

IMPACT OF SCHOOL FACILITIES ON WORKING BEHAVIOR OF TEACHERS

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ABSTRACT. From 1998-99 to 2003-04, the Hong Kong government increased investment in education by 20%. A number of primary schools have been rehoused in new millennium school buildings that have innovative facilities as well as a new design quite different from the design of traditional school buildings. However, whether the money was spent appropriately and cost-effectively as a way of improving education in Hong Kong remains a debatable point. To investigate the facilities management (FM) of new millennium primary schools, a study was conducted of teachers who had worked in old traditional school buildings and then moved to new millennium school buildings. Since staff rooms are the major working areas for teachers, the study focused on the levels of satisfaction with the performance of FM in the staff rooms of primary schools and on the working behavior of primary teachers. Two questionnaire surveys were conducted of 113 teachers who had worked in both types of school buildings. Independent-sample T-tests were employed to evaluate the quantitative data that was collected from the teachers at the two stages in order to investigate the enhancement of FM in millennium school staff rooms and its impact on the working behavior of teachers. The results showed that FM in the staff rooms of the new millennium schools in Hong Kong was remarkably different from FM in the old schools. However, the teachers did not consider that their working behavior were significantly better in the millennium schools. The governmental investment is considered a success to a certain extent, but there are still a lot of areas where construction professionals and facilities managers of primary schools should improve millennium primary school projects in order to achieve the requirements of end-users.

KEYWORDS: Facilities management; Millennium Primary schools; Staff rooms; Working behavior; Teachers

1. INTRODUCTION

The Hong Kong government has increased the education budget by 20% from 1998-99 to 2003-04. However, whether the investment was spent appropriately and cost-effectively as a way of improving education in Hong Kong is still a controversial issue. Although there has been much discussion of the influences of school facilities on students' learning behavior (Colven, 1990; Ornstein, 1997; Samdal, 1999;

Bowen, 2000; Murdoch, 1998; Interactive, Inc. 2000; Leung et al., 2005), there are few studies on the impact of school facilities on the working behavior of teachers. In 2003, three government primary schools were rehoused in new millennium school buildings. This study sought to evaluate the effectiveness of the enhanced facilities management (FM) in these three millennium schools. Since the staff room is the main area in schools where teachers prepare themselves for teaching, the study inves-

tigates the enhancement of FM in millennium school staff rooms and its impact on the working behavior of teachers. Thirteen critical FM components were selected to evaluate the FM enhancement in millennium school staff rooms. Both questionnaire surveys of and interviews with teachers were conducted. The qualitative data results were used to cross-check the quantitative data results in order to develop valuable recommendations for construction professionals and facilities managers in Hong Kong.

2. MAJOR COMPONENTS OF FM IN STAFF ROOMS

FM is a process by which an organization delivers and sustains services in a quality environment to meet strategic needs (Alexander, 1996). It aims to achieve the needs of end-users in organizations, and strives to continuously improve quality, reduce risks, and ensure value for money (Alexander, 1996). In an educational organization, FM plays a key role

in providing a comfortable teaching and learning environment for teachers and students.

Many studies have investigated the relationship between job satisfaction, productivity, and the physical environment (Ferguson & Weisman, 1986; Gruenberg, 1980; Herzberg, 1966; Herzberg et al., 1959; Oshagbemi, 1997; Seybolt, 1976; Uher, T.E. & Ritchie, J., 1998). Oshagbemi (1999) pointed out that physical conditions and facilities are critical elements of job satisfaction. Teachers remain in staff rooms when preparing teaching materials, assessing homework, executing administrative duties, and making decisions (Darling-Hammond, 2000, 2003; Ingersoll, 2001, 2002). Therefore, this paper not only investigates the enhancement of FM in the staff rooms of millennium primary schools, but also studies its impact on the working behavior of teachers.

FM in staff rooms includes various facilities such as personal working space, seating arrangement, outside view, lighting, noise, temperature and ventilation, and safety and security (see Table 1).

