FROM AN ENGINEER GROUP TO A NURSE CORPORATION – A COMPARATIVE ANALYSIS FOR ONLINE COURSE CONDUCTING IN SMALL VS. LARGE CLASS

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Abstract— *One of the crucial issues for online teaching is the size of an online class. It is a common belief that an online teacher will probably face more difficulties and challenges in a larger size of an online class. However, it is also interesting and worthwhile to experiment the ultimate size of an online class and study the teaching effects for such a size. A research study has surveyed 3 sampled online courses, all conducted at Østfold University College. The survey analysis has focused on and sampled in their sizes, thus 15 and 17 vs. 66 students, and their student categories, thus, engineer vs. nurse students. The experiences from these sampled courses indicate that online teaching can be well applied for both small and large class size, also for both engineer and nurse students.*

Key words: Online teaching, class performance, data survey, comparative study and analysis.

SIZE DOES THE MATTER

The size of an online class is a crucial issue and needs to be disussed and addressed. Generally, it is reasonable to believe that the smaller size, the easier to teach, the better teaching effect. However, in some cases, a large size of an online class is needed due to cost saving and effectiveness requirement.

Among many of our university college's online courses, there was one course sampled for large online class. It was an intensive course for nurse practical training for total 66 students in one class. The course needed to be converted online because of cost saving and effectiveness requirement.

For converting course online into a such large class size, 3 major questions should be asked: How to teach a large online class? How is teaching effect for a such large online class? How different such a class would be compared with a small size online class?

In order to answer these 3 questions, the current study was designed to make a comparative analysis between two or three online courses, each with their own respective size. The current study has therefore sampled other two online courses, both are in small class sizes (15 and 17 students respectively), and both are semester based courses for engineering students. The major reason for converting of these two courses were not cost saving and effectiveness requirement, but an experiement for on campus students.

In fact, it could be a misconception to apply an online course merely for cost saving and effectiveness requirement. One can easily forget the other side of the case, that is, the resources and attention that an online teacher has to pay for online students.

Think about a traditional classroom situation, where you may have 100 students to listen your lecture in 45 minutes. You may only give them 5 minutes for their questions to your lecture, and probably as long as another 50-60 minutes for their further questions after lecture (if you are a heart teacher), but you are still in a good shape. On the other hand, think about online class situation, where you have 50 students, but they each can send you 1 question anytime of the day, even night or weekend. How would you manage to answer all these 50 questions is the great challenge.

It is therefore a common belief that an online teacher will probably face more difficulties and challenges in a large size of an online class. Our previous experience from online course conducting indicated the size should not exceed 20-30 students in one online class. Hence, it is interesting and worthwhile to experiement an online class with over 60 students.

Another challenge could be capasity for the courseware server. With so many users, especially when they were online synchronously, the courseware server has to handle large amount of data and its stability and reliability are also challenged.

ENGINEERING COURSES VS. NURSE COURSE

The intensive course for nurse practical training was named as HF-Nurse and it was conducted betweem February to April 2002. The courseware was LearningSpace and all students were recieved a 4-hours introduction course for LearningSpace, intensively right before the course starting. The students were supposed to group togather and accomplish their practice work and produce a number of reports for assisgnments. The lecture materials, questions, discussions and reports were placed in LearningSpace. There are additionally 12 assistant teachers to comment the reports and answer questions from students, online.

Correspondingly, two engineering online courses was sampled from innovation and product analysis, named as IR-Product, and marketing analysis and mangement, named as IR-Marketing. Both courses were conducted in the autumn

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semester 2001 and the courseware was also LearningSpace, and there was no specially arranged introduction course for the students. However, the students were offered to practice the courseware and question the technical issues in the lecture hours during the first 3 weeks, optionally, but face-to-face in the classroom. At the begining, many were unsecured about the courseware and wished to be lectured in a traditional classroom. But after 3 weeks, no one had fear for the courseware.

