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The impact of an active-learning designed faculty development program: A students' perspective of an Italian university

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Abstract: This study aims to understand the impact of a faculty development program emphasizing active learning (innovative teaching) attended by instructors of diverse disciplines at the University of Padova in Italy, which has had an 800-year history of using traditional approaches to teaching and learning. Using a community of practice theoretical framework, it recognized that the development of faculty learning communities provided a supportive medium for fostering innovative teaching. A multilevel research design involving surveys collected from 2019 to 2020 explored the program's impact in terms of student satisfaction and program effectiveness. Findings showed varied levels of impact, among student examination attempts, pass rates and average grades. These findings, although involving one university, are organizationally and culturally emblematic of other Italian universities and have related implications when considering the implementation of innovative approaches to teaching via faculty development programs. This study also revealed challenges (faculty engagement) and limitations when measuring (e.g., satisfaction, exam attempts) the impact of active learning in relationship to learning outcomes.

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I. Introduction

The study of innovating teaching and learning in higher education has been moving from the margins to the center of scholarly discussions throughout Europe (Standards and Guidelines for Quality Assurance in the European Higher Education Area [ESG] 2015). This was particularly an issue for Italian state universities, most of which are many centuries old, where preparing faculty for improving practice had rarely ever been addressed. In response, over the last five years, there has been an effort to improve teaching and learning through faculty development (FD) among a few universities leading to a renaissance in the modernization of teaching in the classroom (Fedeli and Taylor 2016; Ghislandi and Raffaghelli 2014).

Higher education in the Italian context can be characterized as one of the oldest in the world - the first university in Italy was founded in 1088. Contextual factors include its size, long history, strong traditions, central management, and large class sizes, all situated within a society deeply regulated by longstanding regulations and laws. Although none of the factors are unique in themselves if compared to other universities, together they pose a significant challenge when introducing change and innovative approaches in teaching.

A primary example of this long history and tradition can be found at the University of Padova, which recently celebrated its 800th anniversary. The University of Padova is one of the ten largest public universities in Italy and is quite representative of the Italian higher education system. The state-run universities in Italy represent the main part of the system and are managed at a central level by the Italian Ministry of University and Research. Historically, like all Italian universities, the University of Padova's academic culture affirms a strong hierarchical relationship between instructors and students and lecturing is still the most used instructional format (transmission model), with low interaction between student and instructor in the classroom (Fedeli and Taylor 2016).

In addition, many courses do not require readings and/or assignments while a course is underway. Students are expected, in a self-directed manner, to read the required text/course material in preparation for the final examination given at the end of the course. Any additional work (projects, individual/group assignments, assigned readings) outside of class is often seen by students and faculty as burdensome and compromising their time to attend to the needs of other courses and for faculty to conduct research.

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Course attendance is not a requirement in many disciplines and, generally, the only requirement is successful completion of the final examination (oral or written) at the end of a course. This final examination in most courses is the only assessment of student performance/learning. Examinations can be retaken with no limits by students until they pass. These unique practices encourage passive learning in the classroom and a transmission model of teaching. Teaching is also highly individual, such that peer evaluative teaching observations are not practiced or required. Formal and informal faculty learning communities (Cox 2004) about teaching are generally not a part of the higher education context in Italy. In essence, what goes on in the classroom is between the students and the instructor with little discussion among faculty about teaching within the university. Since all universities in Italy are similar in terms of organization, culture, and student demographics, the University of Padova offers an ideal setting to explore the impact of introducing innovative approaches to teaching in Italy.

II. Theoretical framework and review of related literature

Scholarship concerning faculty development (FD) has predominantly been grounded in a "constructivist learning philosophy that situates knowledge as generated through interaction with others, through engagement with one's environment, and as existing in a constant state of renewal" (Brooks 2010, 265). Situated from this perspective, faculty develop new knowledge through participation in an academic community (e.g., teacher study groups; faculty learning communities) committed to innovative teaching and learning (Cornelius-White 2007; Hagenauer and Volet 2014).

