

# **The Assimilation of a Computerized Pedagogical Management System (CPMS) in Israel**

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## Abstract

### Keywords:

Computerized Pedagogical Management System; Jews and Arabs schools; Assimilation Process.

This article discusses the assimilation process of a Computerized Pedagogical Management System (CPMS), which was developed in Israel in 2006 by Hameiri, and since then has been integrated into 1,680 Jewish and Arab schools throughout the country. It was developed in the aim of utilizing the computer and internet infrastructure to process, report and use real time relevant data to carry out management tasks and data presentation by school principals and staff and to improve school effectiveness. This research seeks to examine the culture's impact on the assimilation of the CPMS leading to educational change process, relevant to the 21st century. The Participants (N=96) were teachers, coordinators, and principals, 39 from the Arab society and 57 from the Jewish society.

The study findings indicate that the extent of assimilation of the CPMS vary between Arab and Jewish schools, with the Arab educational staff reporting a greater degree of assimilation. There is also a greater degree of assimilation in the schools supervised by the Ministry of Education, than in the schools of the Ministry of Labor. At the practical level, the study indicates a need to strengthen the assimilation of CPMS in schools supervised by the Ministry of Labor. Training programs and technological support are needed so they may benefit from this system. Training the parents in all schools - both Jewish and Arab, on the value of CPMS, which provides real-time updates on their child's educational development, and how to use this system is of particular importance.

## Zusammenfassung

### Schlüsselworte:

Computergestütztes pädagogisches Managementsystem; jüdische und arabische Schulen; Assimilationsprozess.

Dieser Artikel diskutiert den Assimilationsprozess eines computergestützten pädagogischen Managementsystems (CPMS), das 2006 von Hameiri in Israel entwickelt wurde und seitdem in 1.680 jüdische und arabische Schulen im ganzen Land integriert wurde. Es wurde mit dem Ziel entwickelt, die Computer- und Internetinfrastruktur zu nutzen, um relevante Daten in Echtzeit zu verarbeiten, zu melden und zu verwenden, um Verwaltungsaufgaben und Datenpräsentationen durch Schulleiter und Mitarbeiter durchzuführen und die Schuleffektivität zu verbessern. Diese Forschung versucht, den Einfluss der Kultur auf die Assimilation des CPMS zu untersuchen, was zu einem für das 21. Jahrhundert relevanten Bildungsveränderungsprozess führt. Die Teilnehmer (N=96) waren Lehrer, Koordinatoren und Direktoren, 39 aus der arabischen Gesellschaft und 57 aus der jüdischen Gesellschaft.

Die Studienergebnisse zeigen, dass das Ausmaß der Assimilation des CPMS zwischen arabischen und jüdischen Schulen variiert, wobei das arabische Bildungspersonal einen höheren Grad der Assimilation berichtet. Auch in den vom Bildungsministerium beaufsichtigten Schulen ist die Assimilation stärker ausgeprägt als in den Schulen des Arbeitsministeriums. Auf praktischer Ebene weist die Studie auf die Notwendigkeit hin, die Assimilation von CPMS in den vom Arbeitsministerium beaufsichtigten Schulen zu verstärken. Schulungsprogramme und technologische Unterstützung sind erforderlich, damit sie von diesem System profitieren können. Es ist von besonderer Bedeutung, die Eltern in allen Schulen – sowohl jüdischen als auch arabischen – über den Wert von CPMS zu schulen, was Echtzeit-Updates über die schulische Entwicklung ihres Kindes liefert, und wie dieses System zu nutzen ist.

## 1. Introduction

This article discusses a Computerized Pedagogical Management System (CPMS), that was developed in Israel in 2006 (Blau & Hameiri, 2010) and has been integrated currently into 1,680 schools throughout the country. The aim was 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 in

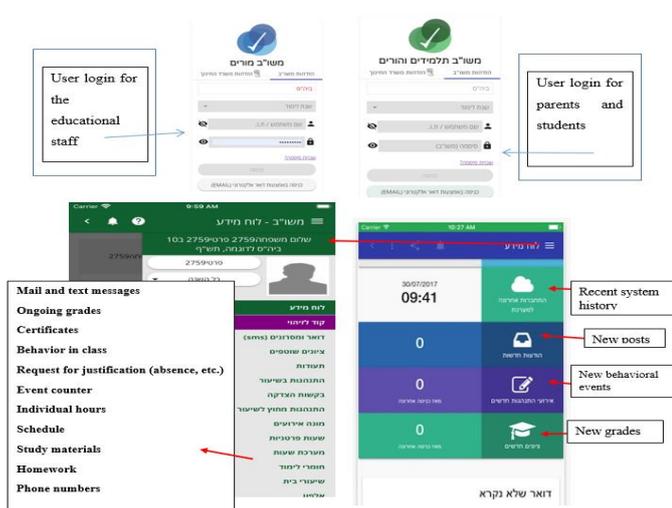
its ability to provide a data-based decision-making for both administrative and pedagogical management objectives (Eisenberg & Selivansky, 2019).

