Chapter #19

HOLISTIC EDUCATIONAL APPROACH: COOPERATIVE LEARNING AND MINDFULNESS IN THE TRAINING OF FUTURE TEACHERS

Consolación Gil, & María Dolores Gil-Montoya
Department of Informatics, University of Almería, Spain

ABSTRACT
Traditional educational instruction is being replaced by new, more holistic paradigms requiring both a methodological change and a new definition of the role of the teacher and students. This study proposes a new education paradigm based on active teamwork methodologies (such as cooperative learning) and mindfulness techniques. Cooperative learning is a well-known strategy that has obtained very positive results in the development of competences and skills. Mindfulness techniques favor the development of attitudes and values as well as increased inner-calm, resulting in lower levels of stress and anxiety among both students and teachers. The proposed paradigm was implemented in a course of the master's degree program for Secondary School Teachers at the University of Almeria (Spain). The results show that students were more engaged with the learning process and developed a greater sense of responsibility and empathy, not only towards their own learning but also to their classmates' learning. The procedure included the application of the Mindful Attention Awareness Scale (MAAS) at the beginning and at the end of the course to measure the evolution of the students in different items related to mindfulness.

Keywords: cooperative learning, mindfulness, conscious and holistic education, competences and skills.

1. INTRODUCTION

At all educational levels, more and more teachers are aware of different attitudes and behaviors among their students, such as low motivation, propensity to lose attention during class, lack of comprehension of theoretical contents, difficulty relating what is being studied to the real world and, in general, a reluctant attitude towards studies overall (McKeachie & Svinicki, 2006). To a large extent, these problems could be due to the methods typically used in teaching, mainly traditional instruction, whereby teachers spend most of the in-class time giving lectures and students rarely have opportunities to apply knowledge or even interact with their peers. Therefore, it is more evident than ever that there is a need to innovate and use new and disruptive tools capable of capturing the attention of students and maintaining it during different activities (MacManaway, 1970; Gallifa, 2019).

These new educational models involve switching from an instruction based on knowledge, in which the student is a passive agent that receives information, to an education based on competences (Gil, Baños, Montoya, Alías, & Montoya, 2011). This new system requires that students learn by doing and, therefore, they must be active and completely attentive. In this regard, active learning methodologies, alternative evaluation systems and an education based on values and competences represent some of the most important tools for developing a holistic education model that makes it possible to achieve the methodological change.

Active methodologies stimulate students not only when studying the content of a given subject but also by helping them to acquire skills that are beneficial for their personal and future work (Gil, Montoya, Herrada, Baños, & Montoya, 2013). As for other trends, the consolidation of ICTs (Information and Communication Technologies) in teaching-learning has resulted in powerful communication tools between teachers and students. They can eliminate temporal and spatial barriers associated with traditional teaching-learning models, to the extent that ICTs have stimulated the consolidation of active methodologies (Gil et al., 2018). Furthermore, the proposals of the so-called "Integral Approach" (Gallifa, 2019) defend the need to connect the cognitive, affective, moral and spiritual dimensions in teaching-learning processes, based on an active teaching methodology that promotes the (self) awareness of the participants. These approaches make it necessary to modify content and, above all, the way classes are taught. This ultimately affects teachers and students equally (Montoya, Herrada, Gil, Montoya, & García, 2009).

In this context, the current student profile must be characterized by the following qualities: active, attentive, autonomous, strategic, reflexive, cooperative, responsible and empathetic. Undoubtedly, such a profile demands a significant shift in mentality in the dominant culture among students and requires special training and attention. Mindfulness represents a means to develop these qualities and other skills (Montoya, Mañas, Gil, Herrada, & Franco, 2012). With regard to the teacher, one of the essential keys is the instructor's identity as a role model. On the one hand, their attitude of awareness will encourage this same attitude among students. On the other hand, the teacher exchanges their role as the only person who possesses the subject knowledge for that of an instructor who acts more as a knowledge manager. With this new function, communication, empathy, group management and individual attention are vital aspects for the teacher if they wish to promote motivation, student involvement and, ultimately, effectiveness in the learning process. Their job would be based on using strategies that allow students to learn to learn, while also creating a suitable environment for the development of students' personal autonomy, promoting critical thought and reflection on their own learning process (Gil et al., 2013).

Literature related to contemplative practice in higher education is very limited and primarily focuses on the wide range of available practices and their outcomes at individual and programmatic levels (Mañas, Franco, Montoya, & Gil, 2014; Flores, 2017). As previously mentioned, the ultimate aim of engaging in contemplative practices in classrooms (i.e. mindfulness) is to foster students' self-awareness, a type of critical reflection recognized as a crucial component of transformative learning (Kasworm & Bowles, 2012).

This project presents a new proposal, which only a few published works have addressed to date (Montoya et al., 2012). This study aims to show how disruptive and innovative active methodologies, together with ICTs and mindfulness techniques (Kabat-Zinn, 2016) promote a holistic education approach, providing a more meaningful and long-term learning experience. An additional goal is to promote the development and consolidation of this new education model in training at all educational levels and, more specifically, in the training of future teachers.