Conceptually, a "community of practice" construct offers a theoretical understanding of the process of change, especially in terms of fostering FD within an authentic and collaborative context. Wenger (1998, 15) defined a community of practice as a "unique combination of three fundamental elements: a domain of knowledge, which defines a set of issues, a community of people who care about this domain and the shared practice that they are developing to be effective in their domain." The following factors are consistent across variations of faculty learning communities (FLCs). FLCs are generally small groups of eight to 15 instructors who seek to establish an equal, non-hierarchical relationship among participants and co-plan meeting agendas, with an aim to improve teaching (Cox 2004, 2013; Fedeli and Taylor 2016; Nugent et al. 2008; Wenger n.d.).

In addition to FLCs, a second model that informs teaching innovation is the implementation of active learning (AL) in the classroom. An abundance

of studies has demonstrated the importance of implementing active learning in faculty development to improve teaching strategies and learning processes (Bierema 2019; Fedeli 2019; Nelson and Bianco 2013; Prince 2004). AL is seen as a "method that engages students in the learning process, an instructional approach that allows students the opportunity to participate in the process of learning and requires them to do something more than just passively receive instruction" (Allsop et al. 2020, 418). However, traditional passive lecture still predominates most undergraduate classrooms, particularly in Italian universities (Stains et al. 2018). Research confirms that an AL approach can be implemented within lectures across different disciplines and settings and could promote greater learning outcomes (Freeman et al. 2014). AL involves new approaches on the part of teachers as well as awareness and involvement on the part of students. It encourages students to participate in learning activities, thereby promoting student engagement (Bonwell and Eison 1991; Freeman et al. 2014) both inside and outside the classroom.

Meanwhile, assessing the impact of faculty development programs (FDPs) on improving teaching remains a perennial challenge in higher education (Bamber and Lorraine 2016; Moya et al. 2018). Measuring the nature of educational development has always been very complex, raising questions such as "what constitutes impact for students and instructors? How is the impact best measured? What is considered effective FD (Beach et al. 2016; Chism et al. 2012; Sutherland and Hall 2018)?" For example, Wheeler and Bach (2021) studied the outcome of FD grounded in AL on STEM classroom instruction and student achievement and found AL had the potential to close the achievement gap in underrepresented student groups. A related study from an Italian university involving AL teaching methods (social platforms, flipped classroom) and student satisfaction in an online physics course found positive student experiences and greater perceived interaction, although no significant change in the grades of specific physics exercises (Tuveri et al. 2022). However, this study involved only one course of students (19 students) and did not address other factors unique to the Italian higher education context. Research in general about AL related to its impact has explored a variety of perspectives such as student and faculty satisfaction (Hyun et al. 2017; Lumpkin et al. 2015), effective teaching methods (Freeman et al. 2014; Waltz et al. 2014), and the change in course design and in learning environments (Stover and Ziswiler 2017; Wieman 2007).

With this research as background to this study, in 2016, the University of Padova initiated a faculty development program, which aimed to introduce AL and other core concepts of community of practice into higher education.

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Along with using an AL approach in the FD program, there is also an emphasis to de-privatize teaching through peer teaching observations, micro-teaching with feedback, facilitating faculty learning communities, and emphasizing the importance of positive student-teacher relationships. Now that the program has been in existence for almost five years, questions have been raised about student satisfaction ("the perception of enjoyment and accomplishment in the learning environment") (Sweeney and Ingram 2001, 57) and program effectiveness. Questions include: how different is the learning experience between students whose instructors participated in the program vis-à-vis those whose did not? What is the impact of active learning on exam attempts and overall course grades?

In addition to student satisfaction, no studies were found that considered two additional factors relevant to the Italian higher education context when measuring the effectiveness of AL in the classroom. The first factor is the number of students passing the course examination at the first attempt (taking the course exam) and the second is the scores of students who successfully completed the exam at the first attempt. In Italy, the final exam is typically the only assessment of student learning for an entire course, and upon concluding the course, students can decide when to take it. Students have at least five or six attempts each year and can enroll and take/retake the exam with no limits, which is a national norm in Italian universities. Taking an exam at the first attempt indicates that students are more prepared and confident about the course material compared to students who do not. Furthermore, students completing a course at the first attempt is a strong indicator that a) these students will more likely complete their degree within the standard time frame (three years for bachelor's degree and two for master's degree); b) there will be higher pass rate among students; c) students will attain higher scores on the final exam and d) reduce the economic cost of the degree.

The following research questions are used to guide this study:

- What was the satisfaction of the students related to the teaching of faculty who participated in the programs compared to those students who attended courses of faculty who did not participate in the program? (Satisfaction.) Related to the satisfaction, the data refers to three level of satisfaction captured by a survey that all students completed before enrolling for the final exam. The three levels are: a) overall course satisfaction, b) teaching methods, and c) organization of teaching.
- How effective was the program in terms of examination pass rates and average grades obtained at the first attempt of students in the courses of

the faculty who attended the FDP compared to those in the courses of faculty who did not participate in the program? (Effectiveness.)

III. Methodology and results

To understand the impact of the faculty development on students' satisfaction and exam successful completion at the University of Padova a multilevel research design was developed using different statistical analyses and related surveys implemented from 2019 to 2020. There were two levels of analysis including satisfaction (students) and program effectiveness (number of students that passed the exam and average grade obtained at the first attempt).

The data was aggregated to explore the relationship of AL to discipline/ research areas in the Fields of Research and Development classification (FoRD). The FoRD classification is used to classify research and development (R&D) units by fields of inquiry, broad knowledge domains based primarily on the content of the R&D subject matter. "The six main FoRD areas are 01 natural sciences, 02 engineering and technology, 03 medical and health sciences, 04 agricultural and veterinary sciences, 05 social sciences, 06 humanities, and the arts" (UNESCO, n.d.). Exploring this relationship would offer insight into what disciplines are more receptive to the application of AL.

The first level investigated the degree of **satisfaction** among the students who attended the courses taught by the trained faculty. Data on the satisfaction of students was collected via survey for the academic year 2019/20 for all courses taught by faculty that had and had not participated in the FDP. Three main areas of satisfaction were analyzed: a) overall course satisfaction b) teaching methods, c) organization of teaching, face-to-face and online. In the Fall 2019, there were 2,215 face-to-face courses and in the Spring 2020, there were 2,094 online courses (due to the COVID-19 pandemic) offered at the University of Padova. The number of students' surveys analyzed included 103,430 from the fall semester of face-to-face classes and 117,819 surveys of online classes for a total of 221,249 surveys.

A comparison of the satisfaction among students who attended courses of trained faculty and students who attended the courses of not trained faculty was conducted to investigate if students of trained faculty were more satisfied than those who attended courses of not trained faculty. Trained faculty predominantly included new faculty (1-2 years' experience. Although, there were some faculty inclusive all the ranks (assistant to full).

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Table 1

Data for the analysis of students' satisfaction

Type of survey	FoRD area	Sample of courses-instructors for the analysis of students' satisfaction					
		N. of courses	N. of courses taught by FDP Instructors	% Courses FDP instructors	Total n. of surveys	N. of students' surveys of courses taught by FDP instructors	% Students' surveys evaluated of courses taught by FDP instructors
Face-to-face	01 - Natural sciences	683	171	25	33.015	9.037	27
	02 - Engineering and technology	304	35	12	15.954	1.599	10
	03 - Medical and health sciences	317	52	16	9.684	1.626	17
	04 - Agricultural and veterinary sc.	186	39	21	6.228	1.313	21
	05 - Social sciences	304	53	17	16.885	2.609	15
	06 - Humanities and the arts	421	36	9	21.664	2.110	10
Face-to-face Total		2.215	386	17	103.430	18.294	18
Online	01 - Natural sciences	557	110	20	30.072	6.247	21
	02 - Engineering and technology	360	50	14	23.168	2.651	11
	03 - Medical and health sciences	230	43	19	8.530	1.702	20
	04 - Agricultural and veterinary sc.	208	43	21	7.905	1.562	20
	05 - Social sciences	313	50	16	21.777	3.311	15
	06 - Humanities and the arts	426	41	10	26.367	2.452	9
Online Total		2.094	337	16	117.819	17.925	15
Total		4.309	723	17	221.249	36.219	16

Concerning students who completed the survey, 36,219 surveys were by students who attended courses held by trained instructors compared to 221,249 surveys completed by students who attended courses of instructors not trained in active learning. The data is organized in Table 1 by: a) type of questionnaires (face-to-face, online, in classrooms); b) the six FoRD areas; c) the numbers of courses evaluated; d) the number of courses taught by trained instructors; e) the percentage of courses taught by trained instructors; f) the total number of surveys; g) the number of surveys related to courses taught by trained instructors, and h) the percentage of surveys completed by students who attended courses taught by trained instructors.

