Abstract: - Collaborative Filtering for teaching in a learning 3.0 environment is an approach in which teachers or learners who share the same interest could start collaboration easily as they have the same background. Through collaborative filtering, the system highly recommends other teachers or learners who have performed the same tasks in a large number of times to become good collaborator. For instance, this collaborative filtering is a significant tool when a learner searches for peer help to solve a problem. The system identifies the process by matching the learner’s actions and the other learners. Thus, opens up more opportunities for educators to practise diverse teaching styles that integrate wide dimension of technologies elements to suit the learners’ needs. In this paper, results from a preliminary study provide useful information to portray the early perception and readiness of the teachers towards Collaborative Filtering (CF) for teaching in a 3.0 learning environment. Finally, it enables teachers to better understand new technology and use it collaboratively to integrate technology into Malaysian education for learners’ benefit as well.

Key-Words: - Collaborative filtering, Web technologies in education, semantic Web in education, teachers’ perceptions and readiness, teaching and learning in 3.0 environment

1 Introduction
With the massive growth in the use of websites on social activities, it is a novel task to consider integrating the activities for the benefit of teaching and learning. Web services, namely wikis, blogs, discussion boards and social networking websites illustrate the current trend of diverse teaching style that uses the integration of collaborative exploration and information of academic environments. The recent research on collaborative filtering in teaching and learning has gained its steady momentum especially in web education. Lane and Yamashiro [1] in their findings on the survey done on assessing learning and scholarly technologies among selected universities in the United States, stated that despite high interest of students use of technologies for their personal lives, namely for communication and entertainment, they showed intention to learn to use the technologies for the sake of learning for instance, discussion boards, electronic homework submission, or even database searching tools initially in their courses. Faculty focus groups were considered to have a considerable desire to participate in collegial discussions on teaching technology and share information collaboratively with their colleagues.

The possible educational benefits of social websites related to the teaching and learning in Web 3.0 underlying the Web 2.0 technologies have triggered the attention of the educators [2]. To date, Web 3.0 education triggers the new digital access to learning environment in which learner takes control and manages his/her own learning [3].

2 What is Web 3.0 Teaching and Learning?
The current trends and the future of learning with the Web education is moving towards a better, smarter, faster, richer and even more complex learning environment [4]. Learning virtually using the Internet and the websites is an active process in which Web 3.0 or known as Semantic Web serves as the personal assistance for teachers to determine whatever is desired and will delivered according to the preferred channel [5]. Web 3.0 technologies offer higher information of acquisition as they are equipped with smart intelligent agents that searchers the right content and subject matter to suit the users’ needs. In addition, 3.0 environment does correlate with successful, effective for teaching and learning.

2.1 What Is Collaborative Filtering (CF)?
Collaborative Filtering (CF) is a novel approach that relies on the prediction of the similarity of the items used according to the users’ preferences [6]. People with similar taste tend to have similar preferences. Hence, it can be a good indicator for the item to be rated personally. Meanwhile, CF can contribute to positive improvement in choosing the right information as it takes into consideration of what being preferred by others to predict preferences. In Malaysia alone for example, a moderator of a virtual discussion group like in The University Kebangsaan Malaysia; Faculty of Education Graduate Association deployed the intelligent filter in sharing the information the users desired. CF is coined as registered users review books at the Amazon.com. Basically, the mechanism embedded within the CF is a system in which such preferences of a large group of people are registered according to a similarity metric; a subgroup of people is selected whose preferences are similar to the preferences of the person who seeks advice; an average of the preferences for that subgroup is considerably weighted and recommendation from the output results is taken into account as the options to fulfil the preferences of the users. This concept can be applied in social filtering and the adaptive filtering as well [6][7].

2.2 The E-learning Recommender Systems (ERS)
To suit the users’ preferences and interests, the E-learning Recommender System (ERS) provides users with personalized suggestions by matching to users’ profiles or groups. The systems require “intelligent” interface to determine the interest of the user and use the input to make suggestions accordingly [6]. Others consider the system as trying to propose to learners based on their previous actions. Those recommendations of options could be on any on-line activities or simply Web resources [8].

2.3 Adaptive Hypermedia Systems (AHS)
The presentation and navigation assistance of the systems are personalized according to users’ needs. Bhosale [9] stated that a user model is coined to the user requirements and a content model is utilized to represent the content. User can select the most appropriate content to be presented using a set of algorithms while interacting to the Adaptive Hypermedia System (AHS). To support, Brusilovsky [10] claimed that the AHS is an alternative to the traditional of “one-size-fits-all” and the preferences and needs of the users are taken into account throughout the process administered.