TABLE I
A SURVEY OF SAMPLED ENGINEERING COURSES VS. NURSE COURSE

Activity\Course	HF-Nurse	IR-Product	IR-Marketing
Duration	8 weeks	15 weeks	15 weeks
Active days	61	49	29
Active students	66	15	17
Total groups	11	4	5
Assistants	12	0	0
Discussions	273	60	22
Average person	4	4	1
Assignments	157	58	89
Average group	14	15	18
Average person	2	4	5
Group work	25	84	104
Average group	2	21	21

Table I shows a survey of sampled engineering courses vs. nurse course in details. A detailed description for each activity is listed below:

- Duration: The period of the course from begining to the end.
- Active days: Any day during the course duration where online activity is undertaking, however, it has to be an active online transaction or communication, for example, sending a document, or answer a question. Only reading the course content online is not an active day.
- Active students: These students have during the course duration performed at least once or more online activities, for example, sending a document or anwser a question, etc. Again, only reading the course content is not an active student.
- Total groups: All students from 3 sampled courses are devided into groups, with 3-5 persons in each group. The intention of grouping is teamwork for assignments.
- Assistants: HF-Nurse course has equiped 12 assistants in helping the online teacher to comment and answer the questions from students.
- Discussions: This is a parameter that can illustrate the course activity. Any question, chat, debate, or commments can be sent to the discussion room during the course. It can indicate how active the students would initiate questions, chat, or debate, online.
- Average person: Number of activities for each person, averagely during the course.
- Assignments: Number of activities related the to assignments, including the assignment documents.

- Average group: Number of activities for each group, averagely during the course.

WHICH ONE IS THE MOST ACTIVE ONLINE CLASS?

As other discussion issues, there is no fixed answer for this question, and it probably will be hard to identify the most active online class in reality. However, by analyzing the course activities and comparing activities among 3 sampled courses, it will be able to study a large size online class, like the class for HF-Nurse course, and how such a class works online.

By comparing active days for these 3 sampled courses, it is easy to observe the differences, that HF-Nurse course is the most active class in 61, against IR-Product in 49 and IR-marketing in 29. This is a good figure for indication, especially when HF-Nurse only had 8 weeks course duration. On the other hand, this figure could also be effected by large number of nurse students 66, against 15 and 17 engineering students.

Looking at group size for each course, it is almost the same size for all 3 courses. HF-Nurse has an average size of 6 students each group, while engineering students has either 3-4 for each group in IR-Product, or 4-5 for each group in IR-Marketing.

It is a huge advantge to engage assistants in helping the online teacher to conduct the online course. However, the challenge is coordinating, organizing and cooperating with online teacher.

Herhaps the engagement of assistants really speeded up the class activities. Reviewing discussion documents, it is easy to notice the fact that HF-Nurse had the leading number in 273, against IR-Product in 60 and IR-Marketing in 22. The potential was almost the same when comparing discussion documents in average person, thus, 4, 4, 1.

Assignments indicator is another aspect of online class activities. Similar as discussions, the large number, the better activities in the class, however, focusing on assignments related activities. For this indicator, HF-Nurse course still dominates the total number as 157 against IR-Product in 58 and IR-Marketing in 89. Their average group loading is also at the same level, as 14, 15 and 18. For average person, HF-Nurse seems to have less activities in 2, than IR-Product in 4 and IR-Marketing in 5. Nevertheless, this does not mean the lower activities with HF-Nurse, but it was rather casued by the fewer required assignments for HF-Nurse course since it was an intensive 8 weeks course.

Group work comparison indicates that HF-Nurse course had fewer documents, compared with engineering courses. It had only 25 documents against 84 for IR-Product and 104 for IR-marketing. For a large HF-Nurse class with 11 groups, there was only averagely 2 documents for each group, against 21 for each group in both engineering courses.

The statistical summary from table I has illustrated a certain activity level of 3 sampled online courses. As a result, it is difficult to identify the most active course against the least active one, because their numbers were cross over each other. However, by summarizing the total activities from table I, it is still reasonable to conclude that HF-Nurse course was not less active than these two engineering courses.

Furthermore, it is possible to survey the detailed level of online course activities in quantity of questions, comments, both in discussion category, or tasks in assignment category.

