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The Implementation Process of a Computerized Pedagogical Management System in Arab and Jewish Schools in Israel

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Table of Contents

		Page
ABSTRACT		6
INTRODUCTION		7
	Gap in knowledge	7
	Research aims	8
CHAPTER I: THEORETICAL BACKGROUND		10
I.1	Implementation of a Technological Change in Education	10
I.2	The Computerized Pedagogical Management System (CPMS)	10
I.3	Jew and Arab Students in the Israeli Education System	11
I.4	Leadership in Education	11
I.5	Sense of Coherence	12
CHAPTER 2: RESEARCH STUDIES		13
II.1	Study 1: Differences between the Arab and Jewish Sectors, School Affiliation and Gender, as Perceived by the Educational Staff (Principals, Teachers and Coordinators from the Arab and Jewish Sectors), in the Implementation of a CPMS in Their School in Israel	13
	II.1.1 Study 1 aims, questions, variables, hypotheses and data analysis	13
	II.1.2 Findings	17
	II.1.3 Conclusions	27
II.2	Study 2: The Factors that Promote and Inhibit the CPSM Implementation Process in Israeli Schools	28
	II.2.1 Study 2 aims, questions, variables, hypotheses and data analysis	28
	II.2.2 Findings	29

II.2.3 Conclusions 40

II.3 Study 3: The Principals' Perceptions of the Opportunities and Challenges Involved in the CPMS Implementation at School 41

II.3.1 Study 3 aims, questions and data analysis 41

II.3.2 Findings 41

II.3.3 Conclusions 47

CHAPTER 3: GENERAL CONCLUSIONS AND IMPLICATIONS 49

III.1 General Discussion and Conclusions 49

III.2 Theoretical. Methodological and Practical Implications 49

III.3 Research Limitations 50

III.4 Recommendations for Further Research 51

REFERENCES 52

List of Tables

Table No.	Table name	Page
1	Methodological summary of study 1	13
2	Study 1 research questionnaire	15
3	T-tests of two independent samples for the extent of CPMS implementation by the principals, teachers, students, and student parents, as perceived by the educational staff, according to sector, with a 1-7 ranking	17
4	T-tests for the educational staff's perception of the extent of CPMS implementation according to Ministry of Labor schools and Ministry of Education schools	20
5	T-tests for the educational staff's perception of the extent of CPMS implementation by principals, teachers, students, and student parents according to Ministry of Labor and Ministry of Education schools	22
6	T-tests for the extent of CPMS according to gender, for the general sample, the Jewish and Arab sectors	24
7	T-tests for the extent of CMS implementation according to gender, of principals, teachers, students, and student parents as perceived by the educational staff	25
8	Methodological summary of study 2	28
9	Correlations between a design management style and the extent of CPMS implementation for the general sample, the Jews and the Arabs	29
10	Correlations between the design management style and the extent of CPMS implementation according to the educational staff's perception of CPMS implementation by the principals, teachers, students and student parents	30
11	Correlations between sense of coherence and CPMS implementation for the general sample, the Jews and the Arabs	31

12	Correlations between sense of coherence and CPMS implementation, by the principals, teachers, students and student parents as perceived by the educational staff	32
13	Correlations between a feeling of computer literacy challenge and CPMS implementation for the general sample, the Jews and the Arabs	34
14	Correlations between the feeling of computer literacy challenge and the extent of CPMS implementation by the principals, teachers, students and student parents as perceived by the educational staff	35
15	Correlations between faculty team support and the extent of the CPMS implementation, for the general sample, the Jews and the Arabs	36
16	Correlations between faculty team support and CPMS implementation by the principals, teachers, students and student parents as perceived by the educational staff	37
17	Multiple Stepwise Regression for predicting the extent of CPMS implementation for the general sample	39
18	Multiple Stepwise Regression for predicting implementation for the Arab sample	40
19	Methodological summary of study 3	41

List of Figures

Figure No.	Figure name	Page
1	Challenges with the CPMS implementation	42
2	Suggested solutions for the challenges with the CPMS implementation	43
3	Themes and categories regarding opportunities in the implementation of the CPMS	45
4	Importance of the CPMS implementation	46

Abstract

This study explores the implementation of a Computerized Pedagogical Management System (CPMS), developed in the State of Israel by Hameiri in the year 2006. Since that time, it has been assimilated by 1680 Jewish and Arab schools nationwide. The system has been designed to use computer and Internet infrastructure in order to process, report and apply real-time data. Thus, principals and school staff are able to manage and perform their tasks and, as a result, enhance their school effectiveness. This study investigates the effect of school culture on the CPMS implementation, introducing a process of educational change that is pertinent to the 21st century. The research population consists of 96 principals, coordinators, and teachers: 39 from the Arab sector and 57 from the Jewish sector. The research findings illustrate that the Arab and Jewish schools have assimilated the CPMS to varying degrees, with greater extent being demonstrated by the Arab schools. Moreover, the findings show that schools under the supervision of the Ministry of Education have assimilated the CPMS more than the schools supervised by the Ministry of Labor. As far as the practical extent of implementation is concerned, the findings indicate that it is necessary to enhance the CPMS implementation in schools under the supervision of the Ministry of Labor. In order to benefit from the CPMS, these schools need technological support as well as training programs. Furthermore, parents of both Jewish and Arab students have to learn the value of this system through which they can be updated online about their children's educational progress. It is also highly important to teach the parents how to utilize the CPMS.

Keywords: Computerized Pedagogical Management System; Jews and Arabs schools; Implementation Process

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Introduction

This study discussed the implementation in school of the Computerized Pedagogical Management System (CPMS), that was developed in Israel in 2006 (Blau & Hameiri, 2010). In the academic year 2019, the Ministry of Education adopted the CPMS and subsidized the payment for it. Thus, all the schools could acquire it, attesting to the importance of these programs in the present era. The CPMS had been integrated into 1,680 high schools throughout the country.

The CPMS aims to apply the computer and internet infrastructure for processing, reporting and using real-time relevant data in order to perform management tasks and present information by principals and school staff. The system is designed to improve school effectiveness and contribute to change and efficiency among all position holders in the school. The guiding principle for investing in this software technology is its ability to provide a data-based decision-making for both administrative and pedagogical management objectives (Eisenberg & Selivansky, 2019).

The CPMS may enhance the consideration of social and educational phenomena (weak spots and educational gaps), pedagogical coping strategies, as well as the improvement of education (Raichel, 2012). Students' data constitute a valuable resource for helping teachers in the identification of students' needs, and choosing tools for students' assessment based on correlated data stored in the system. The CPMS increased professionalism and cooperation among teachers. Eventually, it increased usage due to immediate availability of data and a growing demand for the integration of shared data management technology by both administrative and teaching staff in order to improve students' academic progress (Raichel, 2012). All interactions related to the students are conducted through the system. Moreover, the system includes a function that enables the students and their parents to access to students' data, as well as to communicate with the teaching staff. The interactions are conducted through two main channels:

a. Data entered into the system daily - lesson topics, homework assignments, grade certificates for the student, attendance, scores, and students conduct – interruptions and commendations.
b. An online informal communication channel between the teaching staff, the students and their parents, through an intra-organizational email system.

Gap in knowledge

Only a few studies have explored the implementation of the system at school as well as investigated the implementation process in Israeli schools, while comparing schools in the Arab and Jewish sectors. This study is being conducted at the beginning of the implementation process, so that it accompanies the implementation process that the Ministry of Education has enforced. It enhances

the understanding that it is important to identify the factors that promote and inhibit the implementation of the system and the contribution thereof to these schools.

To date, no study has indicated the factors that inhibit and promote the implementation of these software programs, nor have there been studies that compare ratios between the Jewish and Arab sectors in this respect. This study is being conducted at the beginning of the implementation process, so that it accompanies the implementation process that the Ministry of Education has enforced.

Not many studies have explored the implementation of the digitized learning systems in schools. The same applies to the analysis of the implementation process in Israeli schools, as well as the comparison of implementation between Arab and Jewish schools (Blau & Hameiri, 2010). This study deepens the understanding of the pros and cons of interactive digitized learning systems. In order to thoroughly assess the system, it is important to identify the factors that promote or inhibit the implementation of the system and its contribution thereof to the Israeli schooling system (Blau & Hameiri, 2010). Computerized systems facilitate interactivity between principal/educational staff/teachers/students/student parents. The exchange of knowledge as well as feedback is an important facet of the learning process. For example, teachers' feedback offers a platform for the easy exhange of knowledge and information between students and their teachers (Chen & Epperson, 2008). In his book "Diffusion of Innovations", Roger (2003, cited in Blau & Hameiri, 2010) posits that new ideas take time to disseminate. Nevertheless, creating the platform, shaping the organizational structure, and introducing the new ideas, are steps that need to be taken. There is a distinction between learning mangement systems that focus on organizational aspects, such as immediacy, efficiency, transparency, monitoring feedback, and interaction, and the CPMS which covers all aspects of the learning process, such as content management (Blau & Hameiri, 2010).

I believe that this research will expand the theoretical knowledge about the impact of culture on the educational change process, relevant to the 21st century.

The present study examines implementation of this system by teachers and principals in the Arab and the Jewish schools in Israel.

Research Aims

1. To investigate the differences between the Jewish and Arab schools in the extent of implementation of a CPMS in Israeli schools.
2. To examine the differences the school affiliation has on the extent of CPMS implementation in Israeli schools.