2. BACKGROUND

The methodology utilized in the classroom is based on learning the subject using the same teamwork methodologies that the students are meant to learn. A brief description of these methodologies is as follows:

2.1. Cooperative learning

Cooperative Learning (CL) is a philosophy of interaction and a way of working that involves both the development of knowledge and individual skills and the development of a positive attitude of interdependence and respect for contributions. Cooperating means working together to achieve shared objectives. In cooperative activities, individuals seek results that prove beneficial for themselves and, at the same time, for the other members of the group. This process normally involves the use of small groups that allow students to work together to improve their own learning and that of the other members. Learning is not limited exclusively to the content of a given subject. Instead, learning encompasses various skills or competences, such as communication skills, responsibility or resolving conflicts (Smith, 1996). In today's world, when facing problems of any kind, it is necessary to combine the efforts of everyone to achieve solutions. Nevertheless, simple group action is insufficient—strong intra-group and inter-group cooperation relationships are required to address problems.

Cooperative learning allows the teacher to achieve various key goals at the same time. First, it helps to improve the performance of students, both those that are especially gifted and those that have difficulties learning. Learning involves creating neuron connections (Jensen, 2009). When we listen, our brain only retains 10% of the information we hear. If we carry out an activity on our own, we retain 70%. And, if we explain what we have learned to a classmate as if we were the teacher, we retain 90%. For this reason, cooperative learning is such a powerful tool. Secondly, CL helps to establish positive relationships between students. Encouraging, motivating and enabling classmates strengthen personal commitment to others. In turn, this positive interaction favors group commitment in which the success of each member is the success of the group. Thirdly, this approach provides students with the experience they need to achieve social, psychological, cognitive and, therefore, holistic development. In cooperative situations, students experience a stronger sense of being able to attain success and they consider it more important than in competitive or individual situations. The struggle for mutual benefit creates an emotional link: the collaborators begin to appreciate each other, they want to help others to achieve success, and they also commit themselves to the well-being of others. The opportunity that cooperative learning offers for simultaneously addressing these three areas makes it superior to other teaching methods (Johnson, Johnson, & Smith,1991).

Figure 1.
Ingredients for cooperative learning.

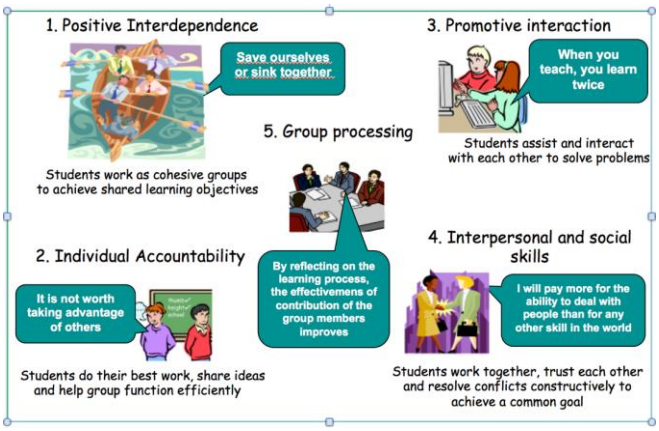
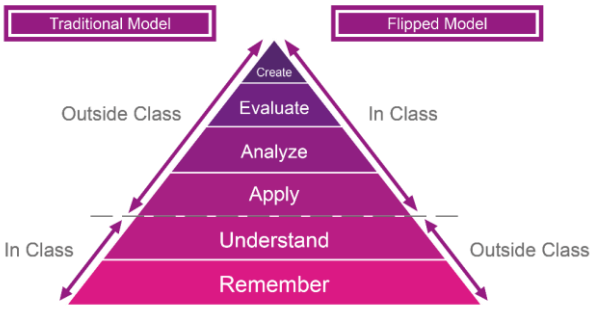


Figure 1 graphically illustrates the five ingredients that make cooperative learning successful in comparison to traditional group work (Johnson, Johnson, & Holubec, 1994).

2.2. Flipped learning

Flipped learning is a blended learning approach where content delivery and direct instruction are scheduled for individual space activities before class, whereas face-to-face group activities in class are designed to be active and carried out in a wide range of high-level cognitive tasks (Bloom's taxonomy). Flipping a classroom requires that activities which have traditionally taken place in the classroom now take place outside the classroom and vice versa (Lage, Platt, & Treglia, 2000). In the traditional learning model, students receive new material during class meetings and perform high-level work, such as application, synthesis and evaluation of said material through individual unsupervised activities after class (See Figure 2). In these traditional class meetings, instructors do not know the knowledge level of the audience and, thus, the lecture may be too difficult or too easy for the students. Flipping a classroom typically relies on networking and computing technologies, such as suitable learning management systems and mobile applications, to meet the needs of students in the twenty-first century. A large body of research from the last two decades supports the benefits of this pedagogical approach (Akçayır & Akçayır, 2018).

Figure 2.
Bloom's Taxonomy in a Flipped Classroom.



2.3. Gamification

Gamification is an instruction trend whereby incentives are used to motivate individuals to perform specific tasks in exchange for a reward. It can also be defined as a set of activities and processes to solve problems by using or applying the characteristics of game-design elements and game principles in non-game contexts. This approach involves using activities or dynamics taken from the world of games to increase competitiveness and cooperation in teams for the purpose of obtaining greater motivation towards the subject material. Gamification combines very well with cooperative learning and offers assessment tools that add an extra measure of motivation (Burke, 2014; Santiago & Rodríguez, 2015).

