

# Attitudes, Openness to Multiculturalism, and Integration of Online Collaborative Learning

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## ABSTRACT

The current study examined the influence of students' openness to multiculturalism on the frequency of integrating Online Collaborative Learning (OCL). The mediating variables were attitudes toward: benefits of OCL, negative aspects of OCL and challenges of OCL. The participants were 315 ICT coordinators who are also subject teachers. 139 coordinators had participated in at least one OCL training program (44%) and 176 coordinators had not (56%). The questionnaire was based on previous ones and comprised 33 items. Path analysis findings indicate that the negative aspects of OCL were a very significant mediating factor in the model, affecting the paths between openness to multiculturalism and experiencing the challenges of OCL, and the frequency of the integration of OCL. Furthermore, for ICT coordinators who had taken part in the OCL programs and saw openness toward multiculturalism among their students, there was little impact when there were complex challenges in the OCL. It may be that educating toward multiculturalism leads to an atmosphere of openness and egalitarianism, to better interpersonal relations and social skills in the class, and so they summon fewer frustrating situations in OCL. This is an atmosphere that assures collaboration and attainment of positive learning results.

## Keywords

Online collaborative learning, Openness to multiculturalism, Attitudes, ICT coordinators

## Introduction

Since 2010, a national ICT program has been operating in Israel known as "Adapting the education system to the 21<sup>st</sup> century." It encompasses hundreds of elementary and junior high schools. The program focuses on applying the output in schools from both the organizational and pedagogical aspects, one of which is communications and collaboration (Ministry of Education, 2016), which affords one of the changes in 21<sup>st</sup> century learning (Resta & Carroll, 2010). Teachers are expected to apply a constructivist collaborative approach in an ICT environment in which students are actively involved in the learning process. According to this approach, students construct new knowledge through shared peer discussion in the learning, social, and cultural context, and the technological abilities of gathering, managing, creating, and sharing information indeed make it possible to realize many opportunities for innovative learning (Mikropoulos & Natsis, 2011). As part of the national program, in each school a teacher was appointed as the ICT coordinator to help introduce the technological changes to the school and instruct the teachers in their successful application. The teachers were chosen for their considerable and successful experience in the field and for their technological-pedagogical-content knowledge (TPACK) (Ministry of Education, 2016), which allowed them to integrate technology intelligently into their own teaching (Magen-Nagar & Avidov-Ungar, 2014).

In the framework of the national ICT program, some 30 diverse ICT collaborative programs serving the schools exist at national and district levels. Online collaborative learning in schools has the defined structure of an educational intervention program that occurs in one or more of the following study settings: Collaborative learning within the school (in small groups in a class or crossing grade levels and disciplines); Collaborative learning between schools in the town / district / country; and collaborative learning between students in Israel and students in other countries around different or common topics around a certain theme (Ministry of Education, 2016). The most common digital means used for collaborative learning are the following: forums or social media, collaborative thinking maps, collaborative documents, a shared gallery and a shared digital book (Magen-Nagar & Shamir-Inbal, 2014). Each collaborative learning program is accompanied by the professional development and training of the teachers. These programs are also budgeted by the Ministry of Education's national ICT program.

The current study examined the variables that predict the integration of Online Collaborative Learning (OCL) among ICT coordinators. The variables in this study were: attitudes toward students' openness to multiculturalism, attitudes regarding the benefits and negative aspects of OCL, and experiencing challenges in

OCL. Various characteristics may influence the teachers' motivation to use OCL. Much research shows that the main obstacle to integrating ICT is the teachers' attitudes towards its role in teaching and their ability to integrate it successfully (e.g., Kusano et al., 2013). The current study examines the attitudes of ICT coordinators towards OCL (benefits, negative aspects, and challenges) as factors affecting the frequency of its use. This learning, which is constantly on the rise following technological changes, is considered a dynamic teaching practice, but with a low level of application (Kaendler, Wiedmann, Rummel, & Spada, 2014; Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2016). These findings show a need to distinguish between different attitudes and identify which of them influence behavior. Moreover, this study adds a new dimension – the teachers' estimation of their students' attitudes toward the universal value of openness to multiculturalism. For OCL, the interaction between different learners is of critical significance, and one of the factors that affect this interaction is openness to diversity. Israel is defined as a multicultural country, and so openness to multiculturalism is a very relevant value in education. It is reasonable to assume that the students' openness to multiculturalism will affect the nature of their learning as well as the teachers' attitudes and behaviors regarding online collaborative learning and teaching.

In the current study, a path analysis model was used, as it enabled concurrent investigation of the direct and indirect influences of the variables on the dependent variable. The construction of the proposed model was based on a review of the literature and on prior research, and the research hypotheses were developed accordingly.

