the process. Institutions could therefore support innovation teams by ensuring that key components are not postponed until implementation, but instead addressed through iterative design moments built into the project timeline.

Third, the limited engagement in sustainability behaviours suggests that teacher teams may benefit from structured reflection moments that focus not only on daily coordination but also on the innovation process itself. Coordinators and programme leaders could create regular opportunities for collective sense-making, learning from one another, and discussing innovative behaviours within a supportive team climate. Such practices can help teams maintain alignment with the intended goals and strengthen their overall capacity for innovation.

Finally, the top-down and incremental nature of this innovation suggests that

teacher teams need clear decision-making criteria and a shared understanding of the rationale behind the innovation. Providing transparent explanations of the purpose, underlying theory, and intended outcomes, combined with sufficient autonomy to make meaningful design choices, can foster a stronger sense of ownership and encourage more proactive opportunity exploration and collaborative design in future innovation projects.

6 Conclusion

This longitudinal case study provides a nuanced picture of how Team Innovative Work Behaviour (TIWB) unfolded across the phases of a top-down, incremental curriculum innovation project in higher education. Overall, the process followed a largely linear sequence, with idea generation concentrated in the design phase and idea realization dominating implementation and evaluation. This predominantly sequential pattern contrasts with the frequently theorised iterative and fluid character of innovation processes (Lubart, 2001; Widmann & Mulder, 2018) and suggests that top-down and incremental conditions may function as boundary conditions that steer teams toward phase-aligned, linear trajectories (Okoth, 2016; O'Connor & Rice, 2013).

At the same time, our findings refine this picture by showing how additional design work can re-emerge during implementation when crucial components have not been sufficiently developed earlier in the process. In our case, assessment development triggered a nested redesign subcycle, illustrating that "non-linearity" may occur as a targeted, component-specific cycle rather than as a fully iterative project trajectory. Importantly, we also observed that idea generation during implementation can take qualitatively different forms: much of it reflected reactive, problem-solving adjustments, whereas the assessment subcycle involved renewed, genuine ideation akin to early-stage design work. This distinction helps explain why innovation processes may appear iterative in practice, while still being largely linear in their overall sequencing.

Sustainability-related behaviours were limited and occurred mainly at the end of the trajectory. This aligns with the broader literature indicating that educational innovations often lose momentum once implementation attention declines and dedicated resources (e.g., time and funding) for the post-implementation phase are lacking (Fullan, 2007; Fix et al., 2021). Because idea sustainability involves both the internal embedding of innovations and outward-oriented activities such as networking and knowledge sharing, this late and limited presence indicates that the innovation did not generate ongoing professional learning or broader dissemination. These findings underscore that sustainable innovation does not arise automatically but requires deliberate attention and resourcing throughout the entire innovation process (Van de Ven, 1986; Fullan, 2010). When sustainability is addressed only at the end, innovations risk remaining isolated within teams and losing momentum once

initial implementation efforts have been completed.

Taken together, these results support earlier calls to move beyond strictly linear innovation models by creating room for iterative refinement and more fluid integration of sustainability considerations throughout the project (Dorenbosch et al., 2005; Widmann et al., 2019). Our case suggests that this does not necessarily require abandoning phase-based project planning; rather, it requires deliberately designing moments for (a) early attention to complex components such as assessment, (b) explicit criteria-setting and reflective dialogue, and (c) sustainability-oriented behaviours (including dissemination roles) from the start, so that innovations are not only implemented but also maintained and shared over time (Fullan, 2010; Krijgsman et al., 2022).

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Appendix

Coding scheme specific

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
Opportunity Exploration More common than innovative behaviour	**General discussion about current situation and opportunities for innovation** * Focused on innovation (Introduction of TOM but also matters that transcend the general)	Questioning the effectiveness of the current way of working and discussing with colleagues new possible approaches by means of current developments that may require a new approach or problems at work that require a new approach. Questioning existing concepts, work processes and results aiming to improve them.	There are now a number of students who are known to the entire population, with whom they do not want to cooperate. How to deal with that now, this is a general problem of TOM, isn't it? So how do we deal with that now?
Idea Generation * Focussed on the innovation (introduce/renewed period)	**Critical analysis of the current situation**	Asking critical questions about the current situation at work	But then we may have a wrong, or a different dossier how in any case of how in-depth do you want to go with those theories, because if we go over it as quickly as in this course, what is the added value if we let them do this course again".
		Asking critical questions about a proposed idea (in-depth question)	Actually, the question is: I'm starting to understand it a little bit, in fact indeed what you do, you do a fact check, that's what you do the diaries for, so what do you do, when do you do it, how do you do it, those aspects. The focus group is in fact for studying the why
		Asking questions for clarification	So how should that analysis take place? What are you talking about? Usage effect, which book?
		* Give a critical statement	I think the name target group is a bit crazy, because it's about, it's about news media. That is for everyone actually, to say target group is a bit crazy.