In general, CPMS may contribute to enhancing consideration of social and educational phenomenon (weak spots and educational gaps), pedagogical coping strategies and the bettering of education (Raichel, 2013). Student data provide a valuable resource in helping teachers identify students' needs, choosing tools for students' assessment based on correlated data stored in the system. The CPMS increased professionalism and cooperation among teachers and eventually increased usage due to immediate availability of data and a growing demand for the integration of shared data management technology by both administration and teaching staff in order to improve pupils' academic progress (Raichel, 2013).

The present study examines implementation of this system by teachers and principals. All interactions regarding pupils are conducted in the system as well as a function that provides parents and pupils access to pupils' data, enabling them 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 pupil conduct – interruptions and commendations.
- b. An online informal communication channel between the teaching staff, the pupils and their parents, through an intra-organizational email system

Figure 1: An example of the information that parents, students and educational staff receive at CPMS.



The more effective this system database is, the more frequent and immediate data entry by the school staff is. This study examines the process of assimilating the program in the Arab and the Jewish schools in Israel. No previous research has indicated the factors that inhibit and promote the assimilation of CPMS nor have there been studies that compare between the Jewish and Arab schools in this respect.

## 2. Theoretical background

There is a worldwide consensus in the field of Education that this is the age of "digital pedagogy" brought about by rapid technological advances that have changed all walks of life. Education is one of the major fields impacted by technology as an individual has access to vast databases of knowledge at press of a button. Many of the digital tools developed have contributed to advancing schools both from a managerial as well as from a pedagogical aspect. One of the digital tools being developed and implemented in schools, is the CPMS. This article addresses the assimilation of CPMS into the Arab and Jewish schools in Israel.

### *Cultural and psychological differences between Jewish and Arab societies in Israel*

The demographic composition of Israeli society is heterogeneous, with multicultural and religious differences. The majority of the population is Jewish, and 20% of the population is comprised of the Arab minorities: Muslim, Christian, Bedouin, Druze and Cherkasy.

Arabs represent 1/6<sup>th</sup> of the entire population and are characterized as a non-assimilating minority, both distinguished and segregated from the Jewish majority in terms of language, religion, place of residence, values, beliefs, cultural differences and tradition. Other cultural characteristics are gender differences, patriarchal approach, power distance (hierarchy between classes), collectivity and uncertainty avoidance (Tatar & Da'as, 2012).

The Arab education system is an integral part of the state education system in Israel, influenced and shaped by academic decision makers in the Ministry of Education. 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).

### *Gaps between Jews and Arabs high-school students in academic achievements*

In contrast to predominant secular, modern western culture of the majority of Hebrew speaking students, the Arabic speaking student belongs to a traditional culture characterized by its collective nature, conservative behavior patterns, dominated by male patriarchy (Gross & Gamal, 2014). Israel has large gaps in educational performance among student population sub-groups between and within schools. Christians Arabs have higher academic achievement than the Muslims and city children have higher academic achievement than those that live in the periphery (Gross & Gamal, 2014).

Dkeidek et. al. (2012) maintains that in the Arab schools, the teachers' approach "in the center of the stage" impairs the autonomous development of the students' learning behavior as independent and constructivist learners. The Arab students expected more teacher support and guidance than the Jewish students who were able to get along independently.

The Ministry of Education in Israel is currently putting into place reform strategies in education allowing for the more teacher-student autonomy and they are given more choice in choosing subjects on the curriculum.

Table 1 shows data from the review published by Haddad-Haj Yahya and Rudnicki (2018) for the Israel Democracy Institute on the Arab education system in Israel about Percentage of those entitled to a matriculation certificate of all examinees among Arab and Jewish students.

Table 1: Percentage of those entitled to a matriculation certificate out of all the examinees among Arab and Jewish students:

Year	1995	2016
Arabic	<b>49%</b>	<b>63%</b>
Jewish	<b>69%</b>	<b>79%</b>

As can be seen from the table, although there seems to be a trend of improvement in the level of achievement in the Arab education system, the eligibility rates for matriculation certificates in Arab schools are lower than in Jewish schools. (Haddad-Haj Yahya & Rudnitzky, 2018)

The Education, Culture and Sports Committee of Israel held a preparation meeting for the school year

2020-2021 for the Arab society, and four concerns emerged:

1. From 2006-2015, the achievements in the Pisa study among Arab students were significantly lower than those of Jewish students in all areas of knowledge examined.