## **Literature review and hypotheses development**

### **Openness to multiculturalism**

The term “cultural” refers to a wide variety of groups, specifically, various ethnic minorities, immigrants, resident aliens, women, men, and homosexuals, as well as a range of political and religious orientations (Narvaez & Hill, 2010). Multicultural education is based on the principle of dialogue and respect between different groups in society and the mutual enrichment of openness to others. Openness to multiculturalism is defined as a basic value that is a component of human nature in every culture. It represents the value of universality relating to concern for the individual and the wellbeing of the collective, i.e., the desire to understand and accept other people, with an emphasis on intellectual and emotional openness to the environment and other cultures (Schwartz et al., 2012). Educational multiculturalism strives to offer equal education, which means providing equal educational opportunities to all students, whatever their ethnic, racial, cultural and social background (Banks & Banks, 2010). Such education is characterized by a commitment to social justice, critical approaches to learning and openness to multiculturalism.

Culturally, Israel is a highly diverse society. Its three main cultural segments are: secular Jews, religious Jews and Arabs. However, each of these three segments contains further subdivisions of diverse cultures and ethnic groups. There is no official national policy regarding intercultural education in Israel. However, projects and initiatives promoting it have regularly been supported and financed by the country's various governments. Moreover, inherent in Israel's Declaration of Independence (1948) is the commitment to extend equal rights to “all inhabitants.” Israel's education system demonstrates such a commitment by allowing the opening of schools according to religious and cultural affiliation. These schools enhance the mandatory educational curriculum with particular national/religious/cultural content. As a result, the majority of schools have a specific religious and cultural orientation, with little or no interaction with other cultures. These differences between cultures tend to create tensions in Israeli society and hence, schools play a vital role in education for tolerance and openness to multiculturalism, a pluralistic approach (Schmida & Yosifon, 2006). As a consequence, educators must seek to create conditions that allow and encourage students to move beyond their narrow personal and social worlds and provide them with opportunities to experience the worlds of those different from them. A teacher who educates his or her students is familiar with their behavior and attitudes, and so it is feasible to assume that the ICT coordinator, who is a teacher, may know to what extent his or her students are open to multiculturalism. One of the most innovative strategies that can provide a solution is cooperative learning (Slavin, 2013). Group learning encourages positive social interactions between students from different cultures. This strategy reduces racial stereotyping and prejudices (McLemore & Romo, 1998). The effectiveness of collaborative learning depends on many conditions, such as the composition of the group (heterogeneity, number, and age), the nature of the task and the medium of communication. These conditions are interconnected and we cannot know what affects the outcomes of the learning (Kusano et al., 2013).

Over the last 40 years, there have been numerous initiatives in Israel to bring together diverse groups in a variety of educational settings. From the start of this century, the integration of ICT in these projects has gained

momentum, as it enables asynchronous meetings from different locations while at the same time concealing external appearances and thus allowing for an unprejudiced first impression (Shonfeld, Hoter, & Ganayem, 2013). This is very relevant when different ethnic/religious groups are easily recognizable by their external appearance (e.g., skin color, length of clothing, type of head covering or absence thereof). In classrooms where teachers educate toward openness to multiculturalism, cooperative learning will be more successful because of students' social skills and values that afford them high quality interactions (Gillies, 2008; Johnson & Johnson, 2009).

In light of the above, the following hypotheses were proposed:

**H1:** ICT coordinators' attitudes toward their students' openness to multiculturalism has a positive effect on their perception of the benefits of OCL.

**H2:** ICT coordinators' attitudes toward their students' openness to multiculturalism has a negative effect on their perception of the negative aspects of OCL.

**H3:** ICT coordinators' attitudes toward their students' openness to multiculturalism has a positive effect on their challenging experiences in OCL.

**H4:** ICT coordinators' attitudes toward their students' openness to multiculturalism has a positive effect on their frequency of integrating OCL.

### **Online collaborative learning**

Collaboration is one of the accepted methods of distance learning that developed with the spread of online learning in the education system (Harasim, 2012). This learning is based on face-to-face collaborative learning, which contains five interrelated components: (1) Positive mutual dependency; (2) Personal accountability; (3) Fostering interaction; (4) Social skills; (5) Group process (Johnson & Johnson, 1999). When these components are well executed, the learners' academic achievements, involvement, responsibility, and intrinsic motivation improve (Hanze & Berger, 2007). "OCL theory provides a model of learning in which students are encouraged and supported to work together to create knowledge: to invent, to explore ways to innovate, and, by so doing, to seek the conceptual knowledge needed to solve problems..." (Harasim, 2012, p. 90). Online collaboration is similar to face-to-face collaborative learning, but the meetings of group members are conducted synchronously and/or asynchronously via the internet. Siemens (2005) claims that learning in the digital age is no longer dependent on individual knowledge acquisition, storage, and retrieval; rather, it relies on the connected learning that occurs through interaction with various sources of knowledge (including the Internet and learning management systems) and participation in communities of common interest, social networks, and group tasks.

