CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The purpose of the literature review is to study about palmtop capability in education sector, the usage of palmtop and multimedia in preschool education and to study about Jawi script and preschool education in Malaysia.

This study is important to come up with Jawi application on palmtop specifically for Malaysian preschool education syllabus. The literature review for this research based on websites, CD-ROMs, journals, books, technical papers and magazines.

This chapter will discuss about palmtop background, palmtop usage in medical and education, multimedia in education and preschool education in Malaysia, Jawi application and the rationale behind Jawi, multikey program in translating roman script to Jawi script and other writing script on palmtop.

2.2 Palmtop Background

2.2.1 Definition

There are many definitions given by people on palmtop and below are few
of palmtop meanings describe by a few authors and electronic dictionaries.

i) A computer small enough to be carried in the palm of the hand.\(^1\)

ii) A small computer that literally fits in your palm. Compared to full-size computers, palmtops are severely limited, but they are practical for certain functions such as phone books and calendars. Palmtops that use a pen rather than a keyboard for input are often called hand-held computers or PDAs. Because of their small size, most palmtop computers do not include disk drives. However, many contain PCMCIA slots in which you can insert disk drives, modems, memory, and other devices. Palmtops are also called PDAs, hand-held computers and pocket computer \(^2\).

iii) Palm-sized computers are smaller and lighter. They have smaller LCDs and rely on stylus/touch screen technology and handwriting recognition programs for data entry \(^3\).

iv) Palm Top can be categorized as hand held computers that does not have a keyboard and some describe it as Personal Digital Assistant (Ebell and Rovner, 2000).

---

1 http://www.computeruser.com/resources/dictionary/definition.html?lookup=3963  
2 http://www.webopedia.com/TERM/P/palmtop.html  
3 http://www.howstuffworks.com/pda.htm
v) PDA is a small and thin unit that accommodates with display that take spaces in front of it and usually known as Palmtop (Jalaludin, 2001).

vi) Palmtop is a hand-sized computer. Often palmtops have no keyboard but the screen serves both as input and output device. A stylus is used to enter information. Text can be entered by manual writing on the screen with the stylus. A palmtop is generally used for simple applications such as personal organization and note taking (Madash and Minhas, 2001).

Thus, the author summarize that palmtop is a computer with limited function, that can fit in the palm of a human and used the stylus pen as input and it is well known as PDA. So in this thesis the term palmtop and PDA will be used interchangeably.

2.2.2 History

The first PDA was introduced by Apple Computer Inc. in 1993⁴ (THE Journal, 2002). They called it Newton. PDAs (personal digital assistants) named by John Sculley, former chairman of Apple Computer Inc. and were sold as the final information appliance. Sculley predicted PDAs would become ubiquitous tools that would hold telephone numbers, keep calendar, store notes, plus sends and receive data wirelessly⁵. However, the Newton did not have the capabilities to deliver all of those features at the

⁴ http://www.handago.com/PDAHistory.jsp?
⁵ http://www.handago.com/PDAHistory.jsp?
time it was released. Unfortunately the PDA sales decreased for the next three years, and were almost off the charts. However, in March 1996, Palm™, Inc. delivered the industry's first truly compelling handheld computer called the PalmPilot. The PalmPilot was portable, robust and small enough to be brought anywhere. The device have helped people manage and organize their personal and professional lives by providing instant, anytime access to schedules, important phone numbers, to-do lists and other key information. The new type of information management was enormously accepted by users. The mobile and busy people adopted the small and powerful Palm™ handhelds for their own good. Nowadays, Sculley's predictions have come true in the form of the Palm™ VII, the first and the only wireless data transfer PDA.

New PDAs continue to arrive from Palm™, Psion/Symbian, IBM, Apple, Compaq, HP, Motorola, Sony, and others. In the near future, the world can expect the next step in PDA performance in the smart phone. It will combine a wireless phone with all of the functions of a PDA. Thus from the time the research has been carried out, the technology of integration of wireless phone plus PDA, called XDA Pocket PC (Mok, 2002) is already in the market.
2.2.3 Operating System

Palm Top can be categorized by its Operating System (OS). The operating system contains the pre-programmed instructions that tell the microprocessor what to do\(^6\). OS is the basic software used to communicate with the hardware and it provides an interface for users to access the hardware and software resource (Jalaludin, 2001). The well-known OS for Palmtop are Palm OS and Windows CE. Palm OS is the first OS invented for Palmtop and after that Microsoft emerged in the market with Windows CE 3.0 (the Palmtop using it is known as Pocket PC). In addition, in 2001 there was another OS entered the market with the name Linux, however people still prefer to use Palm OS and Windows CE.

Whether to choose Palm OS or Windows CE, it depends on the function that the user want. When user want to use palmtop only as replacement for their paper planner, the user should consider purchasing a very basic PDA (Schneider, 2001). However if user plan to use the palmtop for multimedia application and other features, then the user have to choose one with more memories since the display, processor, expansion slot and the software itself determine the type of OS they want to buy.