2.4 Recommendations for Teaching and Learning in Malaysian Context
In relation to the related literatures on the aspects of the Web, the CF, the ERS and the AHS, some big questions arise: Are these aspects fit into the Malaysian educational context? Are the teachers ready to implement these aspects in their teaching approach? Wheeler [11] argued that some aspects such as the users’ choice to accept or deny the use of Web 3.0; the teachers’ willingness to accept the technologies; the students’ readiness to be autonomous learners and mind setting towards 3.0 learning environment as well as the success and failure of Web 2.0, do need to be taken into consideration. Again, Wheeler [12] pointed at the pedagogical level saying that, Web Enhanced Learning (WEL) and other technologies are the indicators that have potential in enhancing approaches to transform the quality of learning. WEL enables students to participate directly, in control and be responsible towards their own learning processes. They are now more engaged deeply and actively with their learning using WEL tools collaboratively.

Malaysian educational system is exam-oriented. Teachers put much emphasis for their students to achieve highly in the national examinations that they often use the chalk and talk approach [13][14]. Textbooks and printed materials would be the main instructional media use since these are the materials which they consider sufficient to enable the students to perform with well. Malaysians need a fresh and new philosophy in their approach to exams. Nevertheless, the Malaysian Ministry of Education is shifting to new paradigm to ensure the school-based assessment is materialized in line with other countries like the United States, Britain, Germany, Japan and Finland [14].

Hence as a first step towards implementing CF for teaching in a 3.0 learning environment, it is better to have information about teachers’ perception on the matter. Teachers’ perception may portray the early readiness towards CF for teaching in 3.0 learning environment. Thus, the purpose of this preliminary study is to investigate the validity and reliability of the items which aim to measure the teachers’ readiness towards Web 3.0. The objectives of the study are: (i) to identify respondents’ perception and readiness to integrate CF in the learning process, (ii) to identify reliability of the CF instrument, (iii) to identify the person...
mapping and (iv) item mapping of CF instrument. In order to fulfil those objectives mentioned, Rasch Measurement Model was employed with the application of WINSTEPS to test the reliability of the instrument and subsequently examined its’ validity.

3 Research Methodology
The preliminary study is based on the conceptual framework illustrated (Fig 1). There are four aspects investigated in the study.

3.1 Conceptual Framework
The four aspects in the conceptual framework investigated in the study (Fig.1) are: (i) Web 3.0; (ii) Teacher context-awareness; (iii) Teacher cognition; (iv) Teacher social skills. The integrations of four learning theories and methods are defined in every section respectively namely: Minimalist Learning Theory (to study Web 3.0 technology), Collaborative Learning (to discover teacher social skills), Situated Learning Theory (to investigate the teacher context-awareness) and Multimodal Learning Theory (to study teacher cognition). The final goal of the study from all of the intersections is generated as “Collaborative Filtering” (supported by Recommender system and Hypermedia system) illustrated at the bottom of Figure 1.

3.2 Pilot Survey
The preliminary study is a survey conducted on 30 teachers from a local secondary school in Cyberjaya, Malaysia. The respondents were conveniently chosen and they anonymously completed a set of questionnaire. The sample size is ample and adequate in Rasch measurement model in providing 95% confidence level on the analysis and prediction of the data for the study administered [19-22]. The survey consisted of a 5-point Likert scale of 25 items and 5 short answers questions. The questionnaire consisted of two sections. Section A is for demographic profile of respondents and Section B is for the constructs surveyed. Section B was designed based on three constructs which are: (i) Context-awareness; perceptions and readiness of the respondents towards the use of Web 2.0 technologies, (ii) Multimodal learning skills; and (iii) Learning style. Those constructs carried 8 items respectively except for construct (iii) which carried 9 items followed by 5 items in short answers questions. These constructs were analyzed using WINSTEPS for Rasch Measurement Model.

4 Results & Discussions
The survey was done using a set of questionnaire consisting of 25 questions of 5-point Likert scaled responses and 5 short answers questions. In section A, responses were yielded from the demographics profiling of respondents’ experience in using Web 3.0 technologies. The demographics showed a non-relatively equal distribution of conveniently selected sample of 26 female respondents which was equivalent to 80 percent of the total 30 teachers involved in the survey; while the remainder consisted of male respondents. The gender of the respondents did not have significant impact on the findings gathered. Most of the respondents were aged from 21 to 40 years old (66.7%), while the remaining respondents were aged above 40 years old. For the Internet usage of the Web 2.0 technologies, thirteen of the respondents (43.3%) used the Internet daily. Nine of the respondents (30%) use it weekly while the rest, i.e. three of the respondents (10%) used it once in a while and five of them (16.7%) used it only when necessary. Section B, investigated on the perceptions and readiness of the teachers on the collaborative approach. From the findings, the respondents mutually agreed that active participation in group activities motivated them in collaborative teaching and learning environment. Respondents were also inquired on their usage and participation in the social networking sites, such as discussion boards, wikis, blog, podcast and others. Most of the respondents agreed to have been involved actively and considered themselves to have positive perception and readiness of the learning style with the Internet devices. Half of the respondents were
considered skilful in manoeuvring the Web technologies in their teaching experience. As for their future perception of learning with ubiquitous devices, the majority of the respondents strongly agreed (40%) and agreed (60%) to be involved and interested to learn the devices in the future. They implied that the collaborative approach with the Web technologies do have positive impact in their teaching and learning and capable to improve their assessment and sense of competiveness in education as well.