Table 1. Impact of FM in Primary Schools

	Functions	Possible Problems
<u>Space management</u>		
- This refers to the type and design of space for personal and team work.	- To maximize the utilization of workspace to achieve the ongoing effectiveness of the working environment, as well as future business needs (Park, 1998). - To enhance the participation and <i>cooperation</i> among employees in working processes (McGregor & Then, 1999).	The more crowded the staff room, the greater the <i>unhappiness</i> of teachers (Rose, 1994). Crowded work spaces, job dissatisfaction, and the physical environment are the main factors affecting the working <i>activity</i> and productivity in office buildings (Clements-Croome & Li, 2000).
<u>Allocation of seats</u>		
- This refers to the seating plan.	- To allow movements and interactions among teachers in the staff room (Senter & Charles, 2002; Murdoch, 1998). - To allow <i>cooperation</i> and <i>sharing</i> with peers.	A too closed seating plan disturbs colleagues who are sitting adjacent to each other. An inappropriate seating arrangement may induce isolation and prevent teachers from cooperation.
<u>Common room</u>		
- This is a place for teachers to relax from intense work and enjoy some entertainment.	- To alleviate teachers' pressure and fatigue, and allow refreshment from their work. - To enhance interaction and <i>affability</i> among teachers.	Teachers have no specific area for relaxation or chat. It will directly affect their social <i>activity</i> and <i>creativity</i> .

(continued)

Functions	Possible Problems	
<i>(continued)</i>		
<u>Outside view</u>		
<ul style="list-style-type: none"> - Size of windows directly affects the outside view in staff rooms. 	<ul style="list-style-type: none"> - To release physical pressure on the eyes. - To provide <i>clear-headed</i> thinking. - To help teachers develop a <i>relaxed mood</i>. - To refresh <i>energy</i>. - To ensure occupants' satisfaction and <i>happiness</i> with buildings (Leaman & Bordass, 2000). 	<p>Teachers' stress cannot be released easily. No stimulation/creation in their daily work.</p>
<u>Lighting</u>		
<ul style="list-style-type: none"> - Levels of luminaries, glare, and brightness are used to measure visual comfort. 	<ul style="list-style-type: none"> - To ensure <i>concentration</i>. - To increase the degree of human responses, task performance, productivity, product quality, morale health, and <i>energy</i> conservation (Park, 1998; Wood, 1996). 	<p>Poor lighting and glare lead to eye strain, headaches, visual fatigue, tension, and frustration (Rose, 1994). Excessive brightness causes tension and leads to difficulty concentrating.</p>
<u>Ventilation</u>		
<ul style="list-style-type: none"> - This involves natural and mechanical ventilation. 	<ul style="list-style-type: none"> - To improve the performance of office work such as text typing and proofreading (Wargoeki et al., 2000). - To refresh the brain in order to lead to <i>clear-headed</i> thinking. 	<p>Poor ventilation induces poor indoor air quality resulting from airborne contaminants, such as volatile organic compounds, suspended particulates, or microbial particles. It causes illness and seriously diminishes learning potential (Friday & Cotts, 1995; Waddick, 1997).</p>
<u>Temperature</u>		
<ul style="list-style-type: none"> - An effective temperature refers to an individual's perception of the ambient temperature and is strongly influenced by the humidity of the air (McAndrew, 1993). 	<ul style="list-style-type: none"> - A room with a slightly cool temperature leads to more effective activities (McAndrew, 1993; Clothier, 1996). 	<p>A cold temperature reduces manual dexterity, tactile sensitivity, and motivation levels, and increases reaction time (McAndrew, 1993). High humidity not only has a negative effect on people's health and comfort, but also on their efficiency (Pratt, 1994; Rose, 1994).</p>
<u>Teaching Facilities</u>		
<ul style="list-style-type: none"> - This refers to the computers, projectors, printers, and relevant software. 	<ul style="list-style-type: none"> - To <i>initiate/create</i> new teaching methods and materials. - To improve working efficiency. 	<p>Working in a staff room with insufficient teaching facilities can cause teachers to be in a bad mood and decrease work enthusiasm or work efficiency.</p>
<u>Indoor plant</u>		
<ul style="list-style-type: none"> - This refers to indoor decoration in the staff room. 	<ul style="list-style-type: none"> - To "bring the outside in." - To remove atmospheric pollutants from sealed environments (Wolverton, 1990; Foster, 1996). - To decorate the indoor environment. - To establish a pleasant, <i>happy</i>, and healthy environment for teachers. - To refresh the brain in order to lead to <i>clear-headed</i> thinking. - To establish <i>perseverance</i> in the working environment. 	<p>No stimulation/creation for daily work.</p>
<i>(continued)</i>		

	Functions	Possible Problems
<i>(continued)</i>		
<u>Noise</u>		
- This is a psychological concept defined as unwanted sound and considered as a source of stress (McAndrew, 1993; Rose, 1994).	- To ensure a consistent working environment for educational <i>activities</i> . - To prevent any disturbance.	Excessive noise can reduce tolerance of other stressors and affect the motivation of teachers (Rose, 1994). Intermittent and unpredictable noise has to be dealt with since it may have a sudden impact on task performance.
<u>Privacy</u>		
- This refers to teachers' personal information at work.	- To allow room for <i>creativity</i> and <i>relaxation</i> . - To enable <i>concentration</i> on work.	Teachers may feel uncomfortable if their personal information is exposed.
<u>Safety and Security</u>		
- This refers to the safeguarding of the property against loss due to bad weather, fire, theft, or accidents.	- To safeguard equipment that has a high resale value (Geisert & Futrell, 1990). - To protect the end-users from accidents in the operational process. - To enable <i>concentration</i> on tasks.	In recent years, equipment such as computers, printers, scanners, and projectors have become popular in schools in Hong Kong. Any sloppy connections of cables or wires may result in accidents and injuries. Inappropriate equipment or furniture may also hurt users. An inconvenient seating plan may be unsafe and uncomfortable (McKenna et al., 1993; Michael, 1998).

The facilities in staff rooms are used to support teachers' daily tasks. Enlarged *working spaces*, *seating areas*, and *common rooms* improve the cooperation, interaction, and affability among teachers. A good *outside view* and *indoor plants* can release stress, encourage clear-headed thinking, refresh energy, enhance initiative, and improve activities. Appropriate *lighting*, *ventilation*, and *temperature* can enhance concentration, clear-headedness, activities, creativity, and initiative. Sufficient *teaching facilities* help teachers to prepare teaching materials, while a control of *noise* provides a consistent environment for teachers that prevent disturbances. A *private*, *safe*, and *secure environment* ensures that teachers can work in safety and comfort. Once teachers establish an affable, happy, and relaxed society, the performance of students will subsequently be enhanced (Ofoegbu, 2004).

3. RESEARCH METHODOLOGY

To investigate the impact of enhanced FM in millennium schools, two questionnaire sur-

veys including 13 questions on FM and 12 questions on the working behavior of teachers were carried out. A within-group research method was employed to ensure the study took place in a controllable environment. Three primary schools that had been rehoused in new millennium school buildings in December 2003 were invited to take part in the research. A pre-test and a post-test were conducted on 113 teachers who had worked in both the old buildings and the millennium buildings. The pre-test survey was conducted between September and December 2003, while the post-test survey and interview were carried out 3-4 months later after the rehousing.

The pre-test questionnaire on the old school buildings involved three main sections: (1) background information on the teachers and the schools; (2) level of satisfaction with FM in the staff room; and (3) working behavior of the teachers in the staff room. The post-test questionnaire on the millennium buildings involved the latter two sections only. The response format employed a 5-point Likert scale ranging from (1), indicating *totally dissatisfied*,

to (5), indicating *totally satisfied*, for sections 2 and 3 of the questionnaire.

In order to understand the enhancement of FM in the staff rooms of millennium schools, an independent sample T-test was employed to compare the pre-test and post-test data collected in the study. Qualitative data collected at the post-test stage was further used to cross-check the results of the quantitative data.

4. RESULTS

Questionnaire Survey

Since the pre-test and post-test data were collected from teachers who had worked in both the old and new buildings, the mean differences between these two sets of data represent the teachers' perceptive comments on the enhancement of FM in the staff rooms of the millennium schools. The results of the independent sample T-test are shown in Table 2.

Table 2 indicates that all the components of the school facilities had been significantly and positively changed in the millennium

schools. Hence, the primary school teachers (end-users) were highly satisfied with FM in the newly established millennium schools. In order to understand the impact of FM in the staff rooms on teaching behavior, a T-test was also conducted to determine the differences between the working behavior of teachers in the staff rooms of the two types of buildings (see Table 3).

