



ISSN Print: 2394-7500  
 ISSN Online: 2394-5869  
 Impact Factor: 5.2  
 IJAR 2019; 5(10): 145-148  
 www.allresearchjournal.com  
 Received: 01-08-2019  
 Accepted: 03-09-2019

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## Continual improvement of the peer mentoring program in the marine engineering department

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### Abstract

Peer mentoring has been practiced generally to guide or assist mentees and make learning manageable. A mentor could be somebody that could inspire, motivate or encourage mentees. In the Marine Engineering Department of the University of Cebu-Maritime Education and Training Center (UC-METC), peer mentoring has been implemented to ensure that competencies required under Standards of Training, Certification and Watch keeping for Seafarers '78 (STCW '78) as amended are acquired by the students. These competencies under STCW '78 are required by the International Maritime Organization (IMO). Peer mentors are volunteer students. They are trained on how to conduct the exercises in the Kongsberg engine room simulator and several relevant equipment in the machine shop including the Ikegai auxiliary engine before they were allowed to mentor other students. They must have a half day vacant time from Monday to Saturday in order to qualify because a regular mentoring schedule is a half-day session open from Monday to Saturday. All qualified volunteer mentors are required to log 40 hours of training in the full-mission engine room simulator and other relevant facilities before they are allowed to mentor. Students enrolled in the review class are required to go through all the scenarios or activities in the "simulators" with the guidance or help of the mentors. In line with the continual improvement requirement of the quality management system of UC-METC, it is the purpose of this study to evaluate the program and to recommend for improvement. The study used a questionnaire adopted from the established and documented Student Mentor Observation Sheet (Document code: SFM-DNS-028-00) and was given to selected engine cadets. The output of the study is the recommendation for improvement of the performance of the mentors, including the scheduling of mentoring and the sustainability of the program.

**Keywords:** Student mentoring, volunteerism, STCW '78

### 1. Introduction

It has been believed that mentoring was first mentioned in Homer's epic poem *The Odyssey* and the first mentor was a friend and adviser of Telemachus, the son of Odysseus. According to Garvey *et al.* (2018) <sup>[5]</sup>, some of the current understanding of mentoring can be traced back to the 8<sup>th</sup> century writing of Fenelon (1651-1715), a French Roman Catholic. These understanding include: mentoring support and help to remove the "fear of failure" by building confidence (Ellinger *et al.*, 2005 <sup>[3]</sup>; Megginson *et al.*, 2006 <sup>[10]</sup>), mentoring involves experiential learning (Kellar *et al.*, 1995 <sup>[8]</sup>; Salimbene *et al.*, 2005 <sup>[14]</sup>) and a mentor is inspirational (Nankivell and Shoolbred, 1997 <sup>[11]</sup>; Vermaak and Weggeman, 1999 <sup>[15]</sup>).

On the other hand, there are also some mentoring models, according to Garvey *et al.* (2018) <sup>[5]</sup>, that are based from the writing of Louis Antonine Caraccioli (1719-1803) in titled *Le veritable mentor ou L'education de la noblesse* in 1759. The following are: has self-knowledged leading to the enhanced knowledge of others (Byrne, 2005 <sup>[2]</sup>; Nelson and Quick, 1985 <sup>[12]</sup>), draws on experiences (keller *et al.*, 1995 <sup>[8]</sup>; Salimbene *et al.*, 2005 <sup>[14]</sup>) and helps to direct attention and assists in making decisions (Brunner, 1998 <sup>[1]</sup>; Pegg, 1999 <sup>[13]</sup>).

In Vygotsky's Zone of Proximal Development (ZPD) as cited in McLeod (2010) <sup>[9]</sup>, the mentor is the adult guiding the learner or the more capable peer, while in the Scaffolding of Wood *et al.*, as cited in McLeod (2010) <sup>[9]</sup>, the mentor is the one that encourages or motivates the mentee in maintaining the mentee's interest in the task, making the task simpler and the one that demonstrate the task.

Huybrecht *et al.* (2010) <sup>[6]</sup> in their study "Mentoring in nursing education: Perceived characteristics of mentors and the consequences of mentorship", had quoted Jordan (2005) <sup>[7]</sup>

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in defining mentoring as “giving support, assistance and guidance in learning new skills, adopting new behaviors and acquiring new attitudes”

The University of Cebu-Maritime Education and Training Center (UC-METC) has been audited by the European Maritime Safety Agency (EMSA) several times since 2006. On this note, the top management has been doing its best in ensuring that the requirements of the International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978 (STCW '78) are complied with. These competencies under STCW '78 are required by the International Maritime Organization (IMO). It is in this context that peer mentoring has been

implemented as one of the methods employed in ensuring that competencies are acquired by the students.

In the Bachelor of Science in Marine Engineering Department, the peer mentoring is implemented in the engine room simulator, main and auxiliary engines (Daihatsu and Ekigai), Electro-Pneumatic laboratory, Hydraulic laboratory and machine shop to ensure that competencies required under Table A-III/1, Specification of minimum standard of competence for officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room, are acquired.



**Fig 1:** Volunteer mentor in the auxiliary engine



**Fig 2:** Volunteer mentor conducting familiarization session

The specific competencies under Table A-III/1 of function 1, under “Marine engineering at the operational level” are: (a) Maintain a safe engineering watch, (b) Operate main and auxiliary machinery and associated control systems, (c) Operate, electrical, electronic and control system, and (d) Maintenance and repair of shipboard machinery and equipment. All mentees were required to perform all the four (4) competencies. They were assessed by the mentors and were given a mark of “Competent” when they performed the task correctly. Debriefing was also conducted after they have completed the tasks.

The students who qualified as volunteer peer mentors have a half day vacant time from Monday to Saturday because the regular mentoring schedule is a half-day session that is open from Monday to Saturday. They are required to log 40 hours of training before they are allowed to mentor and they mentor all students who are enrolled in review class at their own convenient schedule. This mentoring program was also

implemented to ensure full utilization of the equipment of the department.

## 2. Materials and methodology

This evaluation was first conducted for purposes of complying with the requirement of the department’s quality management system, particularly the compliance to ISO (9001) reference clause # 8.2.1 Customer satisfaction and reference clause # 8.5.1 continual improvement. With the permission from the campus director and approval from the quality director, it was developed into a full blown action research to determine the degree of satisfaction of the mentees with the performance of the mentors and to evaluate the program for improvements and sustainability.

The study used a questionnaire adopted from the established and documented Student Mentor Observation Sheet (Document code: SFM-DNS-028-00) and was given to selected engine cadets. The instrument has 3 categories: 1. General Knowledge, 2. Command and Control items and the 3. Overall performance and feedback on the scheduling. Descriptive survey method is used to analyze the data.

## 3. Target area

The study was conducted at the University of Cebu-Maritime Education and Training Center (UC-METC) in Alumnos, Mambaling, Cebu City, Philippines. It is a maritime campus that offers both the marine engineering and marine transportation program and it has a total population of 8,112 when this study was conducted. Specifically the study has looked into the peer mentoring program of the Marine Engineering department. Selected mentees were asked to fill-up the Student Mentor Observation Sheet, a documented evaluation instrument.

## 4. Results

**Table 1:** Satisfactory rating of the mentors' general knowledge skills. N=131

2	General Knowledge	Not Satisfactory	Satisfactory	Very Satisfactory	Excellent
2.1	Mentor's knowledge and understanding of the subjects needed to be applied in the exercises.	6 (4.58%)	28 (21.37%)	43 (32.82%)	54 (41.22%)
2.2	Mentor's familiarity of the instruments needed for the exercise.	5 (3.82%)	30 (22.9%)	35 (26.72%)	61 (46.56%)
2.3	Mentor's knowledge to operate the instruments used during the exercise.	4 (3.05%)	34 (26.00%)	40 (30.53%)	53 (40.45%)
2.4	Mentor's ability to explain the main purpose and functions of the equipment in Navigation in relation to the competence required in the STCW 2010 amendment.	7 (5.34%)	21 (16.03%)	41 (31.30%)	62 (47.33%)
2.5	Mentor's ability to explain the scenario and all the necessary information related to the exercise.	8 (6.11%)	26 (19.85%)	38 (29.01%)	59 (45.04%)
	Average Rating	6 (4.58%)	27.8 (21.22%)	39.4 (30.08%)	57.8 (44.12%)

Table 1 shows the satisfaction rating of the mentors' general knowledge skills as evaluated by the respondents. In all five items, the Mentors are rated Excellent as the highest, with an average rating of 44.12%, second highest rating is Very

Satisfactory, with an average rating of 30.08%, third Satisfactory, with an average rating of 21.22% and the last, Not Satisfactory, with the smallest average rating of 4.58%.

**Table 2:** Satisfactory rating of the mentors' command and control skills. N=131

3	Command and Control	Not Satisfactory	Satisfactory	Very Satisfactory	Excellent
3.1	Mentor's management of the group assigned to him/her.	6 (4.58%)	30 (22.90%)	36 (27.48%)	59 (45.04%)
3.2	Mentor's ability to correctly respond to questions asked by the mentees.	11 (8.39%)	25 (19.08%)	42 (32.06%)	53 (40.46%)
3.3	Mentor's ability to conduct briefing based on the exercise sheet provided and explain the intended outcome of the exercise.	3 (2.29%)	23 (17.56%)	45 (34.35%)	60 (45.80%)
3.4	Mentor's ability to familiarize the mentees to the instruments and equipment needed to perform the exercise.	5 (3.82%)	21 (16.03%)	41 (31.30%)	64 (48.85%)
3.5	Mentor's ability to give final instructions before running the exercise.	7 (5.34%)	30 (22.90%)	36 (27.48%)	58 (44.27%)
3.6	Mentor's ability to monitor each group member's performance of his/her assigned tasks based on the monitoring checklist.	10 (7.63%)	27 (20.61%)	39 (29.77%)	55 (41.98%)
3.7	Mentor's ability to facilitate debriefing after the exercise by engaging the members to express their own experience on the exercise.	8 (6.11%)	28 (21.37%)	33 (25.19%)	62 (47.33%)
3.8	Mentor's ability to check whether intended outcome of the exercise has been achieved or not.	6 (4.58%)	22 (16.79%)	42 (32.06%)	61 (46.56%)
	Average Rating	7 (5.34%)	25.75 (19.66%)	39.25 (29.96%)	59 (45.04%)

Table 2 shows the satisfaction rating of the mentors' command and control skills as evaluated by the respondents. In all eight items, the Mentors are rated Excellent as the highest, with an average rating of 45.04%, second highest

rating is Very Satisfactory, with an average rating of 29.96%, third Satisfactory, with an average rating of 19.66% and the last, Not Satisfactory, with the smallest average rating of 5.34%.

**Table 3:** Satisfactory rating of the mentoring schedule and overall mentors' performance. N=131

		Not Satisfactory	Satisfactory	Very Satisfactory	Excellent
3.9	Overall mentor's performance	5 (3.82%)	28 (21.37%)	32 (24.43%)	66 (50.38%)
3.10	Scheduling of student mentoring	3 (2.29%)	25 (19.08%)	36 (27.48%)	67 (51.15%)

Table 3 shows the satisfaction rating of the overall performance of the mentors and mentoring schedule as evaluated by the respondents. Just like the results in table 1 and table 2, the mentors' overall performance is rated Excellent as the highest, with 50.38%, second highest rating is Very Satisfactory, with 24.43%, third Satisfactory, with 21.37% and the last, Not Satisfactory, with 3.82%. With regards to the mentoring schedule, 51.15% of the mentees have rated it as Excellent, 27.48% of the mentees have rated it as Very satisfactory, 19.08% of the mentees have rated it as Satisfactory and 2.29% of the mentees have rated it as not satisfactory.

## 5. Analysis and discussion

Based from the data collected, the pattern of the ratings in all items in the instrument is the same. "Excellent" is the

highest, second highest is "Very satisfactory", third is "Satisfactory" and the last is "Not satisfactory". This result is an indication that the mentees are satisfied with the performance of the mentors and could also be interpreted as a good performance of the mentors.

In the General knowledge area, the three (3) items that got the highest rating for excellent are; "Mentor's ability to explain the main purpose and functions of the equipment in Navigation in relation to the competence required in the STCW 2010 amendment" (47.33%), followed by the "Mentor's familiarity of the instruments needed for the exercise" (46.56%) and "Mentor's ability to explain the scenario and all the necessary information related to the exercise" (45.04%). The mentors' highest rating in these three items showed their mastery on these specific areas. On the other hand, the item that got the lowest rating of

excellent is the “Mentor's knowledge to operate the instruments used during the exercise” (40.45%) This lowest rating among the items rated as excellent, is an indicator of the limitations of the mentors. Although, normally this is not considered as negative, but for purposes of continual improvement, this indicates an area for improvement. This means that the mentors have a limited knowledge on how to operate the instruments or equipment. It is in this case where the faculty mentor should come in to enhance the mentors knowledge.

In the Command and Control area, the three (3) items that got the highest rating for excellent are “Mentor's ability to familiarize the mentees to the instruments and equipment needed to perform the exercise” (48.85%), followed by “Mentor's ability to facilitate debriefing after the exercise by engaging the members to express their own experience on the exercise” (47.33%), and “Mentor's ability to check whether intended outcome of the exercise has been achieved or not” (46.56%). On the other hand, the item that got the lowest rating for excellent is the “Mentor's ability to correctly respond to questions asked by the mentees” (40.46%). Among the items rated as excellent, this is one got the lowest. Normally this should not be considered as negative but for purposes of continual improvement this is the area where the faculty mentors need to come in for the improvement of the mentors.

## 6. Conclusions

The mentees have rated their peer mentors as Excellent in all items or areas of the instrument. This means that the mentees are very much satisfied with the performance of their mentors. Because of this, it can be concluded that the mentors' 40 hours training before they are allowed to mentor had really helped them prepare to become mentors. Furthermore, another area of the evaluation is the “Excellent” rating of the mentees regarding the system of scheduling. It means that they are very much satisfied with the way the scheduling is being implemented.

## 7. Recommendations

Based from the result and conclusions, it is recommended that all existing requirements should be continued before any student be accepted as peer mentors and allowed to mentor including the existing scheduling system. But for continual improvement purposes and sustainability of the program, the following should be considered.

1. On the area where the mentors got the lowest rating for excellent, the faculty mentor should consider enhancing or training further the mentors on these areas;
2. On the instrument, the Student Mentor Observation Sheet, it should be further improved. One item in the command and control area, item 3.1 is not directly related to mentoring and an open item should be added for the suggestions and recommendations of the mentees;
3. A post training evaluation instrument should be formulated to be given to all mentees every after the exercise for regular continual improvement; and
4. To ensure that competencies are really acquired by the mentees, a competency based assessment needs to be formulated.
5. On the area of sustainability of the program, a regular evaluation should be conducted.

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