To detect significant differences, we use the student's t-test; that is, a test of a statistically significant difference between two groups. A student's t-test was performed for overall course satisfaction, teaching methods, and organization of teaching, divided between face-to-face and online teaching, and split among the six scientific areas to investigate if there were differences. Therefore, the supported hypothesis was that students who attended courses of trained instructors were more satisfied, than those who attended courses of not trained instructors. Therefore, the following hypotheses concerning satisfaction developed (where μFDP and μNOFDP represent the values of the sample of FDP trained and not trained instructors, respectively):

- H0: μFDP = μNOFDP (null hypothesis). There is not a significant difference in term of satisfaction related to students who attended courses of trained instructors compared with students who attended courses of instructors who did not participate in the training.
- H1: μFDP > μNOFDP (alternative hypothesis). Students who attended courses of instructors who participate in the training express higher satisfaction than those students who attended courses of instructors who did not participate in the training.
- H1: μFDP < μNOFDP (alternative hypothesis). Students who attended courses of instructors who participate in the training express lower satisfaction than those students who attended courses of instructors who did not participate in the training.

The second level of analysis explored teaching **effectiveness** related to two impact factors: number of students who passed the exam (pass rate) and average grade obtained at the first attempt. Involved in the analysis of these factors were the students who attended the 231 courses in the Fall semester taught by 180 trained faculty and 199 online courses in the Spring Semester,

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taught by 160 faculty who had participated in the FDP training program. Data regarding the two impact factors were compared with the sample of 1,804 faculty who did not participate in FDP with their 2,379 courses. The courses were also distinguished between face-to-face courses (1,233 in the Fall) and online courses (1,146 in the Spring). The description of the faculty sample concerning the effectiveness of the FDPs is organized in Table 2 as follows: a) six FoRD areas in face-to-face Fall 2019 and online Spring 2020; b) not trained instructors, trained instructors, and total instructors; c) the number of trained instructors and courses taught.

Table 2

Sample of teachers and number of courses analyzed

	Not trained faculty		Trained faculty		Total	
	Instructors	Courses	Instructors	Courses	Instructors	Courses
FoRD areas face-to-face Fall 2019						
01 - Natural sciences	265	338	80	97	345	435
02 - Engineering and technology	154	196	23	29	177	225
03 - Medical and health sciences	75	83	12	15	87	98
04 - Agricultural and veterinary sciences	90	117	24	32	114	149
05 - Social sciences	127	167	21	29	148	196
06 - Humanities and the arts	216	332	20	29	236	361
Total	927	1.233	180	231	1.107	1.464
FoRD areas online Spring 2020						
01 - Natural sciences	218	263	60	70	278	333
02 - Engineering and technology	149	180	24	34	173	214
03 - Medical and health sciences	64	75	15	15	79	90
04 - Agricultural and veterinary sciences	93	119	17	22	110	141
05 - Social sciences	114	148	18	22	132	170
06 - Humanities and the arts	239	361	26	36	265	397
Total online	877	1.146	160	199	1.037	1.345
Total	1.804	2.379	340	430	2.144	2.809

In comparing the values of the indicators obtained from the two samples, it was assumed that FDP training would increase the performance of students. Therefore, the following hypotheses were tested (where μFDP and μNOFDP represent the values of the sample of FDP trained and not trained instructors, respectively):

- H0: μFDP = μNOFDP (null hypothesis). There is not a significant difference related to number of students that passed the exam and average grade obtained at the first attempt by students who attended courses of trained instructors compared with students who attended courses of instructors who did not participate in the training.
- H1: μFDP > μNOFDP (alternative hypothesis). There is a change for the better related to number of students that passed the exam and average grade obtained at the first attempt by students who attended courses of trained instructors compared with students who attended courses of instructors who did not participate in the training.
- H1: μFDP < μNOFDP (alternative hypothesis). There is no change related to number of students that passed the exam and average grade obtained at the first attempt by students who attended courses of trained instructors compared with students who attended courses of instructors who did not participate in the training.

For the analysis of exam pass rate at the first attempt, the Pearson chi square test was used, while for the analysis of average grade earned at the first attempt, the comparison was based on student's t-test. Also, at this level, the data were divided into the six FoRD areas of scientific fields. The data presented below are intended to answer the two research questions of this study. The results of analysis about satisfaction and effectiveness are discussed below.