According to Ajzen's (1991) Planned Behavior Theory, attitude affects behavior through a process of planned decision-making. The theory assumes that behavior is an indirect result of information or relevant behavioral beliefs towards the behavior, so that each of the influential factors is derived from behavioral beliefs; in our case, this would be the teachers' beliefs about including OCL in teaching. This study examined the attitudes of ICT coordinators, which reflect the benefits, negative aspects and challenges of OCL, since these beliefs have a decisive impact on any change in behavior and on choosing the practice of OCL (Ertmer & Ottenbreit-Leftwich, 2010). Studies show that teachers' attitudes have a greater impact on their actions than knowledge, and they are better predictors of teacher behavior (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010; Prestridge, 2012). The strategy of integrating collaborative technologies and the extent of their inclusion are affected by teacher's beliefs, because the use of these technologies will help improve teaching and professional development (Kale & Goh, 2014).

OCL has great potential to promote meaningful interactions and empathy between students and teachers and among the students themselves. Collaborative learning is not only active, but also interactive. Each student interacts with other learners, and while exchanging ideas and knowledge, each student builds his/her own world of knowledge (Harasim, 2012). It was found that collaborative projects increased student engagement and motivation to learn (Kaendler et al., 2014). A link was also found between collaborative projects, student involvement in learning, and knowledge construction (Brett, 2004; Stahl, 2006). Researchers found that collaborative learning provides learners with skills needed in the work world, where much activity takes place in working groups (Palloff & Pratt, 2005). A meta-analysis of 629 studies found that with positive mutual dependency, students' achievements, and motivation were higher than among those who experienced negative dependency or non-dependency (Johnson, Johnson, Roseth, & Shin, 2014).

Despite the benefits of OCL documented here, group collaborative work can scare learners. They often refrain from participating and even have reservations about taking part in group activities. There are some who refuse to

participate because of previous negative experiences due to an unfair amount of effort needed and assessment that did not reflect the level of their contribution to the group work (Harasim, 2012).

Sometimes ethical questions arise regarding the sense of ownership of the knowledge and agreements about sharing the knowledge with others in order to improve the results of the group (Stahl, 2006). Cultural diversity among group members might be a challenge also, as it might lead to empathy toward the other, alongside confrontations and controversies among group members. Confrontations might arise regarding how collaborative tasks are to be completed or how decisions are made. Such disagreements might diminish the effectiveness of the learning if they are not dealt with properly, on the one hand. On the other hand, negotiation, discussion of solutions and brainstorming might advance the collaborative learning toward innovation and creativity (Johnson & Johnson, 2013). Moreover, sometimes a different mother tongue among learners (as is the case between Jews and Arabs in Israel) is a hindrance that can lead to misunderstanding (Shonfeld et al., 2013). Another issue that emerges in collaborative learning is coordinating schedules. Delays in studies due to lack of scheduling coordination might lead to diminished motivation and reciprocal blaming (Chiong, Jovanovic, & Gill, 2012).

Because of the challenges, the teacher plays a crucial role in fostering student interaction that is beneficial for learning (Gillies et al., 2008). Teachers' professional knowledge and competence influence the success of collaborative learning. Teachers' beliefs about their role might play a crucial role in the process of OCL in class (Kaendler et al., 2014). However, it was found that teachers are not always so enthusiastic about learning and implementing new theories (Tondeur et al., 2016) and that the collaborative learning experience changed their behavior (Van Leeuwen, Janssen, Erkens, & Brekelmans, 2013). In this research we suggest involving teachers in organized collaborative projects in order to increase their knowledge, and promote positive attitudes and willingness to integrate collaborative learning in their teaching.

In light of the above findings, the following additional hypotheses were proposed:

**H5:** ICT coordinators' attitudes toward the benefits of OCL have a positive effect on their experience of challenges in OCL.

**H6:** ICT coordinators' attitudes toward the benefits of OCL have a positive effect on the frequency with which they choose to integrate OCL into their work.

**H7:** ICT coordinators' attitudes toward the negative aspects of OCL have a negative effect on their perception of the benefits of OCL.

**H8:** ICT coordinators' attitudes toward negative aspects of OCL have a negative effect on their experience of challenges in OCL.