In contrast to the results in Table 2, Table 3 shows that there were no changes in any of the working behavior of the teachers in the staff rooms after they had moved to the new millennium school environment.

Interview Survey

To fully understand the contradictory results from the questionnaire surveys, face-to-face interviews with the teachers who were working in these three primary schools were also conducted at the post-test stage. Ten teachers from each school were randomly selected for in-depth interviews in order to collect qualitative data. The comments made by

Table 2. Significant Difference in the FM Performance in the Staff Rooms of the Two Types of Buildings

Items	Pre-test		Post-test		Pre-Post		t	df	Sig. (2-tailed)
	Mean	S.D.	Mean	S.D.	Mean diff.	S.E.D.			
Personal working space	2.66	1.220	4.16	0.609	1.50***	0.133	11.283	214	0.000
Seating arrangement	2.73	1.036	3.97	0.765	1.24***	0.125	9.969	214	0.000
Common room	2.66	1.105	3.71	0.802	1.05***	0.125	8.438	212	0.000
Outside view	2.83	0.887	3.64	0.807	0.80***	0.116	6.951	212	0.000
Lighting	3.59	0.855	4.13	0.545	0.55***	0.098	5.565	214	0.000
Ventilation	3.13	0.882	3.77	0.725	0.64***	0.110	5.795	212	0.000
Temperature	3.21	0.855	3.85	0.663	0.64***	0.105	6.058	213	0.000
Teaching facilities	3.06	0.846	3.44	0.984	0.38***	0.125	3.048	214	0.003
Hygiene	3.31	0.792	3.93	0.611	0.62***	0.097	6.363	213	0.000
Indoor plant	2.58	0.759	3.20	0.711	0.62***	0.100	6.195	213	0.000
Noise control	3.08	0.962	3.84	0.695	0.76***	0.115	6.610	213	0.000
Privacy	2.92	0.982	3.72	0.791	0.80***	0.122	6.537	212	0.000
Safety and security	3.04	0.934	3.82	0.680	0.78***	0.111	7.010	212	0.000

Note: S.D. – Standard Deviation; and S.E.D. - Standard Error Difference.

* denotes correlation is significant at the 0.1 level (2-tailed).

** denotes correlation is significant at the 0.05 level (2-tailed).

***denotes correlation is significant at the 0.01 level (2-tailed).

Table 3. Significant Differences between the Working Behaviors of Teachers in the Staff Rooms of the Two Types of Buildings

Items	Pre-test		Post-test		Pre-Post		t	df	Sig. (2-tailed)
	Mean	S.D.	Mean	S.D.	Mean diff.	S.E.D.			
Relaxed mood	3.43	0.875	3.51	1.107	0.08	0.136	0.593	213	0.554
Clear-headedness	3.04	0.843	2.95	0.999	-0.08	0.126	-0.661	213	0.509
Happiness	2.92	0.874	2.75	0.903	-0.18	0.143	-1.471	213	0.143
Initiative	2.84	0.867	2.65	0.882	-0.18	0.119	-1.537	213	0.126
Perseverance	2.49	0.859	2.34	0.860	-0.15	0.118	-0.782	213	0.191
Vigorousness	3.12	0.829	3.04	0.812	-0.09	0.112	-0.782	213	0.435
Creativity	3.13	0.735	3.02	0.782	-0.11	0.104	-1.108	212	0.269
Activity	2.98	0.909	2.95	0.783	-0.03	0.116	-0.229	213	0.819
Concentration	2.92	0.948	2.76	0.789	-0.16	0.119	-1.349	213	0.179
Affability	2.82	0.864	2.72	0.829	-0.10	0.116	-0.894	212	0.372
Cooperation with peers	2.30	0.833	2.15	0.693	-0.15	0.105	-1.433	213	0.152
Sharing with peers	2.33	0.851	2.17	0.740	-0.16	0.109	-1.474	213	0.141

Note: For the meanings of S.D., S.E.D., *, **, and *** refer to the notes for Table 3.

the teachers on the 13 FM components are summarized in Table 4.