Questions and comments are the most important parameters indicating an online class's activity level. The more questions were asked, the more comments were made, the higher level of online class activity would be, and the better learning environment appears to be.

Tasks were identified as an important term for students to discuss during their online activities, and it shows how much students are engaged in assignment related discussions compared with general discussions in theories or other course content.

Table II illustrated the survey results for this detailed level of online activities.

TABLE II
A SURVEY OF 3 SAMPLED COURSES IN DETAILED LEVELS

Activity\Course	HF-Nurse	IR-Product	IR-Marketing
Duration	8 weeks	15 weeks	15 weeks
Active days	61	49	29
Active students	66	15	17
Total groups	11	4	5
Assistants	12	0	0
Questions	274	61	21
Average person	4	4	1
Comments	137	90	16
Average group	12	22	3
Average person	2	6	1
Tasks	116	51	111
Average group	10	12	22

As the results indicated from the table, HF-Nurse course had the most questions in 274 and comments in 137, against IR-Product course's questions in 60 and comments in 90, which was a quite good figure when they had so few as 15 students. IR-Marketing class seemed to be a silent working horse, with only 21 questions, 16 comments, but 111 tasks related terms. HF-Nurse class also picked up tasks term with their 116 frequences during the course period, which means they had many documents in this category.

By looking at the data from both tables, it is important to identify the activity levels and details among these 3 sampled online courses. However, most of activities and details (except group work activity) indicate HF-Nurse is no less active than other two engineering courses.

GROUP WORK COMPARISON OF COURSES

From tabel I, we could easily notice a fact that group work is the only indicator showing the significant weakness of HF-

Nurse course compared with engineering courses. Why? The possible reasons could be (a) some HF-Nurse groups did not work online; (b) they did not discuss frequently for work on assignments; (c) they had fewer required assignments than engineering student groups.

A closed look at HF-Nurse course's group work log in Figure 1 cofirmed the mentioned possibilities.

Etter gruppearbeid
 Fra/status Emne / oppgave
 < Gruppe 1 >
 < DISKUSJONER >
 AGN Med aansker en god praksis fra AGH (opprettet:12.02.2002)
 < Gruppe 2 >
 < DISKUSJONER >
 KSN Til gruppe 2 (opprettet:20.02.2002)
 < Gruppe 3 >
 < DISKUSJONER >
 KSN Til gruppe 3 (opprettet:20.02.2002)
 < Gruppe 4 >
 < DISKUSJONER >
 RON DISKUSJONER (opprettet:27.02.2002)
Modul 3 - 1. Refleksjonsnotat til medstudent (frist: 01.03.2002)
 Paagaar for <Gruppe 4> (frist: 18.03.2002)
 < Gruppe 7 >
 < DISKUSJONER >
 EAS EASsin "turnus" (opprettet:12.02.2002)
 EAS EASsin "turnus" (opprettet:12.02.2002)
 < Gruppe 8 >
 < DISKUSJONER >
 EAS EASsin "turnus" (opprettet:12.02.2002)
    - TURNUS FOR LINDA (av LDS den 05.03.2002)
 < Gruppe 9 >
 < DISKUSJONER >
 KSN refleksjonsnotat til gr. 9 (opprettet:01.03.2002)
 RDV Samtale om maalene (opprettet:11.02.2002)
    - Fra Sarpsborg (av HSD den 13.02.2002)
 RDV Til gruppe 9 (opprettet:19.02.2002)
 RDV Om refleksjonsnotat (opprettet:24.02.2002)
 RDV GRUPPE 9 (opprettet:05.03.2002)
 SSN Hvor er refleksjonsnotatet (opprettet:05.03.2002)
    -    Paa leting! (av RDV den 05.03.2002)
 < Gruppe 10 >
 < DISKUSJONER >
 ESK refleksjonsnotat til student (opprettet:22.02.2002)
 ESK refleksjonsnotat en gang til (opprettet:22.02.2002)
 RDV Gruppe 10 - Bytte av grupperom (opprettet:14.03.2002)
Modul 2 - Ukeplan
 Paagaar for <Gruppe 10> (opprettet: 25.02.2002)
 < Gruppe 11 >
Modul 3 - 2. Refleksjonsnotat til laarer (frist: 15.03.2002)
 Levert 08.04.2002 for <Gruppe 11> (frist: 08.04.2002)

FIGURE. 1
HF-NURSE COURSE'S GROUP WORK LOG (IN NORWEGIAN).