2.4. Clickers

Clickers are devices that use communication software to obtain information from an audience both quickly and reliably. The first systems that used clickers consisted of a set of specific devices that included numerous commands and an infrared sensor that could emit and receive answers. In recent years, whether on webpages or as instant messaging tools,

they have become very popular as they allow identical activities to be carried out by clicking on any electronic device with Internet access, including computers and mobile phones, without the need for a large number of remote controls to emit responses (i.e. Kahoot (Wang, 2015)). Regardless of their implementation, the use of clickers allows the teacher to solicit opinions or ask questions of students regarding a given topic, and students can include any additional details they deem relevant (Gil et al., 2018). These devices are used for the purpose of fostering more participation from students, increasing levels of attention and motivation and obtaining the ability to carry out training assessments, which would provide students with feedback, for example. In addition to pursuing these objectives, clickers are also useful in the context of the flipped classroom and cooperative learning.

2.5. Digital group portfolio

The development of the e-Portfolio implies not only documenting student achievements, but also self-evaluations, applied strategies and analysis of learning experiences (Gil et al., 2011). Therefore, e-Portfolio is more than a simple collection of tasks. One of the main advantages of the digital group portfolio is that all the information is available to all students. As a result, they can: 1) learn how they carry out their work by learning with their classmates; 2) assist other groups when questions are raised about their activities; and 3) participate in the process of co-evaluation. All the activities conducted by each group are made visible in the group portfolio, as well as the reflections of the group after each activity, including their experiences with mindfulness. Figure 3 shows an example of the professors' digital portfolio developed in the Moodle platform.

Figure 3.
Example of a digital group portfolio (professors) in Moodle platform.

2.6. Mindfulness

Mindfulness is considered both a philosophy of life and a series of practices or specialized training that allow people to improve their attention skills. They may become increasingly more attentive to the present moment, both in terms of what occurs inside them (thoughts and emotions) and around them, whether it be in their personal lives or their own daily experiences (Gunaratana, 1991). Intrinsically, mindfulness is a state of consciousness that involves paying attention to the experience in the present moment. This state is cultivated and developed through the practice of meditation (formal and informal techniques), self-inquiry and compassion (Kabat-Zinn, 2016). This regular practice offers a method by which individuals react less compulsively to what happens to them in the current moment.

Mindfulness equips educators with resources like patience, flexibility and equanimity, which help them to cope with adversity. Cultivating positive states -calm, relaxation, and peace- builds our inner strength to take on daily challenges at school. In this sense, only with a relaxed mind is it possible to see how things truly are in reality, and it is this clear vision which allows individuals to transform the present and find a suitable solution to whatever problem they may have at any given moment (Kabat-Zinn, 2016). Mindfulness practice is a powerful way to develop a deeper sense of connection with both ourselves and others. Building our capacity for empathy supports us in effective communications, collaboration and leadership. Therein lies the objective of this work: to train students' attention skills through CL aided by mindfulness techniques.

Germer (2005) proved that the use of this method produces changes in the cerebral structure and optimizes potentials that human beings have but do not use or use inefficiently. Several applications in the education system have shown that it improves attention and reduces student failure and demotivation in the classroom—quite remarkable considering the wealth of current evidence of high stress levels at schools (Mañas et al, 2014). Studies have demonstrated that students experiencing stress are not able to learn; their level of anxiety is so high that it is impossible for them to concentrate in class. Meditation reduces students' stress levels, inducing a change in brain waves and provoking more states of calm, i.e., a brain that functions better (Flores, 2017; Leon, 2008).

3. METHODOLOGY: INTEGRATING COOPERATIVE LEARNING AND MINDFULNESS

The proposed paradigm was implemented in a course of the master's degree program for Secondary School Teachers at the University of Almeria (Spain). This course was part of a "Conscious Teaching Project" (García et al., 2019) at the same university and included the participation of five other educators specializing in different fields. All the educators involved share a commitment to the use of contemplative practices in education. More specifically, these contemplative practices are all based on the use of mindfulness, both on a personal growth level and as a pedagogical resource. With this project we intend to validate the transforming potential of certain didactic activities that can offer a more enriching learning experience to our students.

For our specific course, we have combined mindfulness practices with active methodologies, such as cooperative learning, flipped classroom and digital group portfolio.

3.1. Goals of the project

This innovative and holistic teaching project has these main goals:

- To test forms of didactic interaction based on a greater awareness of the elements involved in teaching/learning situations, such as:
  A. Presence: Activate full attention, active listening and the joy of sharing rewarding learning experiences with groupmates.
  B. Reflective Dialogue: When you want to speak, reflect on how your contribution will deepen the conversation. Do not just talk to make a point or to have your special idea heard. Be willing to both raise your hand and not raise it.
  C. Inquiry: Continually inquire into your own experience and be reflective of how you are reticent and/or open.

- To empower students to be more aware of what they think, feel and do when they are in the classroom and how these elements influence the quality of their learning. Learn to distance oneself from external events – learning to relativize them as a strategy for improving communication and opportunities for cooperation with other classmates.