3. To explore the gender differences in the educational staff's perceptions of the implementation of a CPMS in Israeli schools.
4. To examine what are the factors that inhibit and promote the process of CPMS implementation in Israeli schools

Chapter I: Theoretical Background

There is a worldwide consensus in the field of education that this is the age of "digital pedagogy" (Ministry of Education, 2017). Education is one of the major fields impacted by technology (Awang et sl., 2019). In academic year 2019, the Ministry of Education adopted the CPMS that is basically a software application, designed to plan, integrate, and monitor the entire learning process. Many education systems around the world use various computer software programs in their teaching and learning processes (OECD, 2018).

I.1 Implementation of a Technological Change in Education

Research illustrates that problem-solving capabilities and higher order thinking skills have been enhanced (Adam et al., 2017), due to all the advantages of integrating technology in education systems, Ministries of Education both worldwide and in Israel have exerted intensive efforts in the introduction of these technologies in the schooling system (OECD, 2016). For the purpose of achieving an optimal educational climate, teacher-student relationships play an important role. cs. Teachers' need to feel stability in the workplace and be appreciated are essential for functioning properly and motivating their students' learning. Technology has the potential to relieve some of the burden, allowing teachers to devote time to pedagogy and engage in poblems of violence and discipline (Freund et al., 2021).

I.2 The Computerized Pedagogical Management System (CPMS)

The system is designed to improve school effectiveness and contribute to change and efficiency among all position holders in school. The guiding principle for investing in this software technology resides in its ability to provide a data-based decision-making for both administrative and pedagogical management objectives (Eisenberg & Selivansky, 2019). Mahdi (2018 cited in Maklada & Ceobanu, 2021) specifies that Israel has other concerns, among them equality in education, especially where educational gaps have been identified in the Arab society. The CPMS allows easy access to real-time information, knowledge dissemination, and monitoring students' progress (Maklada & Ceobanu, 2021). The OECD reports on education (2018) specify that education is an influential factor in the reduction of inequality in all aspects of society. More

importantly, education is a key factor in ensuring job and financial security for students after their graduation.

I.3 Jews and Arab Students in the Israeli Education System

According to the recently-published research of Hadad Haj-Yahya et al. (2021). the education system in Israel is characterized by deep gaps between the Arab and Israeli education systems. The gaps are manifested in budgeting and educational attainments. The teaching methods and curricula do not provide the necessary knowledge and skills for the future integration of Arabs into Israeli society and the world of labor of the 21st century (Yahya et al., 2021).

The demographic composition of the Israeli society is heterogenous and the Arabs represent 1/6 of the entire population and are characterized as a non-assimilating minority. They differ in language, religion, place of residence, values, beliefs, cultural differences, tradition, as well as gender and hierarchy between classes (Tatar & Da'as, 2012). The Arab society retains its unique identity and culture, yet at the same time realizes the educational, economic and occupational benefits of integration and acculturation (Gross & Gamal, 2014). In recent years, the implementation of the computerized system has become a way of life and a part of the organizational culture at school.

I.4 Leadership in Education

Pursuant to the Israeli law, before becoming leaders in the field of education, educational leaders must attend a designated tutoring program. Nisan (1997 cited in Cohen, 2010)) coined the term "educational leader", referring to educators committed to their work, and guided by their values that reflect their educational actions. Educational institutions prepare the younger generation to contend with unknown challenges, develop the economy, and fill the necessary functions needed by society (Sehar & Alwi, 2019). In order to create a positive and harmonious environment, a learning-oriented school vision, motivated teachers, staff, and students, certain organizational strategies have to be implemented on campus (Sehar & Alwi, 2019). Pedagogical leaders are aware of the individuals, whether teachers or students. These leaders must communicate with their students in order to understand their needs. They should instruct teachers to view the students as individuals, providing them with a high-quality learning (Hauseman et al., 2017).

I.5 Sense of Coherence

The Sense of Coherence (SOC) is a theory conceived by Antonovsky and Sourani (1988) who studied the relationship between stress, health, and well-being. Recent research has discovered a direct relationship between the Salutogenic Sense of Coherence theory (SOC) and Bowlby's Theory of Attachment (Hiebler-Ragger et. al., 2021). Emotional close relationships first with a parent figure and then with a teacher is a basic principle in the development of SOC. Not only do pre-service teachers have to be able to cope with heterogeneous classrooms characterized by ethnic, cultural, social, and demographic differences (inclusion of students with special needs), they also need to address the individual needs of each student. The Ministry of Education (2020) has implemented a reform that has been gradually changing teachers' traditional role. The teachers are required to perform in class new roles that have previously been the responsibility of the family and the community, among them development of close teacher-student relationships. This change is manifested by adjusting and implementing specific teaching and educational methods, providing emotional support to students, teaching life skills, and monitoring students' personal development (Eploig & Shalev-Vigiser, 2010).

Chapter II: Research Studies

This study consists of three studies that are detailed below.

II.1 Study 1: Differences between the Arab and Jewish Sectors, School Affiliation and Gender, as Perceived by the Educational Staff (Principals, Teachers and Coordinators from the Arab and Jewish Sectors), in the Implementation of a CPMS in Their School in Israel.

II.1.1 Study 1 aims, questions, variables, hypotheses and data analysis

Table 1 shows the aims, instruments, participants and variables of Study 1.

Table 1: Methodological summary of study 1

Aim	Instruments	Participants	Variables	Data Analysis
1. To investigate the differences between Israeli Jewish and Arab schools in the extent of implementation of CPMS 2. To examine the differences the school affiliation has on the extent of implementation of CPMS in Israeli schools.	A quantitative questionnaire based on a qualitative guiding questions (Blau & Hameiri, 2011)	39 teachers, coordinators and principals from the Arab sector. 57 teachers, coordinators and principals from the Jewish sector.	**Independent:** • Nationality • Gender • Affiliation: Ministry of Labor/ Ministry of Education **Dependent**: • Perception of the extent of CPMS implementation	T-tests for independent samples were performed in order to analyze the differences between the groups.

3. To explore the gender differences in the educational staff's perceptions of the implementation of CPMS in Israeli schools.				

Hypotheses

Hypothesis 1.1: The extent of CPMS implementation is perceived **by the educational staff to be higher in Jewish schools than in Arab schools.**

1.1.a The principals' extent of CPMS implementation is perceived by them and by other educational staff to be higher in Jewish schools than in Arab schools.

1.1.b The teachers' extent of CPMS implementation is perceived by them and the other educational staff to be higher in Jewish schools than in Arab schools.

1.1.c The students' extent of CPMS implementation is perceived by the educational staff to be higher in Jewish schools than in Arab schools.

1.1.d The student parents' extent of CPMS implementation is perceived by the educational staff to be higher in Jewish schools than in Arab schools.

Hypothesis 1.2: The extent of CPMS implementation is perceived by the educational staff to be higher in the Ministry of Education schools than in the Ministry of Labor schools.

1.2.a The principals' extent of CPMS implementation is perceived by them and the other educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

1.1.b The teachers' extent of CPMS implementation is perceived by them and by the other educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

1.2.c The students' extent of CPMS implementation is perceived by the educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

1.2.d The student parents' extent of CPMS implementation is perceived by the educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

Hypothesis 1.3: The extent of CPMS implementation is perceived by the educational staff to be higher among male teachers than female teachers.

1.3.a The principals' extent of CPMS implementation is perceived by them and the other educational staff to be higher among male teachers than female teachers.

1.3.b The teachers' extent of CPMS implementation is perceived by them and the other educational staff to be higher among male teachers than female teachers.

1.3.c The students' extent of CPMS implementation is perceived by the educational staff to be higher among male teachers than female teachers.

1.3.d The student parents' extent of CPMS implementation is perceived by the educational staff to be higher among male teachers than female teachers.

Study 1 guiding questions (Blau & Hameiri, 2010) examined the extent of CPMS implementation at school. For the purpose of this study, these guiding questions were amended to a Likert-type questionnaire on a scale ranging between 1 (never) and 7 (to great extent). The questionnaire was tested for validity by expert judges and reliability was calculated by Cronbach's Alpha test. The educational staff (teachers, principals, coordinators) responded to the questionnaire regarding the implementation of teachers, parents, principals and students.

Table 2: Study 1 research questionnaire

Implementation questionnaire		
1.	Objective	To examine the extent of CPMS implementation by comparison of results between Jewish and Arab schools, school affiliation, and gender
2.	Source	Qualitative guiding questions developed by Hameiri and Blau (2010) and adapted to a quantitative version for this study by the researcher.
3.	General description & Reliability	**General Implementation Cronbach's Alpha** Reliability of: **0.96** Divided into 4 implementation variables –

		Educational staff perceptions of **principals' implementation**– **8 items**, Cronbach's Alpha Reliability of .91 Educational staff perceptions of **teachers' implementation** – **10 items**. Cronbach's Alpha Reliability of .92 Educational staff perceptions of **students' implementation– 6 items**, Reliability of .95 Educational staff perceptions of student **parents' implementation**– **6 items**. Cronbach's Alpha Reliability of .95
4.	Calculation of results	The average of items 1 to 7: the higher the result, the higher the perception of the extent of CPMS implementation
5.	Instrument validity	In order to test the validity, an expert validation was performed by a team of professionals in this field. For the purpose of the research, the questions were adapted: questions were omitted and categories were added: students, parents, teachers, administrators, (See attached appendices, Section 6 of 7: Chapter 4). In order to verify whether the questionnaire examines the appropriate research variables, three experts holding senior positions in the field of education were involved in the implementation process in schools (pedagogical team of the education system) as well as five teachers.
6.	Measurement scale	Very Low Extent - 1 2 3 4 5 6 7 - Very High Extent
7.	Sample item	• How frequently do you use the pedagogical management software as a pedagogical tool that assists you in your self-management teaching processes? • Educational staff perceptions of principals' implementation: How much do you feel pedagogical management software promotes the performance of the principal in relation to the various areas? • Educational staff's perceptions of teachers' implementation: To what extent do you benefit from the use of pedagogical management software?