5. DISCUSSION

It is interesting to note that some qualitative data collected in the interviews (see Table 4) contradicted the quantitative data results in Tables 2 and 3 concerning the enhancement of FM in millennium schools, including personal working space, seating arrangement, common room, privacy, and safety and security.

Since a small working space, storage space, and seating area caused a lot of trouble for teachers in the old staff rooms, all the interviewees in the study greatly appreciated the enlarged *personal space* and *seating arrangement* in the millennium schools (mean difference = 1.50*** and 1.24 *** respectively). However, the study revealed that the enlargement of the personal working space still had some negative influences as the teachers found it difficult to communicate with colleagues while carrying out their daily tasks, which negatively affected the relationships among peers. One of the old school buildings had its staff room on the third floor, thus the students

often chatted with teachers in the staff room. In the millennium schools, for reasons of security and privacy, the staff rooms were located on the seventh floor. This discouraged communication between students and teachers, and isolated the staff room from student activity areas. It seemed that the desire to create larger, more comfortable spaces negatively influenced the communication between peers, and between teachers and students. Architects need to consider the location of staff rooms at the design stage in order to support the relationship between teachers and students in the operation process.

Common rooms need to be comfortable to allow teachers to relax. The study revealed a significant improvement in the level of satisfaction with the facilities of common rooms (mean difference = 1.05***), since the new millennium common rooms were larger than the old ones and the facilities were upgraded. However, the teachers generally complained that the new common rooms were too far away from the staff rooms (e.g., they were located on different floors). Because the common rooms were rarely used by staff as common rooms, they instead became workplaces for carrying out activities with students (e.g., chat-

Table 4. Qualitative Data Collected in Interviews

Facility Components	T-test (refer to Table 1)	New Design in Millennium Schools	Comments Made by Teachers		Recommendations
			General Comments	Pros Cons	
F1 Personal working space	1.50***	Enlargement of personal space areas.	-	Working space, storage space, and sitting area for teachers in old offices are very small, and cause a lot of trouble for the end-users. The space enlargement is generally appreciated by most interviewees.	Architects / Facilities managers need to re-allocate the seating plan for teachers in staff rooms, in order to reinforce the relationship between teachers.
F2 Seating arrangement	1.24***	Row /group seating plan		Sufficient space in a room allows a better seating arrangement. The occupied area for each person is enlarged.	The harmony of relationships is reduced due to the isolated space and the distance between colleagues' seats.
F3 Common room	1.05***	Enlargement of common room areas; separate from staff rooms.	The environment of the new common rooms should be comfortable for teachers to take a break in and relax.	The facilities in the old common rooms were basically sufficient, but the space was very small. The common rooms in the new schools are much comfortable and attractive.	Architects should locate the common room close to the staff room in future designs.
F4 Outside view	0.80***	Some windows are blocked by curtains, cabinets, and sundry items.	Outside view is very important to help teachers to relieve stress.		Architects need to ensure that end-users can see the outside view at the design stage, while Facility managers have to remove any blockages from windows.
F5 Lighting	0.55***	Installation of artificial lightings	Natural lighting can refresh teachers and ensure that they feel comfortable.		Natural lighting is still insufficient in the millennium schools, since some windows were blocked by cabinets and miscellaneous items. Bright artificial lighting is thus required to overcome such deficiency

(continued)

Facility Components	T-test (refer to Table 1)	New Design in Millennium Schools	Comments Made by Teachers		Recommendations
			General Comments	Pros Cons	
<i>(continued)</i>					
F6 Ventilation	0.64***	Installation of air-conditioning systems	Teachers generally like natural ventilation, because the mechanical air distribution is often uneven.		Architects / Building services engineers should check the location of diffusers and ensure that there is fresh air in the air-conditioning system. A sufficient opening size is also essential.
F7 Temperature	0.64***	Installation of central air-conditioning systems	A slightly cold temperature leads to effective working.	End-users cannot adjust the temperature zone-by-zone.	Building services engineers should use several independent air-conditioning systems with controllable devices.
F8 Teaching facilities	0.38***	Installation of a lot of equipment (e.g., projectors in classrooms; copy and fax machines in the offices).	Basically, the teaching facilities in millennium schools are better than those in the old buildings.	The facilities in the old buildings performed well over the past 10 years. Since the new schools have only operated for a short period, a lot of equipment such as projectors in the classrooms and copy machines in the office has not been installed well at the post-test stage. Some facilities (e.g., fax machines, printers, and copy machines) often break down.	Sufficient installation period should be allowed before the formal operation.
F9 Hygiene	0.62***	Weekly cleaning services	Hygiene problem is an important issue in school. Weekly cleaning is necessary.		Facilities managers should arrange regular cleaning services for the whole school.