- To combine cooperative learning and mindfulness strategies to promote greater interaction between students so that they can learn with others not only the contents of the course but also learn about themselves when they interact with their peers.

- To analyze how well teamwork methodologies match with mindfulness practices. Most of the works published to date include mindfulness practices individually (Flores, 2017; Park, Long, Chose, & Schallert, 2018), as something separate from the methodologies used to learn the contents and competences of a certain course.

3.2. Teaching intervention

The practical experience in this study was part of the "Active Teamwork Methodologies" course, which was attended by 65 students. This course took place during November and December of 2020 and lasted six weeks, with five hours of class per week. The students who attended this course had finished their degrees in different fields, such as mathematics, history, economics, biology and so on. During the 2019-2020 academic year, they were studying a master's degree to be secondary school teachers. Our course belongs to this master's degree as an elective subject to learn teamwork methodologies, and the number of students who choose it rises every year. All students were assigned to a formal cooperative group. All students engaged in in-class cooperative and mindfulness activities but only 33 students took part in the complete out-of-class mindfulness program since it was not mandatory. We will analyze the study in three parts in order to explain the methodological aspects.

3.2.1. Teaching using teamwork methodologies

Teamwork methodologies were used to teach the course contents. For this purpose, we combine different active methodologies and ICT tools:

- Cooperative learning: Most class-activities featured cooperative organization. Students learned cooperative methodologies by working together, using the jigsaw technique (Aronson, Blaney, Stephan, Sikes & Snapp, 1978), research groups (Johnson et al., 1991), gamification through team tournaments (Santiago, 2015; Burke, 2014) and problem-based learning for the final project (McKeachie & Svinicki 2006).

- Flipped classroom (Lage et al., 2000) was used to learn the theoretical knowledge.

- Clickers: At the beginning of the subsequent face-to-face session, clickers (Wang, 2015) were used to determine whether the students had watched the videos that had been previously assigned. For this purpose, we applied a tool called ZquizUALbot (Gil et al., 2018) developed by our research group and based on the message application Telegram. Clickers were also used to evaluate groups after performing certain activities.

- The digital group portfolio (Gil et al., 2011) was the medium to make the activities carried out by each group visible, along with their reflections, group regulations and the self-evaluation and co-evaluation within each group.

- Problem-based learning: each group did a final project about a subject for their future secondary school students. This project must be organized according to some of the active methodologies studied in our course. The groups presented orally their projects and the rest of the groups evaluated them (co-evaluation) using the corresponding rubric.

- Different rubrics were also used for the evaluation of transversal competences (teamwork and oral communication). The results were evaluated using the co-rubric tool.

3.2.2. Mindfulness program

A six-week mindfulness program was implemented along with the above methodologies. This program included short meditations sessions in class (in the middle of the class and sometimes at the end) and formal and informal exercises to practice outside the classroom. The main activities of the program were the following:

- Formal mindfulness exercises: These included meditative exercises focusing on attention to breathing (week 1), attention to the body (week 2), exploring the senses (week 3), attention to thoughts (week 4), attention to emotions (week 5) and open monitoring meditation (week 6). The time dedicated to each exercise in class was 5 minutes. Outside of class, it was suggested that the time be gradually increased to 15 minutes.

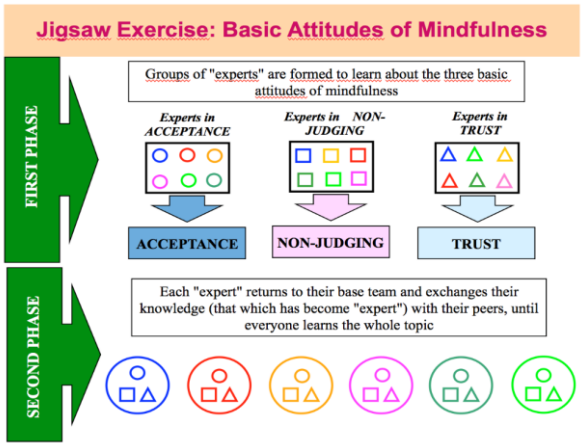
- Informal mindfulness exercises: These included exercises to bring attention to any daily-life activity, paying attention to breathing and body sensations. For example, while eating, showering, washing hands, driving or walking.

- Emotional development and self-inquiry exercises: These included exercises to recognize automatic and reactive patterns. For example, practicing "active listening" when working in cooperative groups. Another exercise was "observing mobile phone dependence", counting and being aware of the number of times students *need to* look at their mobile phone (including social networks and message applications). Another exercise involved becoming aware of the reactions that arise in us when someone criticizes our ideas —observing what judgements, emotions and thoughts emerge in these situations.

3.2.3. Integrating cooperative learning and mindfulness

The proposal for basic integration consists of teaching and training students in mindfulness while the teacher simultaneously uses the methodology of cooperative learning so students may acquire certain knowledge or content related to the subject content. After a meditation exercise, students share their experiences with their groupmates. On other occasions, after a cooperative activity about contents, they do a short meditation to quiet their minds. An example of this integration is a jigsaw activity (Figure 4).

Figure 4.
Example of learning mindfulness attitudes through a jigsaw exercise of CL.



The jigsaw exercise served to determine whether the students were familiar with mindfulness and what attitudes are essential in its practice (Kabat-Zinn, 2016).