Table 2 illustrated that the reliability of the entire questionnaire, as well as of its parts, was higher than 0.90

Data analysis method

Statistical tests: t-tests for independent samples were performed in order to analyze the differences between the groups.

II.1.2 Findings

The findings of Study 1 are presented below according to order of the hypotheses.

Hypothesis 1.1: The extent of CPMS implementation is perceived by the educational staff to be higher in Jewish schools than in Arab schools.

In order to examine whether there is a difference in the extent of the CPMS implementation between the Jewish and Arab schools, a *t*-test was performed for independent samples. The dependent variable was the perception of the extent of CPMS implementation, while the independent variable was the Jewish sector as opposed to the Arab sector. The hypotheses were tested for the general variable, as well as for the educational staff's perceptions of CPMS implementation by the principals, teachers, students, and student parents (Table 3).

Table 3: T-tests of two independent samples for the extent of CPMS implementation by the principals, teachers, students, and student parents, as perceived by the educational staff, according to sector, with a 1-7 ranking

CPMS Implementation (General)		**Jews N=57**		**Arabs N=39**	***t* (94)**
	Mean Standard Deviation	4.382 1.138		4.952 1.342	2.239*
Principals' CPMS Implementation		Jews N=52		Arabs N=37	*t* (87)
	Mean	4.852		5.515	2.263*

	Standard Deviation	1.313		1.428	
Teachers' CPMS Implementation		Jews N=57		Arabs N=39	*t* (94)
	Mean Standard Deviation	5.048 1.259		5.182 1.415	0.478
Students' CPMS Implementation according to educational staff's perceptions		Jews N=55		Arabs N=39	*t* (92)
	Mean Standard Deviation	3.788 1.415		4.667 1.443	2.943**
Student parents' CPMS Implementation according to educational staff's perceptions		Jews N=53		Arabs N=38	*t* (89)
	Mean Standard Deviation	3.460 1.714		4.246 1.810	2.106*

p>.05 ,*p<.05 ,**p<.01

Table 3 illustrates that there is a significant difference between the perception of the extent of CPMS implementation of the Jewish and Arab sectors. The Arab educational staff reported a higher extent of implementation by principals, students, and student parents than that reported by the Jewish educational staff [$t(94)=2.239$, $p<.05$].

The mean value of implementation for the Arabs was found to be ($M = 4.952$, $S.D. = 1.342$), which was significantly higher than the mean value of implementation for the Jews ($M = 4.382$, $S.D. = 1.138$).

Since the results contradicted what had been expected, hypothesis 1.1 was not corroborated by the data.

Hypothesis 1.1.a: The principals' extent of CPMS implementation is perceived by them and the other educational staff to be higher in Jewish schools than in Arab schools.

A significant difference was found between the Jewish and Arab schools [$t(87)=2.263$, $p<.05$] with respect of the extent of the principals' CPMS implementation. The mean value for the implementation of principals in the Arab schools ($M=5.515$, SD=1.428) was significantly higher than the mean value for the implementation of principals in the Jewish schools ($M=4.852$, SD=1.313).

Since the results contradicted what had been expected, hypothesis 1.1.a was not corroborated by the data.

Hypothesis 1.1.b: The teachers' extent of CPMS implementation is perceived by them and the other educational staff to be higher in Jewish schools than in Arab schools.

No significant difference was found between the Jewish and Arab schools [$t(87)=2.263$, $p<.05$] with respect of the extent of the teachers' CPMS implementation. The mean value of teachers' implementation in the Arab schools ($M=5.182$, SD=1.415) was found to be similar to the mean value of implementation by teachers in the Jewish schools ($M=5.048$, SD= 1.259).

Hypothesis 1.1.b was not corroborated by the data.

Hypothesis 1.1.c: The students' extent of CPMS implementation is perceived by the educational staff to be higher in Jewish schools than in Arab schools.

A significant difference was found between the Jewish and Arab schools [$t(92)=2.943$, $p<.01$] with respect of the educational staff's perceptions of students' implementation. The mean value for students' implementation in the Arab schools ($M=4.667$, SD=1.443) was found to be significantly higher than the mean value for students' implementation in the Jewish schools ($M=3.788$, SD= 1.415).

Since the results contradicted what had been expected, hypothesis 1.1.c was not corroborated by the data.

Hypothesis 1.1.d: The student parents' extent of CPMS implementation is perceived by the educational staff to be higher in Jewish schools than in Arab schools.

A significant difference was found between the Jewish and Arab sectors [$t(92)=2.106$, $p<.05$] with respect of the educational staff's perceptions of student parents' implementation. The mean value

for student parents' implementation in the Arab schools (*M*=4.246, SD=1.810) was found to be significantly higher than the mean value for student parents' implementation in the Jewish schools (*M*=3.460, SD=1.714).

Since the results contradicted what had been expected, hypothesis 1.1.d was refuted on the basis of the data.

Hypothesis 1.2: The extent of CPMS implementation is perceived by the educational staff to be higher in the Ministry of Education schools than in the Ministry of Labor schools.

In order to examine whether a difference exists between the Ministry of Education and the Ministry of Labor schools regarding extent of CPMS implementation, a *t*-test was performed for independent samples as presented in Table 4 and Table 5.

The dependent variable was the perception of the extent of CPMS implementation, while the independent sample was the Ministry of Education schools as opposed to the Ministry of Labor schools.

Table 4 presents the examination of the hypothesis for the general sample, and for Jewish and Arab samples.

Table 4: T-tests for the educational staff's perception of the extent of CPMS implementation according to Ministry of Labor schools and Ministry of Education schools

The CPMS implementation (general)		**Ministry of Labor N=30**	**Ministry of Education N=67**	***t*(95)**
	Mean	4.066	4.858	-3.019**
	Standard Deviation	1.309	1.140	
The CPMS implementation (Jews)		**Ministry of Labor N=21**	**Ministry of Education N=36**	***t*(55)**
	Mean	3.930	4.645	-2.382*
	Standard Deviation	1.037	1.124	

The CPMS implementation (Arabs)		Ministry of Labor N=9	Ministry of Education N=30	*t*(9.932)
	Mean	4.382	5.123	-1.147
	Standard Deviation	1.833	1.141	

p>.05 ,*p<.05 ,**p<.01

Table 4 illustrates a significant difference in the CPMS implementation between the Ministry of Education schools and the Ministry of Labor schools for the general sample [$t(95)=-3.019$, $p<.01$]. The mean value of implementation for the Ministry of Education schools ($M=4.858$, SD=1.140) was significantly higher than the mean value of implementation for the Ministry of Labor schools in the general sample ($M=4.066$, SD=1.309).

Hypothesis 1.2 was corroborated.

However, when examining the Jewish sample, a significant difference was found between the extent of the CPMS implementation in schools supervised by the Ministry of Education, compared to the schools supervised by the Ministry of Labor [$t(55)=-2.382$, $p<.05$]. The mean value of implementation for the Ministry of Education schools ($M=4.645$, *S.D.* = 1.124) was significantly higher than the mean value of implementation for the Ministry of Labor schools ($M=3.930$, *S.D.* = 1.037).

Hypothesis. 1.2 was corroborated for the Jewish sample.

No significant difference was found in the Arab Sample between the extent of CPMS implementation in schools supervised by the Ministry of Education, compared to the schools supervised by the Ministry of Labor [$t(9.932)= -1.147$, $p>.05$]. The mean value of implementation for the Ministry of Education schools ($M=5.123$, *S.D.* = 1.141) was similar to the mean value of implementation for the Ministry of Labor schools ($M=4.382$, *S.D.* = 1.833).

Hypothesis 1.2 was refuted based on the data related to the Arab sample

Table 5 presents the educational staff's perceptions of the extent of CPMS implementation by principals, teachers, students, and student parents in the Ministry of Labor schools and the Ministry of Education schools

Table 5: T-tests for the educational staff's perception of the extent of CPMS implementation by principals, teachers, students, and student parents according to Ministry of Labor and Ministry of Education schools

Principals' CPMS implementation		**Ministry of Labor N=24**	**Ministry of Education N=66**	***t*(88)**
	Mean	4.979	5.181	-0.611
	Standard Deviation	1.331	1.411	
Teachers' CPMS implementation		**Ministry of Labor N=30**	**Ministry of Education N=67**	***t*(95)**
	Mean	4.340	5.446	-4.067**
	Standard Deviation	1.359	1.180	
Students' CPMS implementation according to educational staff's perceptions		**Ministry of Labor N=28**	**Ministry of Education N=67**	***t*(93)**
	Mean	3.583	4.390	-2.496*
	Standard Deviation	1.629	1.350	
Student parents' CPMS implementation according to educational staff's perceptions		**Ministry of Labor N=26**	**Ministry of Education N=66**	***t*(90)**
	Mean	3.250	3.991	-1.821
	Standard Deviation	1.746	1.761	

p>.05 ,*p<.05 ,**p<.01

Table 5 illustrates a significant difference in the extent of the CPMS implementation.