2. In 2017-2018, the final matriculation exam scores of the Arab students increased yet remain lower than the Hebrew sector.

3. The data shows that the annual dropout rates among Arab post-primary education students are higher than the corresponding dropout rates in Jewish schools.

4. An Arab student receives on average a lower budget than a Jewish student, at all stages of education. (Assaf, 2020).

The Ministry of Education recognizes there are gaps in educational support and have implemented CPMS to provide real-time data that help managers in making the information-based decisions needed to narrow the gaps.

### *Schools supervised by the Ministry of Education and schools supervised by the Ministry of Labor<sup>3</sup>*

The Ministry of Education and the Ministry of Labor operate various education systems in Israeli high schools. The Ministry of Education operates under the Compulsory Education Law (1949) which regulates the basic right to education from the age of 3 to 18 while emphasizing academic-educational aspects.

The Ministry of Labor operates under the Apprenticeship Law (1953) which regulates the practical work of the student under the guidance of a vocational school approved by the state while emphasizing professional aspects, either because of academic difficulty, or because of the requirement to combine profession with work. The gaps between schools supervised by the Ministry of Labor compared to schools supervised by the Ministry of Education that exist to this day:

A. Gaps in the conditions of students taking the matriculation exams - in the schools of the Ministry of Labor there is no recognition of an annual grade that can help students improve the final matriculation score. This grade is averaged together with the matriculation exam score.

B. Gaps in the pedagogical field - Students in the schools of the Ministry of Labor receive less budget for study hours in English and Mathematics, and fewer services such as a library and learning centers.

C. Gaps in budget and infrastructure - These institutions receive less funding and resources for classrooms, services, rewards and incentives for teachers, renovation and equipment. (Udi, 2002).

### 3. Methodology

*The research aims* were to investigate the differences in the process of assimilating CPMS between the Arab and Jewish schools, between male and female teachers and principals and between schools under the Ministry of Labor and the Ministry of Education.

*The study participants* were 39 teachers, coordinators and principals from the Arab schools and 57 from the Jewish schools.

The Arab participants' demographics: Male (43.6%), Female (56.4%). Average Age: 43.23years.

School Supervision: Ministry of Labor (23.1%), Ministry of Education (76.9%). Seniority: 15.33years.

The Jewish participants' demographics: Male (33.3%), Female (66.7%), Average Age: 48.53years. School Supervision: Ministry of Labor (36.8%), Ministry of Education (63.2%). Seniority: 18.18 years.

**The research questionnaire** (Blau and Hameiri, 2011) examined the extent of assimilation of the CPMS at school. For the present study, this questionnaire was 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) answer the questionnaire regarding the assimilation **of teachers**, parents, principals and students.

Table 2: The structure of the questionnaire, its purpose, validity and reliability

CPMS assimilation questionnaires		
1.	Objective	To examine the level of assimilation of the CPMS by comparison of results between Arab and Jewish schools
2.	Source	A qualitative questionnaire developed by Hameiri and Blau (2010) and adapted to a quantitative version for this study by the researcher.
3.	General description & Reliability	General Assimilation Cronbach's Alpha Reliability of: 0.96 Divides into 4 assimilation variable – Educational staff's perspective on teachers' assimilation - 9 items. Cronbach's Alpha Reliability of .92 Educational staff's perspective on parents' assimilation– 6 items. Cronbach's Alpha Reliability of,95 Educational staff's perspective on principals' assimilation– 8 items, Cronbach's Alpha Reliability of.91 Educational staff's perspective on students' assimilation– 8 items, Cronbach's Alpha Reliability of.90
4.	Calculation of results	The average of items 1 to 7; the higher the result the higher the degree of assimilation.
5.	Instrument validity	In order to test the validity, expert validation was performed by team professionals in this field. In order to verify if the questionnaire examines the proper variables of the research, 3 team professionals holding senior positions in education were involved in the assimilation process in schools (pedagogical team of the education network) as well as 5 teachers.
6.	Measurement scale	Very Low Degree 1 2 3 4 5 6 7 Very High Degree

### 4. Findings

In order to examine whether there is a difference in the CPMS level of assimilation between the Jewish

and Arab schools, a *t*-test was performed for independent samples as shown in Table 3.

Table 3: The results of *t*-test of two independent samples for the extents of assimilation of the CPMS by teachers, students, parents, and principals according to sector

		Arabs N=39	Jews N=57	<i>t</i> (94)
Assimilation of the CPMS, (General)	Mean	4.952	4.382	2.239*
	Standard Deviation	1.342	1.138	
		Arabs N=39	Jews N=57	<i>t</i> (94)
Teachers' Assimilation of the CPMS	Mean	5.182	5.048	0.478
	Standard Deviation	1.415	1.259	
		Arabs N=39	Jews N=55	<i>t</i> (92)
Educational staff's perspective on Students' assimilation	Mean	4.667	3.788	2.943**
	Standard Deviation	1.443	1.415	
		Arabs N=38	Jews N=53	<i>t</i> (89)
Educational staff's perspective on Parents' assimilation	Mean	4.246	3.460	2.106*
	Standard Deviation	1.810	1.714	
		Arabs N=37	Jews N=52	<i>t</i> (87)
Principals' Assimilation of the CPMS	Mean	5.515	4.852	2.263*
	Standard Deviation	1.428	1.313	

\**p*<.05, \*\**p*<.0

There is a significant difference between the assimilation extent of the two sectors: The Arab educational staff reported a higher assimilation extent by parents, students and principals than the Jewish one. In order to examine whether a difference exists in

the CPMS assimilation extent between the Ministry of Education and the Ministry of Labor schools, a *t*-test was performed for independent samples as presented in Table 4 and 5.

Table 4: The results of the *t*-test of two independent samples for the CPMS assimilation extent according to the schools' affiliation, for the general sample and for Jews and Arabs

		Ministry of Labor N=30	Ministry of Education N=67	<i>t</i> (95)
Assimilation of the CPMS, (general)	Mean	4.066	4.858	-3.019**
	Standard Deviation	1.309	1.140	
		Ministry of Labor N=21	Ministry of Education N=36	<i>t</i> (55)
Assimilation of the CPMS, (Jews)	Mean	3.930	4.645	-2.382*
	Standard Deviation	1.037	1.124	
		Ministry of Labor N=9	Ministry of Education N=30	<i>t</i> (9.932)
Assimilation of the CPMS, (Arabs)	Mean	4.382	5.123	-1.147
	Standard Deviation	1.833	1.141	<i>p</i> >.05

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

As seen in Table 4, there is a significant difference in the CPMS assimilation, between the Ministry of Education and the Ministry of Labor schools: the

extent of assimilation was higher in the Ministry of Education Jewish schools.

No significant difference was found in the Arab schools supervised by the Ministry of Education, as

compared with school supervised by the Ministry of Labor.

Table 5 : The results of the t-test of the educational staff's perspective on CPMS assimilation by teachers, students, parents and principals (ranking 1-7) according to school affiliation, for the general sample.

	Ministry of Labor N=30	Ministry of Education N=67	t (95)
Assimilation of the CPMS, Teachers	Mean Standard Deviation	4.340 1.359	5.446 1.180
			- 4.067**
Assimilation of the CPMS, Educational staff's perspective on Students assimilation	Mean Standard Deviation	3.583 1.629	4.390 1.350
			-2.496*
Assimilation of the CPMS, Educational staff's perspective on Parents assimilation	Mean Standard Deviation	3.250 1.746	3.991 1.761
			1.821-
Assimilation of the CPMS, Principals	Mean Standard Deviation	4.979 1.331	5.181 1.411
			0.611-

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

Table 5 shows a significant difference in the CPMS assimilation extent for teachers and students: the assimilation extent is higher in the Ministry of Education schools.

No significant differences were found in the CPMS extent of assimilation of principals and of

parents between the Ministry of Education and the Ministry of Labor schools. For examining the impact of gender on CPMS assimilation t-test was performed for independent samples, as can be seen in the Tables 6 and 7.

Table 6: The results of the t-test of two independent samples for the CPMS assimilation extent (ranking 1-7) according to gender, for the general sample, for Jews, and for Arabs.

Assimilation of the CPMS, (general)	Males N=37	Females N=60	t (95)
Mean Standard Deviation	4.624 1.237	4.606 1.258	0.067
Assimilation of the CPMS, (Jews)	Males N=19	Females N=38	t (55)
Mean Standard Deviation	4.389 0.992	4.378 1.217	-0.033
Assimilation of the CPMS, (Arabs)	Males N=17	Females N=22	t (37)
Mean Standard Deviation	4.890 1.482	4.999 1.257	0.249

p>.05

No significant differences were found in the CPMS assimilation between male and female teachers and principals in the Arab and in the Jewish schools.

Table 7: The results of the t-test of two independent samples of the educational staff's perspective on CPMS assimilation by teachers, students, parents and principals (ranking 1-7) according to gender, for the general sample.