2.2.4 Memory

A PDA does not have a hard drive. It stores basic programs (address book, calendar, memo pad and operating system) in a read-only memory chip

\(^6\) http://www.howstuffworks.com/pda.htm
(ROM) which remains intact even when the machine shuts down. Additional data and programs are stored in the RAM. This approach has several advantages over standard PCs. When the user turn on the PDA, all programs are instantly available. User does not have to wait for applications to download. When user makes changes to a file, the changes are stored automatically and user does not need a Save command. Furthermore when the user turn the device off, the data is still saved because the PDA continues to draw a small amount of power from the batteries.7

All PDA's use solid-state memory, some use static RAM and some use Flash memory. Some of the PDAs incorporates removable forms of memory. They usually come with 2-MB minimum of memory. One megabyte of memory can store up to 4,000 addresses and 100 e-mail messages. However many application programs take up memory space, so more advanced models usually have more memory (5 to 32 MB). In addition, PocketPC takes more memory space so PDAs with this operating system usually have 16 or 32 MB. In some PDA models, the amount of memory is upgradeable.8

The amount of memory in PDA is referring to amount of storage for application and file (Jalaludin, 2001). However for Pocket PC, the memory does not refers directly to its usage. For example, Palm OS with 8 MB can keep many programs than Pocket PC with 16 MB.

7 http://www.howstuffworks.com/pda.htm
8 http://www.howstuffworks.com/pda.htm
2.2.5 Microprocessors

The microprocessor is the brain of the PDA and coordinates all of the PDA’s functions according to the programmed instructions. PDAs use smaller, cheaper microprocessors such as the Motorola Dragonball, Multiprocessor without Interlocked Pipeline Stages (MIPS) or Hitachi’s SH 7709a.9

PDA processor handle all of it operation and it means that the speed of the processor determine the duration of the processing time. The higher speed needs more power and energy. Thus, the slower speed of PDA does not need lots of battery power. Dragonball 33MHz and Intel StrongARM 206 Mhz. are among processors that have been used in PDA (Jalaludin, 2001).

2.2.6 LCD Display

PDAs have some type of LCD display screen 10. PDAs use their screens for output and input device while LCD screens for desktop or laptop computers used the screen solely as output device only. The LCD screens of PDAs are smaller than laptop screens but vary in size. Hand-held computers generally have larger screens than palm-sized computers.

PDA displays have the following features:

1. LCD, enhanced LCD or color super-twist nematic (CSTN)

2. Pixel resolutions (160 x 160, 240 x 320)

3. Black and white (16 grayscale) or color (65,536 colors)

9 http://www.howstuffworks.com/pda.htm
10 http://www.howstuffworks.com/pda.htm
4. Passive or active matrix (Active matrix displays have sharper images and are easier to read)

5. Reflective or backlit (Backlit screens are good for reading in low light)

2.2.7 Application Software

PDA have the ability to work with variety of software. As the time goes and technology changes, more softwares are being developed for PDA. For example user can use PDA for image editing and paint tools, likes Photogenics, Pocket Artist, iPaint, PocketSketch, Pocket Painter and One Cat Doodler 3(Louis, 2002). All of these image editing and paint tools applications suitable for Pocket PC and Pocket PC 2002. User can also use PDA for watching television by installing the PocketTV and play the MPEG files available (Louis, 2002c).

2.3 Examples of Palmtop Usage

2.3.1 Medical application using palmtop

Palmtop has been manipulated by physician in keeping data about the patients, prescription of drugs and keeping clinical information. Adding just a few applications can turn even the most Palm compatible PDA into a useful practice partner11. Nowadays, the doctor can access the required and necessary information by using Palmtop that equipped with the right software without leaving their patients. Within a few seconds, the doctor

11 http://www.aafp.org/fpm/20000900/59apal.html
can create an electronic prescription and sends it by electronic mail to the pharmacy (Marisa Mohd.Isa, 2003). Doctors who use handheld or palmtop computers say they would be at lost without them, not just for the time saved but also for the increased efficiency in caring for patients, running a practical handling their daily information needs (Labkoff and et.al, 1997). The physician should own the Palmtop because they can get the information in the point of care and can access the data in real time. Furthermore, a lot of time can be saved from searching the description and data at their office.

One of the physicians that are very familiar with palmtop functionality for medical usage is Dr.Willyard from Riverside Family Practice\textsuperscript{12}. Dr.Willyard found that many general-purpose applications for Palm devices could also be adapted for medical use including a wide variety of databases, spreadsheets and document readers. The small size of the PalmIIIe that is less than 5 inches tall and can fit easily into a shirt pocket makes a perfect chose for Dr.Willyard because he can just bring it in his pocket everywhere. In addition he can transfer or hot sync the information from the desktop computer to the palmtop easily by just pressing a specific button.

\textsuperscript{12} http://www.aafp.org/fpm/20000900/59apal.html
Another owner of palmtop is Dr. Chasin from Mary Hospital in Hoboken in New Jersey (Chasin, 2001). Dr. Chasin admitted that palmtop is much neater and more efficient way to keep track of addresses, phone numbers and schedule. With that he no longer needs to use any type of paper address or appointment books. The memo pads function in palmtop also gives Dr. Chasin chances to jot down brief notes during the meetings for later review. He no longer needs to bring paper. The most important thing is the PDA with 8 MB of memory gives him plenty space to download clinical information that he always uses at the point of care. Furthermore the clinical drug information could be automatically added to the database through Internet by using the AutoUpDate feature.