Hypothesis 1.2.a: The principals' extent of CPMS implementation is perceived by them and the other educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

No significant differences were found in the principals' extent of the CPMS implementation between the Ministry of Labor schools and the Ministry of Education schools [$t(88)= -0.611$, $p>.05$]. The mean value of principal implementation for the Ministry of Education schools (M=5.181, $S.D.$ = 1.411) was similar to the mean value of principal implementation for the Ministry of Labor schools (M=4.979, $S.D.$ = 1.331).

Hypothesis 1.2.a was refuted based on the data related to the Arab sample.

Hypothesis 1.2.b: The teachers' extent of CPMS implementation is perceived by them and the other educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

Significant differences were found in the extent of teachers' CPMS implementation between the Ministry of Education and the Ministry of Labor schools [$t(95)= -4.067$, $p<.01$]. The mean value of teacher implementation for the Ministry of Education schools (M=5.446, $S.D.$ = 1.180) was significantly higher than the mean value of teacher implementation for the Ministry of Labor schools (M=4.340, $S.D.$ = 1.359).

Hypothesis 1.2.b was corroborated

Hypothesis 1.2.c: The students' extent of CPMS implementation is perceived by the educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

A significant difference was found in the extent of CPMS implementation with respect of the educational staff's perceptions of students' implementation between the Ministry of Education and the Ministry of Labor schools [$t(93)= -2.496$, $p<.05$]. The mean value of students' implementation for the Ministry of Education schools (M=4.390, $S.D.$ = 1.350) was found to be significantly higher than the mean value of student implementation for the Ministry of Labor schools (M=3.583, $S.D.$ = 1.629).

Hypothesis1.2.c was corroborated

Hypothesis 1.2.d: The student parents' extent of CPMS implementation is perceived by the educational staff to be higher in Ministry of Education schools than in the Ministry of Labor schools.

No significant differences were found in the extent of CPMS implementation with respect of the educational staff's perceptions of student parents' implementation between the Ministry of Education and the Ministry of Labor schools [$t(90)= -1.821$, $p>.05$]. The mean value of student parents' implementation for the Ministry of Education schools ($M=3.991$, $S.D. = 1.761$) was similar to the mean value of student parents' implementation for the Ministry of Labor schools ($M=3.250$, $S.D. = 1.746$).

Hypothesis 1.2.d was refuted based on the data related to the student parents' sample.

Hypothesis 1.3: The extent of CPMS implementation is perceived by the educational staff to be higher among male teachers than female teachers.

In order to examine whether there was a difference between male and female educational staff members regarding the extent to which the CPSM was assimilated, *t*-tests were performed for independent samples, as presented in Tables 6 and 7. The dependent variable was the perception of the extent of the CPMS implementation, while the independent sample was male educational staff as opposed to female educational staff.

The hypothesis was tested for the general sample, and for the Jewish and Arab sectors, as shown in Table 6.

Table 6: T-tests for the extent of CPMS according to gender, for the general sample, the Jewish and Arab sectors

CPMS implementation (general sample)		**Males N=37**	**Females N=60**	***t*(97)**
	Mean	4.624	4.606	0.067
	Standard Deviation	1.237	1.258	
CPMS implementation (Jewish sector)		**Males N=19**	**Females N=38**	***t*(55)**
	Mean	4.389	4.378	-0.033
	Standard Deviation	0.992	1.217	

CPMS implementation (Arab sector)		**Males N=17**	**Females N=22**	***t*(37)**
	Mean	4.890	4.999	0.249
	Standard Deviation	1.482	1.257	

p>.05

Table 6 illustrates no significant differences in the CPMS implementation between male and female education staff [$t(95)=0.067$, $p<.05$]. The mean value of implementation for male educational staff ($M=4.624$, SD=1.237) was found to be similar to the mean value of implementation for female educational staff ($M=4.606$, SD=1.258).

Hypothesis 1.3 was refuted on the basis of the data.

The dependent variable was the perception of the extent of CPMS implementation, while the independent sample was male educational staff as opposed to female educational staff. The hypotheses were tested for the educational staff's perceptions of CPMS implementation by the principals, teachers, students, and student parents, as shown in Table 7.

Table 7: T-tests for the extent of CMS implementation according to gender, of principals, teachers, students, and student parents as perceived by the educational staff

Principals' CPMS implementation		**Male N=34**	**Female N=56**	***t*(88)**
	Mean	5.259	5.048	0.699
	Standard Deviation	1.171	1.505	
Teachers' CPMS implementation		**Male N=35**	**Female N=60**	***t*(95)**
	Mean	4.982	5.179	-0.706
	Standard Deviation	1.298	1.361	
Students' CPMS implementation according to the educational staff's perceptions		**Male N=35**	**Female N=60**	***t*(95)**
	Mean	4.262	4.089	0.549
	Standard Deviation	1.490	1.477	

Student parents' CPMS implementation according to the educational staff's perceptions		**Male N=35**	**Female N=57**	***t*(92)**
	Mean	3.757	3.796	-0.102
	Standard Deviation	1.795	1.785	

p>.05

No significant differences between males and females were found in the extent of CPMS implementation by principals, teachers, students, and student parents.

Hypothesis 1.3.a: The principals' extent of CPMS implementation is perceived by them and the other educational staff to be higher among male teachers than female teachers.

No significant differences were found between males and females [$t(88)= -0.699$, $p>.05$] with respect of the principals' CPMS implementation. The mean value of school principal implementation was perceived by males (M=5.259, $S.D.$ = 1.171) to be similar to the mean value of school principal implementation perceived by females (M=5.048, $S.D.$ = 1.505).

Hypothesis 1.3.b: The teachers' extent of CPMS implementation is perceived by them and the other educational staff to be higher among male teachers than female teachers.

No significant differences were found between males and females [$t(95)= -0.706$, $p>.05$] with respect of teachers' CPMS implementation. The mean value of teachers' implementation as perceived by the male educational staff (M=4.982, $S.D.$ = 1.298) was found to be similar to the mean value of teachers' implementation as perceived by the female educational staff (M=5.179, $S.D.$ = 1.361).

Hypothesis 1.3.b was refuted on the basis of the data.

Hypothesis 1.3.c: The students' extent of CPMS implementation is perceived by the educational staff to be higher among male teachers than female teachers.

No significant differences were found between males and females [$t(93)= 0.549$, $p>.05$] with respect of the students' CMPS implementation. The mean value of students' implementation as perceived by the male educational staff (M=4.262, $S.D.$ = 1.490) was found to be similar to the mean value of students' implementation as perceived by the female educational staff (M=4.089, $S.D.$ = 1.477).

Hypothesis 1.3.c was refuted on the basis of the data.

Hypothesis 1.3.d: The student parents' extent of CPMS implementation is perceived by the educational staff to be higher among male teachers than female teachers.

No significant differences were found between males and females [$t(90)= -0.102$, $p>.05$] with respect of the student parents' CPMS implementation. The mean value of student parents' implementation as perceived by the male educational staff (M=3.757, $S.D.$ = 1.795) was found to be similar to the mean value of student parents' implementation as perceived by the female educational staff (M=3.796, $S.D.$ = 1.785).

Hypothesis 1.3.d was refuted on the basis of the data.

II.1.3 Conclusions

The main conclusions of Study 1 were:

1. Contrary to the hypothesis, the educational staff members perceive that the extent of CPMS implementation is higher in the Arab schools compared to the Jewish schools. This could have stemmed from the need for social desirability, i.e., the need of the Arabs to present their perception of the extent of CPMS implementation as high.
2. The educational staff members perceive the extent of CPMS implementation as higher in the schools of the Ministry of Education compared to the schools of the Ministry of Labor. This gap might stem from the advantage of the Ministry of Education schools in terms of equipment and resources for implementing technology in their education system
3. There is no difference in the perception of the extent of CPMS implementation between male and female educators

II.2 Study 2: The Factors that Promote and Inhibit the CPMS Implementation Process in Israeli Schools

II.2.1 Study 2 aim, questions, variables, hypotheses and data analysis

Table 8 shows the aims, instruments, participants and variables of Study 2

Table 8: Methodological summary of study 2

Aim	Research Instruments	Research participants	Variables	Data Analysis
To examine what are the factors that inhibit and promote the process of the CPMS implementation	A questionnaire comprising several parts: 1. Management style (Bass & Avolio, 1997) 2. Faculty team support, (Zimet et al., 1988) 3. Feeling of computer literacy challenge (Lazarus & Folkman, 1985) 4. Sense of Coherence (Antonvsky & Sourani. 1988). Use of existing questionnaires adjusted and connected to this study	96 participants (teachers, principals and coordinators) chosen randomly.	**<u>Independent</u>:** • management style • faculty team support • feeling of computer literacy challenge • sense of coherence • age • seniority • position scope **<u>Dependent:</u>** • perception of the extent of CPMS implementation	Relationship between variables, correlations and regression.

II.2.2 Findings

The findings of Study 2 are presented below according to the order of hypotheses.