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
		If there is a real difference in points of view.	I don't see like it is as an added value, I see it like it is an opposite, there is so much to learn if you just read the report for your strategic advice'
	Suggesting ideas in terms of content, testing, how to collaborate (no ideas about planning)	Suggesting and exchange of new ideas to resolve problems in the current situation or in developing a course/ discuss with colleagues your own improvement proposals * Also if an idea comes from someone else, confirm it (neutrally) or recommend talking to someone.	You could say, I want to report for what kind of information task, for example using new media, isn't it, that's a result of your diary study. You can of course put that in 27 tables or in a long report, but maybe you can also show it in a very attractive way in twenty seconds of video. What is actually the nature of the information behaviour of this
		Making proposals to improve an expressed idea, giving additions, and further brainstorming out of an introduced idea	
Idea Promotion	**To promote ideas** * Giving a little more evidence, that's why that's a good idea, giving a plea for an idea or very fervently indicating that you think it's a good idea.	Convincing others of the importance of a new idea or solution	In Leeuwarden they have also set up a number of courses in this way, right? It is actually completely project-based work. You can do that five times as often and then you can graduate
		Bringing the new idea to the attention of those individuals who provide the necessary authorizations and allocation of resources for this new idea	

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
		Promote new ideas to the manager or to direct colleagues to get their active support	The first assignment, the first assignment is basically writing your problem statement based on the context analysis, based on that letter. That is concrete, you can work with it".
	To promote practical implementation * Still in the development phase so if other colleagues are guided through it we will do it this way	Promoting the implementation of a new solution in one's own work context	In practice I do that, that is the idea of the red and green cards of (name) etcetera. Who said yes to this statement, hands up. So you said no, just tell me
	*If it is in the implementation phase, it is rather to inform IRLBC	Familiarize colleagues with the use of the new idea or solution (e.g. by talking about it or showing it)	
		Step by step making it clear to other parties how a new idea can be converted into practice (describe very concretely how this will take place in the classroom)	
Idea Realisation Criteria based Implementation		Apply PDCA during implementation. What goes wrong (analysis,) what can we do (come up with solutions), how do we think the students are doing?	

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
	Critical evaluation and reflection on the subject of Module 3	*During the execution of the course/lesson critically evaluate or transcend the module or give a reflection with aiming to improve the course. What goes wrong (analysis)? The urgency is high here, because there is concern. The message is: next time we have to do this better/ differently. Asking critical questions during the implementation about things that already have been done. When you clearly think something of the design or idea while you are in the executive phase.	
*(new)	**Implementation related Idea Generation**	To suggest new ideas to solve problems that occur during realisation. *if the arrangement is really made it is called Idea Sustainability-Improvement	But then I would actually assign groups to certain posters. So that there is then... that we get the names that have a poster there from (name) and that we therefore explicitly organize, your three groups are going to ask about that, you three ask about that
*(new)	**Implementation related Idea Promotion**	* Convincing others of the importance of the solution found for acute problems during implementation	
	Define criteria *and the discussion concerning this	To define success criteria for realising the new idea. When is the new idea a success?	
		* Discussing or clarifying the imposed general criteria of TOM	

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
Idea Realisation Learning based communication	**Reflection on the innovation process itself** = Reflection in action Meta level	To reflect systematically on the experiences you gained by implementing the new idea. What is a nice way and what is not? *to name strong and weak points related to other modules or giving your own opinion about the innovation process itself and about how this is going.	And I get a bit of the feeling, at least I notice that in my own group, they just really have enough of it. They don't feel like doing module 4 anymore though. Because they know, yes module 4 is again like this... this is again such a big project. And in the second year we will do it again. They just really have enough of it
		Thinking critically about one's own actions when putting the idea into practice (wouldn't it have been better .....)	it's too late, but I think it would have been nice if we had combined this exercise with that obligatory visit. That they already had to fill in this about each other once."
	To inform about the process aiming to tune during implementation *(that's the way I do it)	Keeping colleagues informed of the progress of the realisation of the idea (e.g. by means of a newsletter or telling; tutors speaking) How are things going on within the different groups. Actively provide information	People from my group said more psychology. ..they thought that was a really nice part. They even found the communication card interesting.
	*(how do you do it? How do we do it? Who does what)	To ask information about the process during implementation to fine-tune. How exactly are we going to do it? Ask for clarity about progress, content, material, working method. Ask for information without criticism	Do you, prepare the tool, so to speak, for use? And the instructions about whether it should be printed out or whether they just take it electronically, as they have filled in about the group, but so that they pay attention to it together.