III.1. Overall student satisfaction

There are three tables about students' perceptions of satisfaction. They are organized by three indicators of satisfaction: overall course satisfaction (Table 3), teaching methods (Table 4), and organization of teaching (Table 5). Each table is organized according to a) six FoRD areas b) teaching face-to-face and teaching online, and c) three hypotheses based on student's t-test for independent samples. The study found that among the university's courses there is no difference in overall course satisfaction among students

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(Table 3). However, analyzing the individual six FoRD areas: students enrolled in medical and health sciences and humanities and the arts expressed an overall higher satisfaction of teaching delivered by trained faculty in face-to-face settings. The area of humanities and the arts maintained the same higher satisfaction also for the online teaching settings. The satisfaction was the same for the other areas except for social sciences delivered by trained faculty which students expressed lower satisfaction in the face-to-face settings.

Table 3

Overall course satisfaction

Area FoRD	Teaching - face-to-face			Teaching - online		
	Indicator Overall course satisfaction			Indicator Overall satisfaction		
	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$
01 - Natural sciences			X			X
02 - Engineering and technology			X			X
03 - Medical and health sciences	X					X
04 - Agricultural – veterinary sciences			X			X
05 - Social sciences		X				X
06 - Humanities and the arts	X			X		
All university's courses			X			X

This pattern of no significant difference in satisfaction was also found concerning teaching methods among students (Table 4). The only exception is for social sciences. There is not a significant difference in term of satisfaction related to students who attended courses of trained instructors compared with students who attended courses of instructors who did not participate in the training in the online setting.

Table 4
Teaching methods

Area FoRD	Teaching - face-to-face			Teaching - online		
	Indicator Teaching methods			Indicator Teaching methods		
	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$
01 - Natural sciences			X			X
02 - Engineering and technology			X			X
03 - Medical and health sciences	X					X
04 - Agricultural – veterinary sciences			X			X
05 - Social sciences		X				X
06 - Humanities and the arts	X			X		
All university's courses			X			X

However, when analyzing the individual six FoRD areas, medical and health sciences, humanities, and the arts students expressed a higher satisfaction of teaching organization delivered by trained faculty in face-to-face settings. The area of agricultural-veterinary sciences, humanities, and the arts also expressed higher satisfaction for teaching organization in online settings. In conclusion, satisfaction in teaching organization (Table 5) both face-to-face and online has increased compared to the past although in a different way, depending on the setting.

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Table 5
Teaching organization

Area FoRD	Teaching - face-to-face			Teaching - online		
	Indicator Teaching organization			Indicator Online teaching organization		
	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$
01 - Natural sciences			X			X
02 - Engineering and technology			X			X
03 - Medical and health sciences	X					X
04 – Agricultural-veterinary sciences			X	X		
05 - Social sciences			X			X
06 - Humanities and the arts	X			X		
All university's courses			X			X

III.2. Effectiveness of the FDP

Recognizing that satisfaction can be a weak indicator, even if significant, two additional indicators were included in the data collection to address program effectiveness: a) the examination pass rate at the first attempt and the average grade obtained in the academic year 2019/2020. The students were divided into two samples: those who attended courses led by faculty who participated in the FDP and those who attended courses led by faculty who did not participate. The following indicators were calculated for both (independent) samples: examination pass rate at the first attempt (Table 6) and average grade obtained at the first attempt (Table 7).

Table 6
Examination pass rate

Area FoRD	Teaching - face-to-face			Teaching - online		
	Examination pass rate First attempt			Examination pass rate First attempt		
	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$
01 - Natural sciences	X					X
02 - Engineering and technology	X			X		
03 - Medical and health sciences		X		X		
04 - Agricultural and veterinary sciences		X				X
05 - Social sciences			X	X		
06 - Humanities and the arts	X			X		
All university's courses	X					X

There are three hypotheses illustrated in Table 6 about the effectiveness of the FDP in terms of students' examination pass rate. Findings indicated that in all the university's courses there is a difference in the pass rate among students in the course settings. The face-to-face setting had a higher pass rate than the online setting among the courses taught by faculty that participated in the FDP. In fact, when COVID broke out, instructors were not prepared to teach online, much less for using active learning methods online. The abrupt transformation of teaching and learning scenarios did not lead to a rapid change in methods and in teaching online. In addition, there was a difference found in the FoRD areas. Engineering and technology, humanities and arts had a higher pass rate in both settings. Natural sciences had a higher pass rate in face-to-face and medical and health sciences and social sciences also had higher pass rate in online settings. Similar to the higher pass rate there was no difference in all university's courses in the average grade obtained in the first attempt among students (of trained and not trained faculty) with regards to both course settings.