Hypothesis 2.1.a: There is a positive correlation between a design management style and the extent of CPMS implementation for the general sample, the Jews and the Arabs.

In order to test whether there is a positive correlation between a design management style and the extent of CPMS, a Pearson correlation coefficient test was performed, as shown in Table 9 below. The hypothesis was tested for the general variable, for Jews, and for Arabs.

Table 9: Correlations between a design management style and the extent of CPMS implementation for the general sample, the Jews and the Arabs

Sample	Variable	CPMS implementation	Design Management Style
General	Implementation	1	0.305**
	Design Management Style		1
Jews	Implementation	1	0.231
	Design Management Style		1
Arabs	Implementation	1	0.384*
	Design Management Style		1

p>.05 ,*p<.05 ,**p<.01

The findings presented in Table 9 show a significant positive correlation between the variables of design management style and the extent of the CPMS implementation (r_p=0.305, p<.01) in the general sample. That is., the closer the desired management style was to the design type, the better the extent of the CPMS implementation was.

Hypothesis 2.1.a was corroborated for the general sample.

No significant correlation was found in the Jewish sample between the variables of design management style and the extent of the CPMS implementation (r_p=0.231, p>.05).

Hypothesis 2.1.a was refuted based on the data for the Jewish sample.

A significant positive correlation in the Arab sample was found between the variables of design management style and the extent of the CPMS implementation (r_p=0.384, p<.05). That is, the closer

the desired management style was to the design type, the better the extent of the CPMS implementation was.

Hypothesis 2.1.a was corroborated for the Arab sample.

Hypothesis 2.1.b: There is a positive correlation between a design management style and the extent of CPMS implementation by principals, teachers, students, and student parents.

In order to test whether there is a positive correlation between a design management style and the extent of CPMS implementation, a Pearson correlation coefficient test was performed, as shown in Table 10 below. The hypothesis was tested for the educational staff's perception of CPMS implementation by the principals, teachers, students and student parents.

Table 10: Correlations between the design management style and the extent of CPMS implementation according to the educational staff's perception of CPMS implementation by the principals, teachers, students and student parents

	The CPMS implementation	**Design Management Style**
Principals' Implementation	1	0.299**
Principals' Design Management Style		1
Teachers' Implementation	1	0.226*
Teachers' Design Management Style		1
Student' CPMS Implementation according to educational staff's perceptions	1	0.236*
Students' Design Management Style		1
Student parents' CPMS Implementation according to educational staff's perceptions	1	0.333**
Student parents' Design Management Style		1

*p<.05 ,**p<.01

Table 10 illustrates a significant positive correlation between the variables of design management style and the principals' CPMS implementation (r_p=0.299, p<.01). That is, the closer the desired management style was to the design type, the better the principals' CPMS implementation was.

Hypothesis 2.1.b was corroborated for the principals.

A significant positive correlation was found between the variables of design management style and the teachers' CPMS implementation (r_p=0.226, p<.05). That is, the closer the desired management style was to the design type, the better the teachers' CPMS implementation was.

Hypothesis 2.1.b was corroborated for the teachers.

A significant positive correlation was found between the variables of design management style and the students' CPMS implementation (r_p=0.236, p<.05). That is the closer the desired management style was.

Hypothesis 2.1.b was corroborated for the students.

A significant positive correlation was found between the variables of design management style and the student parents' CPMS implementation (r_p=0.333, p<.01). That is, the closer the desired management style was to the design type, the better the student parents' CPMS implementation was.

Hypothesis 2.1.b was corroborated for the student parents.

Hypothesis 2.2.a: There is a positive correlation between sense of coherence and the extent of CPMS implementation for the general sample the Jews and the Arabs.

In order to examine whether there is a positive correlation between sense of coherence and the extent of the CPMS implementation, a Pearson correlation coefficient test was performed, as shown in Table 11 below. The hypothesis was tested for the general variable, the Jews and the Arabs,

Table 11: Correlations between sense of coherence and CPMS implementation for the general sample, the Jews and the Arabs

Sample	Variable	CPMS implementation	Sense of coherence
General	Implementation	1	-0.248*
	Sense of coherence		1
Jews	Implementation	1	-0.094
	Sense of coherence		1
Arabs	Implementation	1	-0.513**
	Sense of coherence		1

p>.05 ,*p<.05 ,**p<.01

The findings presented in Table 11 indicate a significant negative correlation between the sense of coherence and implementation variables (r_p=-0.248, p<.05). That is, the better the coherence, the lower the extent of the CPMS implementation.

Hypothesis 2.2.a was refuted based on the data **for the general sample**.

Furthermore, no significant correlation was found in the Jewish sample between the sense of coherence and CPMS implementation variables (r_p= -0.094, p>.05).

Hypothesis 2.2.a was refuted based on the data **for the Jewish sample**.

A significant negative correlation was found in the Arab sample between the sense of coherence and CPMS implementation variables (r_p= -0.094, p>.05). That is, the better the coherence, the lower the extent of the CPMS implementation.

Hypothesis 2.2.a was refuted based on the data **for the Arab sample**.

Hypothesis 2.2.b: There is a positive correlation between the sense of coherence and the extent of CPMS implementation by principals, teachers, students, and student parents.

In order to examine whether there is a positive correlation between sense of coherence and the extent of the CPMS implementation, a Pearson correlation coefficient test was performed, as shown in Table 12 below. The hypothesis was tested for the educational staff's perceptions of CPMS implementation by the principals, teachers, students and student parents.

Table 12: Correlations between sense of coherence and CPMS implementation, by the principals, teachers, students and student parents as perceived by the educational staff

	CPMS implementation	**Sense of coherence**
Principals' implementation	1	-0.288**
Sense of coherence		1
Teachers' implementation	1	-0.221*
Sense of coherence		1
Student' CPMS Implementation according to educational staff's perceptions	1	-0.144

Sense of coherence		1
Student parents' CPMS Implementation according to educational staff's perceptions	1	-0.131
Sense of coherence		1

p>.05 ,*p<.05 ,**p<.01

The findings shown in Table 12 suggest a significant negative correlation between the sense of coherence and principals implementation variables (r_p = -0.288, p<.01). That is, the better the coherence, the better the principals' CPMS implementation.

Hypothesis 2.2.b was refuted based on the data **for the principals**.

A significant negative correlation was found between the sense of coherence and teachers' implementation variables. (r_p = -0.221, p<.05). That is, the better the coherence, the better the teachers' CPMS implementation.

Hypothesis 2.2.b was refuted based on the data **for the teachers**.

No significant correlation was found between the sense of coherence and students' implementation variables (r_p = -0.144, p>.05).

Hypothesis 2.2.b was refuted based on the data for the students.

No significant correlation was found between the sense of coherence and Student parents' CPMS Implementation according to educational staff's perception**s** (r_p = -0.131, p>.05).

Hypothesis 2.2.b was refuted based on the data **for the student parents**.

Hypothesis 2.3.a: There is a negative correlation between the extent of CPMS implementation and the feeling of computer literacy challenge for the general sample, the Jews and the Arabs.

In order to examine whether there is a negative correlation between the feeling of computer literacy challenge and the extent of the CPMS implementation, a Pearson correlation coefficient test was performed as shown in Tables 13 below. The hypothesis was tested for the general variable, the Jews and the Arabs.

Table 13: Correlations between a feeling of computer literacy challenge and CPMS implementation for the general sample, the Jews and the Arabs

Sample	Variable	CPMS implementation	Feeling of Challenge
General	Implementation	1	-0.207*
	Feeling of Challenge		1
Jewish	Implementation	1	-0.084
	Feeling of Challenge		1
Arab	Implementation	1	-0.316
	Feeling of Challenge		1

*p<.05 p>.05

The findings shown in Table 13 indicate a significant negative correlation between the feeling of f computer literacy challenge and the extent of CPMS implementation in the general sample (r_p = -0.207, p<.05). That is, the higher the feeling of computer literacy challenge, the lower the extent of CPMS implementation.

Hypothesis 2.3.a was corroborated

No significant correlation was found between the feeling of challenge of computer literacy and the extent of CPMS implementation in the Jewish sample (r_p = -0.084, p>.05).

Hypothesis 2.3.a was refuted based on the data **for the Jewish sample**.

No significant correlation was found between the feeling of challenge of computer literacy and the extent of CPMS implementation in the Arab sample (r_p = -0.316, p>.05).

Hypothesis 2.3.a was refuted based on the data **for the Arab sample**.

It is noteworthy that significance was found to be notably high (p=.05018). As a rule, when the p-value is smaller or equal to 0.05, the null hypothesis is to be rejected, whereas if the p-value is greater than 0.05, the null hypothesis is not to be rejected.

Hypothesis 2.3.b: There is a negative correlation between the extent of CPMS implementation and the feeling of computer literacy challenge for principals, teachers, students, and student parents.

In order to examine whether a negative correlation exists between the feeling of challenge of computer literacy and the extent of the CPMS implementation, a Pearson correlation coefficient was used as can be seen in Table 14 below. The hypotheses were tested for the educational staff's perceptions of CPMS implementation by principals, teachers, students and student parents.

Table 1: Correlations between the feeling of computer literacy challenge and the extent of CPMS implementation by the principals, teachers, students and student parents as perceived by the educational staff

	CPMS implementation	**Feeling of Challenge**
Principals' implementation	1	-0.176
Feeling of Challenge		1
Teachers' implementation	1	-0.298**
Feeling of Challenge		1
Student' CPMS Implementation according to educational staff's perceptions	1	-0.081
Feeling of Challenge		1
Student parents' CPMS Implementation according to educational staff's perceptions	1	-0.104
Feeling of Challenge		1

p>.05 ,**p<.01

The findings shown in Table 14 suggest that no significant negative correlation was found between the variables of the feeling of computer literacy challenge and CPMS implementation, for the educational staff's perceptions of the principals' CPMS implementation (r_p=-0.176, *p*>.05).

Hypothesis 2.3.b was refuted based on the data **for the principals**.

A significant negative correlation was found between the variables of feeling of computer literacy challenge and the CPMS implementation, for the educational staff's perceptions of the teachers' CPMS implementation (r_p=-0.298, p<.01). That is, the higher the feeling of computer literacy challenge, the lower the extent of teachers' CPMS implementation.

Hypothesis 2.3.b was corroborated for the teachers.

No significant negative correlation was found between the feeling of computer literacy challenge and the CPMS implementation of the students' CPMS implementation (r_p=-0.081, p>.05)

Hypothesis 2.3.b was refuted based on the data **for the students.**

No significant negative correlation was found between the feeling of computer literacy challenge and the CPMS implementation of the student parents' CPMS implementation (r_p=-0.104, p>.05).

Hypothesis 2.3.b was refuted based on the data **for the student parents**.

Hypothesis 2.4.a: There is a positive correlation between faculty team support and the extent of CPMS implementation for the general sample, the Jews and the Arabs.

In order to test whether there is a positive correlation between faculty team support and the extent of CPMS implementation, a Pearson correlation coefficient test was performed, as shown in Table 15 below. The hypothesis was tested for the general variable, the Jews and the Arabs.

Table 15: Correlations between faculty team support and the extent of the CPMS implementation, for the general sample, the Jews and the Arabs

Sample	Variable	CPMS implementation	Faculty Team Support
General	Implementation	1	0.360**
	Faculty Team Support		1
Jews	Implementation	1	0.061
	Faculty Team Support		1
Arabs	Implementation	1	0.766**
	Faculty Team Support		1

p>.05 ,*p<.05 ,**p<.01

The findings shown in Table 15 imply a significant positive correlation between the variables of faculty team support and the extent of CPMS implementation for the general sample (r_p=0.360, p<.01). That is, the better the faculty team support, the better the CPMS implementation.

Hypothesis 2.4.a was corroborated for the general sample.

No significant correlation was found in the Jewish sample between the variables of faculty team support and the extent of CPMS implementation (r_p=0.061, p>.05).

Hypothesis 2.4.a was refuted based on the data **for the Jewish sample.**

A significant positive correlation was found in the Arab sample between the variables of faculty team support and the extent of the CPMS implementation (r_p=0.766, p<.01). That is, the better the faculty team support, the better the CPMS implementation.

Hypothesis 2.4.a was corroborated for the Arab sample.

Hypothesis 2.4.b: There is a positive correlation between the faculty team support and the extent of CPMS implementation by principals, teachers, students, and student parents.

In order to test whether there is a positive correlation between faculty team support and the extent of CPMS implementation, a Pearson correlation coefficient test was performed, as shown in Table 16 below. The hypothesis was tested for the educational staff's perceptions of CPMS implementation by principals, teachers, students and student parents.

Table 26: Correlations between faculty team support and CPMS implementation by the principals, teachers, students and student parents as perceived by the educational staff

	Implementation	**Faculty Team Support**
Principals' implementation	1	0.412**
Faculty Team Support		1
Teachers' implementation	1	0.324**
Faculty Team Support		1
Student' CPMS Implementation according to educational staff's perceptions	1	0.231*

Faculty Team Support		1
Student parents' CPMS Implementation according to educational staff's perceptions	1	0.239*
Faculty Team Support		1

*p<.05 ,**p<.01

Table 16 illustrates a significant positive correlation between the variables of faculty team support and the principals' CPMS implementation (r_p=0.412, *p*<.01). That is, the better the faculty team support, the better the principals' CPMS implementation.

Hypothesis 2.4.b was corroborated for the principals.

A significant positive correlation was found between the variables of faculty team support and teachers' CPMS implementation (r_p=0.324, p<.01). That is, the better the faculty team support, the better the teachers' CPMS implementation.

Hypothesis 2.4.b was corroborated for the teachers.

A significant positive correlation was found between the variables of faculty team support and the students CPMS implementation (r_p=0.231, *p*<.05). That is, the better the faculty team support, the better the students' CPMS implementation.

Hypothesis 2.4.b was corroborated for the students.

A significant positive correlation was found between the variables of faculty team support and the students' parent CPMS implementation (r_p=0.239, *p*<.05). That is, the better the faculty team support, the better the student parents' CPMS implementation.

Hypothesis 2.4.b was corroborated for the student parents.

Hypothesis 2.5: The variables of designer management style, sense of coherence, challenge of computer literacy, faculty team support, age, seniority, as well as scope of position, predict the level of implementation.

The seven independent variables were tested for predictability of the dependent variable by means of regression analysis. This procedure facilitates examination of the optimal model, as well as the variability ascribed to each essential variable. The dependent variable was the perception of the extent of CPMS implementation, and the independent variables were design management style, sense of coherence, feeling of challenge, faculty team support, age, seniority, and scope of position.

In the general sample, seven independent variables were accounted for in the model, while only a single one was found to be significant. The regression analysis suggested that the extent of the CPMS implementation was best accounted for by the variable of faculty team support ($F(1,93)=12.941$, $p<0.01$). The predictor variables accounted for 12.2% of variability in the extent of CPMS implementation. Table 17 presents the results of the regression analysis.

Table 17: Multiple Stepwise Regression for predicting the extent of CPMS implementation for the general sample

Predictor Variable	B	β	t		R^2 Accumulated
Faculty Team Support	0.336	0.349	3.597**		0.122

**p<.01

According to Table 17, the faculty team support was the most significant predictor variable with regards to the variability in the extent of CPMS implementation (β=0.349), accounting for 12.2% of the variability in the extent CPMS implementation. The remaining variables were not included in the regression model and were not found to be statistically significant, nor did they significantly contribute to the results.

In the Jewish sample, seven independent variables were accounted for in the model, and none was found to be significant.

In the Arab sample, seven independent variables were accounted for in the model, while only two were found to be significant. The regression analysis suggested that the extent of the CPMS implementation could be accounted for by the variables of faculty team support, as well as seniority ($F(2,36)=31.805$, $p<0.01$). The predictor variables accounted for 63.9% of variability in the extent of CPMS implementation. Table 18 below shows the results of the regression analysis for the Arab sector.

Table 38: Multiple Stepwise Regression for predicting implementation for the Arab sample

Predictor Variable	B	B	t	R^2 Accumulated
Faculty Team Support	0.768	0.738	7.310**	0.586
Seniority	0.028	0.230	2.279*	0.639

**p<.01

Table 18 illustrates that the most significant variable in accounting for the variability in the extent of CPMS implementation was faculty team support (β=0.230). It accounted for 58.6% of the variability in the extent of CPMS implementation, followed by the variable of seniority (β=0.230) that accounted for 5.3% of variability. The remaining variables were not included in the regression model and were not found to be statistically significant, nor did they significantly contribute to the results.

II.2.3 Conclusions

The main conclusions of Study 2 are:

1. A strong positive correlation was found between design management style and the extent of the CPMS implementation in the Arabs schools but not in the Jewish schools. Further effort in developing management styles in the Jewish school should be focused on management styles that increase teachers' satisfaction and students' motivation. Additional effort invested in reforms is needed to ensure the effective CPMS implementation in the Jewish schools.
2. The essential trait of coherence is successfully dealing with challenges, change, and stress. Consequently, the positive correlation between the two variables is highly comprehensible. Staff members with a high sense of coherence demonstrated a high extent of CPMS implementation.
3. Conceivably**,** results demonstrated a negative correlation between the feeling of computer literacy challenge variable and the extent of the CPMS implementation. In all sectors of occupation, the integration of a new technology poses a barrier and, the majority of professionals prefer their traditional style of work. Future investment in training programs and technical guidance for the principal/teaching staff could bridge the gap and increase implementation scores.

4. Firstly**,** team support is a highly valuable component in the success and attainment rates in schools. Secondly, team support is crucial in the generation of change in the conventional and bureaucratic education system. In conclusion, this study found a strong and positive correlation between the two variables: team support by the principal, the teachers, the educational staff, students and student parents, and the extent of CPMS implementation.
5. Contrary to the scientific literature, out of the seven variables tested in the sample, only one turned out to be significant. In conclusion, a high correlation was found only between team support and the extent of CPMS implementation. Another conclusion drawn from this study was that team support was significant only for the Arab sample, whereas no significant association with the seven variables was found for the Jewish sample.

II.3 Study 3: The Principals' Perceptions of the Opportunities and Challenges Involved in the CPMS Implementation at School

II.3.1 Study 3 aims, questions and data analysis

Table 19: **Methodological summary of study 3**

Aim	Instruments	participants	Data Analysis
To examine in-depth the opportunities and challenges in the CPMS implementation according to the principals' perceptions.	Semi-structured interview.	15 principals in charge of CPMS implementation in schools.	Qualitative content analysis by themes and categories.

II.3.2 Findings

The following section presents the qualitative findings obtained from content analyses of semi-structured interviews conducted with the principals.

The findings are presented with relation to several main themes:

1. The challenges with the CPMS implementation.
2. The suggested solutions for these challenges.
3. The opportunities created by the CPMS implementation in the schools.
4. The importance of the CPMS implementation.

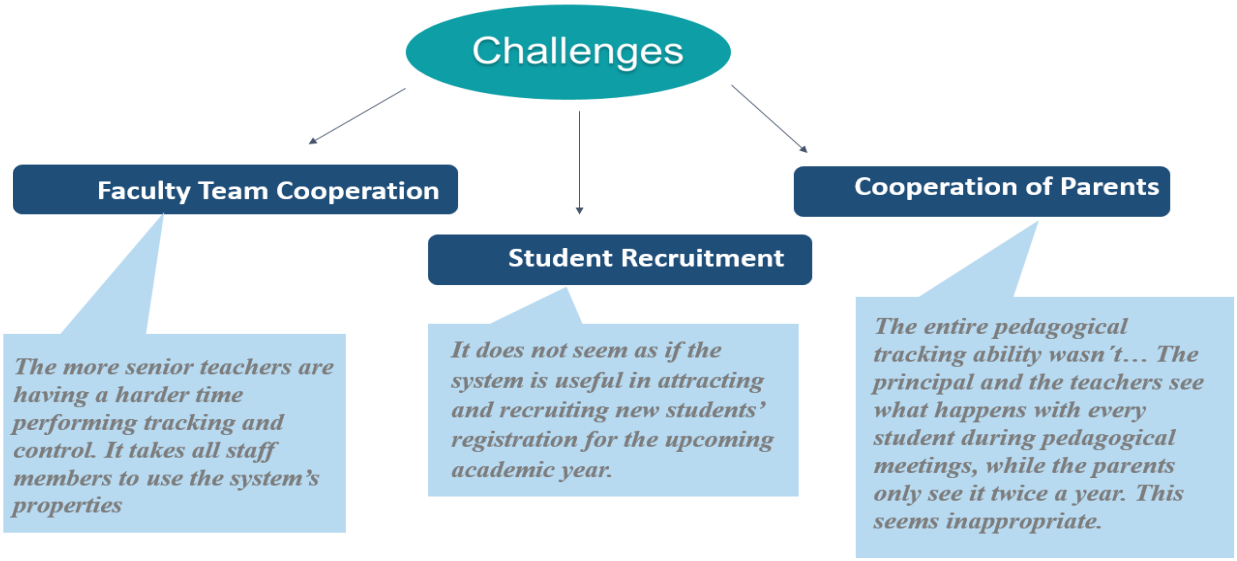

Figure 1: Challenges with the CPMS implementation

Theme 1: Challenges with the CPSM implementation

Cooperation of Educational Staff (Faculty Team) – Most principals are concerned with the cooperation of the educational staff regarding the existing motivation for the use of the numerous options the system provides. They note that some senior teachers are struggling with the application of the feedback control tool. Moreover, some principals claim that little cooperation was received from their ICT and pedagogical coordinators.

Recruiting New Students for the Following Year – Two principals have also raised the issue of enrollment of new students for the upcoming school year. How can the advantages of the system´s tracking of students be utilized for the recruitment and registration of new students to the school?

Cooperation of Student parents – Principals express the necessity for communicating the advantages of the system to the student parents so that, in turn, they would be able to best utilize the system as an instrument for maximizing their child's performance: *"The entire pedagogical tracking ability wasn´t… The principal and the teacher see what happens with every student during pedagogical meetings while the student parents only see it twice a year. This seems inappropriate"*.

Theme 2: Suggested Solutions for Challenges in the CPMS Implementation

Even though they were not asked to do so during the interviews, the principals raised ideas and suggestions for solution of the aforementioned challenges.

Mediation for student parents and the community; and learning from colleague principals in different institutions, as can be seen in figure 2.

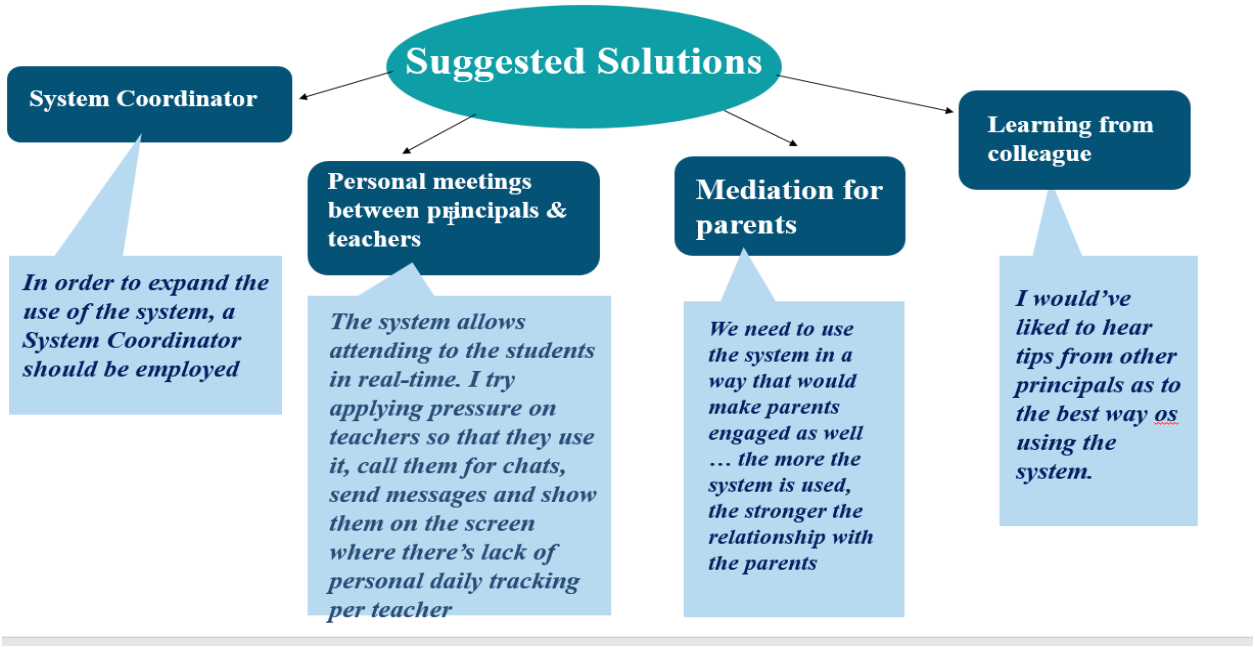

Figure 2: Suggested solutions for the challenges with the CPMS implementation

Four categories of solutions were mentioned in the interviews, among them: employment of a System Coordinator for the school; personal meetings between principals and teachers; mediation for the parents, and learning from colleagues.

System Coordinator

Principals mentioned the need for employing a System Coordinator in the school, whose responsibilities would be the teachers' reports, attendance follow-up, and organizational as well as real-time data feeding. The system coordinator could assist teachers and increase their motivation for carrying out the follow-up by utilizing the system's data, and thus help strengthening the personal interaction with their students.

Personal Meetings between Principals and Teachers

Some principals suggested scheduling personal meetings with the teachers in an attempt to increase their motivation, and to demonstrate the added value that the CPMS offers, as described by one of the principals: "*The system allows to attend the students in real-time. I try to pressure the teachers into using it, call them for chats, send messages and show them on the screen where there's a lack of personal daily tracking per teacher".*

Mediation for Parents

Principals suggested tightening the relationships with the student parents and the community, as explained by one of the principals: "*We need to use the system in a way that would make student parents engaged as well … the more the system is used, the stronger the relationship with the student parents can become".*

Learning from Colleagues

Some principals expressed their need for learning from other principal-colleagues. This would expose them to the added benefits of the CPMS for principals, teachers and students in order to receive suggestions from their principal-colleagues experience.

Theme 3: Opportunities Created by the CPMS Implementation

Findings from the content analysis indicated that the principals perceived that the CPMS implementation had four main categories of benefits:

1. Improving the pedagogical follow-up of the students.
2. Enhancing pedagogical leadership.
3. Improving communication and information sharing between all members.
4. Providing appropriate responses to all staff members.

The four main categories of benefits of implementation of the CPMS are presented in Figure 3.

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Figure 3: Themes and categories regarding opportunities in the implementation of the CPMS

Improving the pedagogical follow-up of the students

The principals emphasized the importance of the system with regards to the follow-up of class progress, be it in attendance, scores, attainments, and mapping.

Enhancing pedagogical leadership

The system provides principals and teachers with tools for promoting their pedagogical leadership.

Improving communication and information sharing between all members

The principals mentioned the importance of improving the communication and information sharing, through closer cooperation with the Ministry of Education, strengthening communication between students and teachers, and utilizing the uniqueness of the platform in its ability to send and receive messages. The system is largely effective in communicating messages to all users: *"Personal chats with teachers, the objective is maintaining a singular recorded channel of communication".*

Providing appropriate responses to all staff members

The principals acknowledged the importance of the system´s ability to provide different responses and assistance to teachers and principals in an efficient and relevant manner, while considering the distribution of workload and the system´s overall efficiency. Accessibility and reliability refer to the users' experience with the CPMS: *"A more user-friendly platform for class data entries*".

Theme 4: The importance of the CPMS implementation.

The principals acknowledged the importance of the CPMS implementation for three main categories:

1. General systemic management.
2. Efficiency in utilizing the CPMS.
3. Better tool for pedagogical, emotional, and social management.

Figure 4 shows the perceived importance of the CPMS implementation.

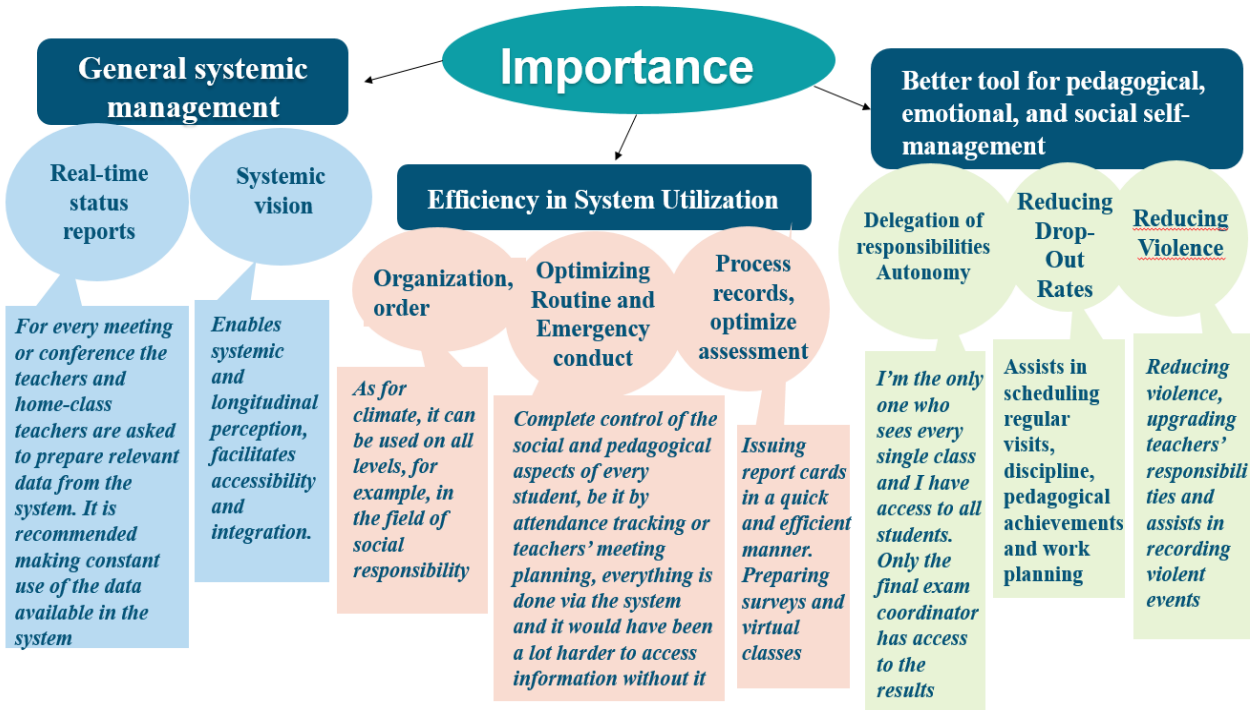

Figure 4: Importance of the CPMS implementation

1. The CPMS presents a systematic vision of the conduct within the classroom, which allows for a deeper understanding of the teacher's work, as well as the students' progress. Furthermore, the system offers real-time status reports, which include all of the relevant data, and allow for appropriate management of the classroom environment. It is also worth noting that the CPMS seems to allow for proper organization and working procedures during both routine and emergency situations.

2. The participants in the study consider the CPMS as a tool which allows for proper delegation of responsibilities between principal and staff, thus improving the efficiency of the educational activities.
3. The principals maintain that the CPMS provides a real-time status report on the student and seems to have a positive impact on the reduction of drop-out rates, reducing incidents of violence between students and improving school climate.

II.3.3 Conclusions

Conclusions relating to the challenges of the CPMS implementation

ICT support for teachers is still inadequate. Moreover, teachers' motivation to use the various CPMS options is low due to lack of assistance as well as difficulties in managing the feedback control tool of the system.

Conclusions relating to the suggested solutions for these challenges

The suggested solutions are:

1. Appointing a System Coordinator in every school who is in charge of the teachers' reports, attendance follow-up, organizational as well as real-time data feeding. The System Coordinator should motivate teachers to make full use of CPMS options by providing them with usage assistance.
2. Personal meetings between principals and teachers are required as an effective strategy in enhancing inter-personal communication, teachers' cooperation, as well as raising their motivation and commitment.
3. Both the Ministry of Education and principals realize that it is important to establish relationships with the student parents and the community, strengthening students, with added resources and mutual educational ventures.
4. There is a need for support of colleagues: exchange of ideas, assistance in problem-solving, suggestions based on the experience of principal-colleagues which are all added benefits of the CPMS support group for principals, students, and teachers. Furthermore, sharing pedagogical strategies among the educational staff results in greater efficiency.

Conclusions relating to the opportunities created by CPMS implementation

CPMS implementation promotes the pedagogical follow-up of the students by real-time data about students' progress. This can improve immediate teachers' response and pedagogical strategy.

Another advantage is enhancing pedagogical leadership: leadership traits that bring about enthusiasm, charisma, cooperation, and commitment.

The improved communication and information sharing between all school members enhances knowledge management for both teachers and students, not only in administrative processes but in pedagogy as well.

The CPMS implementation reduces the required efforts by providing time-saving techniques and allowing quick responses to student parents, principal, and supervisors.

Conclusions relating to the importance of the CPMS implementation

The importance of CPMS implementation can be derived from these sources:

a. General systemic management – the technology provides prompt and accurate data on administrative and pedagogical issues.
b. Time-saving principal-teacher-student-parent communication, delegation of responsibilities.
c. Better tool for pedagogical, emotional, and social management – the enhanced communication opportunities offered by CPMS, enables more individual attention to each student, knowledge of their emotional, psychological, social problems, learning difficulties, and behavior control.
d. Special attention given to all these factors recorded in the system improve the school climate, atmosphere, and the environment, with less violence incidents. It also enhances the learning, attainments, and success rates of schools.

Chapter III: General Conclusions and Implications

III.1 General Discussion and Conclusions

This study sheds light on the CPMS implementation in Arab and Jewish secondary schools. The CPMS helps the educational staff in making information-based educational decisions, and allows parents and students to receive real-time information about assignments, academic attainments, and school functioning. The importance of implementing the system in schools resides in its ability to make information-based educational decisions that can help in the bridging of educational gaps.

The main conclusions of the whole research are as follows:

1. The Arab educational staff reported a greater extent of implementation than the Jewish educational staff. Social desirability could account for this finding: the Arab participants have presented the implementation in a positive way in accordance with what is considered appropriate and desirable. Another possible explanation is an extremity bias***:*** extreme reports that try illuminating small successes as if they are greater. This might be due to the fact that their expectations were lower than those of the Jews in the context of implementation in their sector.
2. There is a greater extent of implementation in schools supervised by the Ministry of Education than in the schools supervised by the Ministry of Labor.
3. No significant differences were found in the extent of implementation between female and male principals, teachers, students and student parents in the Arab and Jewish schools.
4. There is not enough implementation of the system by the parents in both the Arab schools and the Jewish schools.
5. Out of the seven variables, a high degree of correlation was found only between team support and the extent of CPMS implementation. Team support was significant only for the Arab sample.

III.2 Theoretical, Methodological and Practical Implications

On the theoretical level

The findings shed light on the promoting and inhibiting factors of the CPMS implementation and indicate new insights about the pedagogical and social contribution of CPMS to the teachers, parents, and students.

On the methodological level

This study presents a valid and reliable questionnaire that was adapted to the examination of the extent of the CPMS implementation in school.

On the pedagogical level

The CPMS provides a comprehensive picture of the students' academic and behavioral situation- a real-time status report of the students. There is a correlation between the interviewees' perceptions and that discussed in the literature review. Both concur that having real-time access to information provides the teachers the ability to apply problem-solving strategies. This implies understanding the personal and specific needs of students that require personal attention in pedagogical aspects; identifying learning difficulties and integrating new pedagogical techniques in order to strengthen students' weaknesses and prevent the students' further deterioration.

On the practical level

This study indicates a need to strengthen the CPMS implementation in schools supervised by the Ministry of Labor. The Atid Education Network will be able to use the findings to improve and optimize the implementation of the programs in the schools under its supervision.

There is a need for training programs for educational staff as well as for the parents. These programs will demonstrate the value of CPMS and instruct the participants how to implement the system in their context. Thus, the education system as a whole may capitalize on the benefits of this system.

III.3 Research Limitations

The main limitations of this study are:

(a) This study was conducted only in the Atid Education Network and not in the other educational networks in Israel.

(b) The teachers and principals presented their point of view about the implementation process. However, no interviews were conducted with the students and their parents.

(c) The method used in stepwise regression analysis. A recommendation for future research is using the method of hierarchical multiple regression analysis to better see the efficiency of each predictive models.

III.4 Recommendations for Further Research

This study explored schools that belong to the Atid Education Network that includes 55 schools throughout the country from all sectors and under both types of supervision, the Ministry of Labor and the Ministry of Education.

It is recommended conducting further studies in other educational networks in Israel. Moreover, future studies should focus on the point of view of parents and students, as well as on the experience of using the CPMS during and after the COVID-19 era.

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