As we can notice from the group work log, not all 11 groups have been appeared in the log. Group 5 and group 6 were not represented in the log. The rest of groups also have great changes in their group work activities from one to another.

Group 1, 2, 3 had only one document from each, so they contributed the least number of group work documents. In total, they also might be cinsidered as least active groups in this aspect. Group 9 had totally 8 documents for this

category, so this group contributed the most number of group work documents, though many of them seemed to be "indirect" documents, as questions, answers and comments. In fact, these "indirect" documents are the vital part of online activities and they indicate a course's performance level.

Another remark should be mentioned here, is that HF-Nurse course used group work log as a free discussion panel, while IR-Product and IR-Marketing used this category as a systematical working panel for group assignments.

This difference can be illustrated through the Figure 2, IR-Product course's sampled group work log (in Norwegian). There were only two student groups "School Lab" and "Boat Motor", which were sampled (in order to save the space). The former was the least active one while the latter was the most active one.

```
Etter gruppearbeid
 Fra/status Emne / oppgave
< School Lab >
< DISKUSJONER >
 TCH  Maskinen kommer mandag 10.9 (opprettet:05.09.2001)
 Kapittel 4 - Naar referat fra faarste maatet innleveres (frist: 19.09.2001)
  Returnert for <School Lab> (frist: 18.09.2001)
 Kapittel 5 - Naar forprosjektrapporten innleveres. (frist: 26.09.2001)
  Returnert for <School Lab> (frist: 04.10.2001)
 Kapittel 5 - Naar statusrapporten 1 innleveres. (frist: 10.10.2001)
  Returnert for <School Lab> (frist: 09.10.2001)
 Kapittel 7 - Naar statusrapport 2 innleveres (frist: 24.10.2001)
  Returnert for <School Lab> (frist: 29.10.2001)
 Kapittel 8 - Naar andre produktet/prosjektet innleveres. (frist: 31.10.2001)
  Returnert for <School Lab> (frist: 07.11.2001)
 Kapittel 9 - Naar statusrapport 3 innleveres (frist: 07.11.2001)
  Returnert for <School Lab> (frist: 07.11.2001)
 Kapittel 10 - Naar ferdige analyserapporten innleveres. (frist: 14.11.2001)
  Returnert for <School Lab> (frist: 16.11.2001)
 Kapittel 10 - Naar etteranalyserapporten innleveres. (frist: 23.11.2001)
  Returnert for <School Lab> (frist: 23.11.2001)
……
< Boat Motor >
< DISKUSJONER >
 TCH  Boat-note1 (opprettet:20.09.2001)
 TCH  Spm. til case side 98 - Boat (opprettet:01.10.2001)
 TCH  Boat-ref4 (opprettet:09.10.2001)
 TCH  SPaaRSMaaL TIL KAPITTEL 7 (opprettet:26.10.2001)
 Kapittel 4 - Naar referat fra faarste maatet innleveres (frist: 19.09.2001)
  Returnert for <Boat Motor> (frist: 19.09.2001)
 Kapittel 5 - Naar forprosjektrapporten innleveres. (frist: 26.09.2001)
  Be om vurdering for <Boat Motor> (frist: 25.09.2001)
  Returnert for <Boat Motor> (frist: 26.09.2001)
 Kapittel 5 - Naar statusrapporten 1 innleveres. (frist: 10.10.2001)
  Returnert for <Boat Motor> (frist: 10.10.2001)
  Vurdert for <Boat Motor> (frist: 09.10.2001)
 Kapittel 6 - Naar produkt/prosjekt beskrivelse innleveres (frist: 17.10.2001)
  Returnert for <Boat Motor> (frist: 17.10.2001)
 Kapittel 7 - Naar statusrapport 2 innleveres (frist: 24.10.2001)
  Returnert for <Boat Motor> (frist: 22.10.2001)
 Kapittel 8 - Naar andre produktet/prosjektet innleveres. (frist: 31.10.2001)
  Returnert for <Boat Motor> (frist: 31.10.2001)
 Kapittel 9 - Naar statusrapport 3 innleveres (frist: 07.11.2001)
  Returnert for <Boat Motor> (frist: 06.11.2001)
 Kapittel 10 - Naar ferdige analyserapporten innleveres. (frist: 14.11.2001)
  Returnert for <Boat Motor> (frist: 15.11.2001)
 Kapittel 10 - Naar etteranalyserapporten innleveres. (frist: 23.11.2001)
  Returnert for <Boat Motor> (frist: 26.11.2001)
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  Vurdert for <Boat Motor> (frist: 21.11.2001)
```

