Interactive pedagogical strategies in medical education: how first experience impact teachers' motivations and barriers.

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Abstract

Introduction:

Interactive pedagogical strategies (IPS) shown their efficiency on motivation and learning in higher education students. However, their use by teachers remains low in some universities, and though many teachers try IPS, many drop it, because of various motivations and constraints. Our work seeks to show how teachers' early experiences of IPS impact their motivations and constraints to continue using an IPS in medical education. We proposed here an IPS new to teachers: Group Gathering Improves Memory (GGIM).

Material and methods:

Five psychiatry teachers changed their initial lecture course for GGIM and implemented it 3 times with 5th year undergraduate medicine students. Data was collected through semi-structured interviews carried after each implementation. A qualitative data analysis was then fulfilled.

Results:

Teachers' motivations were numerous and student-centered (memorization, lightness, concision, etc.). The constraints were few but sometimes strong and clearly dominated by time management concerns. Students feedback was a key expectation in motivating teachers to continue using IPS.

Conclusion:

We highlighted the importance of early experimentation of IPS in teachers' decisions to continue/stop using it. Initial motivations were numerous but could be slowed down by time management concerns, particularly striking during first experiment. The weight of student feedback was highlighted, showing the importance of gathering teachers and students early when implementing a new IPS.

Introduction

Many researchers have shown the value of interactive pedagogical strategies in higher education (e.g. Bligh 2002; Deslauriers et al. 2011; Kalaian & Kasim 2014; McLean et al. 2016). However, there are still universities where these are little used. Though university teaching policies play an important role in spreading the use of IPS, individual factors are also meaningful. Turpen et al. conducted a study to identify the affordances and constraints regarding Peer Instruction (PI) in physics teachers (Turpen et al. 2016). They interviewed teachers who used or did not use PI and studied the patterns of affordances and constraints in these different subgroups. In our study, we looked at teachers who were trying an IPS for the first time to understand how these experiences influenced their decision to continue or stop using an IPS. Indeed, in a previous study, Henderson et al. showed that 1/3 of teachers stopped using an IPS after trying it (Henderson et al. 2012). We hypothesized that the first experiences of teachers with an IPS play a key role in this process and sought to understand how these first experiences impacted initial teachers' motivations to use an IPS, so to address their concerns and favor further use of IPS. Moreover, to our knowledge, no studies proposing our design have been carried out in the field of medical education.

Background

A new teaching approach: Group Gathering Improves Memory

We decided to use Group Gathering Improves Memory (GGIM) as an interactive pedagogical strategy (IPS). GGIM was born in France, originally named MIGG (for "Méthode d'Intégration Guidée par le Groupe") (Demeester & Gagnayre 2005; Demeester 2008). In a GGIM class, the teacher initially asks students to write pedagogical objectives, plan, abbreviations and definitions previously shown on a slide, or distributes this material. Then, he delivers a short lecture (15-20 min) followed by an individual filling of their plan (10 min) and a collective comparison and completion of this plan in groups of about 3 to 5 students (10 min). The course ends by answering students' questions and synthetizing lesson's key points.

We chose GGIM for several reasons. First, this pedagogical strategy did not require much effort to implement. This was an advantage to us as we needed to explore teachers' reactions as they implemented the IPS and to cross over the constraint "change requires time and energy". Second, although GGIM has been little studied, it relies on theoretical principles that showed their efficacy in improving memory in students, like testing-effect and

collaborative learning (Prince 2004; Rowland 2014). Third, it was appropriate to students' context (the need to learn structured information) and allowed interactivity.

Process of instructional change

Our analysis will be guided following Roger's conception of innovation (Rogers 1995). He considers adopting an innovation takes place through a series of five stages: (1) knowledge about the innovation, (2) persuasion about the benefits of innovation, (3) decision to use the innovation, (4) implementation of the innovation and (5) confirmation of continued implementation of the innovation. As "more work is needed to support faculty during implementation and continued use of [interactive pedagogical strategies]." (Henderson et al. 2012), our work focused on the 3 last steps of dissemination of innovation (decision, implementation, continuation). Indeed, as we proposed teachers to implement GGIM, we could focus on collecting their motivations in deciding to implement, then implementing and continuing to implement. Guskey's vision of teacher change completes Roger's conception of innovation, as he supposes that teachers change through 3 steps: (1) change in teachers' classroom practices, (2) change in student learning outcomes and (3) change in teachers' beliefs and attitudes. We then suppose that teachers will need to verify student learning outcomes to move from "implementation" to "confirmation" (following Roger's stages).

Material and methods:

Procedure

Five psychiatry teachers changed their initial lecture for GGIM and implemented it 3 times in a row with 5th year graduate medicine students. Each year group being divided into 6 sub-groups, teachers must repeat their lesson every 2 months. Teachers' motivations and barriers, positive and negative experiences they had while trying GGIM were collected through interviews conducted after each course conducted with GGIM. This way, all teachers participated in 3 interviews of 30 to 45 minutes each. A qualitative data analysis was then fulfilled. Focus groups with students were performed to control their perception of GGIM. Interviews and focus groups were led by the main investigator (ACM).

Participants

Eighteen psychiatry and addictology teachers provide teaching at the University of Strasbourg. All were invited to discover GGIM. Ten teachers attended this presentation between November 2017 and January 2018. GGIM's presentation was done by ACM using GGIM itself, so that teachers could experiment it as students. After the presentation, teachers exchanged together with ACM, and were asked to say how they experienced the method. Then, teachers were invited to enter the study protocol by trying GGIM in their classes. Five teachers voluntarily decided to take part to the study (see Table 1). We specifically chose to recruit volunteers as we wanted their motivation to implement GGIM to be spontaneous.

Students were invited to take part in three focus-groups (guided by ACM), conducted with a total of 18 students recruited on a voluntary basis. The content of focus-groups will be examined in another paper.

INSERT TABLE 1 ABOUT HERE

Interview procedures

Interviews with teachers were conducted by ACM following a semi structured interview protocol. As each teacher was interviewed 3 times, there were 3 different interview protocols.

The first interview aimed at answering the following questions with its corresponding goal (see Table 1).

INSERT TABLE 2 ABOUT HERE

The second interview was designed to deepen first interview and highlight new affordances and constraints (see Table 2).

INSERT TABLE 3 ABOUT HERE

The third interview was designed to explore teachers' representations and beliefs about teaching. These representations will be explored in another paper.

Analysis

The analysis process aimed at answering these questions:

- What are the sources of teachers' motivations to try GGIM?
- What reasons teachers give for initially trying GGIM?

- What do teachers experience during their first try of GGIM that leads them to continue/discontinue implementing GGIM?
- Which major arguments lead teachers to continue/discontinue implementing GGIM?

Interviews were transposed and analyzed by ACM. Analysis was conducted with TAMS Analyzer©. Main themes were coded and classified in categories of motivations and barriers, then positive and negative experiences regarding teachers' use of GGIM. We outlined major arguments leading teachers to continue/discontinue implementing GGIM.

Results

We chose to categorize our results following two characteristics: (1) Roger's steps of dissemination of innovation, and (2) positive or negative valence of teachers' arguments. These categories are resumed in Table 4.

INSERT TABLE 4 ABOUT HERE

What are the sources of teachers' motivations to try GGIM?

The sources of teachers' motivations are summarized in Table 5. External reasons are mainly the teaching context and students' opinions about teaching methods.

Teachers' experiences (as teachers but also as students) played a major role: this role was already highlighted by Dancy et al. (2016). Every teacher who already taught (4/5) cited their teaching experience as a motivation to try GGIM, either by referring to the attention difficulties of students in lecture, or their learning difficulties. The teacher who began his teaching practice with GGIM naturally focused his discourse on his experience as a graduate student. For this teacher, it was even a difficult experience of "boring" courses that motivated him to try GGIM.

The trial of GGIM as a student was a key motivating factor to implement it for many teachers (e.g "I guess that I wouldn't have put myself in question if you didn't let us live and test the method ourselves").

Other sources of motivation were the conviction or belief in the effectiveness of GGIM (conviction that could be linked to teachers' training in pedagogy, their scientific or literary reading, their experience during the presentation of GGIM or conversations with colleagues).

INSERT TABLE 5 ABOUT HERE

What reasons teachers give for initially trying GGIM?

Teachers' motivations to try GGIM are summarized in Table 6. Beyond the limits of lecture, main motivations were related to GGIM's characteristics and effects (conciseness, lightness, leading to better memorization), as teachers were truly concerned by students' learning. Only 3 teachers praised the benefits of interaction itself, beyond its interest as a useful tool for memorization. For one teacher, it was a very important reason to try GGIM. This teacher also saw GGIM as a motivational factor for students, that is, an argument that could lead them to come to class more regularly.

INSERT TABLE 6 ABOUT HERE

Did teachers hesitate in trying GGIM and why?

Our study pointed few initial barriers to use GGIM. Only one teacher declared she hesitated when it was proposed to try the method, and it was the only teacher to mention barriers even before trying GGIM (see Table 7).

INSERT TABLE 7 ABOUT HERE

What do teachers experiment during their first try of GGIM that lead them to continue/discontinue implementing GGIM?

Positive experiences

Teachers' positive experiences trying GGIM are summarized in Table 8. Attention was the most remarkable experience for all teachers. It was the most visible indication to them that GGIM had a direct effect on students. Three teachers implemented GGIM in a 2-hour format where they usually led 1 hour of lecture and 1 hour of clinical case management. All replaced their first hour of lecture by GGIM, and followed on with their usual hour of clinical case management using multiple choice questions. Each of these teachers found that the articulation between the 2 pedagogical approaches was done naturally and made sense. One teacher noted that the use of GGIM in the first part of the course may even have encouraged interaction during clinical case management. Two other teachers also noted that interaction may have been generally stimulated by GGIM, either because students were more likely to ask questions in class, or because it encouraged conversations among them about the course during and even

after class. Several teachers pointed the reduction in cognitive load made possible using GGIM. This was compared with the usual teaching context, which sometimes offered 5 hours of lectures in a row. One teacher said in this regard: “It's not the fact of doing a lecture course that is problematic. It's the fact of doing four hours of lecture course.” Teachers also noted that using GGIM allowed controlled interaction in which students could interact about the course, replacing their usual talks about other topics during lectures.

INSERT TABLE 8 ABOUT HERE

Negative experiences

Teachers' negative experiences trying GGIM are summarized in Table 9. Time management was the major negative experience for every teacher. Time management concerns were generally linked with content-coverage management. Some teachers wanted more time to answer questions, others to give more content. Time-management concerns often led to course structure modifications, emphasizing lecturing time and neglecting the other parts (plan filling, group completion, synthesis). Most teachers underlined their ability to lecture or their tendency to let their speech go contrasting with their difficulty to manage new features, leading to this misbalance in time management. On students, major consequences were decreasing attention when lecturing time was long, as showed by Risko et al. (2012). We were then back to a lecture like condition: students had less time for interaction and a lack of clear synthesis led to vague ideas.

INSERT TABLE 9 ABOUT HERE

Which major arguments lead teachers to continue/discontinue implementing GGIM?

Teachers need students’ feedback

First, we highlighted how much teachers rely on students’ opinion on GGIM. To the question “What could be a major motivation/constraint for you to continue implementing GGIM?”, every teacher answered “students’ feedback”. This need was put forward at a very early stage by all teachers and was raised each time during the first interview, even though the question had not yet been asked yet.

However not all teachers had the same expectations of students’ feedback and outcomes. All teachers expected students might say that they learned better with GGIM or that they better

understood the course. Some expected that the students also appreciated the method and that it motivated them to come to class.

Teachers need to feel “at ease” with the method

“If you’re not comfortable, even with a good method I don't think it works.”, says a teacher. Although teachers are concerned about students' views of GGIM, they all express the need to be "at ease" with the approach. Thus, the obstacles they encountered, although few (time management, interaction management...) could become real reasons to stop using GGIM if not addressed. We consider that these powerful obstacles to continued use of GGIM must be resolved, particularly through dialogue between teachers and students. In addition, every teacher underlined the importance of trying a pedagogical strategy several times to assimilate it. Indeed, early experiences are the most complex and those in which teachers feel least "at ease". Thus, strong resistance to change can occur very early if teachers are not accompanied to assimilate the approach and if they do not receive feedback from students.

Teachers consider the consistency between pedagogical strategy and course content as very important.

Three teachers emphasized this aspect. Those who felt that their course provided many concepts to memorize emphasized the consistency between GGIM and course content. Another teacher, whose course provided less declarative knowledge mentioned the possibility of using GGIM in a more "academic" course.

These remarks can be related to the inherent properties of GGIM, which promotes its interest in attention and memorization and uses interaction between students for this purpose.

This can also be linked to the teachers' conception of a pedagogical strategy, often presented as a "tool" that can be adapted to different teaching situations. This point could have a major decision-making impact, considering that when teachers thought the "tool" unsuitable for their course, they might prefer not to use it.

At the end of the experiment, one teacher is sure to continue with GGIM, 3 others consider using the lecture format again.

All teachers who plan to repeat the lecture course think they will simplify their content (i.e. keep their slideshow clean and with less exposed theoretical content), and 2 think they will encourage questions and interaction. However, they all rely on student feedback to decide.

Discussion

Our study seeks to explore the impact of early experiences of an IPS on further utilization of such pedagogical strategy. Although motivations and barriers to change in pedagogy are the subject of much research, to our knowledge there were no studies interested in it specifically at the time of initial experimentation and in medical education. The most complete study on this subject seemed to us to be the Turpen et al. in the field of physics (Turpen et al. 2016). Our work shows similar results on certain points, notably that teachers seek to adapt their pedagogical strategy to their teaching context and that they are convinced of the usefulness of IPS. This corresponds to our idea that there are similar barriers to the use of different IPS and in different contexts. If content covering concerns were raised by Turpen et al. we find here a difficulty at a much more primary level: the difficulty of managing time in a one hour class. This reflects the willingness still very present among teachers trying for the first time an IPS, to cover as much content as by doing it in a lecture course. This paradigm shift and in time management appears to be the biggest shock for all teachers. Although they had been warned of this new feature (GGIM explicitly scheduled 20 minutes of lessons instead of 60 minutes), the experience of this change was often complex and even confusing and could lead to major blockages. This "unease" was even more important as all teachers wanted to be "at ease" with a pedagogical strategy. This change therefore needs to be seriously considered by specific and early support for teachers, because any IPS requires a reduction in the time dedicated to top-down teaching of declarative knowledge. Support may be offered through reflective teaching practice (Armstrong & Asselin 2017; Mercer et al. 2018) or teamwork among teachers (as some teachers also highlighted that they would continue implementing GGIM only if other teachers do so) (Kunnari et al. 2018). Nevertheless, at the end of Ralston et al.'s (2017) experience implementing collaborative teaching "every faculty member […] found a way to not substantially sacrifice content coverage", showing that at the end of the change process teachers may make IPS their own and be satisfied with it. Early support may help them consider a possible satisfactory change.

The natural tendency of teachers to overcome time pressure was to increase their speaking time. This was felt quickly by the students (with a decrease in attention). However, the willingness of most teachers to take over lectures seemed to be linked to the factors mentioned (difficulties in time and/or interaction management and lack of feedback from students at the end of the experiment). The proposal to respect basic rules concerning student attention and adopt IPS (no more than 18 minutes of class without intermediary activity, collaborative works, etc.) as suggested by Graffam (2007) would perhaps have raised less difficulty in time management than a "turnkey" strategy with an apparently rigid structure like GGIM. There may have been

resistance specific to GGIM, which could be demonstrated by proposing to try other IPS. Teachers here used GGIM on a single course content and some pointed out that they would like to use it on other, more "academic" courses. It would be interesting to study how a teacher adapts a technique to several different courses.

Students' feedback is rich in proposals for improving GGIM, which could lead teachers to take liberties adapted to students' experiences and thus enhance their pedagogical adjustments. Indeed, in addition to changing teachers' beliefs and attitudes (as proposed by Guskey's model), student feedback can allow them to adapt their course to their students' specific needs with confirmation that their changes are being adapted. We therefore emphasize the importance of an early meeting between students and teachers when testing a new IPS. These meetings should aim at building and adapting the IPS, but must be carefully conducted not to be funded only on students' satisfaction as it doesn't reflect courses' effectiveness. Plus, students also need time to get used to a new pedagogical strategy and appreciate it (Reimschisel et al. 2017). At the end of our study, teachers have not yet received feedback from the students and it would be interesting to continue by seeing the effect of this feedback on teachers' decision.

Conclusion

We have seen the importance of the first experiments with IPS in teachers' choice to continue or stop using it. Indeed, if the initial motivations were student-centered, they were maintained only if teachers received feedback from students. Without this, initial difficulties in implementing the method or the lack of awareness of its impact on students became obstacles leading teachers to stop using GGIM. We therefore invite change agents to gather teachers together with students early when implementing a new IPS in their curriculum. The aim of these meetings is to maintain teachers' motivation to implement a new IPS over their tough first experiment and to foster continuous development of their pedagogical skills. Decisions should not be based only on students' satisfaction but consider their learning goals as much as teachers' need to make IPS their own. Such meetings will be carefully designed to offer a new method of early pedagogical support.

Declaration of Interest

None declared in relationship with the topic of the manuscript

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