David Wilkinson, Professor of rural health from Adelaide University and University of Australia is also using palmtop as his diary, address book and notepad (Wilkinson, 2001). The comprehensive clinical drug information can be installed into Palmtop to check the prescription of the medicine. When the palmtop synchronized with PC through a cradle or infrared port then the database is automatically updated. Using this way, Dr. Wilkinson found that prescribing medicine is quicker, more accurate and much more accessible than any paper based resources.

Besides the examples of several physicians using Palmtop as complement tool in their life as doctors there is one pilot project will be highlighted on the issue. The project that took place in 1999 for the medical residency program at University of Kansas School of Medicine in Wichita to
incorporate Palmtop computers into the daily patient care and educational activities of the residents. From this pilot project, there were variety of information had been able to retrieve, carry and use in clinical settings. People also began to collaborate and share information. There was also request to find medical textbooks that can be downloaded to their palmtops. The pilot study demonstrated that palmtop not only useful in the residency setting but also residents are capable of devising new tools for palmtop to meet their individual needs. Due to the development of wireless technology, palmtop will more likely become nodes of information access rather than information databases (Beasley, 2002). Rather increased memory, the future palmtop will focus on speed of connection and retrieval.

Based on the four examples mention above, palmtop has been successfully manipulated by doctors to help them access the prescriptions electronically, sharing the information quickly by infrared beaming, synchronize the information from or to PC and access medical information at the point of care.

2.3.2 Education application using palmtop

2.3.2.1 Introduction

The basic functions of palmtop in its early invention were just for storing addresses and phone numbers, taking notes and keeping track of appointments (Chasin, 2001; Wilkinson, 2001). However with the rapid changes in mobile and wireless technology the palmtop has turn into
mobile machine for playing games (Louis, 2003) and music, accessing information from the internet, editing image and paint tool (Louis, 2002), keeping medicine prescriptions and even educating children through preschool education series (Louis, 2002).

Preschool educational application is being used across the curriculum in a wide range of subjects including art, biology, languages, geography, history, music, reading and writing.

2.3.2.2 Education application

A website 13 has a section on pocket PC programming for teachers that specifically focuses on English subject. Pocket Education series from Thompson Solutions is intended in educating preschool children using Palmtop. This application is specifically for children to recognize and familiarize object from photographs and calling out the names when pictures are shown. It just takes 5 minutes to be downloaded with 56k modem. The Pocket Education: Pictures can be found in the following website, www.handago.com.

Vancouver Community College has used palmtop in their teaching for solving overcrowding problem in their main computer laboratory (Gale, 1993). They used the Hewlett Packard 95LX palmtop to teach statistic and mathematics in that college. By using portable palmtop in the classroom,

13 http://www.bagetta.com
the instructor can just carry around the palmtop easily. In addition teacher
can maintain the focus of students and in the same time students were able
to communicate with their friends in the class. Students who get the
opportunity to use palmtop in the math class were eager to use the palmtop
in their next class. Based on the students' feedback and responds, many
members of the mathematics and statistic department planned to use
palmtop and laptop in their class.

In Green middle school, Ohio, United States, palmtop has been the solution
of overcrowded students in the school that enabled them to learn even in
the cafeteria\textsuperscript{14}. With the innovation of palmtop in the education, with
certain suitable software like Classroom Wizard, students have just to bring
the palmtop that contain the worksheet to do their work without bringing
pencil and paper. Palmtop offers individual access without constraints of
time and place. So they could learn without being in classroom.
Furthermore students were able to be independent and collaboration with
their friends in study was done through the palmtop.

Another example of palmtop usage is in the Stanford University (Davis,
2002). The usage of palmtop in Stanford is actually for their staff, faculty
and students to easily access their University portal and other information.
With the Bluefish Wireless infrared network in Stanford, members in
campus were able to communicate to each other without bringing laptops.

\textsuperscript{14} http://palm.com/education/studies/study37.html
The palmtop provides a cheaper mobile solution for communication in the campus.

Dr. Matthew Hafar, a music professor from Winston-Salem State University (WSSU) (Roach, 2002) has made an experiment of handheld computers usage to his class. This experiment is part of the learning tools used by his students in his music classes. Dr. Hafar just write the assignment for his student on his PDA and transfer the assignment through infrared to the students PDA in the classroom without writing on the board. The WSSU planning to transform the campus into wireless networking environment so the PDA technology such as iPAQ can be used to the entire campus.

In United States, there have been many experiments done in order to see the impact of PDA to the education. Based on the 100 classrooms using handhelds for teaching and learning the evaluation have been made and 96% of the respondents agreed or strongly agreed that handheld computers are effective instructional tools for teachers.

**2.4 Multimedia in Education**

In the conventional teaching and learning process, mediums like chalk and voice are used as the instructional communication process that comprise one way method. Teacher is giving the information and students receive it.

With the introduction of multimedia technology into the classroom environment, the delivery of information enters a new phase. The use of
multimedia technology changed the roles of teacher and students. Multimedia application will cultivate some interaction between the students and information that make the learning environment and process more effective. The content still have to be delivered by teachers to students but the instructional media would be computer based interactive multimedia.

2.4.1 Multimedia

Multimedia definition has been debated aggressively in Information Superhighway or Information Society Debate\(^\text{15}\). Lots of definitions have been given by experts in order to make the public more aware and understand about the usage of multimedia. Below are the definitions that have been quoted by an expert in Multimedia.

