

Effectiveness of an Industry Information Technology Professional in Teaching Senior High School Computer-Related Subjects

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Abstract

Alongside the implementation of the K – 12 program is the ever-fast-changing advancement in the field of information technology. The said advancements greatly affect the quality of education and as well as the effectiveness of the teacher in teaching computer-related subjects in the two added years of senior high school. Since, industry professionals were allowed to teach in the senior high school for as long as s/he has a masteral degree with or without the professional teacher license, the study aims to determine the effectiveness of an industry information technology professional in teaching computer-related subjects in the senior high school in terms of the learners' academic performance.

Keywords: K to 12 Curriculum, IT Professional, Education

1. Introduction

The K-12 Program is an education system under the Department of Education that was implemented in the country last 2013 during the time of former President Benigno “Noynoy” Aquino III. The K – 12 program covers Kindergarten and twelve years of basic education: six years of primary education, four years of Junior High School, and two years of Senior High School. The said program intends to enhance learners' basic skills, produce more competent citizens, and prepare graduates for lifelong learning and employment. It is believed that when competence is contextualized and viewed holistically, and the subsequent training program is based on the complex reality of the particular workplace, all the professional skills of teachers are required to design effective learning strategies.[1]

2. Method

Research Design

The design of this study is descriptive. The study will use mixed-methods approach combining qualitative and quantitative data to provide a comprehensive understanding.

Participants

The study will involve senior high school students taking computer-related subjects taught by both industry professionals and traditionally qualified teachers in one High School in Bacolod City.

Sampling

Random sampling will be employed to classes and students to ensure a representative sample.

Data Collection

Qualitative Data

- Pre- and post-assessment scores of students.
- Surveys to measure students' perceptions of the effectiveness of industry professionals. See Figure 1.1 and 1.2

Sample Survey Questionnaire

Survey Questions:

1. Grade Level:
 - Grade 11
 - Grade 12
2. How would you rate your overall satisfaction with the computer-related subjects you have taken?
 - Very Satisfied
 - Satisfied
 - Neutral
 - Dissatisfied
 - Very Dissatisfied
3. Please rate the effectiveness of the teaching methods used by your current computer-related subjects teacher.
 - Very Effective
 - Effective
 - Neutral
 - Ineffective
 - Very Ineffective
4. To what extent do you feel the integration of real-world industry experiences enhances your understanding of computer-related subjects?
 - Strongly Enhances
 - Enhances
 - Neutral
 - Does not Enhance
5. How would you describe the level of interaction and engagement in your computer-related subjects class?
 - Very High
 - High
 - Moderate
 - Low
 - Very Low

Figure 1.1

6. Rate your academic performance in computer-related subjects compared to other subjects.
 - Much Better
 - Better
 - About the Same
 - Worse
 - Much Worse
7. How would you assess the effectiveness of assessments in measuring your understanding of computer-related subjects?
 - Very Effective
 - Effective
 - Neutral
 - Ineffective
 - Very Ineffective
8. How comfortable are you providing feedback on your teacher's performance?
 - Very Comfortable
 - Comfortable
 - Neutral
 - Uncomfortable
 - Very Uncomfortable
9. Do you feel that your teacher seeks feedback from students for continuous improvement?
 - Yes
 - No
 - Unsure
10. In your opinion, do you think having an industry information technology professional as a teacher positively impacts your learning experience compared to teachers without industry experience?
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree

Figure 1.2

Quantitative Data

- Interviews with industry professionals and traditionally qualified teachers. See figure 2
- Classroom observations to understand teaching methodologies.

Sample Interview Questions

- Interview Questions:**
- Background Information:**
1. Can you tell me about your experience as an industry information technology professional?
 2. What motivated you to transition into teaching computer-related subjects in senior high school?
 3. How do you stay updated with the latest trends and developments in the field of information technology?
- Teaching Methodologies:**
4. Can you describe your typical approach to teaching computer-related subjects?
 5. How do you integrate real-world industry experiences into your teaching methods?
 6. What challenges have you encountered in adapting industry knowledge to the classroom setting?
- Interaction with Students:**
7. How do you foster interaction and engagement in the classroom?
 8. Can you provide examples of successful student-teacher interactions that contributed to the learning process?
 9. How do you address diverse learning styles among students?
- Academic Performance:**
10. How do you assess the academic performance of your students?
 11. In your opinion, what factors contribute to the academic success of students in computer-related subjects?
- Feedback and Improvement:**
12. How do you gather feedback from students about your teaching effectiveness?
 13. How do you seek feedback and evaluation from school administration and colleagues?
 14. In what ways do you continuously improve your teaching methods?
- Comparative Analysis:**
15. Have you ever worked alongside traditionally qualified teachers in the same subject area? If so, how do you perceive the differences in teaching approaches?
 16. How do you think your industry background influences the learning experiences of students compared to teachers without industry experience?

Figure 2

Participants

The study will involve senior high school students taking computer-related subjects taught by both industry information technology professionals and traditionally qualified teachers in Bacolod City.

3. Results and Discussion

The result of the study shows that industry information technology professionals teaching computer related subjects in senior high school has an advantage in terms of acquired skills needed, experiences in the specialized field and the effectiveness in teaching and achieving the competencies of the K - 12 curriculum.

Quantitative Results

The quantitative analysis shows the students' academic performance in computer-related subjects taught by industry professionals and traditionally qualified teachers. A pre- and post-assessment scores was statistically analyzed using t-tests and ANOVA to identify any significant differences between the two

groups. Students' perceptions were quantitatively analyzed to identify patterns in attitudes towards the effectiveness of industry professionals.

Student	Group 1 Industry Professionals (Scores)	Group 2 Traditionally Qualified Teachers (Scores)	Student	Group 1 Industry Professionals (Scores)	Group 2 Traditionally Qualified Teachers (Scores)
1	90	80	26	86	83
2	88	77	27	88	89
3	86	90	28	89	90
4	92	85	29	90	91
5	93	82	30	81	81
6	87	83	31	87	83
7	91	81	32	90	84
8	95	80	33	95	84
9	87	79	34	91	85
10	84	84	35	89	89
11	86	88	36	94	89
12	91	86	37	93	86
13	90	79	38	91	87
14	90	80	39	88	84
15	89	88	40	85	85
16	89	84	41	93	85
17	90	85	42	91	85
18	88	85	43	91	86
19	83	87	44	88	89
20	86	89	45	85	87
21	88	84	46	80	82
22	89	85	47	85	85
23	94	92	48	89	80
24	91	81	49	87	86
25	91	83	50	88	83

Figure 1. Scores of students taught by industry professionals and traditionally qualified teachers.

T-Test Results

I. Hypotheses:

H0: $\mu_1 - \mu_2 = 0$

H1: $\mu_1 - \mu_2 \neq 0$

II. Calculate Test Statistics:

Using the two-sample t-test formula, calculate t .

Mean Group 1 (\bar{X}_1) = 88.18, Mean Group 2 (\bar{X}_2) = 84.88

Standard Deviation Group 1 (S_1) = 3.51, Standard Deviation Group 2 (S_2) = 3.07

$$t = \frac{(\bar{X}_1 - \bar{X}_2)}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

$$t \approx \frac{(88.18 - 84.88)}{\sqrt{\frac{3.51^2}{30} + \frac{3.07^2}{30}}} \approx 2.05$$

III. Determining Degrees of Freedom:

Degrees of freedom (df) is $50+50-2=9$.

IV. Determining Critical Value or P-Value:

At a significance level of 0.05, the critical two-tailed t-value is approximately ± 1.984 .

V. Decision and Conclusion

The calculated t is greater than the critical value ($2.35 > 1.984$) or the p-value is less than 0.05.

Conclusion: Reject the null hypothesis.

There is a statistically significant difference in mean scores between students taught by industry professionals and traditionally qualified teachers.

ANOVA Results

I. Hypotheses:

$H_0: \mu_1 - \mu_2 = 0$

$H_1: \mu_1 - \mu_2 \neq 0$

II. Calculate Test Statistics:

Using the ANOVA formula, calculate

$F = MSW / MSB$

Where:

MSB (Mean Square Between) is calculated based on the variability between groups.

MSW (Mean Square Within) is calculated based on the variability within groups.

III. Determining Degrees of Freedom:

$df_B = 1$ (number of groups - 1)

$df_W = 98$ (total number of observations - number of groups)

IV. Determining Critical Value or P-Value:

At a significance level of 0.05, the critical F-value with

$df_B = 1$ and $df_W = 98$ is approximately 3.96 (from the F-distribution table).

V. Decision and Conclusion

The calculated F-statistic is greater than the critical value (or the p-value is less than 0.05).

Conclusion: Reject the null hypothesis.

There is a statistically significant difference in mean scores between students taught by industry professionals and traditionally qualified teachers.

Qualitative Results

Qualitative data collected through interviews with industry professionals' teachers and traditionally qualified teachers were thematically analyzed. The results identified the teaching methodologies, challenges faced, and the impact of real-world industry experiences on teachers' effectiveness in teaching senior high school computer-related subjects.

The quantitative and qualitative findings were integrated to provide a holistic understanding of the effectiveness of industry information technology professionals in teaching senior high school computer-related subjects. Comparative analysis was conducted to identify any correlations between teaching methodologies, industry experience integration, and academic performance.

4. Conclusion

With the implementation of the K - 12 Curriculum of the Department of Education, teacher shortages have encouraged initiatives to tailor training programs to meet the demand in both past, current, and future contexts. Thus, hiring teachers from non-traditional groups or industry professionals as a source of potential educators has been one of the best solutions. Since there are developments that have explored online and other forms of distance education, problem-solving methodologies and increased site-based learning opportunities.[2]

5. Recommendations

In conclusion, the study aims to contribute insights into the effectiveness of an industry information technology professionals in teaching senior high school computer-related subjects. The results of this research will help improve the Department of Education's educational policies, guide the hiring process of qualified professionals, and enhance the quality of computer education in the context of the K-12 program.

6. References

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