Assimilation of the (CPMS), Teachers	Male N=37	Female N=60	t (95)
Mean	4.982	5.179	-
Standard Deviation	1.298	1.361	0.706
Assimilation of the (CPMS), Educational staff's perspective on Students assimilation	Male N=35	Female N=60	t (93)
Mean	4.262	4.089	0.549
Standard Deviation	1.490	1.477	
Assimilation of the (CPMS), Educational staff's perspective on Parents assimilation	Male N=35	Female N=57	t (90)
Mean	3.757	3.796	0.102
Standard Deviation	1.795	1.785	-
Assimilation of the (CPMS), Principals	Male N=34	Female N=56	t (88)
Mean	5.259	5.048	0.699
Standard Deviation	1.171	1.505	

p>.05

No significant differences between males and females were found in the CPMS assimilation by teachers, parents, students and principals.

## 5. Discussions

The research findings show a significant higher CPMS assimilation extent by principals, parents and students among the Arab schools than in the Jewish schools, which is contrary to the hypothesis.

It is worthwhile mentioning that increased investment in education and technology in recent years throughout the country including the periphery and Arab populations, has improved academic achievements and decreased educational disparities that still exist in the results of the matriculation exams between the Arab and Jewish schools. CPMS seems to have the potential to enhance teaching and learning strategies, students' achievements as well as provide a data-based decision-making for both administrative and pedagogical management objectives. Maybe, therefore the Arab high schools principals and educational staff have higher motivation in CPMS assimilation.

Other possible explanation for the discrepancies may be Social Desirability: the Arab participants might present the assimilation in a more positive way in accordance with what is considered appropriate and desirable. Another explanation can be the Extremity

Bias: extreme reports trying to illuminate small successes as if they were bigger. Perhaps this is because when considering all areas of educational achievements, they have been lower than those of the Jews. So, when successes are seen, they are given more value.

Findings proved that the level of CPMS assimilation was considerably higher for both Jews and Arabs in the Ministry of Education schools than in the Ministry of Labor schools.

Based on the scientific literature, vocational schools like the schools of the Ministry of Labor in Israel have yet to develop innovative technologies involved in higher education (Pfeiffer, 2015). Huge investments by governments around the world have focused on mainstream education system whereas vocational schools remain neglected and have much lower budgets for technological innovation (Pfeiffer, 2015). Additional constraints in the CPMS assimilation in the Ministry of Labor schools are:

a. heavy bureaucracy and lack of coordination due to multiple units (pedagogical administration, computer, technology and information systems unit);

b. lack of administrative support and training programs for integrating technology (Kay, 2006; Pelgrum & Anderson, 1999).

No CPMS assimilation differences were found between male and female teachers and principals in the Jewish and the Arab schools. The Arab traditional society have gender differences such as male dominance, but the previous research pointed out that female teachers have many leadership traits, a fact that could shed light on lack of difference in assimilation patterns between Arab male and female teachers (Reichel, 2015).

The lowest degree of assimilation reported in this study was found among parents in both Arab and Jewish schools. It is possible the parents did not receive sufficient instruction on the importance of entering the system in order to access the information on their child's development. They may have found it difficult to navigate the technology.

## 6. Conclusions

The study sheds light on the CPMS assimilation in Arab and Jewish high schools. CPMS helps the educational staff make information-based educational decisions and allows parents and students to receive real-time information about assignments, academic achievement and school functioning. The importance of implementing the system in schools lies in the ability to make information-based educational decisions that can help reduce educational gaps.

The main conclusions of the study are as follows:

1. The Arab educational staff reported a greater degree of assimilation than Jewish educational staff.
2. There is a greater degree of assimilation in schools supervised by the Ministry of Education than in the schools of the Ministry of Labor.
3. No significant differences were found in the degree of assimilation between women and men among teachers, principals, parents and students in the Arab and Jewish schools.
4. There is not enough assimilation of the system by the parents in both the Arab schools and the Jewish schools.

At the methodological level, the study presents a valid and reliable questionnaire that was adapted to examine the degree of assimilation of the CPMS in school.

At the practical level, the study indicates a need to strengthen the assimilation of CPMS in schools supervised by the Ministry of Labor. There is a need for training programs for educational staff as well as for the parents, that will reveal the value of CPMS and instruct them how to implement it in their context, so that the educational system as a whole may capitalize on the benefits of this system.

Future research should engage in an in-depth examination of the factors that promote and inhibit assimilation of CPMS in Jewish and Arab schools.

**Authors note:** The authors have equal contributions to this article.

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