FIGURE. 2
IR-PRODUCT COURSE'S GROUP WORKLOG (IN NORWEGIAN).

Nevertheless, it is easy to notice the fact that the difference between these two IR-Product groups is not so much in quantity, compared with HF-Nurse course. The group of "School Lab" had 17 documents while the group of "Boat Motor" had 25 documents. Both are well over HF-Nurse course in document numbers for each group.

```
Etter gruppearbeid
 Fra/status Emne / oppgave
< PC Club >
 Kapittel 3 - Planlegging og plandokumentet (frist: 07.09.2001)
  Returnert for <PC Club> (frist: 07.09.2001)
 Kapittel 6 - Innleveringsoppgave for uke37 (frist: 14.09.2001)
  Returnert for <PC Club> (frist: 17.09.2001)
 Kapittel 8 - Innleveringsoppgave for uke38 (frist: 21.09.2001)
  Returnert for <PC Club> (frist: 21.09.2001)
 Kapittel 9 - Innleveringsoppgave for uke39 (frist: 28.09.2001)
  Returnert for <PC Club> (frist: 27.09.2001)
 Kapittel 11 - Innleveringsoppgave for uke41 (frist: 12.10.2001)
  Returnert for <PC Club> (frist: 05.10.2001)
 Kapittel 12 - Innleveringsoppgave for uke42 (frist: 19.10.2001)
  Returnert for <PC Club> (frist: 19.10.2001)
 Kapittel 16 - Innleveringsoppgave for uke45 (frist: 09.11.2001)
  Returnert for <PC Club> (frist: 09.11.2001)
 Kapittel 17 - Innleveringsmappe eksamensbesvarelser (frist: 30.11.2001)
  Levert 30.11.2001 for <PC Club> (frist: 30.11.2001)
……
< Nature Product >
 < DISKUSJONER >
 TCH  Besvarelsen for kapittel6 (opprettet:19.09.2001)
 Kapittel 2 - Innleveringsoppgave for BCG-modellen (frist: 03.09.2001)
  Returnert for <Nature Product> (frist: 03.09.2001)
 Kapittel 3 - Planlegging og plandokumentet (frist: 07.09.2001)
  Returnert for <Nature Product> (frist: 06.09.2001)
 Kapittel 6 - Innleveringsoppgave for uke37 (frist: 14.09.2001)
  Returnert for <Nature Product> (frist: 13.09.2001)
 Kapittel 8 - Innleveringsoppgave for uke38 (frist: 21.09.2001)
  Returnert for <Nature Product> (frist: 21.09.2001)
 Kapittel 9 - Innleveringsoppgave for uke39 (frist: 28.09.2001)
  Returnert for <Nature Product> (frist: 27.09.2001)
 Kapittel 11 - Innleveringsoppgave for uke41 (frist: 12.10.2001)
  Paagaar for <Nature Product> (frist: 05.10.2001)
  Returnert for <Nature Product> (frist: 10.10.2001)
  Vurdert for <Nature Product> (frist: 09.10.2001)
 Kapittel 12 - Innleveringsoppgave for uke42 (frist: 19.10.2001)
  Returnert for <Nature Product> (frist: 19.10.2001)
 Kapittel 13 - Innleveringsoppgave for uke44 (frist: 26.10.2001)
 Kapittel 16 - Innleveringsoppgave for uke45 (frist: 09.11.2001)
  Returnert for <Nature Product> (frist: 09.11.2001)
 Kapittel 17 - Innleveringsmappe eksamensbesvarelser (frist: 30.11.2001)
  Levert 30.11.2001 for <Nature Product> (frist: 30.11.2001)
```

FIGURE. 3
IR-MARKETING COURSE'S GROUP WORKLOG (IN NORWEGIAN).

The corresponding illustration from IR-Markting course showed in Figure 3, was almost the same as its sibling engineering course, with only 2 of 5 student groups on display. The least active group of "PC Club" with 16, against the most active group of "Natural Product" with 21 documents. Again, there was not so much difference in

quantity between these IR-Marketing groups and they all did similar amount of group work.

Comparing Figure 1 with Figure 2 and 3, it is easy to observe the differences between them. The differences are, that Figure 2 and 3, representing two engineering courses are chapter based group work, while HF-Nurse group work was random based. This might also give the explanation for their differences in the measurement of group work.

For IR-Product class, group work was defined after each chapter. The students were required to accomplish group work after each chapter's lecture and they must send their group work with chapter's label, from chapter 4, 5, 6.....10. In a way, group work is a part of duty online assignments and rutine prosess. Correspondingly, IR-Marketing class students did the same prosedure, even from their chapter 2, 3, 4.....17. As a result, all IR-Marketing students had to work as a silent working horse, and they were not able to focus on other matter than their assignments.

Reviewing group work between engineering courses and nurse course, it seems to be noticeable difference in their ways of group work. As observed, HF-Nurse group work was random based, while engineering group work was more systematic and chapter based. One possible reason for the difference, is that HF-Nurse course operated for a large class, so it was more challenging to manage the whole class, especially for systematic group work. Think about sending an online message to 66 students, compared with the same message to 15 students, it is no doubt which group would most likely misunderstand the content and having the difficulty to bring to message into practice.

THE CHALLENGES OF A LARGE CLASS

Having a large class is a challenging task for many teachers. However, having a large online class will probably be even more challenges for an online teacher, especially when an online course is conducted asynchronously. Think about how stressful and demanding situation an online teacher would be experienced during an online course when students could be anywhere, and they can question an online teacher anytime.

It is therefore necessary to have assistants in helping the online teacher for this course. The experiences and feedback from the course conducting inidcated also the positive effect of having assistants for such a large class size.

There are few other challenges and remarks that could be mentioned, partly for such a large class and partly for nurse students' backgrounds:

- It was budgeting only one day after 4-hours introduction course for LearningSpace, before HF-Nurse course started. Thus, not enough time for online exercise, so many wish to having few more days in between for next course.
- It was bedgeting every two students for one PC during 4-hours introduction course for LearningSpace, which was manageable, but not comfortable for students, since

each student had to log in or out when the other one needs to visit his/her own profile in the course.

- The majority part of students did not have previous experience from online course, and most of them were not familiar with IT or internet technical issues. However, they did manage well their 4-hours introduction course for LearningSpace, and learned this courseware quickly.
- It was a great challenge and relatively huge loading for courseware's server when all students attempted to enter the courseroom online, especially druing their 4-hours introduction course for LearningSpace. The internet speed was sometimes slow, but still in functioning.
- It was imbalansed document and online traffic distribution, concentrated in few days with large amount of documents. Figure 4 illustrated this phenomenon in details. HF-Nurse course had totally 61 active course days, however, most of days had only minor traffic with less than 10 documents per day. There were only 16 active course days with more than 10 documents. From Figure 4, it is easy to observe that Thurday and Friday seem to be busy day for documents. With this information, an online teacher might be able to organize course activities or assistants in a way that work loading for everyone and internet traffic are well balanced and better distributed.