Multimedia is a combination of text, sound, animation, and video elements and graphic art. Interactive multimedia is when user is allowed to control the elements' type and time. When a structure of linked elements is provided which the user can navigate, interactive multimedia becomes hypermedia (Vaughan, 2001).

Based on Hofstetter and Li (Hofstetter, 2001; Li and Cheng; 2001), multimedia is the use of a computer to present and combine text, graphics, audio, video and animation with links and tools that let the user navigate, communicate, interact and create. So we can conclude that multimedia in

\(^\text{15}\) http://www.city.ac.uk/~sf320/sitemenu.html
terms of education is the combination of variety of media that interact with each other and have to be build from discrete and continuous data.

Multimedia become important nowadays because of its contribution towards several industries including education. In this paper, the author will not discuss other industries and concentrate on education only. In the era of information, communication and technology (ICT), the utilization of multimedia in education is widely practised like the usage of computer to give a (Rozinah Jamaludin, 2000) simulation for dangerous topic such as air flight training, virtual reality that can simulate real environment, interactive tutorial and electronic presentation. The simulation of real environment and interactive tutorial needs active participation from the students. The more actively involved students in teaching and learning process, the more knowledge gets retained (Hofstetter, 2001). The result from research and publishing company, Computer Technology Research (CTR) Corporation has report that, people retain only 20% of what they see and 30% of what they hear, they remember 50% of what they see and hear and as much as 80% of what they see, hear and do simultaneously. Based on CTR studied the author can conclude that students involvement through see, hear and do simultaneously is really important in order to maintain and retain the knowledge they learn.

The transformation of paradigm from behaviorism to cognitive and then constructivism is one of the reasons of multimedia usage in education (Clark and Solomon, 1986). This paradigm transformation is more towards
cognitive like computer added learning that involved implementation likes hypermedia, expert system and intelligent tutor (Rozinah Jamaludin, 2000). In addition, multimedia can improve the teaching and learning process by provided an environment that can attract students to read and learn to write in early age (Maslin Masrom and Rokiah Bahari, 2002). Navigational links can be added to the content to enable the students to interact and to move around the content easily (Neo and Neo, 2002). Thus students can control their pace of learning. Because of that matter, the author made a conclusion that multimedia provides a powerful tool for learning and teaching.

Before multimedia becomes one of the powerful tools to teach and learn, traditional method in teaching like using crayon, blocks and model was used. With technology changes, computer has added other ways in learning even though the usage of traditional method in presenting knowledge is still being used. Thus computer become the supplement and not the replacement of traditional method.

Clement, has shown that computers contribute to the development of young children’s cognitive, social and emotional development (Clements, 1987). In addition computer now days become part of our lives. We used computer to accomplish office work rather than using typewriter. From telecommuting, home shopping, advertising business, electronic publishing, mass media, teaching and learning, all are using computers as their medium to communicate. They are part of the natural landscape and
culture and they are becoming part of nearly every aspect of our lives (Shade and Watson, 1990).

2.4.2 Education

Education is a systematic training and instruction designed to impart knowledge and develop skill (The Oxford Paperback Dictionary, 1991). Developing skills does not mean that writing, reading and counting skills only but it more than that. Exposing the children to computer in the early age by using hand movement to dragging and dropping object, point and click is also a skill where the interaction styles impacts children performance in interactive learning environments (Inkpen, 2001). Point and click object for example can be used in the education package. Education package that runs on computer can be manipulated to enhance children cognitive and physical development by providing them with quiz and games.

Education does not mean that children have to sit and read the books all the time. The children especially in the early age should not be pressured for academic achievement only and neglecting the play. Play not only involves the use of sport materials, tools, toys and equipment but it more than that. For example words and ideas that promote literacy and develop thinking skills can be categorized as play (Moyer, 2001). When children build ship, house or even human with Lego, they actually enhanced and develop their creativity skill and critical thinking. Using mouse and even joystick in the computer game also enhanced the psychomotor skill. As proverb say that
‘working without play will make Jack a dull person’. Vygotsky (Vygotsky, 1976) and Piaget (Arnold, 1999) have proved this proverb. The author concluded that play also part of the education process and play in computer term involve hand movement in touching keyboard, drag-drop and point-clicking by mouse. In addition games like Tetris can developed cognitive skill for children because they have to think fast enough to put block in the right position.

The preschool practitioners and researchers can used Erikson’s theory of psychosocial development in order to make computer as tools to enable children development (Shade and Watson, 1990). Three development tasks have special application to children and computers such as autonomy, initiative and industry. Autonomy is when the children can mastery a sophisticated piece of space age technology (Papert, 1983) that means preschool children between eighteen and sixty months can master a variety of computer tasks (Pearlman, 1976). Initiative means children have learned that they have the ability to exercise control over some aspects of the environment (Shade and Watson, 1990). As the child continues to explore and master the physical and social environment initiative is increased (Fisher and Lazerson, 1984). While with industry, the ability to master the skills necessary to compete and function successfully in society. Due to this, the preschool educational application on palmtop can be part of the contribution towards making teaching and learning more effectively.
Children can be taught to learn everything but they have to passed through different stages in their life to learn anything (Arnold, 1999). They can be exposed to the computer usage that equipped with the suitable and interesting software especially through multimedia application in the early age. After the Multimedia terminology was being quoted, the usage of computers in education getting more active. This is due to the great impact of multimedia to the children especially in accepting, recalling (Calvert, 1990) and understanding information (Richard and Moreno, 2002) more easily. The variety of media elements like sound, animation, audio, video and graphics shall give great influences to children's learning process and will capture children's attention in conveying knowledge in the early childhood. However, not all the multimedia elements was effective in convey meaningful learning (Richard and Moreno, 2002) to the children. Thus the multimedia learning environment or pedagogues (Mayer 1997; Mayer 1999a,b; Hall and Woolf, 1995) should be designed properly to promote learning effectively and this responsibility for example have been taken by researchers at University of California, Santa Barbara (Mayer, 1997).

Even though, the variety of media can be used to educate the children in different way but without the proper pedagogues the teaching will not be effectively conveyed to them. Pedagogues must be educationally effective and provide children the same quality of experience as traditional teaching methods do, if not better and at least such system using pedagogues will enhance and improve the quality of teaching (Hall and Woolf, 1995). One
of the methods in pedagogues is to make children remains active by participating, involving in the system and motivated. An example of multimedia technologies being used to achieve rich interactivity, enhance teaching and learning (Li and Cheng, 2001; Neo and Neo, 2002) with children is systems that teach Development and Evaluation of Life Sciences. This example falls into scenario-based multimedia simulations where the system cannot respond to students questions compared to knowledge based simulation. However knowledge based multimedia simulations that contain user model, better than scenario based multimedia simulations and require complicated representations and sophisticated control structure to respond to students (Hall and Woolf, 1995).

The software package called Development and Evaluation of Life Sciences was shown during Taiwan 1999 Children’s Information month where 20 students and 10 parents were selected to evaluate their learning efficiency. Based on the evaluation, the system was exceptionally well received by parents and children (Li and et.al, 2001). Thus the author can conclude that using multimedia technology can enhance teaching and learning.

2.4.3 Preschool Education in Malaysia

2.4.3.1 Introduction

Preschool education in Malaysia is an informal education (Policy and Programmes, 2002; Kurikulum Prasekolah Kebangsaan, 2001) for children aged 4 to 6 years old. The Community Development Division (KEMAS) of the National Unity Development (Policy and Programmes, 2002; Kurikulum
Prasekolah Kebangsaan, 2001), private sector like Montessori and Vital Care and NGO like Malaysian Kindergarten Association and Malaysian Association of Child Care Providers (Early Childhood Education, 2002) are among institutions and government agencies that conduct the preschool education. Even though the preschool education is conducted by various government agencies, institutions and private sector but the entire preschool center must be registered with the Ministry of Education (MOE). Though MOE does not fund the preschool centers in Malaysia except the center that conducted by government like KEMAS, the MOE is responsible for preparing the preschool curriculum called National Preschool Curriculum.

"National Preschool Curriculum is a standard reference document that have to be followed and used by all preschool center in Malaysia. The standard reference document have rules out the teaching syllabus and minimum learning that have to be implemented at all preschool centers "(Kementerian Pendidikan Malaysia, 2001).

*Tan Sri Dato' Seri Musa Bin Muhammad

Minister of Malaysian Education, 2001*
"National Preschool Curriculum was legislated as an initiative to coordinate and enhance the preschool education quality. It's being a standard reference document for the all preschool centers as stated in amendment of Education Act 1996 (Preschool Education)" (Kementerian Pendidikan Malaysia, 2001).

Datuk Abdul Rafie Bin Mahat

Chief Director of Education Malaysia, 2001

The MOE has legislated education charter (1994) and produced the Act 550, Education Act for Malaysian Law (1996) that mention 3 things as the basis for preschool center in Malaysia. The first one is to make sure children that aged between 4 to 6 years old is given the opportunity to enter preschool education. The second one is to integrate all preschool education under MOE while the third one is to coordinate and ensure the preschool education to be implemented in all preschool centers. The government policy for preschool education in Section 20(1) stated that, 'None of the kindergarten can be build, organized or managed unless the kindergarten has been registered under the Act 550' and in Section 22 stated that, 'Any program and activity in every kindergarten should be based on the curriculum guidelines for kindergarten that approved by minister'.

---

16 http://www.keluarga.net.my/anak/pra/pendidikan_prasekolah.html
17 http://www.keluarga.net.my/anak/pra/pendidikan_prasekolah.html
18 http://www.keluarga.net.my/anak/pra/pendidikan_prasekolah.html
The goal and objectives of preschool education in Malaysia is provided by MOE in National Preschool Curriculum (Kementerian Pendidikan Malaysia, 2001) for preschool center guidelines.

Goal

Preschool education is aimed at enriching the children's potential in any development aspects, empower the basic skills and substance the positive attitude as a preparation to the primary school.

Objectives

1. Have the personal trait, character and positive self-concept to be a patriotic citizen.
2. Using Malay Language properly and expand the linguistic skills to communicate.
3. Using Chinese and Tamil language properly to communicate in a school that used Chinese and Tamil Language as medium.
4. Using English language as second language in daily interaction.
5. Practice the Islamic values in daily life for Muslim children.
6. Practice the good values in daily life.
7. Have the cognitive, thinking and problem solving skills.
8. Have the mature emotion and social skills.
9. Have the intelligent and physical skills, practice the healthy and safety living.
10. Have the creativity and esthetical paradigm in appreciating the nature and cultural heritage.
2.4.3.2 Content of National Preschool Curriculum

The content of national preschool curriculum consists of 6 components that implemented integratively. The Jawi education for preschool is under the Spiritual and Moral Components and has a complete syllabus. Following is a brief overview about the components of preschool curriculum in Malaysia.

1. Language and Communication Component

Language and communication skills are the main factor to the students learning. It consists of Malay Language as National Language, Chinese and Tamil Languages as medium in Chinese and Tamil schools and English Language as a second language.

The main principal in teaching language is to integrate 4 language skills such as listening, speaking, reading and writing in any language they learn in kindergarten.

2. Cognitive Development Component

Cognitive Development Component is the main focus in early children education because it influences all the learning activities. The component stresses on substance the positive attitude towards science and mathematics. The cognitive skills comprises of:

i) Classification

The ability in identify certain object characteristic and gather the object based on the identified characteristic.
ii) Spatial Concept

Give the understanding about surrounding and position of the object in space.

iii) Numbering Concept

Students have to master the series and one to one matching skills logically.

iv) Science Process

Students can interact with the nature and substance the exploration and investigation concept by observing and comparing activities.

v) Problem Solution

The quality of problem solution depends on decision-making skills based on instinct or acceptable reasoning.

3. Spiritual and Moral Component

To produce Malaysian citizen that belief in God, have the positive attitude, responsible and have the ability to achieve self, family, community and country prosper. It consists of Islamic education for muslim children and moral education for non-Muslim. In this paper only the Islamic education, specially Jawi will be highlighted as it is related to the author's thesis. Below is the table of syllabus of the Jawi script for preschool education.
5. Physical Development Component

It focuses on students' growth and development to substance their self-confidence and shapes the positive personality. The component stress on 3 aspects as below:

i) Psycho Motor Development

Basic movements to enable the students involve in any physical activity confidently.

ii) Health

Students trained to practice healthy life whether physically or mentally through hygienic, balance diet and method to prevent from diseases.

iii) Safety

Help the students identify the dangerous objects and situations and know the steps that have to be taken when they are in danger.

The development of the Jawi application also used the fifth component of the National Preschool Curriculum. It stress on the psychomotor development where students used hand movements and control their hand and eyes through stylus pen or hand to navigate the Jawi application. The psychomotor development is part of the Jawi application because students used the stylus pen and hand to interact with the application. This concept can train their hand and eye movement.
6. Esthetical and Creativity Component

Focus on developing expressive and creative characters through imagination and thinking. The component consist of 5 aspect as below:

i) Environment and beautiful of the nature
ii) Painting and handycraft
iv) Music, song and creative movement
v) Drama and poem
vi) Culture heritage

Active involvement in 5 aspects of component enables the students to express their feeling and idea. The experience is important because it can help students to develop self-confidence and identify their interest.

In the development of Jawi application, the author has put 2 aspects of the component in the system. The background of the first page consists of nature like mountain, grass, rabbit and moving butterflies to fulfill the first characteristic of the component that related with environment and beautiful of the nature. The application also has ‘Lagu AlifBaTa’ module that try to accomplish the third characteristic where students learn through music and song.
2.4.3.3 Approach in Teaching and Learning Method for Preschool Education

In preschool education, teachers have to use variety of approach that suitable with students self-development, ability, talent and interest. There are 4 approaches used in teaching and learning that shall be stated below:

i) Playing While Learning

Playing while learning approach can enhance cognitive ability, the desire to explore, motor skill, innovative skill, critic and creative. Thus, the development of the Jawi application for preschool on palmtop caters certain characteristic of the approach. Children that using stylus pen to navigate and interact with the application on palmtop actually fulfill the Navigation and Interaction with Environment characteristic.

ii) Theme

Thematic approach is a learning and curriculum management through one topic chosen that suit with students' life, time, place and students interest.

iii) Integration

Integration approach helps students in understanding the real life and its interrelation of each item.
iv) Information Technology And Communication

This approach helps student to enrich their learning experience through alternative tools like computers and palmtop. It also can be used to gain information and help the learning process.

2.5 Jawi application

2.5.1 Jawi

Jawi is a Malay script based on traditional Arabic letter (Ahmad Zaki. 1998; Muhammad Mun' im and Haliza, 1994) and consists of 35 characters which twenty nine are adopted from Arabic and six are invented (Muhammad Mun' im and Haliza, 1994; Mashkuri and et.al, 2001) to accommodate local vocal sound (Mashkuri Yaacoob and et.al, 2001). Each of the characters may have up to four forms such as alone, in the beginning, middle and end of word (Muhammad Mun’im Ahmad Zabidi and Haliza Ibrahim, 1994)). Jawi was widely used since 1300’s and unfortunately, since 1960’s, Jawi become less important after the Malaysian Government officially adopted the use of romanized (Ahmad Zaki, 1998). In order to revive the use of Jawi then the implementation of Jawi application on palmtop is one of the approaches.

2.5.2 Jawi Multikey Program

In this research, the author has chosen Jawi Multikey Software 19 in translating the romans script to the Jawi script. This software is a text-based program where user can just used the normal keyboard to get Jawi script. However to

19 http://webfauzi.tripod.com/cgi-bin/panduangunajawi.htm
know the keyboard code keypress for Jawi, users have to refer to the attach table.

The following method used in Jawi Multikey Software in Microsoft Word and its transformation to the Macromedia Flash 5.0:

1. Installed Jawi Multikey Program and the additional font of Jawi.
2. Start the Jawi Multikey by following the steps below:

- Start Jawi Multikey on the desktop as shown below.

- Put the mouse on the multikey writing and right click. The following picture will appear.
- Click on the Notification area and the multikey changes its position on the computer clock likes below:

- Open the Microsoft Word
- Go to the icon and click it. The following picture will appear.

- Click Right to Left – Jawi as shown below:

- The multikey icon next to the computer clock changes to the active Jawi like this icon. The icon shows that the Jawi multikey is active.
• The author has chosen Jawi Modern Khazan from 13 choices of fonts given in the Jawi Multikey Software.

• Click the mouse on the Microsoft Word display and type the word ‘Mari Belajar Jawi’, ‘Itik’, ‘Beti’k, ‘Tembikai’ and ‘Selasa’. The multikey will change the romans script to the Jawi script.

• Highlight the word and right clicks the mouse. Then choose Copy.

• Open the Macromedia Flash 5.0 and Paste the words to the wanted file.

The author has used this table to translate the romans script to the Jawi script.

<table>
<thead>
<tr>
<th>ءج</th>
<th>ز</th>
<th>ت</th>
<th>ب</th>
<th>ا</th>
<th>a</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>ذ</td>
<td>د</td>
<td>خ</td>
<td>ج</td>
<td>ح</td>
<td>h</td>
<td></td>
</tr>
<tr>
<td>ص</td>
<td>ش</td>
<td>س</td>
<td>ز</td>
<td>ر</td>
<td>r</td>
<td>R</td>
</tr>
<tr>
<td>غ</td>
<td>ع</td>
<td>ظ</td>
<td>ط</td>
<td>ض</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>(apostrophe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ء</td>
<td>ق</td>
<td>ف</td>
<td>ف</td>
<td>ن</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>
2.5.3 The Rationale Behind Jawi application

The rationale behind Jawi application are to preserve the script from extinction and to save the Jawi as a national heritage especially its reintroduce in the public school curriculum (Ahmad Zaki, 1998). By trying to implement the prototype Jawi application on the palmtop, it will give another approach to the academicians, researchers and software developers to use new innovation in teaching Jawi script. Furthermore, if an outsider like Profesor Kang Kyoung Seock from Pusan University, North Korea was very proud and keen of Jawi script (Pat Matlob, 2002) then as users of Jawi script we should have the same feeling.

Even though the implementation of educational application on Palmtop is quite new in Malaysia but in United States there are educational applications being mounted on server and can be accessed through Internet. For example, The Pocket Education series from Thompson Solutions is intended to assist the teacher in educating preschool children using Palm
OS 20. Another example is learning English in a fun and educational way where students can get the software from a web site21. They also use palmtop as a Portable Library where students and teacher can install program like Microsoft Reader22. Based on 3 examples found in the Internet about the educational application that can be accessed through palmtop then there’s no doubt that Jawi application can be implemented in the same method. Thus, the revival of Jawi can be done through information technology (Mashkuri Yaacoob and et.al, 2001).

However, the educational application focusing to on muslims especially for Malay is rarely found in the Internet. Because of that, this paper tend to focus one part of education, such as knowing, recognizing and pronouncing Jawi alphabets. This will help children to learn about Jawi alphabets and can promote the revival of Jawi. In addition, the Ministry of Education have introduced the teaching of Jawi script in public primary school to make sure that children who completes year six at primary level can read and write Jawi (Mashkuri Yaacoob and et.al, 2001).

The initiative to prevent Jawi script from extinction cannot be totally rest on government institutions like Jabatan Pendidikan Islam dan Moral (JAPIM), Jabatan Kemajuan Islam Malaysia (JAKIM), Jabatan Agama Islam Negeri and education ministry only. Other parties like Dewan Bahasa and Pustaka (DBP), SIRIM, Arkib Negara, academicians from

20 http://www.handago.com  
21 http://www.bagetta.com  
higher education institutions, researchers, press and electronic media like newspapers (Berita Minggu and Utusan Malaysia) and television stations (TV3 and RTM), private sector especially ones that involved in developing system should cooperate together in reviving and preserving the national heritage.

2.6 Examples of Other Writing Script on Palmtop

Nowadays, palmtop not only being used for the personal management purposes but has being manipulated to suit the modern lifestyle that need people to access information anywhere and anytime. Due to this some developers have developed the electronic Quran that can be read on palmtop like Al-Muhaiffiz\textsuperscript{23} and Pocket Alim 1.0\textsuperscript{24}. There are also softwares for learning Hanzi and Kanji scripts on the palmtop. Below are brief descriptions about the variety of writing scripts on palmtop. All of the examples were taken from the internet.

\textsuperscript{23} http://www.onlineislamicstore.com/a3521.html
\textsuperscript{24} http://www.intertrama.com/i/pocketalim-e.htm
2.6.1 Al-Muhaffiz

![Figure 2.1: Al-Muhaffiz Picture](http://www.intertrama.com/l/al-muhaffiz-e.htm)

Al-Muhaffiz is only 3-inch width, 5-inch height and 0.75 inch depth. The weight is about 0.4 lb. and using 4AA batteries to function in 12 hours in normal mode. Al-Azhar University in Egypt and Islamic Dawa Center of Brunei verified the content developed by the Harf Technologies and Verification.

Al-Muhaffiz is a complete Quran Audio Recitation and has text in Arabic and English. It also contains Nawawi 40 Hadiths, Hajj and Umra information, prayer times and Qibla direction information. It also has the

---

capability for the users to practice recitation for memorizing Quran. It is suitable for everyday use whether at home or works, driving, long-distance travel and lots more. With the Holy Quran, Nawawi’s 40-Hadiths, Hajj and Umrah information in both Arabic and English translation, user can learn them at their own pace.

2.6.2 Pocket Alim 1.0

![Pocket Alim 1.0](http://www.intertrama.com/l/pocketalim-e.htm)

**Figure 2.2 : Picture of Pocket Alim 1.0**

Source: [http://www.intertrama.com/l/pocketalim-e.htm](http://www.intertrama.com/l/pocketalim-e.htm)

Pocket Alim is available on Toshiba’s e330 color Pocket PC. It is the mobile solution which has the applications of a regular desktop or laptop such as MS-Office including Pocket Word, Pocket Excel, Pocket Outlook, and MS ActiveSync 3.5. Pocket Alim is suitable for the busy Muslim community, professionals and students that want to recite, find reference

---

26 [http://www.intertrama.com/l/pocketalim-e.htm](http://www.intertrama.com/l/pocketalim-e.htm)
and research Quran everywhere they can. Users can search the feature by Surah or Ayah and commentary.

The features of Pocket Alim include 64 MB SDRAM, 300 MHz Intel StrongArm processor with 32MB built-in flash ROM and 64MB SDRAM, 3.5" color display and 240x320 resolution, rechargeable battery, 16-bit stereo sound, integrated microphone, speaker and headphone jack.  

2.6.3 KingKanji for Windows CE

![Image of KingKanji Interface]

Figure 2.3: Example of KingKanji Interface

Source: [http://www.gakusoft.com/kanji_ce.htm](http://www.gakusoft.com/kanji_ce.htm)

KingKanji is a kanji flashcard program that highlight on writing and reading kanji script, a Japanese writing script. It consists of stroke animation and

---

27 [http://www.intertrama.com/1/pocketalim-e.htm](http://www.intertrama.com/1/pocketalim-e.htm)
28 [http://www.gakusoft.com/kanji_ce.htm](http://www.gakusoft.com/kanji_ce.htm)
automatic feedback for over 1200 characters. It includes the first until the sixth grade Joyo kanji and kana. A flashcard may accommodate single or multiple kanji and kana with the English meaning. Over 294 lessons are included in the kanji flashcard program. In addition, if user want to make an additional kanji lessons that are not available in flashcard, they can create the new one by using the included Lesson Editor, Microsoft Word XP/2000 or a Japanese word processor. With the amazing characteristic, it has won the first award in the Association of Computing Machinery’s Quest for Windows CE contest. For trial, it have 30-day trial at the following website, www.gakusoft.com/kanji_ce.htm.

2.6.4 KingHanzi for PocketPC

![Image of KingHanzi Interface]

Figure 2.4: Example of KingHanzi Interface

Source: http://www.gakusoft.com/hanzi_pktpe.htm
KingHanzi\textsuperscript{29} is a flashcard system for learning to write and read Chinese on the PocketPC. It consists of stroke order animations and automatic stroke order feedback for over 530 characters. The flashcard contains single or multiple Hanzi, the romanized pronunciation and the English meaning. User can have for 15 days trial by accessing www.gakusoft.com/hanzi_pktpc.htm. They can choose whether to download a Simplified Chinese or Traditional Chinese package.

2.6.5 Chinese Reviewer 1.1

![Flashcards Interface](image)

Figure 2.5: Example of Chinese Reviewer 1.1 Interface

Source: [http://www.ocf.berkeley.edu/~mlyang/chinesereviewer/](http://www.ocf.berkeley.edu/~mlyang/chinesereviewer/)

Chinese Reviewer\textsuperscript{30} is a combination flashcard program and a Chinese-English Dictionary. The version comes with a large database of Chinese characters. It can be run on the PocketPC 2002 platform and ARM processor. The Chinese Reviewer requires 6.5 megabytes space in the memory. It used 350k for the

\textsuperscript{29} http://www.gakusoft.com/hanzi_pktpc.htm
\textsuperscript{30} http://www.ocf.berkeley.edu/~mlyang/chinesereviewer/
application and 6 megabytes for the mingliu font library. User has to connect the PocketPC with computer through Microsoft ActiveSync if they want to install this program.

2.6.6 CJ Reader 1.1

![CJ Reader 1.1 Interface](http://www.pocketgear.com/software_detail.asp?id=5609)

Figure 2.6: Example of CJ Reader 1.1 Interface


CJ Reader 1.1\(^{31}\) is a document viewer on PocketPC for Chinese and Japanese. It has the built-in Chinese and Japanese fonts (16x16 fonts) where user can read Chinese and Japanese documents on any language (English for example) PocketPC. CJ Reader 1.1 support Traditional Chinese, Simplified Chinese and Japanese codes.