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
	Strategy Development	Design possible action strategies for future and similar situations (more formal than critical evaluation and more high over, so more contemplative). In relation to other courses instead of only for your own course.	Maybe we should mix it differently with... maybe sometimes a project goes wrong. Or not wrong, but maybe you can fill it in a different way. Perhaps you can also first provide the theory and then start the project. Letting it go a little bit. Doing smaller projects. Maybe also an individual project. But those are things that we really need to discuss with each other."
	Ask input for possible solutions *(Actively ask yourself)	Obtain information from third parties, who already have experience with the idea, about possible bottlenecks during the implementation of the new idea. This could also with the teacher who has already gained experience in a previous course or within another subject. *Ask specific information to be able to solve your own problem immediately. More practical in nature. How are they doing elsewhere?	Yes, that seems to be quite complicated, because I have now started to inform (name) how that is really to be done.
Idea Sustainability Internal Embedding	***Analysis and discussion of results (data)**	Active gathering of the results of implemented ideas or solutions (e.g. student evaluation data, test results)	It was before we added this correction that 50% had a failing grade. And now after the correction, there were a lot of people between 4.5 and 5.5, and after the correction we were at a third insufficient.
		Comparing the results of the implemented ideas with predetermined (original) goals	
		The numerical substantiation of the result of the implemented ideas	

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
		Exchange experiences about bottlenecks with people who already have experience with the implementation of the idea. Asking about calculation of the results	
	Improvement * Actions that end up in the improvement plan. If they choose a certain solution / tuning with each other after suggesting ideas in IR phase or from previous experiences.	Executing improvement actions to optimize implemented solutions	Shall we hereby agree that all tutors just email their group and say "remember we have a mandatory meeting this week"
	Embedding	Discuss with direct colleagues how the implemented ideas can be more firmly embedded in the existing organization	
		Show initiative to integrate the new idea into existing protocols or organisational structures (e.g. by engaging support services that can adapt systems)	Let's go back, because you bring up here and you say how should we arrange this uniformly in the module? Actually, with the rules that are in the OER, an attempt has been made to at least have a procedure ... make a clear procedure around it. But what exactly do you want to discuss for this module?
		Initiating appropriate quality assurance systems for the implemented idea (e.g. by contacting a quality officer)	
	Professional Development	Organizing professionalisation activities for yourself or colleagues for the further development of the idea.	

Phase Innovative Work Behaviour Main code	Behavioural indicator Partial code	Description	Example (translated Dutch quotes)
		Attending colleagues on professionalisation	By the way, there will be a separate meeting tomorrow about testing.
		Promoting professionalisation	But I think it's useful to go to.
	Informing about process and results	Be aware of the steps that need to be taken to make the implementation process a success	
		Explicitly communicating the proceeds of the implemented idea within the own team	
Idea Sustainability External Dissemination	**Networking**	Participate in networks in which the innovation or the new idea is a theme. More transcending, general in nature. The goal is to get inspired about a certain theme.(e.g. formative evaluation).	^
	Scale up/ Expand	Discussing broader possibilities of the implemented idea with colleagues outside your own team	^
		Initiating cooperation with other parties within the organisation to apply the new idea in other places	
		Initiating cooperation with other parties outside the organization to apply the new idea in other places	
	Communicating revenues (results and benefits)	Explicitly communicating the proceeds of the implemented idea outside the own team (e.g. presenting "good practices" to other faculties or other teams within the faculty)	^
		Making the proceeds of the implemented ideas visible to a wider audience (e.g. social media or presentations at conferences)	

*adjustments after first practice- items

^ no quotes available

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Samenvatting

Hoe innovatief teamwerkgedrag zich ontwikkelt tijdens top-down, stapsgewijze veranderingsprocessen in het onderwijs: een longitudinale casestudy

Duurzame onderwijsinnovatie vereist teams die innovatief teamwerkgedrag (TIWB) vertonen. Hoewel TIWB vaak wordt omschreven als iteratief en flexibel, is er weinig bekend over hoe het zich in de loop van de tijd ontwikkelt binnen docententeams.
We voerden een casestudy uit bij een docententeam van een Nederlandse universiteit dat een onderwijsmodule ontwierp en implementeerde. Over een periode van acht maanden werden 19 teamvergaderingen opgenomen en getranscribeerd. De analyse, gebaseerd op een codeboek met de vijf dimensies van TIWB en een gevalideerde vragenlijst Lambriex-Schmitz, P., Van der Klink, M. R., Beausaert, S., Bijker, M., & Segers, M. (2020a). Towards successful innovations in education: Development and validation of a multi-dimensional Innovative Work Behaviour Instrument. Vocations and Learning, 13(2), 313-340.), laat zien dat TIWB vooral een lineair proces volgt in plaats van een iteratief patroon. Sommige gedragingen in bepaalde fasen kwamen nauwelijks voor.

Idee-generatie en -realisatie waren veel zichtbaar, terwijl het exploreren van kansen en idee-duurzaamheid weinig aandacht kregen. Deze inzichten laten zien hoe TIWB in de praktijk verloopt en welke gedragingen per fase een rol spelen. Dit draagt bij aan kennis over het stimuleren van duurzame innovaties in docententeams en biedt praktische handvatten voor samenwerking en innovatie in het onderwijs.

Kernwoorden innovatief werkgedrag in teamverband, curriculumherziening, duurzaamheid, hoger onderwijs, top-down innovatie, kwalitatieve casestudy, innoveren in het onderwijs