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Table 7

The average grade obtained in the first attempt

Area FoRD	Teaching - face-to-face			Teaching - online		
	The average grade obtained at the first attempt			The average grade obtained at the first attempt		
	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$	$\mu_{FDP} > \mu_{NOFDP}$	$\mu_{FDP} < \mu_{NOFDP}$	$\mu_{FDP} = \mu_{NOFDP}$
01 - Natural sciences		X		X		
02 - Engineering and technology	X					X
03 - Medical and health sciences	X				X	
04 - Agricultural and veterinary sciences	X				X	
05 - Social sciences		X			X	
06 - Humanities and the arts	X				X	
All university's courses			X			X

However, when analyzing the individual six FoRD areas in relationship to online and face to face settings the engineering and technology, medical and health sciences, agricultural and veterinary sciences, humanities, and the arts of trained faculty had a higher examination pass rate at the first attempt in the face-to-face setting. Turning to the online setting: medical and health sciences, agricultural and veterinary sciences, social sciences, humanities, and the arts all had a lower grade among students at the first attempt. The natural sciences had a higher grade in the online setting, and in engineering and technology, there was no difference between face to face and online setting.

IV. Discussion and conclusion

Investigating the impact of faculty development is certainly a challenge for the scholars of the field. In this study, different aspects related to the outcomes are discussed along with the role of the Italian higher education and the impact of COVID followed by a section on the limitations of the study.

Several programs demonstrated significance in terms of satisfaction and effectiveness in relationship to courses taught by trained faculty, while at the same time some programs in different settings reflected no significance. A possible explanation is related to the application of active learning in specific programs by trained instructors. The hypothesis that students who took courses taught by trained instructors are more satisfied than others was demonstrated in several disciplines: medical and humanities and the arts in face-to-face teaching. Humanities and the arts area had the same higher satisfaction also in the online teaching and agricultural and veterinary medicine, only for one indicator which is teaching organization. These results are consistent with the literature on active learning and its impact on students' satisfaction (Hyun et. al. 2017, Prince 2004). Satisfaction likely increases among students if the conditions for collaboration and knowledge sharing exist.

However, despite these outcomes, the impact of the FDP was not significant in all six FoRD areas, where single area differences emerged. A possible explanation is recognizing that some of these discipline areas have stronger faculty learning communities that encourage reciprocal supportive relationships among faculty members (e.g., Angehrn and Maxwell 2010; Corcoran and Duane 2019; Kagwesage 2014). These disciplines likely provide faculty support to "reinvent themselves as educators" in concert with their peers in "experimenting, reflecting, discussing, and assessing" about their teaching and learning perspectives (Sturko and Gregson 2009, 36). The "community structure creates a social fabric for learning with the development of trust and energy to encourage risk-taking...to share the specific knowledge and products that the community develops" (Cox 2013, 19). Faculty learning communities play an important role in the adoption of active learning particularly by new and younger instructors who are making changes in their teaching practice. Also, few studies related to the impact of active learning have been carried out in some disciplines, such as humanities, arts, and the social sciences, particularly studies that compare the impact of faculty development across different disciplines. These findings encourage further research based on the distinction between the humanities and STEM, which traditionally has always been given more attention by scholars in relationship to active learning (Borda et al. 2020; Wheeler and Bach 2021).

Another point of discussion is the context of where the study took place (Italian higher education) and its impact on the findings. Some factors are unique and non-generalizable beyond Italian higher education. For example, the possibility of taking a course examination (generally the only form of student evaluation) at the end of a course as well as pre-established

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appointments (five per year) during the year. In most courses students can freely enroll and decide when to take and retake the examination during the entire academic year. These findings support the position that effective educational development processes are designed for a particular university system (Henderson et al. 2011). Despite this unique form of evaluation, this study for the Italian system is significant for several reasons. It offers initial understandings of the challenges and opportunities for capturing the impact of active learning in the classroom within a particular higher education system. Also, this study highlights shortcomings in the system (e.g., few points of student evaluation and feedback and the over-reliance on final exams) when educating students. Further, it offers support for the importance of engaging teaching innovation within a higher education system that has experienced little instructional innovation in hundreds of years.

A second contextual factor is the Italian students' possible resistance to active learning (Scheyvens et al. 2008; Tharayil et al. 2018). It's important to recognize the FDP was the first systemic university wide educational intervention (change an approach to teaching) ever introduced in the Italian higher education. The teaching approach was significantly different to what students had traditionally experienced, where they are expected to be in a passive role in the classroom. Also, students who had no prior knowledge of this educational intervention was being introduced by some faculty in classrooms. Along with students' resistance, similar research has shown that faculty can also (Tharayil et al. 2018) resist educational innovation. Even though faculty of this study participated in a FDP, it cannot be assumed that they all engaged in AL with the same degree of depth, consistency, and assuredness. Research has identified a host of factors and perceived barriers to active learning, such as teaching competence, confidence, degree of comfort with learner-centered practices, and preoccupation with student evaluations (particularly for pre-tenured faculty), to mention a few (Karcher, et al. 2022). Therefore, it is likely that students experienced a range of depth and quality of active learning methods in their courses of faculty that participated in FDP.

Finally, a further contextual factor is the outbreak of the COVID-19 and having to move the courses online, which likely had an impact on the results. This exceptional event pushed instructors to teach online, without significant professional development, and left them little time to reflect and implement teaching strategies for this new setting. Despite this experience the results were very similar in both settings. This is not meant to equate the pandemic with promoting innovation, further research needed about this relationship. It is important to recognize what was experienced was due to an unexpected

and unpredictable situation which institutions are often forced to react and be able to meet their institutional and social tasks (Bertoni and Fedeli 2021). Not only do institutions have to be flexible to respond effectively, but also researchers, recognizing that educational settings are complex and ever shifting, posing both challenges and opportunities for new insights. Furthermore, it reinforces the idea that faculty development is not only a question of promoting instructional innovation but also a learning process overtime that requires questioning of deeply held beliefs and values (Hativa 2000) by instructors who try to translate this approach into practice in face-to-face and/or online settings.

V. Limitations of the study

In closing, it is important to reflect on the limitations this study raised, with the intent to help future scholars in both Italy and other countries as they explore the impact of active learning in the classroom. Beginning with satisfaction as a category to measure, possibly it is too broad whereby it lacks the nuance to capture what it means from the varied students' perspectives in relationship to active learning. Students may not remember the various methods and possibly considered other factors (e.g., relationship with instructor, classroom climate) when considering their rating of satisfaction. This indicates a high degree of subjectivity when using satisfaction as a measure (Hyun, Ediger and Lee 2017). Recognizing this shortcoming would encourage researchers to explore satisfaction across several criteria better identifying what students consider as most significant when assessing active learning.

Secondly, it is also important to recognize that the study identified faculty who applied active learning based only on their participation in the faculty development program. There was not a means to accurately determine if these faculty were using active learning methods in their classrooms. There could have been faculty who did not participate in the faculty development program that could also be using active learning. To strengthen future research, it would be helpful to develop criteria along with participation in training, that allows faculty to self-evaluate or be evaluated by others if they are using active learning in their classrooms.

Third, using the exam attempt as a construct to measure the impact of active learning offered a new means, particularly for Italian universities. However, like the construct satisfaction it would have strengthened the study to identify other measures (e.g, exam scores, evaluation mid-course) to better understand the application of active learning in the classroom.

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In conclusion this study investigated the impact of faculty development programs (FDPs) focusing on active learning within Italian higher education, considering various outcomes, contextual elements, and unique factors of the Italian educational system. The findings indicated that trained faculty increased student satisfaction in specific disciplines, especially in face-to-face settings, consistent with existing literature relating to active learning and student satisfaction. The unique characteristics and inherent resistance to new teaching methodologies within the Italian educational system and among students and faculty posed additional challenges. The rapid shift to online learning due to the pandemic underscored the necessity for adaptability in instructional methods. Finally, it highlighted the importance of faculty learning communities and suggested a more multifaceted approach for future research to deepen the understanding of the impact of active learning in the classroom.

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