(continued)

Facility Components	T-test (refer to Table 1)	New Design in Millennium Schools	Comments Made by Teachers		Recommendations
			General Comments	Pros Cons	
(continued)					
F10 Indoor plant	0.62***	Only a few plants are cultivated in the staff rooms.	Although there was no consistent opinion on this point, teachers generally made positive comments about the indoor plant.	Indoor decoration can induce relaxation.	Indoor plants are not important to teachers. <i>Facilities managers need to consult teachers about indoor plants.</i>
F11 Noise control	0.76***	Installation of controllable sound systems	Excessive noise causes many problems to human beings, in terms of health, psychosocial impact, and performance (e.g., hearing loss, high blood pressure, and stroke).	Playing some music during break time can relax both pupils and teachers.	Architects need to use sound-insulated material, especially for locations close to noise sources.
F12 Privacy	0.80***	Installation of CCTV systems in staff rooms			Architects / Facility Managers have to ensure safety and security, but also need to avoid any disturbance to teachers. Relocating CCTVs in staff rooms, limiting CCTVs' operation period at night, and installing lockers are recommended.
F13 Safety and security	0.78***	Installation of CCTVs in corridors, offices, special rooms, main gates, and general offices.	Security is very important for schools, there was no CCTV system. Therefore, some equipments /facilities were stolen.		Privacy was infringed in the millennium schools because of the CCTVs in staff rooms. They generally feel uncomfortable during their daily work. The CCTV system in offices infringes on teachers' privacy. Some teachers feel uncomfortable during their daily work. They generally consider that privacy is more important than safety, since it causes negative feelings and subsequently affects their work performance. Some teachers suggested that lockers be provided to ensure safety and security.

Note: There involves some discrepancies for the Facility Components of F1, F2, F3, F12, and F13 between quantitative data (see Tables 2 and 3) and qualitative data (see Table 4).

ting with students and assessing homework). Hence, the initial plan for the common rooms could not be achieved in practice.

All facilities relating to *privacy* and *safety and security* were significantly improved in the millennium buildings (mean difference = 0.80*** and 0.78*** respectively; see Table 2). CCTVs were installed in corridors, staff rooms, special rooms, and general offices of the millennium schools, and at the main gates, while the old schools had no CCTVs at all. The teachers generally agreed that the new CCTV system could definitely improve safety and security. However, having CCTVs in the staff room encroached upon their privacy and caused them to feel uncomfortable during their daily work. In order to provide a safe and comfortable working environment, it was suggested that the CCTV system be operated only at night or during holidays. It was also suggested that lockers be provided as a way of further preventing valuable properties from being stolen.

In general, the teachers felt that the facilities in the millennium schools were substantially better than those in the old buildings, thus the governmental investment in the millennium schools could by and large be considered a success. However, the teachers (end-users) still faced a number of problems during the operational period. Hence, the enhancement of facilities in the millennium schools might not have had a clear, positive impact on the working behavior of teachers.

Facility managers need to consider social relationships among teachers in the arrangement of seating plans in staff rooms, prevent blockages from windows, ensure that office equipment/facilities are installed well for operation, arrange weekly cleaning services, discuss with teachers about indoor decoration/plants and broadcast music during breaks, limit the operation period of CCTVs, and provide lockers to keep certain valuable properties secure.

For the long term, it is recommended that architects redesign the layout of staff rooms

and common rooms, ensure that the end-users can see out of the windows, allow sufficient natural lighting inside the rooms, use sound-insulated building materials, and allow a sufficient installation period before formal operation. Building services engineers, meanwhile, should design diffusers evenly and install a controllable device in the air-conditioning system at the design stage.