Etter dato
Emne / oppgave Opprettet av
......
12.04.2002 Fredag (36 dokumenter)
......
15.03.2002 Fredag (37 dokumenter)
14.03.2002 Torsdag (38 dokumenter)
13.03.2002 Onsdag (14 dokumenter)
......
11.03.2002 Mandag (20 dokumenter)
......
08.03.2002 Fredag (11 dokumenter)
07.03.2002 Torsdag (13 dokumenter)
06.03.2002 Onsdag (14 dokumenter)
05.03.2002 Tirsdag (29 dokumenter)
04.03.2002 Mandag (13 dokumenter)
......
01.03.2002 Fredag (45 dokumenter)
28.02.2002 Torsdag (10 dokumenter)
......
26.02.2002 Tirsdag (11 dokumenter)
......
22.02.2002 Fredag (13 dokumenter)
......
14.02.2002 Torsdag (13 dokumenter)

FIGURE. 4
HF-NURSE COURSE'S DAILY DOCUMENTS CONCENTRATION (OVER 10).

Generally, a large online class requires more time, resources, equipments and better organization to conduct. However, our experience from this large online class was the discipline should be the first.

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HF-Nurse course was conducted successfully, and the feedback and comments from nurse students were positive and encouraged. Reflecting the entire prosess, the course online teacher's discipline and firm decision were the key factor to the success.

At the course begining, the online teacher informed the nurse students that the course will be giving online and a 4-hours introduction course for LearningSpace will be giving for technical supports. As other two engineering online courses, there were quite few skeptical opinions and unwillingness, but after online conducting, no one was fear for this online arrangement.

A FINAL SUMMARY OF THE STUDY

The current study has sampled and compared 2 engineering online courses against 1 nurse online course, with class size from 15, 17 to 66 students. From the courses' statistics and data analysis, it is reasonable to conclude that online teaching can be well applied for small and large class. A large online class as HF-Nurse course had no less than small class IR-courses, in their online class performance statistics. However, it is necessary with helps of assistants for a large class though.

On the other hand, engineering online courses seemed to have more systematical group work, while HF-Nurse course online conducting seemed to be random based. It was still unclear whether this caused by the large class size, or by random organizing of their group work, through discussions. For engineering students, it was clearly systematical arrangement for group work. The positive effect is that they are working systematically, while the downside is that they had to focused only on this matter, due to work loading.

Having a large class online will be a new challenge and experience for many online teachers. As a summary of our own experiences and lessons from HF-Nurse course conducting, we suggest few advises and recommendations for large online class teachers, or for unexperienced new online students:

- It shall budget few more days, say, a week, between the introduction course for courseware and online course begining. Thus, the students shall have enough time for online exercise, and absorb what they learned from the introduction course before they can apply their online skills for the course.
- It shall bedget one PC for every student during their introduction course for courseware, so that each student will have their own access to the course room all the time during online training.
- It is not necessary for students to have previous online experience from their past, nor necessary for them to be familiar with IT or internet technical issues. However, they need either a short and intensive introduction course for courseware (as for HF-Nurse course) or continually supporting at the course begining (as for IR-courses).

- It is well possible that coursware is interrupted, due to huge loading to the server or heavy internet traffic. Be prepared for this and explain the reasons for students. Many new biginers do not have internet knowledge and they may easily blame courseware for any trouble.
- It shall allocate assistants or manpower properly to the period when heavy traffic and work loading are concentrated on. Say, if Thursday and Friday appear to be two havey days of the week for document traffic, so assistants shall focus on these two days and work intensively on these two days.
- For engineering courses, it seems to be too many required assignments to accomplish and this could harm their initiation and creativity for the online discussions. For further course conducting, it may be worthwhile to reduce their required assignments, say, down to 6-8 for the whole course period.

It is indeed a challenging task to converte online teaching from an engineering group to a nurse corporation. The class size becomes larger and it requires more time, resources, but mostly important, discipline to manage such an online class. The class cultures and working methods could also be very different from engineering to nurse students. They surely may contribute each other in learning style, and togather, they may enrich the online learning environment, as engineering students could learn to engage in online discussions, while nurse students could learn to work systematically.