A bar chart illustrates the percentage of the respondents in their use of the collaborative approach in their teaching (Fig.2). It was found that there were nineteen respondents (64%) who agreed practicing the collaborative approach in their teaching. This is the highest degree of agreement in utilizing the method intended for the study. Four respondents (20%) strongly agreed to follow the same course. In contrast, there were six respondents (13%) who disagreed practicing the collaborative approach in their teaching and only one respondent strongly disagreed employing this approach. This was the lowest degree of disagreement towards practicing the collaborative approach in the teaching education.

As shown in Table 1, the findings revealed that the item reliability index was 0.75 with a separation index of 1.72. After discussion with experts, it was decided to be acceptable since this is a pilot part of the work. In relation, reliability of item can be interpreted on a 0 to 1 scale the same way as Cronbach’s alpha is interpreted [17][18]. The item reliability index indicated the replicability of item placements used in the study conducted if ever these same items were to be given to other respondents from purposive samplings that behave the same way. Thus, if the reliability of item shows high index measurement, it can be inferred that the items used in the study have generated a line of inquiry in which some of the items are considered more difficult and some of them are relatively easier. Hence, consistency of the inference is much to be expected in the findings from the study conducted [17].

Table 1: Summary Statistics and Item Reliability

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Fig. 3: Wright Person-Item

1 Respondents strongly disagreed to practice the collaborative approach in teaching.
2 Respondents disagreed to practice the collaborative approach in teaching.
3 Respondents agreed to practice the collaborative approach in teaching.
4 Respondents strongly agreed to practice the collaborative approach in teaching.

Figure 3 shows output analysis from WINSTEPS that illustrates the four levels of the agreement and disagreement of the respondents in the study. The presentation of the data shows both figures of the distribution of respondents along the logit scale on the right side and the sample of items on the left side. The relative distribution of the respondents...
who practiced collaborative teaching hanged considerably and can be detected between the logit scale of 0 and 1. In other words, nineteen of the respondents/teachers (64%) agreed to practice collaborative approach in their teaching. Four respondents were detected along logit scale 1 in which they strongly agreed to practice the collaborative approach in their teaching. Contrary to that, seven respondents were detected to hang along logit scale of 0 and -1 in which 6 of them disagreed and one strongly disagreed to practice the collaborative approach in their teaching respectively. Hence, it can be concluded that 23 out of 30 teachers in the pilot study conducted had given mutual agreement on the collaborative approach in their teaching and learning environment that contributed to their positive perceptions and readiness on the usage of Web 3.0 technologies of the ubiquitous devices in future.

Figure 4 illustrates the 25 items of the instrument used for collaborative approach in the study. Those respondents that practiced the highest degree of collaborative approach in their teaching were shown on the top left side of the item map that can be captured along the logit scale of 0 and 1.

6 Conclusion
The primary objective for this study was to increase the awareness of various Internet-based resources for educators/teachers. From the findings, it was possible to say that teachers perceived an increase in the awareness of such resources and showed positive perceptions of the pedagogical benefits of Web 3.0 technologies in teaching and learning. Yet, it was difficult to assert that this activity was more beneficial than others in accomplishing this goal.

Nevertheless, teachers, educators or any laymen who have interest in technology, need to be involved in the buzz of digital and education. It is high time to have rich conversation, conduct active teaching and learning research, but the collaborative intelligent filtering need to play as the significant role to ensure technology 3.0 won’t do any harm to the users. Through this, it is hoped that the Malaysian National Philosophy could be materialised. Thus, as teachers or educators progress, they need to discuss and scrutinise their own practices, and make explicit their pedagogies that can meet the current demands. Apart from that, with the reliability index of 0.75 found for the items measured, though it is adequate, it is strongly suggested for this questionnaire to be improvised in order to be used for more data of larger number of respondents for future study.

References:


