

Pedagogical Content Knowledge and Instructional Skills of Faculty Members in a selected Medical College

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Abstract: This study aimed to investigate the Pedagogical Content Knowledge and Instructional Skills of faculty members in a selected medical college. The respondents were 59 faculty members and 314 medical students. The data were gathered through two (2) researcher-made questionnaires culled from different literatures. The survey questionnaire underwent validation, pilot testing, and reliability testing. This study showed that academic rank was significantly related with the faculty members' PCK. On the other hand, no significant relationship was seen on sex, years of teaching experience, year level taught, and highest educational attainment. With regard to the respondents' instructional skills, sex, years of teaching experience, year level taught, rank, and highest educational attainment had no significant relationship. Similarly, there was no significant difference noted on the faculty members' instructional skills when grouped according to profile. It was likewise noted that as the faculty members' PCK increased so did their instructional skills. Furthermore, significant difference was observed between the faculty members' assessment of their PCK and the students' assessment of the respondents' PCK in the subcomponent of subject matter knowledge and knowledge of pedagogy. Similarly, significant difference was noted on the respondents' assessment of their instructional skills and the students' assessment of the respondents' use of critical thinking skills as instructional skills in the subcomponents of analysis, explanation, evaluation, and induction. The findings of this study suggests that there is a need on the part of the faculty members of the College of Medicine to do their best to meet the expectations of the students in as much as their performance is concerned.

Keywords: Pedagogical Content Knowledge, Instructional Skills, Faculty members, Medical College

1. INTRODUCTION

Teaching as a core professional activity occurs at all stages of the doctors' medical career path from formal classroom-based learning at the undergraduate level to informal training in the clinical environment. It is recognized as a core professional activity (Bartle, 2014) and the role of doctors as teachers have evolved throughout the years.

With the changing attitudes and expectations of the society on the role and performance of doctors

and as the demands for delivery of healthcare system changes, there is also a significant implication with the way medical students are taught. As a result, doctors constantly must develop new clinical skills, get and implement integrated medical curricula with constant emphasis on self-directed learning that later need to be taught to medical students. However, despite the stringent preparation of medical doctors as clinicians and experts in the subject matter, the training on effective teaching skills is lacking (George, 2006).

The effectiveness of doctors as medical teachers was studied and fair level of satisfaction was seen among students with regard to medical teachers' attitude to teaching such as appropriateness of design and preparation in relation to students' level, behavior to persons other than patients, linkage of topic to other disciplines, use of training aids,

provision of handouts, and involvement of students in the teaching process (Virk, Bhalwar, & Kapila, 1999).

Hence, aside from knowledge of subject matter like board certified teachers, doctors in the academe are expected to have proficient knowledge on how to motivate the learner, assess competence, and give constructive feedback. There is an international and growing focus on the command of content required for successful teaching. However, beyond the relevance of strong content knowledge, teachers also require a solid foundation in pedagogical content knowledge (Olfos, Goldrine, & Estrella, 2014). A good teaching of best quality will be delivered when there is deep understanding of different theories that influence learning (Ahmed, 2018).

Despite the predictive power of teacher knowledge, more recent research emphasizes the distinction between the knowledge a teacher may possess and the application of knowledge that becomes relevant in practice (Sanatagata, 2018). This is especially true with respect to teachers' instructional skills to apply knowledge for teaching a domain in the classroom (Jeschke, 2019). Instructional Skills are the most specific instructional behaviors, and these include such techniques as questioning, discussing, direction -giving, explaining, and demonstrating. Such skills are geared towards nurturing of the rational thinkers.

Critical thinking has become an important process in education. It enables students to engage in purposeful, and self-regulatory judgment (Horenstein & Niu, 2011). In the 21st century, students must think their way through abstract

problems, work in teams, distinguish good information from bad, and be multilingual and globally/ environmentally sensitive so that they can be more effective in their disciplines. These are the same characteristics expected of today's medical students to enable them to face undefined medical circumstances and to take effective clinical decisions (Zayapragassarazan, 2016). Facione (2015) believes that critical thinking is some kind of judging and meaningful activity and it consists of interpretation, analysis, evaluation, explaining and explanation, self-regulation, and induction.

Teachers are one of the most important school-based resources in determining students' future academic success and lifetime outcomes. Hence, to enhance student learning, there should be a strong emphasis on improving teacher effectiveness (Burroughs, 2019).

2. RESEARCH QUESTIONS

The study aimed to determine the Pedagogical Content Knowledge and Instructional skills of faculty members in a selected Medical College.

It specifically sought to answer the following research questions:

1. What is the demographic profile of the faculty as to gender, year level of students taught, academic rank, years of teaching experience and highest educational attainment?

2. What is the distribution of the faculty according to their Pedagogical Content Knowledge (PCK) and instructional skills?

3. What is the association between demographic profile and PCK of faculty?

4. What is the association between demographic profile and instructional skills of faculty?

5. What is the relationship between PCK and Instructional skills among faculty?

6. What is the comparison of the PCK between faculty and students?

7. What is the comparison of the instructional skills between faculty and students?

3. SCOPE AND LIMITATION OF THE STUDY

This study determined the pedagogical content knowledge specifically, subject matter knowledge, knowledge of pedagogy, and knowledge of students' conception and instructional skills specifically the core critical thinking skills, namely: interpretation; analysis; evaluation; explanation; self-regulation; and induction among faculty members in a selected medical college. The

study was done from January – February 2020. Included in the criteria were all teaching faculty members handling 1st, 2nd or 3rd year medical students, regardless of their teaching experience or years as lecturers. Excluded were non-teaching faculty members, faculty who had not given a lecture during the study period and those who did not give consent or participate in the data gathering. Student participants were all 1st to 3rd year medical students who were asked to assess the Pedagogical Content Knowledge and Instructional Skills of faculty members.

4. METHODOLOGY

Research Design

A quantitative descriptive, descriptive-comparative and descriptive correlational design was utilized for this research in order to investigate the pedagogical content knowledge and instructional skills among faculty members in a selected Medical College.

The Sample and Sampling Technique

The study utilized purposive and quota sampling. All teaching faculty members regardless of age, years of teaching experience, academic rank and highest medical attainment as long as they are involved in the teaching of 1st to 3rd year medical students were asked to participate in the study. The faculty members were evaluated by a determined number of students depending on which year level they frequently teach. All 117 teaching faculty members and 376 first to third year students were asked to participate in the study.

Data Gathering Procedure

The data gathering instrument to assess the pedagogical content knowledge and instructional skills among the faculty members was made by the researcher based from several related literature and was validated prior to conduct of research. Upon approval of the Bioethics Committee, and the Dean of the Medical College, the researcher personally distributed the questionnaire to the consented faculty members and students.

Statistical Treatment of Data

Upon the completion of the data and tabulation, statistical treatment followed. To analyze and interpret the result of the study, the researcher used both descriptive and inferential statistical tools. Descriptive statistics employed frequencies and mean scores. Frequency of respondents belonging to a certain profile category and frequency of respondents giving the same rating was determined. Percentage, Weighted Mean, Chi Square, Pearson Product-Moment Correlation, Independent T test, and ANOVA were the statistical tools used in this study.

Rating Scale Used in the Study

The questionnaire was answered by the respondents (faculty and students) using numbers 1 - 4. Each number had the following verbal interpretation:

4- Always (76-100%; applied/observed in all teacher student encounter)

3-Often (51-75%; commonly applied /observed during student teacher encounter)

2- Sometimes (26-50%; applied/ observed in a few of the student's teacher encounter)

1- Never (0%; not applied/ seen in any student teacher encounter)

5. RESULTS AND INTERPRETATION OF DATA

Table 1. Demographic profile of the respondents

	Frequency (n=59)	Percentage
Sex		
Male	19	32.2
Female	40	67.8
Years Teaching		
1 - 5	14	23.7
6 - 10	13	22.0
11 - 15	5	8.5
16 - 20	10	16.9
21 - 25	7	11.9
26 - 30	7	11.9
>30	3	5.1
Mean = SD = 14.78 ± 9.96		
Rank		
Assistant Professor 1	24	40.6
Assistant Professor 2	5	8.5
Assistant Professor 3	9	15.3
Associate Professor 1	4	6.8
Associate Professor 2	9	15.3
Associate Professor 3	7	11.9
Professor	1	1.7
Year Level		
1 st year	14	23.7
2 nd year	18	30.5
3 rd year	27	45.8
Educational Attainment		
Doctor of Medicine	54	91.5
Masteral Units	9	15.3
Masters Graduate	8	13.6
Doctoral Units	6	10.2
PhD	2	3.4

This table shows the demographic profile of the respondents. A total of 59 faculty respondents were included in the study. The findings of this study showed that there are more female teaching in the College of Medicine. This finding was supported by local statistics. According to the Commission on Higher Education (CHED) 2019 census, female gender predominates the teaching profession on higher education faculty by sex and institution type (CHED Database, 2019).

Fourteen percent (14%) or 24 respondents have been teaching for 1-5years, this finding indicates that new faculty members dominate the list of teachers in the College of Medicine. With regard to faculty ranking, most of the respondents have a rank of Assistant Professor 1 because this is the entry level for the College of Medicine. To be promoted to another level a faculty needs to submit certificates of attendance to workshops, seminars, or conventions. CHED Memorandum 2016 also says that at least one recently published research paper as principal author in a peer reviewed, scientific journal is required for promotion across ranks. A great number of faculty members

are aspiring for a higher academic degree pursuant to the requirement of the Commission on Higher Education. However, majority of faculty respondents have not taken masteral or doctoral courses.

Table 2. Distribution of faculty according to their Pedagogical Content Knowledge and Instructional Skills

	Frequency (n=59)	Percentage
A. Subject Matter Knowledge		
I. Comprehensive knowledge of the topic		
4 - Always	56	94.9
3 - Often	3	5.1
2 - Sometimes	0	0
1 - Never	0	0
II. Class Preparation and Management		
4 - Always	54	91.5
3 - Often	5	8.5
2 - Sometimes	0	0
1 - Never	0	0
III. Student Teacher Communication		
4 - Always	54	91.5
3 - Often	5	8.5
2 - Sometimes	0	0
1 - Never	0	0
B. Knowledge of Pedagogy (Teaching Strategies)		
4 - Always	51	86.4
3 - Often	7	11.9
2 - Sometimes	1	1.7
1 - Never	0	0
C. Knowledge of Student Conception (Classroom Strategy)		
4 - Always	48	81.4
3 - Often	9	15.3
2 - Sometimes	2	3.4
1 - Never	0	0
Over-all Pedagogical Content Knowledge		
4 - Always	52	88.1
3 - Often	7	11.9
2 - Sometimes	0	0
1 - Never	0	0
Over-all Instructional Skills		
4 - Always	48	81.4
3 - Often	10	16.9
2 - Sometimes	1	1.7
1 - Never	0	0

This table shows that most if not all faculty members always apply the components of the Pedagogical Content Knowledge namely subject matter knowledge, knowledge of pedagogy and knowledge of students conception in their teacher-student interaction . Similar results were observed with the application of instructional skills specifically interpretation, analysis, explanation, evaluation, induction and self-regulation.

Table 3. Association between the Demographic profiles and Pedagogical Content Knowledge of Faculty

PROFILE & Pedagogical Content Knowledge	Tabular Chi-square Value	Degree of Freedom	Computed Chi-square Value	Decision	Interpretation
Sex	3.84	1	2.26	H ₀ Accepted	Not Significant
Year Teaching	12.59	4	7.93	H ₀ Accepted	Not Significant
Rank	12.59	4	12.65	H ₀ Rejected H ₁ Accepted	Significant Association
Year Level	5.99	2	5.46	H ₀ Accepted	Not Significant
Educational Attainment	9.49	4	5.67	H ₀ Accepted	Not Significant

This table shows the association between the demographic profiles and pedagogical content knowledge of the faculty. Using F-test at 0.05 level, the results showed that there was significant difference noted in the pedagogical

content knowledge according to rank. Results imply that lower pedagogical content knowledge score was noted among faculty with the lowest and highest rank. Rank showed significant effect on the faculty members' PCK especially the lowest and highest rank faculty members. The results of this study may be attributed to teacher burn out. Teacher burn out is not only seen in senior faculty members but also among beginning faculty members.

Similar results were seen in the study of Jamaludin and You (2019) regarding Burnout in relation to gender, teaching experience, and educational level among educators. In their study, educators are emotionally exhausted and experience reduced personal accomplishment levels with high levels of depersonalization. Both genders regardless of years of experience with Bachelor, Master, and PhD degrees demonstrated high levels of emotional exhaustion. The educators who are troubled by depersonalization are mainly bachelor degree holders with less than 5 years of experience. This indicates that these educators had negative attitudes towards the people they are working with including students and parents. This may be attributed to their lack of working experience. Nevertheless, female educators with master's degrees and 6 to 10 years of experience were highly affected by reduced personal accomplishment levels. The lack of fulfillment felt by these educators can lead to weak performance in class.

On the other hand, sex, years teaching and educational attainment were not significantly associated with pedagogical content knowledge.

Table 4. Association Between the Demographic Profiles and Instructional Skills of Faculty

PROFILE & Instructional Skills	Tabular Chi-square Value	Degree of Freedom	Computed Chi-square Value	Decision	Interpretation
Sex	3.99	2	0.53	H ₀ Accepted	Non Significant
Year Teaching	21.03	12	11.34	H ₀ Accepted	Non Significant
Rank	21.03	12	11.37	H ₀ Accepted	Non Significant
Year Level	9.49	4	4.38	H ₀ Accepted	Non Significant
Educational Attainment	15.31	8	8.91	H ₀ Accepted	Non Significant

Table 4 shows the association between the demographic profiles and instructional skills of faculty. Using chi-square at 0.05 level of significance, the results showed that there was no significant associations noted as shown by the acceptance of all the H₀. Results imply that none of the demographic profiles affects instructional skills of faculty.

The relationship between the Pedagogical content knowledge and Instructional skills of the faculty members were likewise determined.

Table 5. Relationship between Pedagogical Content Knowledge and Instructional Skills among Faculty

	Tabular Pearson Value	Degree of Freedom	Computed Pearson Value	Decision	Interpretation
A. Subject Matter Knowledge					
I. Comprehensive knowledge of the topic	0.258	57	0.485	H ₀ Rejected H _a Accepted	Significant Relationship
II. Class Preparation and Management	0.258	57	0.548	H ₀ Rejected H _a Accepted	Significant Relationship
III. Student Teacher Communication	0.258	57	0.273	H ₀ Rejected H _a Accepted	Significant Relationship
B. Knowledge of Pedagogy (Teaching Strategies)					
	0.258	57	0.342	H ₀ Rejected H _a Accepted	Significant Relationship
C. Knowledge of Student Conception (Classroom Strategy)					
	0.258	57	0.632	H ₀ Rejected H _a Accepted	Significant Relationship
Over-all Pedagogical Content Knowledge	0.258	57	0.542	H ₀ Rejected H _a Accepted	Significant Relationship

Results from this table demonstrated that using Pearson Correlation Analysis at 0.05 level, significant relationships were noted between faculty members PCK and Instructional skills. A direct relationship were noted in all components which means that as pedagogical content knowledge increases, the instructional skills of faculty also increases and vice versa.

The findings of this study were similar to the study of Creasy, Whipp, and Jackson (2017). In their study, teachers who evidenced PCK through the delivery of effective instructions, frequent corrective feedback and structured opportunities to practice facilitated student attainment of more intricate and higher-level outcomes. These teachers were also able to provide students with opportunities to maximize learning outcomes.

When teachers are able to apply the components of pedagogical content knowledge their instructional skills follow.

Table 6. Comparison of the PCK between faculty and students

	Tabular T-test Value	Degree of Freedom	Computed T-test Value	Decision	Interpretation
A. Subject Matter Knowledge					
I. Comprehensive knowledge of the topic	1.97	371	2.88	H ₀ Rejected H _a Accepted	Significant Difference
II. Class Preparation and Management	1.97	371	2.69	H ₀ Rejected H _a Accepted	Significant Difference
III. Student Teacher Communication	1.97	371	3.64	H ₀ Rejected H _a Accepted	Significant Difference
B. Knowledge of Pedagogy (Teaching Strategies)					
	1.97	371	2.05	H ₀ Rejected H _a Accepted	Significant Difference
C. Knowledge of Student Conception (Classroom Strategy)					
	1.97	371	1.54	H ₀ Accepted	Non Significant
Over-all Pedagogical Content Knowledge	1.97	371	2.13	H ₀ Rejected H _a Accepted	Significant Difference

Table 6 shows the comparison of the pedagogical content knowledge between faculty and students. Using T-test at 0.05 level, the results showed that there was significant differences noted in the comparison of the pedagogical content knowledge except for knowledge of student conception. For all comparisons, the responses of faculty were significantly higher than students.

The students were likewise asked to assessed the instructional skills of the faculty members.

Table 7. Comparison of Instructional Skills between faculty and students

	Tabular T-test Value	Degree of Freedom	Computed T-test Value	Decision	Interpretation
I. Interpretation	1.97	371	1.83	H ₀ Accepted	Not Significant
II. Analysis	1.97	371	2.82	H ₀ Rejected H _a Accepted	Significant Difference
III. Explanation	1.97	371	2.84	H ₀ Rejected H _a Accepted	Significant Difference
IV. Evaluation	1.97	371	2.88	H ₀ Rejected H _a Accepted	Significant Difference
V. Induction	1.97	371	3.87	H ₀ Rejected H _a Accepted	Significant Difference
VI. Self Regulation	1.97	371	-1.34	H ₀ Accepted	Not Significant
Over-all Instructional Skills	1.97	371	2.83	H ₀ Rejected H _a Accepted	Significant Difference

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As to students assessment of the faculty members instructional skills, this table shows that using T-test at 0.05 level, the results showed that there was significant differences noted in the comparison of the evaluation by the faculty and student specifically analysis, explanation, evaluation, and induction. For all comparisons, the responses of faculty were significantly higher than students. On the other hand, there was no significant difference noted in the comparison of the evaluation of faculty and students of the instructional skills specifically interpretation and self-regulation.

6. CONCLUSION AND RECOMMENDATIONS

Assessment of Pedagogical Content Knowledge and Instructional Skills among faculty respondents significantly differs from that of the students. Based on the findings obtained, there is a need on the part of the faculty members of the College of Medicine to do their best to meet the expectations of the students in as much as their performance is concerned. Therefore, it is necessary that a program be designed to develop the faculty members' pedagogical content knowledge in the College of Medicine.