

Invited lectures



TIME FOR CREATING NEW ARENAS FOR ERGONOMICS

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Abstract

An important mission of International Ergonomics Association (IEA) is to promote ergonomics on the global scale. Regional needs for ergonomics are increasingly diverse. There are emerging technologies such as artificial intelligence and advanced imaging technologies which are expected to induce new kinds of human-system interactions. Group of eight (G8) recognizes that well-being is an important economic index. ISO has published a new standard which encourages company executives to better acknowledge ergonomics. These are examples of emerging trends which motivate IEA to implement specific promoting actions.



ERGONOMICS AND ERGONOMISTS IN EUROPE: DISCIPLINARY APPROACHES AND JOB PRACTICES

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Abstract

In this communication, the issue is dealt on the development factors of Ergonomics discipline and Ergonomist job practice. Europe area is used as a benchmark framework in order to highlight the determining of the situation in different European countries.

In first part, historical details, FEES' mission and activities will be presented. Then, some few numbers will be reported in order to give an overview on discipline and job development from National Societies' data. Moreover, some qualitative data will be used to complete this analysis, based on contextual situation from some countries.

Second part will be focused on differences which could be noticed in approaches' definition and business dissemination.

Finally, we'll propose a draft answer regarding the development ways and the compromise to make between academics and professional practices requirement.



THE INSPIRATION OF “SMALL IS BEAUTIFUL”: APPROPRIATE ERGONOMICS FOR LOCAL PEOPLE

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Abstract

Written by E. F. Schumacher, “Small is Beautiful: Economics as if people mattered” has been an influential bestseller for years since its first publish in 1973. Although economics is the focus of the book, it argued that “appropriateness” is more important than “size”, therefore, the “appropriate technology” with a human face is emphasized. With similar concept, if “economics” is replaced by “ergonomics” in the argument, inspiration from the book will be obvious. Therefore, it should be highlighted that appropriate ergonomics should be the ones that best fit local needs. This talk will elaborate on this point and encourage professional ergonomists to apply ergonomics solutions based on local needs and local resources.



REMOTE STUDENT PERFORMANCE ASSESSMENT USING A NOVEL SMART-PHONE APPLICATION

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Abstract

The ability to monitor the clinical proficiencies of students who are preparing to enter a healthcare profession is important in assuring that each student will be able to carry out their future professional functions successfully. A new smart-phone application (app) was tested to determine if the proficiency levels of nursing students carrying out a standardized seasonal influenza immunization protocol could be documented accurately. The student performance was evaluated by four instructors independently where each instructor used a standardized competency checklist. The study demonstrated that the remote evaluation of clinical nursing student proficiencies could be accomplished quickly and accurately using the new smart-phone application.

Keywords: smart-phone application, store-and-forward telehealth, remote proficiency assessment

1. INTRODUCTION

Evaluating student performance accurately is an important component in maintaining quality control within clinical educational settings. However, clinical training often occurs at off-campus sites located at some distance from the main university campus. This can make it difficult for instructors to meet with and supervise their students on a regular basis and in a consistent manner. To assist educators in interacting with their students more easily at a distance, a new smart-phone telehealth application [1,2,3] was evaluated to determine whether such a technology could be used to support clinical instructors in their supervisory capacity. The study included student volunteers who were asked to execute a standardized seasonal influenza immunization protocol. The activities were then reviewed and scored by four instructors independently using a standardized competency checklist.

2. METHODS AND PROCEDURES

Four 2-person teams of nursing students volunteered to demonstrate their proficiency in performing a standardized influenza vaccination protocol. The steps required in performing the vaccination protocol are listed in Table 1. All necessary materials and supplies needed to carry out the vaccinations were provided prior to the start of the activities. The smart-phone was positioned in the room so that all activities could be viewed clearly at all times. The positioning of the I-Pad is illustrated in Fig 1. After

completion of the demonstrations, the videos were up-loaded onto a secure server reviewed independently by four clinical nursing instructors. The screen view presented to the instructors is illustrated in Fig 2. The scores assigned by each of the four instructors were automatically tabulated and summarized. The functional flow schematic for this process is illustrated in Fig. 3.

Table 1: Competency activities for the standardized vaccination protocol

Step #	Protocol Description
1	o Check vaccine consent form and verify contraindications or precautions for immunization
2	o Wash hands and / or use waterless gel appropriately
3	o Position patient and located anatomic landmarks specific to an Intra-Muscular injection
4	o Prepare the skin site with alcohol pad using a circular motion
5	o Control the limb with the non-dominant hand; hold the needle 1" from the skin; insert the needle quickly
6	o Dispose needle and syringe in the appropriate container
7	o Encourage comfort measure after procedure
8	o Provide information to patient about potential adverse reaction to vaccination
9	o Complete encounter by asking if there were any questions



Figure 1: Illustration of nursing students demonstrating the standardized vaccination protocol. The I-Pad was positioned so that all activity could be observed at all times



Figure 2: Illustration of computer screen presented to the clinical instructors. The video clip for each student team could be reviewed as often as desired. When a correct protocol step was identified, the video clip was “tagged” and the activity matched to an evaluation item listed on the right side of the screen

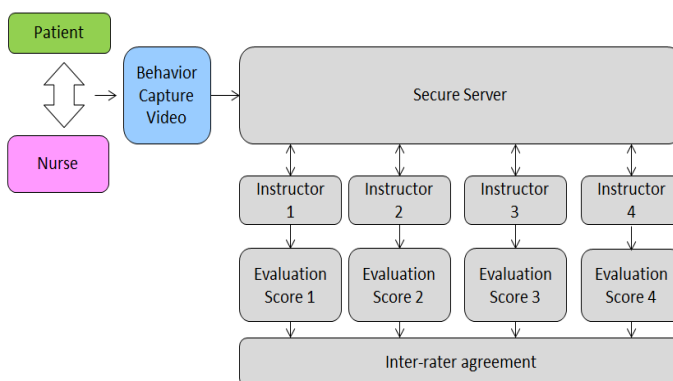


Figure 3: Functional flow chart illustrating the influenza vaccination protocol carried out by the nursing students and the subsequent independent evaluation by four clinical instructors

3. RESULTS

All nursing student teams completed the simulated vaccination protocol in a timely manner. Their activities were recorded using the behavior imaging video application and subsequently uploaded onto the secure telehealth server platform. Four instructors reviewed the student activities independently of each other. Each of the 9 tasks was recorded as a pass (+) or a fail (-) score.

- o Team #1. Table 2 summarizes the scores given to Team 1 by each of the four instructors. Protocol steps 1, 2, 3, 4, 7 and 9 were rated by all four instructors as passing (+). Steps 6 and 8 were rated by three instructors as passing (+) while task #5 was rated by only one instructor as passing (+).

- o Team #2. Table 3 summarizes the scores given to Team 2 by each of the four instructors. Protocol steps 1, 2, 4, 6, 7 and 8 were rated by all four instructors as passing (+) while Tasks 3, 5, and 9 were rated passing (+) by two instructors.
- o Team #3. Table 4 summarizes the scores given to Team 3 by each of the four instructors. Protocol steps 1, 2, 3, 4, 7 and 9 were rated by all four instructors as passing (+) while steps 6 and 8 were rated passing by three instructors. Step 5 was rated as passing by only one instructor.
- o Team #4. Table 5 summarizes the scores given to Team 4 by each of the four instructors. Protocol steps 1, 2, 4, 6, 7 and 8 were rated by all four instructors as passing (+) while steps 3, 5, and 9 were rated passing by only 2 instructors.

Table 2: Summary of evaluation scores issued to the four teams by the four instructors

Student Team #1

Item #	Competency	Rater 1	Rater 2	Rater 3	Rater 4	Inter-Rater Agreement (%)
1	Checks vaccine consent form and verifies contraindications	+	+	+	+	100
2	Washes hands appropriately / or uses gel appropriately	o	o	o	o	100
3	Positions patient and locates anatomic landmarks	o	o	o	o	100
4	Preps the site with alcohol pad using circular motion	+	+	+	+	100
5	Controls limb with the non-dominant hand and inserts needle at appropriate angle	+	+	o	+	75
6	Disposes needle and syringe in a sharps container	+	+	+	+	100
7	Encourages comfort measures after the procedure	+	+	+	+	100
8	Provides information on adverse reactions and appropriate follow-up measures	+	+	+	+	100
9	Completes encounter by asking if there are any questions	+	+	+	+	100
Overall Inter-Rater Agreement						97.2%

Student Team #2

Item #	Competency	Rater 1	Rater 2	Rater 3	Rater 4	Inter-Rater Agreement (%)
1	Checks vaccine consent form and verifies contraindications	+	+	+	+	100
2	Washes hands appropriately / or uses gel appropriately	+	+	+	+	100
3	Positions patient and locates anatomic landmarks	o	o	o	+	75
4	Preps the site with alcohol pad using circular motion	+	+	+	+	100
5	Controls limb with the non-dominant hand and inserts needle at appropriate angle	+	+	o	o	50
6	Disposes needle and syringe in a sharps container	+	+	+	+	100
7	Encourages comfort measures after the procedure	+	+	+	+	100
8	Provides information on adverse reactions and appropriate follow-up measures	+	+	+	+	100
9	Completes encounter by asking if there are any questions	o	+	o	+	50
Overall Inter-Rater Agreement						86.1%

Student Team #3

Item #	Competency	Rater 1	Rater 2	Rater 3	Rater 4	Inter-Rater Agreement (%)
1	Checks vaccine consent form and verifies contraindications	+	+	+	+	100
2	Washes hands appropriately / or uses gel appropriately	+	+	+	+	100
3	Positions patient and locates anatomic landmarks	+	+	+	+	100
4	Preps the site with alcohol pad using circular motion	+	+	+	+	100
5	Controls limb with the non-dominant hand and inserts needle at appropriate angle	+	o	o	+	50
6	Disposes needle and syringe in a sharps container	o	+	+	+	75
7	Encourages comfort measures after the procedure	o	o	o	o	100
8	Provides information on adverse reactions and appropriate follow-up measures	+	o	+	+	75
9	Completes encounter by asking if there are any questions	+	+	+	+	100
Overall Inter-Rater Agreement						80.5%

Student Team #4

Item #	Competency	Rater 1	Rater 2	Rater 3	Rater 4	Inter-Rater Agreement (%)
1	Checks vaccine consent form and verifies contraindications	+	+	+	+	100
2	Washes hands appropriately / or uses gel appropriately	+	+	+	+	100
3	Positions patient and locates anatomic landmarks	+	o	o	+	50
4	Preps the site with alcohol pad using circular motion	+	+	+	+	100
5	Controls limb with the non-dominant hand and inserts needle at appropriate angle	+	o	o	+	50
6	Disposes needle and syringe in a sharps container	+	+	+	+	100
7	Encourages comfort measures after the procedure	o	o	o	o	100
8	Provides information on adverse reactions and appropriate follow-up measures	+	+	+	+	100
9	Completes encounter by asking if there are any questions	o	+	o	+	50
Overall Inter-Rater Agreement						83.3%

4. ANALYSIS

The study showed that each of the nine required vaccination protocol steps could be identified by the instructors reviewing the video-clips. Although all of the instructors were experienced nursing educators, there was substantial disagreement among the instructors in terms of their evaluation of the four student nursing teams. This is illustrated by the inter-rater agreement values seen for each of the teams. The inter-rater agreement value for Team #1 was 97.2%, for Team #2 it was 86.1%, for Team #3 it was 80.5% and for Team #4 it was 83.3%. These results suggest that an instructor training component should be included before the technology is used in the field. A standardized training video clip would allow the instructors to view video evaluation skills in advance and this could improve instructor inter-rater agreement. In general, however, the study showed that the remote evaluation of clinical nursing proficiencies using the new smart-phone app can be accomplished quickly and relatively accurately. It seems reasonable that this technology could also help increase student-teacher interactions and potentially lead to improved learning outcomes.

5. CONCLUSIONS

The simulation exercise performed by the four student nursing teams showed that the performance of clinical skills could be evaluated objectively using the new behavior capture app technology. The outcomes indicate that the new app may be able to serve as a teaching tool by providing students with visual documentation of their own performance within clinical settings. The results also infer that rater training can strengthened through training and easily monitored through app use.

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