We hypothesized that integrating teamwork methodologies and mindfulness exercises would be associated with potentially higher commitment to a group. Training in mindfulness develops certain skills, attitudes and competences in the individual (such as attention, memory, self-knowledge, emotional regulation, patience, flexibility, acceptance, tolerance, empathy and social skills). Therefore, it is expected that if the students are trained in mindfulness, they will learn faster and more easily, not only the content proposed through CL methods, but also skills, attitudes and competences on both a personal and social level.

Group efforts towards achieving positive interpersonal relationships and psychological health are reciprocally related (Johnson et al., 1994). In cooperative situations, these relationships are always bidirectional, and mindfulness improves and develops these types of cognitive and communication skills, self-knowledge, emotional regulation and, ultimately, psychological health.

Most of the qualities and characteristics inherent to cooperative learning —its competences, attitudes and skills— are shared with the concepts, attitudes and components of mindfulness. When utilized together, mindfulness can contribute to the development of these competences, attitudes and skills and can help individuals to delve deeper into these aspects to achieve an even higher level of interiorization.

In short, we hypothesize that mindfulness training can produce and strengthen greater efficiency and effectiveness in cooperative learning techniques.

4. RESULTS/DISCUSSION

This course had 65 students, all of whom were assigned to a cooperative group. It should be noted that this course was taught before the pandemic restrictions, and the results can be compared with those of previous years. The results were evaluated using different indicators.

The first indicator was the number of students who passed the course, 99% in the 2019-2020 academic year, compared to 97% the previous academic year. Although not highly significant, we consider it important to consider this result positive, mainly because

the numbers of students taking this course increases each year. More specifically, in the 2020-2021 academic year, the number of students in this course increased by 30% compared to the previous year. Thus, we also consider that this holistic approach has increased interest in this course.

Another indicator was a specific survey with different items and questions about the methodologies of the course. As Table 1 shows, the students rated the use of different active methodologies of teamwork very positively, such as cooperative learning, flipped classroom and gamification. They also positively assessed the use of computer tools such as e-portfolio to improve teamwork, reflection and self-evaluation, and using clickers in flipped classroom to monitor the learning of the main concepts. They also considered that mindfulness techniques allowed them to pay more attention and remain less stressed in class.

Table 1.
Survey on the methodologies used in the subject.

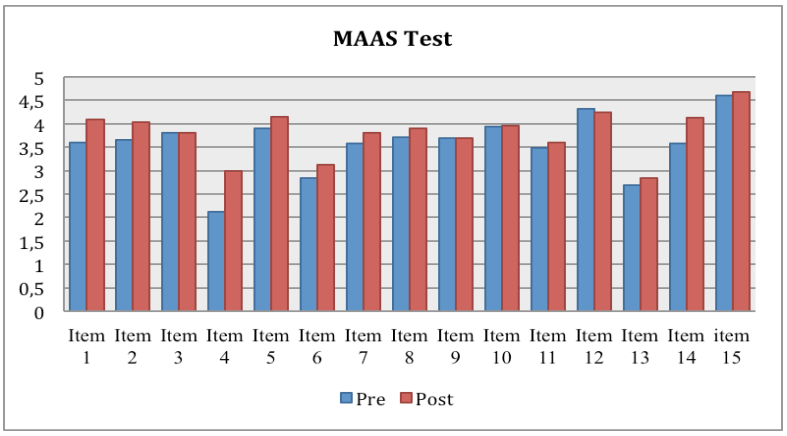
Item	True	False
Active methodologies have increased my interest in the subject	60	5
I do not like it because some teammates do not collaborate	1	64
The use of the group e-portfolio in the follow-up of the subject has not resulted in considerable improvement in learning	0	65
My teammates make me waste my time	6	59
The use of mindfulness techniques has allowed me to pay more attention and be less stressed in class	63	2
Using clickers has allowed me to ask questions and dubts	65	0
This methodology gives me more motivation to study	64	1
My overall assessment of teamwork and flipped classroom (including e-Portfolio and Clickers) with Mindfulness is favorable	65	0

The next indicator analyzed during this course was the mindfulness experience itself. All students who attended classes completed formal mindfulness exercises in the classroom. Mindfulness exercises outside the classroom were not mandatory, but more than half of the students completed them. The Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003) was used at the beginning and at the end of the course to measure the evolution of the students in different items related to mindfulness. MAAS is a scale that globally evaluates and records the ability of an individual to be aware of the experience of the present moment in everyday life. The survey introduces this 15-item scale as follows: "Below is a series of statements about your everyday experience. Please answer according to what truly reflects your experience rather than what you think your experience should be." The items are scored according to a Likert scale ranging from 1 (almost always) to 6 (almost never). Some examples of the items in Figure 5 are the following (Brown & Ryan, 2003): Item 1: *I could be experiencing some emotion and not be conscious of it until later*. Item 3: *I find it difficult to stay focused on what's happening in the present*. Item 9: *I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to reach my aim*. Item 12: *I drive places on "automatic pilot" and then wonder why I went there.* Item 15: *I snack without being aware that I'm eating*.

The final result is obtained from the arithmetic average of the total items. Figure 5 shows these results for 33 students, those who completed the entire program (as it was not mandatory, some students did not do all out-of-class mindfulness activities). Lower scores show lower levels of mindfulness (related to higher levels of stress or anxiety) and higher scores show high levels of mindfulness. An increase in the average values of mindfulness is observed in 12 of the 15 issues, with an average increase of 21%.

Some improvements were observed such as decreased stress perceived by students and increased satisfaction with the integration of the mindfulness program. Above all, students recognized that mindfulness could help them greatly, both in their daily lives and in their work as future teachers. The exercises of mindfulness and learning in cooperative groups also offered experiences that allowed students to see themselves in their partners (mainly their impulsive reactions), thereby giving them the opportunity to know themselves better and to improve their communication and empathy skills.

Figure 5.
Average results for the MAAS test (pre and post) for the 15 items.



As a final indicator, we considered it important to highlight some aspects that the students commented on in their mindful-diary (as part of their e-portfolio) concerning their progress in the mindfulness program:

Student-A: "The group was agitated that day, but following the meditation guidance by the teacher, after a few minutes, the feelings of agitation had disappeared. My groupmates commented that they felt much calmer and focused, confirming these effects in my own body and mind. It was very important to be able to share the experience with my partners in the cooperative group because, that way, we could compare experiences, difficulties and some discoveries".

Student-B: "The benefits of mindfulness are more and more evident, and by sharing experiences with my groupmates, we've seen that we all have a stronger capacity to concentrate on our breathing and to focus and distance ourselves from thoughts that return to our minds again and again. As the weeks go by, I realize that using this methodology is beneficial for my performance and simply carrying out my daily life, allowing me to relax more easily, see problems from another perspective, like something not connected to me, something that must be confronted, but from a point of view of something that can be faced more easily since it is manifested outside the body, but most of all outside the mind".

Student-C: "Informal practices provide me plenty of benefits because, since I'm aware of the tasks I'm doing at a given moment, I can perceive different sensations. For example, when I'm showering or eating something. With this practice, I could realize that by paying attention to the task I was carrying out at the moment, my senses were heightened a certain extent. Today I ate macaroni with tomato sauce and I think I've never enjoyed them so much in my life! Wow! I was never aware of just how much I love them!"

Student-D: "Today is the presentation of the final project, and we had another session of attention to breathing in the classroom prior to the presentation. Honestly, it was of great help when the time came to face the presentation. I could feel the beating of my heart more than on other days, and I could even hear my partner's breathing. On a final note, I'm grateful to the teacher who taught us this technique, not only for us to use as teachers in class, but to use in our day-to-day lives".

Student-E: "With regard to the activity involving mobile phones, I enjoyed this little moment of calm before doing such a routine and repetitive action throughout the day as answering or looking at the phone. In fact, I'm now more aware of just how many times I have to grab the phone for work and I've acquired a conscious attitude towards this action which had always been so automatic".

After analyzing all the *mindful-diaries* containing the project experiences of the students who successfully completed the holistic education program, feedback was provided to all the students regarding the difficulties that arose during the practice of mindfulness.

The key contributions of integrating the techniques of cooperative learning groups with mindfulness can be summarized in the following aspects:

Attention: We believe any improvement made in this aspect to be of utmost importance given that, in the digital era and with an excess of information and overstimulation, our capacity to maintain attention is weakening (Carr, 2010). During this experience, we observed that attention and concentration were the areas where students perceived the most improvement, not only during classes but also in the presentation of their final project, where they reported less anxiety and stress. When working in groups, members pay complete attention to the person they are interacting with and both the past and future are removed from this relationship, except for practical purposes.

Positive effect on motivation: Different studies highlight the impact that cooperative learning has on motivation in learning (Panitz, 1999). On the one hand, we observed that cooperative learning increases the value of acquiring certain skills in a context of participation in which the students are the protagonists (including ICT tools). On the other hand, mindfulness facilitates the feeling of having an innovative experience, mainly when they use guided meditations such as those available through apps, that generates curiosity and proves particularly appealing to generations that have grown up in environments increasingly dominated by digital technology.

Adaptative skills and attitudes: It is necessary to develop certain skills and attitudes that promote and facilitate teamwork, collaboration and learning (Johnson et al., 1994). The aspects which the students discuss include improving self-awareness, improving aspects such as active listening, the correlation of emotions in order to distance oneself from situations by learning to relativize them, which fosters empathetic communication with groupmates they interact with every day. We also observed states of well-being and resiliency, cognitive capacities including creativity and focus, and mental calmness ―aspects that promote more creative, motivating and meaningful learning (Rechtschaffen, 2014). This type of learning is based on knowledge, skills, (patience, flexibility and equanimity), collaborative competences and especially values, namely empathy, tolerance, compassion and kindness.

5. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

It is important to remark that although there may be obstacles to implementing more conscious education using strategies like those proposed in this study, there are also many potential benefits. We hope that advances in practice and research in the years to come help to avoid these obstacles and limitations, and progressively allow contemplative pedagogy to enrich our education system.

This study relied on student self-reports (*mindful-diaries*) to understand the relationship between mindfulness and cooperative learning and outcomes such as content learning and skills development.

As this was the first time the holistic approach was applied, it was decided that the out-of-class mindfulness activities would be voluntary. In this regard, it would have been interesting to compare the results obtained in relation to the general perception of a group of students who had done the complete program with a group that had not done the out-of-class mindfulness activities, using the latter as a control group.

Therefore, incorporating a control group into the same project in the future could provide a great deal of information that would help to improve the program and even include certain aspects related to emotional self-regulation in the teamwork exercises.

Of course, following the implementation of this holistic approach, which is part of a project in conjunction with other subjects or courses that apply mindfulness using other more traditional methodologies, we will analyze the complete project. This will involve an assessment of the strong and weak points according to the professors who participated in the project and a detailed study of the overall effect on the students, in terms of both academic results and their general quality of life. In addition, we will analyze which teaching methodologies adapted best to the use of mindfulness.

Also, future studies should examine the process by which compassion to the self and others is related to issues of motivational and group conflicts.

6. CONCLUSIONS

Both teachers and students often become overwhelmed by their daily workload –the result of the numerous requests, demands, tasks and distractions that arise. Such a challenging routine provokes a disconnection with one's own emotions and needs, and this becomes evident in the academic field (lack of attention and creativity, demotivation), social aspects (lack of collaboration and empath among partners) and in personal life (health problems associated with stress, burnout, mobbing and frustration).

The practice of meditation allows people to acquire heightened awareness of themselves. With this insight, they can then start to respond to their needs and stressful situations using adaptative skills, rather than reacting to them automatically.

Mindfulness can also help to improve strategies and techniques involved in cooperative learning. Also, cooperative learning can be utilized to teach and train in mindfulness. This proposal is novel and implies a reciprocal relationship between both fields. The integration of cooperative learning and mindfulness can offer a series of advantages in terms of research, theory and methodology, and it has not been explored enough in the literature.

This study also shows how an integration of active methodologies (cooperative learning, gamification and flipped learning aided by ICT tools) and mindfulness can transform the way students learn, by placing the student at the core of the learning process. This holistic educational approach can be applied at any level, including primary school, secondary school and university.

Cooperation and mindfulness represent a way of life, and they are not acquired overnight. It is necessary to develop certain skills and attitudes that promote and facilitate teamwork, collaboration and observation. In this sense, cooperative learning combined with mindfulness constitutes an educational key, both from the perspective of academic results, as it fosters the practice of social and interpersonal skills. At the same time, students (future teachers/educators in our course) are given tools to improve stress management and coping skills, both for themselves and so that they can offer them to their future secondary school students, helping them to cope with adversity and build their inner strength to face the daily challenges of school.

The results obtained in this work highlight the need to apply mindfulness programs combined with active teamwork methodologies, within the educational context to improve states of well-being among students, and increased community, connection and awareness among partners, which also directly influences their academic performance.

We conclude by openly inviting those educators with some meditation experience to find ways to share this gift with their students. For those educators who are not familiar with any mindfulness practice, we strongly recommend exploring it as an option for their own well-being and growth, as well as for the growth and well-being of their students.

REFERENCES

Akçayır G., & Akçayır, M. (2018). The flipped classroom: a review of its advantages and challenges. *Computers & Education, 126*, 334-345.

Aronson, E., Blaney, N., Stephan, C. Sikes, J., & Snapp, M. (1978). *The jigsaw classroom*. Beverly Hills: California, Sage Publications.

Brown, K., & Ryan, R. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822-848.

Burke, B. (2014). GAMIFY: How gamification motivates people to do extraordinary things. EUA: Gartner, Inc.

Carr, N. G. (2010). The shallows: how the internet is changing the way we think, read and remember. W. W. Norton & Company.

Flores, S.A. (2017). Contemplative pedagogy: mindfulness methodology in education & human development. *Journal of Education and Human Development, 6(3),* 65-69.

Gallifa, J. (2019). Integral thinking and its application to integral education. *Journal of International Education and Practice, 2(1)*, 15-27.

García, E., Gil, C., Gil, M.D., Pulido, R.A., Iniesta, M.A., & Águila, C. (2019). *Connecting with our students: how to promote a more conscious teaching/learning process*. In L. Gómez Chova, A. López Martínez, I. Candel Torres (Eds.). *Proceedings of 11th International Conference on Education and New Learning Technologies* (pp. 4468-4472). IATED.

Germer, C. K. (2005). Mindfulness. What is it? What does it matter? In C.K. Germer, R. D. Siegel & P. R. Fulton (Eds.), *Mindfulness and Psychotherapy* (pp. 3-27). New York: Guilford Press.

Gil, C., Montoya, M. G., Herrada, R. I., Baños, R., Montoya, F. G., & Manzano, F. (2011). Cooperative learning and electronic group portfolio: tutoring tools, development of competences and assessment. *International Journal of Learning Technology,* 6(1), 46-61.

Gil, C., Montoya, M. G., Herrada, R. I., Baños, R., & Montoya, F.G. (2013). Engaging students in computer-supported cooperative learning. *International Journal of Learning Technology, 8*(3), 297-311.

Gil, C., Alcayde, A., Montoya, F. G., Baños, R., Herrada, R.I., & Gil, M.D. (2018). Implementation and analysis of a new tool for clickers. In L. Gómez Chova, A. López Martínez, I. Candel Torres (Eds.), *Proceedings of 10th International Conference on Education and New Learning Technologies* (pp. 7359-7367). IATED.

Gunaratana, H. (1991). *Mindfulness in plain English*. Massachusetts: Wisdom.

Jensen, E. (2009). Cerebro y Aprendizaje. Competencias e implicaciones educativas [Teaching with the brain in mind]. Madrid: Narcea.

Johnson, D.W., Johnson, R., & Smith, K. (1991). *Active learning: Cooperation in the college classroom*. Edina, Minnesota: Interaction Book Company.

Johnson, D.W., Johnson, R., & Holubec, E. (1994). *Cooperative learning in the classroom*. Virginia: ASCD.

Kabat-Zinn, J. (2016). Mindfulness for beginners. Reclaiming the present moment and your life. Boulder, Colorado: Sounds True.

Kasworm, C., & Bowles, T. (2012). Fostering transformative learning in higher education settings. In E. Taylor & P. Cranton, (Eds.), *The handbook of transformative learning* (pp. 388-407), Thousand Oaks, CA: Sage.

Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *Journal of Economic Education, 31*(1), 15-25.

Leon, B. (2008). Atención plena y rendimiento académico en estudiantes de enseñanza secundaria [Mindfulness and academic achievement in high school students]. *European Journal of Education and Psychology, 1(3),* 17-26.

MacManaway, I. (1970). Teaching methods in higher education – innovation and research. Universities. *Higher Education Quarterly, 24*(3), 321-329.

McKeachie, W. J., & Svinicki, M. (2006). McKeachie's teaching tips: Strategies, research, and theory for college and university teachers (12th ed.). Boston: Houghton-Mifflin.

Mañas, I., Franco, C., Montoya, M.G., & Gil, C. (2014). Educación consciente: mindfulness (atención plena) en el ámbito educativo. Educadores conscientes formando a seres humanos conscientes [Conscious education: mindfulness in the educational field. Conscious educators training conscious human beings]. In R. L. Soriano, & P. Cruz (Eds.) *Alianza de civilizaciones, políticas migratorias y educación* (pp.193-229). Sevilla: Aconcagua.

Montoya, M. G., Herrada R. I., Gil, C., Montoya, F.G., & García, A. (2009). The importance of cooperative work in the faculty and in the classroom. In W. Kouwenhoven (Ed.), *Advances in Technology, Education and Development* (pp. 263-280). InTech.

Montoya, M.G., Mañas, I. Gil, C., Herrada, R.I., & Franco, C. (2012): Integrando el aprendizaje cooperativo y la atención plena (Mindfulness) en el desarrollo de competencias [Integrating cooperative learning and mindfulness in competency development]. In F. Manzano (Ed.), *Propuestas de Actividades y Metodologías Específicas para la Mejora del Bilingüismo en Ingeniería* (pp. 89-127). Almería: Universidad de Almería.

Panitz, T. (1999). Benefits of cooperative learning in relation to student motivation. In M. The-all (Ed.), *New Directions for Teaching and Learning*, (pp.59-68). San Francisco, CA: Josey-Bass.

Park, J. J., Long, P., Choe, N. H., & Schallert, D. L. (2018). The contribution of self-compassion and compassion to others to students' emotions and project commitment when experiencing conflict in group projects. *International Journal of Educational Research, 88*, 20-30.

Rechtschaffen, D. J. (2014). The way of mindfulness education. Cultivating well-being in teachers and students. Norton Professional Books.

Santiago, R., & Rodríguez, F. (2015). Gamificación: cómo motivar a tu alumnado y mejorar el clima en el aula [Gamification: how to motivate your students and improve atmosphere in the classroom]. Madrid: Grupo Oceáno.

Smith, K.A. (1996). Cooperative learning: making "groupwork" work. In T.E Sutherland & C. C. Bonwell (Eds.), *New Directions for Teaching and Learning* (pp. 71-82). San Francisco, CA: Jossey-Bass.

Wang, A.I. (2015). The wear out effect of a game-based student response system. *Computers & Education, 82*, 217-227.

ACKNOWLEDGEMENTS

This work has been supported by project 19_20_1_20C *Connecting with our Students: How to Promote a more Conscious Teaching/Learning Process* of the University of Almería.

AUTHORS' INFORMATION

Full name: Consolación Gil
Institutional affiliation: Superior School of Engineering. University of Almería
Institutional address: CITE III. La Cañada de San Urbano s/n 04120 Almería, Spain
Email address: cgilm@ual.es
Short biographical sketch: Consolación Gil, PhD in Computer Engineering, is a Full Professor at the Department of Informatics, University of Almería. She runs the research group PARETO. Her main research interests are parallel computing, evolutionary optimization of real-world problems and IoT. Her teaching research interests include active methodologies, such as cooperative learning, PBL, flipped classroom, virtual reality and mindfulness in education.

Full name: María Dolores Gil-Montoya
Institutional affiliation: Superior School of Engineering. University of Almería.
Institutional address: CITE III. La Cañada de San Urbano s/n 04120 Almería, Spain
Email address: dgil@ual.es
Short biographical sketch: María Dolores Gil-Montoya, PhD in Computer Engineering and PhD in Philosophy, is an Associate Professor at the Department of Informatics, University of Almería. Her main research interests are active methodologies, such as cooperative learning, philosophy and mindfulness in education.