6. CONCLUSIONS

Staff rooms should provide a comfortable environment that supports and refreshes teachers, enabling them to more effectively carry out their daily tasks. Based on an empirical survey of 113 teachers in three primary schools in Hong Kong and a series of formal interviews with some of these teachers, this study revealed that all the components of FM in staff rooms were significantly better in the millennium schools than in the old schools. Although the results of the T-test indicated significant changes in the performance of FM in the millennium schools, teachers' working behavior in these schools showed no significant changes. The interviews provided some explanation for this surprising phenomenon. Although FM was greatly enhanced in the millennium schools (refer to Table 2), some of the enhancements turned out to be inconvenient to teachers. For instance, the teachers took pleasure in the large staff room, but simultaneously found it more difficult to communicate and work with their colleagues. Similarly, the teachers liked the new common room, but the long distance between the common room and the staff room reduced their tendency to use it. Meanwhile, the CCTVs in the staff room meant that valuables were more secure, but they also created a sense of discomfort among the teachers.

Construction professionals and facilities managers need to understand the expectations of end-users at the design stage. Some important issues include the size of staff rooms, the seating arrangement in staff rooms, the loca-

tion of common rooms, the provision of natural lighting and ventilation, the adjustment of air-conditioning system, and the installation of CCTVs in staff rooms. Facility managers should ensure that effective management services are maintained during the operational period.

Moreover, the government should establish a channel through which to collect information from end-users (e.g., about the level of satisfaction with FM and the working behavior of teachers), especially for the new school design. Since teaching performance is a crucial factor in education, it is suggested that a great deal of support (e.g., introduction of new schools, facilities and equipments; and feedback collection from end-users) be provided to teachers, especially during the beginning of the operational period.

Due to time constraints, the post-test was conducted when the schools had been rehoused for only a short period, thus the teachers may not have been very familiar with all the facilities in the new millennium schools. A longitudinal study of this topic focusing on these three millennium schools is recommended in order to understand the long-term impact of the new facilities on education.

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SANTRAUKA**MOKYKLOS MATERIALINĖS BAZĖS ĮTAKA MOKYTOJŲ ELGSENAI DARBE****Mei-yung LEUNG, John K. W. CHAN, Zhaohong WANG**

1998–1999 ir 2003–2004 metais Honkongo vyriausybė investicijas į švietimą padidino 20 %. Nemažai pradinėjų mokyklų buvo perkelta į naujojo tūkstantmečio naujoviškai įrengtus pastatus su nauju dizainu, kuris gerokai skiriasi nuo tradicinių mokyklų. Tačiau ar tobulinant švietimą Honkonge, pinigai buvo išleisti tinkamai ir efektyviai – vis dar diskutuotina tema. Siekiant iširti pastatų ūkio valdymo (PŪV) veiksniumą naujojo tūkstantmečio pradinėse mokyklose, buvo apklausti mokytojai, dirbę senosiose tradicinėse mokyklose, o paskui persikėlę į naujojo tūkstantmečio mokyklas. Kadangi mokytojai dažniausiai dirba mokytojų kambariuose, tiriant daugiausia dėmesio skirta pasitenkinimui, kurį sukelia PŪV efektyvumas pradinėjų mokyklų mokytojų kambariuose, ir pradinėjų klasių mokytojų elgsenai darbe. Pagal anketas apklausta 113 mokytojų, dirbusių abiejų tipų mokyklose. Siekiant įvertinti dviem etapais iš mokytojų surinktus kiekybinius duomenis, skirtus PŪV sustiprinti tūkstantmečio mokyklos mokytojų kambariuose ir jo įtakai mokytojų elgsenai darbe tirti, panaudoti nepriklausomų imčių T-testai. Rezultatai parodė, kad PŪV Honkongo naujojo tūkstantmečio mokyklų mokytojų kambariuose gerokai skyrėsi nuo PŪV senosiose mokyklose. Tačiau mokytojai nemanė, kad jų elgsena darbe buvo daug geresnė tūkstantmečio mokyklose. Vyriausybės investicijos laikomos sėkmingomis iki tam tikro lygio, bet vis dar yra daugybė sričių, kurias statybų profesionalai ir pradinėjų mokyklų pastatų ūkio valdytojai turėtų patobulinti, kad būtų patenkinti galutiniai vartotojų reikalavimai.