**H9:** ICT coordinators' attitudes toward the negative aspects of OCL have a negative effect on the frequency with which they choose to integrate OCL into their work.

**H10:** ICT coordinators' challenging experiences in OCL have a negative effect on the frequency with which they choose to integrate OCL into their work.

**H11:** ICT coordinators' attitudes toward their students' openness to multiculturalism has a positive effect on their frequency of integrating OCL via the attitudes toward the benefits of OCL, and attitudes toward the negative effect and challenging experiences in OCL.

It could be assumed that all variables in path analysis are stronger among ICT coordinators who participate in such programs compared to ICT coordinators who do not participate. This is because those who receive guidance, preparation, and training to integrate OCL should be better at it than those who are not prepared (Gillies, 2008; Johnson & Johnson, 2009).

## Methodology

### The participants

The study comprised 315 school ICT coordinators who participated in the national ICT program, and in addition, are also teachers of various disciplines (e.g., mother tongue, math, English). Prior to the study, 139 coordinators had participated in OCL programs (44%) and 176 coordinators had not participated (56%) in any such course. Most of the participants taught in elementary schools (70.6%); about half had held that position for up to three years (52.2%) and the rest for longer (47.8%). Similarly, about half of the coordinators had a Master's degree (52.2%), others had a Bachelor's degree (42.1%), and 0.9 % held a PhD. Most had 11 years or more of teaching seniority (66.5%) and the rest had less (33.5%).

## The research tools

The research hypotheses were examined using a self-reporting questionnaire developed for this study that was based on several questionnaires and on the literature. It included 33 items divided into five indices. The items were measured using a 5-point Likert scale with responses ranging from "not at all" (1) to "greatly" (5). Furthermore, background data such as age, education, teaching seniority and subject coordination were gathered. Table 1 presents the descriptive information about the research questionnaire.

*Table 1. Descriptive information about the research questionnaire*

Scales	Scale description	Item example	List of items	Cronbach $\alpha$
Attitudes toward the benefits of OCL (adapted from Brown, 2008)	Attitudes toward the benefits of OCL	1. A better understanding of the contents	1-8	.90
Attitudes toward the negative aspects of OCL (adapted from Brown, 2008 and Capdeferro & Romero, 2012)	Attitudes toward the negative aspects of OCL	13. Does not suit all types of students	9-16	.84
Challenging experiences in OCL (adapted from Capdeferro & Romero, 2012)	Challenging experiences in OCL	21. Online discourse among students leads to misunderstandings	17-23	.80
Attitudes toward students' openness to multiculturalism (adapted from Narvaez, Endicott, & Hill, 2009)	Student's experiences of, or efforts to increase their multicultural experiences	27. My students try to listen to opinions that differ from their own	24-32	.86
The frequency of integrating OCL	Frequency of integrating OCL	33. How frequently do you integrate OCL in your lessons?	33	

In Table 1, the internal consistencies of the scales, which can be used to claim convergent validity, were assessed using Cronbach' alpha. The alpha value of four scales ranged from 0.80 to 0.90.

## The research process

In the middle of the semester of 2016, while schools were following the annual ICT curriculum, the ICT coordinators were asked to complete the online self-reporting questionnaire. Anonymity and confidentiality were assured since the questionnaires were completed without the inclusion of any identifying details.

## Results

In order to examine the research hypotheses via path analysis, the correlations between the research variables were examined with a Pearson correlation matrix. The results of these analyses are presented in Table 2.

*Table 2. Pearson correlation matrix between the research variables*

	2	3	4	5	<i>M</i>	<i>SD</i>
1 Attitudes toward the benefits of OCL	-.385**	-.174**	.434**	.244**	3.91	.70
2 Attitudes toward the negative aspects of OCL		.605**	-.238**	-.326**	2.51	.73
3 Experiencing challenges in OCL			-.237**	-.298**	2.95	.73
4 Attitudes toward the students' openness to multiculturalism				.219**	3.11	.72
5 The frequency of integrating OCL					2.92	1.14

*Note.*  $N = 315$ ; \*\* $p < .01$ .

Table 2 shows significant Pearson correlations between the five research variables. The strongest positive relationship was between attitudes toward the negative aspects of OCL and the experiences of challenges in OCL (.605), and between attitudes toward the students' openness to multiculturalism and attitudes toward the benefits of OCL (.434), while the weakest positive relationship was between attitudes toward the benefits of OCL and the frequency of integrating OCL (.244). Additionally, the weakest negative relationship was between attitudes toward the benefits of OCL and challenging experiences in OCL (-.174). The mean values of research variables were medium when positive attitudes toward the benefits of OCL were higher.

In order to examine the variables that predict the integration of OCL during lessons among ICT coordinators who participated in the collaborative ICT programs, compared to ICT coordinators who did not participate, a path analysis was conducted using the statistical AMOS 22.0 software for SEM (Arbuckle, 2013). This is a multi-variable data analysis in a graphic environment, used when testing a complex model that includes a range of variables or diverse dependency connections between them (Byrne, 2009). The first stage in SEM is evaluating the measurement model. The results of this model show that the value of  $\chi^2$  is 0.42 ( $df = 1$ ) which is statistically not significant ( $p = .515$ ). The RMSEA index was lower than .06 (.000), thus reflecting a good fit; the NFI index was very high, approaching 1 (.999), the CFI index was 1.000 and the GFI index was .98. These results demonstrate that the measure achieved a satisfactory model fit.

The second stage involved evaluating the structural model that classifies the inter-variable effects. Figure 1 presents the path analysis of the ICT coordinators who participated in the OCL program, and Figure 2 presents that of the non-participating ICT coordinators. Each figure presents the standardized coefficients of effect ( $\beta$ ).

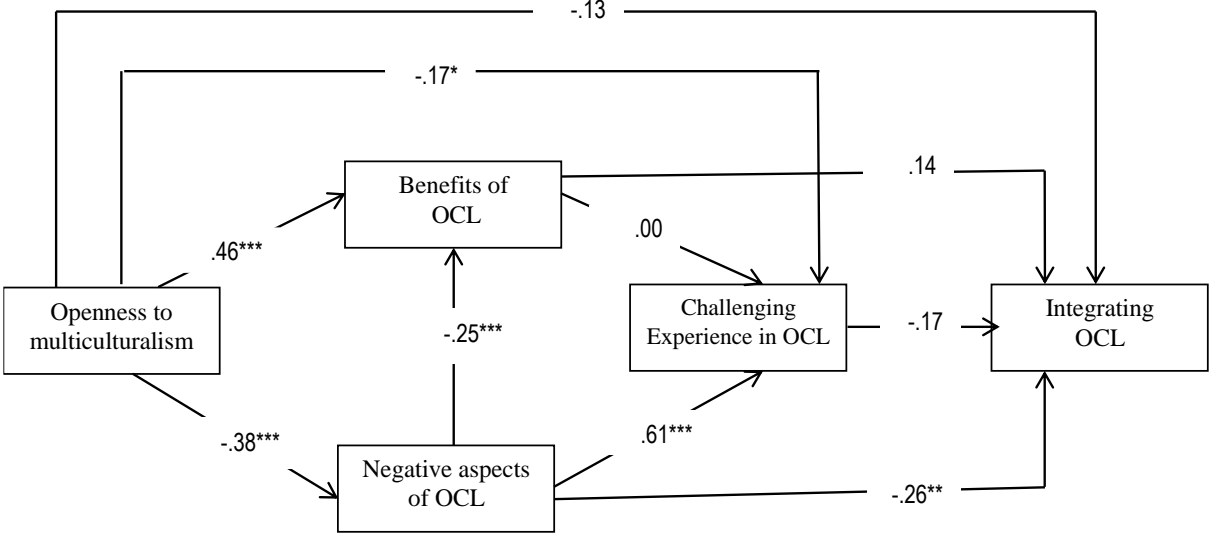


Figure 1. Path analysis for ICT coordinators after an OCL program (Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .)

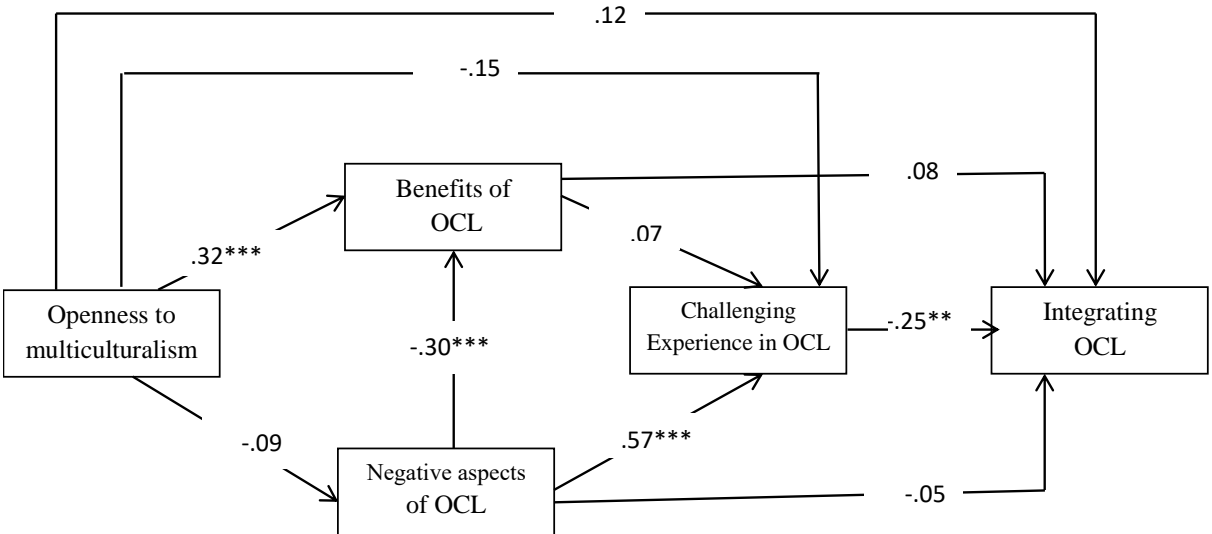


Figure 2. Path analysis for ICT coordinators not in any OCL program (Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .)

## Examination of the structural model and confirmation of the research hypotheses

Figures 1 and 2 show that openness to multiculturalism is the independent variable and integrating OCL is the dependent variable. The model's intermediary variables are benefits of OCL, negative aspects of OCL and challenging experience in OCL.

Examination of the first four research hypotheses (H1, H2, H3, H4) indicate that regarding attitudes toward their students' openness to multiculturalism, among ICT coordinators who participated in OCL programs there is a significantly strong effect on the attitudes toward the benefits and negative aspects of OCL ( $\beta = .46, \beta = -.38, p < .001$  respectively), and of a low, negative intensity on the experience of challenges in OCL ( $\beta = -.17, p < .05$ ), but there is no significant effect on the frequency of integrating OCL ( $\beta = -.13, p > .05$ ). In other words, in the group of ICT coordinators who had participated in OCL programs, the more open the coordinators believed their students were to multiculturalism, the more familiar the coordinators were with the benefits and negative aspects of OCL, and the more they agreed with the experience of challenges in OCL.

Among ICT coordinators who had not participated in any OCL training, for attitudes regarding their students' openness to multiculturalism, there is a significant effect of medium, positive intensity on the attitudes regarding the benefits of OCL ( $\beta = .32, p < .001$ ), but there is no significant effect on the negative aspects ( $\beta = -.09, p > .05$ ), on the challenging experience in OCL ( $\beta = -.15, p > .05$ ) and on the frequency of integrating OCL ( $\beta = .13, p > .05$ ). In other words, in the group of coordinators that had not participated in an OCL program, the more open the coordinators believed their students were to multiculturalism, the more significantly they recognized the benefits of OCL.

Examination of the remaining five research hypotheses (H5, H6, H7, H8, H9) indicate that among ICT coordinators who participated in the OCL program regarding the benefits of OCL, there is no significant effect on the challenging experiences in OCL ( $\beta = .00, p > .05$ ), nor any significant effect on the frequency of integrating OCL ( $\beta = .14, p > .05$ ). However, attitudes toward the negative aspects of OCL have a significant effect of a strong, positive intensity on the challenging experiences in OCL ( $\beta = .61, p < .001$ ) and of a low, negative intensity on the attitudes toward the benefits of OCL ( $\beta = -.25, p < .001$ ), as well as of a low, negative intensity on the frequency of integrating OCL ( $\beta = -.26, p < .01$ ). In other words, in the group of ICT coordinators who had taken part in OCL programs, it was found that the greater the extent to which they agreed with the negative aspects of OCL, the less they agreed with the benefits of OCL, the more they agreed about challenging situations in OCL and the more frequently they integrated OCL in lessons.

Among ICT non-participating coordinators, regarding attitudes toward the benefits of OCL, there is no significant effect on the challenging experiences in OCL ( $\beta = .07, p > .05$ ), nor any significant effect on the frequency of integrating OCL ( $\beta = .08, p > .05$ ). However, attitudes toward the negative aspects of OCL have a significantly strong, positive effect on the challenging experiences in OCL ( $\beta = .57, p < .001$ ), and a low, negative intensity on the attitudes toward the benefits of OCL ( $\beta = -.30, p < .001$ ), but there is no a significant effect on the frequency of integrating OCL ( $\beta = -.05, p > .05$ ). In other words, in the group of ICT coordinators who had not participated in any OCL program, the greater the extent to which they agreed with the negative aspects of OCL, the less they agreed with the benefits of OCL, and the more they agreed about challenging situations in OCL.

Table 3. The significance of mediator effect - Sobel test (Z)

	Benefits of OCL	Negative aspects of OCL	Challenging experiences in OCL
<b>For ICT coordinators after OCL programs</b>			
Sobel test (Z) - integrating OCL	2.71**	3.42***	3.25***
Sobel test (Z) - challenging experiences in OCL	-3.70**	-4.42***	-
<b>For ICT coordinators not in OCL programs</b>			
Sobel test (Z) - integrating OCL	2.23*	1.17	2.11*
Sobel test (Z) - challenging experiences in OCL	-2.08*	-1.25	-

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Examination of hypothesis H10, indicates that among ICT coordinators who had participated in OCL programs, with regard to challenging experiences in OCL, there is a no significant effect on the frequency of integrating OCL ( $\beta = -.17, p > .05$ ), but among ICT coordinators who had not participated in OCL programs there is a significant effect on the frequency of integrating OCL ( $\beta = -.25, p < .01$ ). In other words, for the group of ICT coordinators who had not taken part in OCL programs, the greater the extent they agreed with the challenging

experiences in OCL, the more frequently they integrated OCL in their lessons. To examine hypothesis H11, the indirect effects for each mediator were tested with Sobel and the results are shown in Table 3.

Table 3 shows that among coordinators participating in the OCL program, there is significantly mediate between openness to multiculturalism and integrating OCL and challenging experiences in OCL. Among coordinators who had not participated in an OCL program, only the benefits mediator was significant between them.

A summary of the hypotheses testing results is shown in Table 4.

Table 4. Results of hypothesis tests

Hypothesis	Causal path	Path coefficient		Supported
		For ICT coordinators in the OCL programs	For ICT coordinators not in the OCL programs	
H1	OM → BE	.46***	.32***	Yes
H2	OM → NA	-.38***	-.09	Yes
H3	OM → CE	-.17*	-.15	Yes
H4	OM → integrating of OCL	-.13	.13	No
H5	BE → CE	.00	.07	No
H6	BE → integrating of OCL	.14	.08	No
H7	NA → BE	-.25***	-.30***	Yes
H8	NA → CE	.61***	.57***	Yes
H9	NA → Integrating of OCL	-.26**	-.05	Yes
H10	CE → Integrating of OCL	-.17	-.25**	Yes
H11	OM → NE → BE → CE → Integrating of OCL	.17	.34**	Yes

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . BE= Attitudes toward the benefits of OCL; NA= Attitudes toward the negative aspects of OCL; CE= Challenging experiences in OCL; OM= Attitudes toward the students' openness to multiculturalism.

Finally, different images were obtained in the percentage of explained variance of the endogenous variables for each group, wherein the variables are endogenous in the model for ICT coordinators who had participated in an OCL program. Attitudes toward the benefits of OCL (36% and 21% respectively) and the negative aspects of OCL (15% and 1% respectively) and the challenging experiences in such learning (47% and 33% respectively) are explained at a higher level than that in the model for the ICT coordinators who had not participated. However, integrating OCL is explained to a similar, relatively lesser, extent by the five research variables among the ICT coordinators in the program and among the non-participatory ICT coordinators (17% and 13% respectively).

## Discussion and conclusions

The current study used a path analysis model to examine the influence of openness to multiculturalism on the frequency of integrating OCL in lessons among school ICT coordinators. The mediating variables were attitudes toward: benefits of OCL, negative aspects of OCL and challenges of OCL. The path analysis model, which provided satisfactory correlating indices, explained only to a relatively small extent the frequency of integration of OCL in both research groups, as opposed to the explained variance of the experience of the challenges of OCL. This finding could strengthen the claim that teaching with OCL is hard, not simple and infrequent for any teacher (Magen-Nagar & Shamir-Inbal, 2014) but it is challenging (Slavin, 2013). The two groups consisted of school ICT coordinators, who, besides their role as managers of ICT in the school, are also teachers who usually have TPACK knowledge that sensibly integrates technological tools and services, constructivist teaching practices and study content. They teach using advanced, rich, and up-to-date technological means more than other teachers at school. Thanks to their technological skill, techno-pedagogical experience, technology orientation, and ongoing training, they guide students through collaborative research assignments and problem solving in technology-based learning environments (Mishra, Koehler, & Henriksen, 2011).



The division into two groups was according to their participation in specific OCL programs, in order to identify the significant variables affecting the frequency of the integration of OCL in teaching. The current study found that the more the ICT coordinators saw their students' behaviors as being open to children from a different culture, the more positive their attitudes were toward OCL. It seems that in a class in which students learn in an open and respectful atmosphere, the teacher leading ICT recognizes the benefits of OCL. The benefits are directed mainly at the learner as an individual, i.e., better understanding of the material and developing higher-order thinking. In high-quality collaborative learning, each student is active and interacts with the other learners, and when there is negotiation and the exchange of opinions and knowledge, each student constructs his or her own world of knowledge and thus develops (Harasim, 2012). However, only the ICT coordinators who had taken part in the programs also recognized the negative aspects of OCL, which relate to the class as a social unit, e.g., OCL creates tensions among the children. This is because OCL is based on the friendships and mutual dependency among group members (Siemens, 2005). Constructing collaborative knowledge in an online environment requires discussion and the exchange of opinions, while maintaining ongoing contact and reciprocal communication among the group members (Gillies, 2008). Furthermore, for ICT coordinators who took part in the OCL programs and saw openness toward multiculturalism among their students, there was little impact when there were complex challenges in the OCL. It may be that educating toward multiculturalism leads to an atmosphere of openness and egalitarianism, to better interpersonal relations and social skills in the class, and so they summon fewer frustrating situations in OCL. This is an atmosphere that assures collaboration and attainment of positive learning results in the 21<sup>st</sup> century (Harasim, 2012).

The attitudes toward negative aspects of OCL were a very significant mediating factor in the model, affecting the paths between openness to multiculturalism and experiencing the challenges of OCL, and the frequency of the integration of OCL. All the negative aspects examined in this study focus on the interaction between the students, which might harm the class as a social group. For example, it may be hard for students to maintain proper ongoing communication with all members of the group. This finding supports earlier studies that emphasize the importance of interaction in collaborative learning (Johnson et al., 2014), where the students are either unable to create high-quality shared knowledge or are unable to communicate with each other, or the online discourse leads to misunderstandings and formation of ideas, and the mutual dependency is negative. In such a process, the interaction between the students is impaired and this leads to ineffective learning, lack of motivation, dissatisfaction, and to a decline in achievements (Hanze & Berger, 2007). For the teachers' part, these attitudes toward negative aspects generate a poor experience of OCL, especially in the more complex and challenging part of this kind of learning. In addition, these negative aspects affect the frequency with which they will integrate OCL activities into their teaching plans. In other words, seeing attitudes toward the negative aspects of OCL has very negative implications for the teacher, especially among ICT coordinators who did not participate in a specific OCL program. Thus it is important to prepare the ICT coordinators not only for the benefits of OCL, but also for its negative aspects, and to provide them with the knowledge and strategies to cope with the challenges of OCL. At the same time the students in the class as a social unit should be equipped with the necessary social skills, while being educated toward openness to multiculturalism.

The research findings may offer a conceptual framework that distinguishes three dimensions that teachers and school ICT coordinators must attend to in order to be ready for OCL in their lessons:

- The systemic dimension – cultivating a positive, egalitarian school climate that is open to multiculturalism and supportive of reciprocal social and interpersonal relations in class and in the school.
- The professional dimension – developing pedagogical knowledge for OCL, including the formation of attitudes and understandings regarding the benefits and negative aspects of OCL.
- The practical dimension – experience in OCL accompanied by training to cope with the challenges.

The most important of these is the practical dimension.

This study was original since it took into account a number of significant variables and examined their simultaneous influence on the choice to integrate use of OCL. However, the study has certain limitations: the variable of the frequency of integration of OCL was examined by only a single item ranked on a scale of 1-5, so that it was not possible to check the validity and reliability of the variable. In other words, it did not take into account other situations that might indicate the frequency of OCL integration. Consequently, future research should add items for this variable, such as – to what extent do you guide your students to use collaborative technology (a forum, social media, a shared document). Likewise, an ICT coordinator who is a homeroom teacher or a subject teacher reported reporting on the openness of students to multiculturalism is a general impression based on the interpersonal relations between the students. In order to reinforce the findings, there should be a further study, administering a multiculturalism questionnaire to students, with a two-phase analysis teacher level and student level (such as in SEM). Also, attitudes toward OCL and experience of its challenges

might change as a function of contextual situations or factors. The study should be expanded and repeated in a year's time to examine differences between the findings, and the parameter of the coordinator's TPACK knowledge should be added.

In practical terms, these findings suggest clues to help the ICT coordinators and teachers in general plan collaborative teaching and learning, so that the objectives and performance are more directed at the class level and less at the level of the individual learner. The class is a natural experimental field for social processes supporting both openness to multiculturalism and collaborative learning, and so it should be perceived as a social unit that aspires to achieve shared social and scholastic goals. The findings provide useful information for writing OCL intervention programs, particularly for ICT leaders, the agents of change for learning adapted to the 21<sup>st</sup> century.

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