Integration of ICT in the Instructional Management of Senior High School in the Division of Valencia City, Region X, Philippines

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Abstract:

This research investigates the integration of Information and Communication Technology (ICT) in instructional management at Valencia Colleges Inc. - Senior High School (VCI-SHS) in Valencia City. Through a quantitative descriptive research design, data were collected from a target group of 25 teachers representing various disciplines. The study aimed to assess the availability and utilization of ICT resources, involvement of learners in ICT-based activities, challenges faced by teachers, and alternative resources employed in the absence of required ICT tools. Findings reveal a robust foundation of essential ICT resources, with 100% availability of computers, laptops, internet access, educational software, and more. While interactive whiteboards and video conferencing tools show strong adoption, opportunities for further enhancement, particularly in internet access, are identified. Teachers demonstrate positive trends in ICT use, with a balanced approach to involving learners in interactive and participatory learning experiences. However, significant challenges hinder effective ICT integration, including digital inequality, limited access to technology, infrastructure issues, and budgetary constraints. Teachers rely on alternative resources such as printed materials, whiteboards, and peer collaboration to compensate for the absence of ICT tools, showcasing adaptability and a dynamic pedagogical approach. This study provides valuable insights into the current state of ICT integration at VCI-SHS, identifying areas for improvement and emphasizing the adaptability of teachers in navigating challenges. Recommendations are proposed to enhance professional development, infrastructure, curriculum alignment, learner-centric approaches, and collaborative learning platforms, offering a strategic guide for advancing ICT integration efforts at VCI-SHS.

Keywords: Integration of ICT, Instructional Management, Senior High School

Introduction

One of the objectives of the Department of Education is to incorporate Information and Communication Technology (ICT) into educational institutions, with the purpose of equipping learners for the upcoming economy that relies on knowledge. Although the government, business sectors, NGOs, and individuals have contributed ICT infrastructure and offered training opportunities for teachers at Valencia Colleges Inc. in the Municipality of Valencia City, there is a delay in the utilization of ICT for educational purposes. Learners sometimes exhibit reluctance towards assignments that necessitate the utilization of the internet. Therefore, the researchers intend to examine the level of integration of ICT in the school, by identifying the resources that are already accessible, how teachers are using them, the difficulties they encounter, and providing suggestions for improved integration and alternative approaches.

Information Communication Technology (ICT) refers to electronic items that digitally store, retrieve, alter, transmit, or receive information. This includes digital television, computers, email, modems, and the internet. This study defines ICT in education as the utilization of digital resources in every facet of the instructional and learning process. In contemporary culture, where technology exerts control over various facets of life, proficiency in ICT is indispensable. In order to cultivate learners who possess a strong understanding of information and communication technology and are capable of effectively navigating the technology-driven landscape of the 21st century, it is imperative that ICT education is seamlessly incorporated into the curriculum.

Utilizing ICT tools, particularly computers and the internet, in the classroom enhances learners' readiness for the workplace and the worldwide job market. Academics contend that the integration of Information and Communication Technology (ICT) in education enables learners to navigate the digital age proficiently, in contrast to traditional teaching approaches that fail to fully equip learners with the necessary technological skills demanded by the job market. Institutions purporting to equip learners for the current era must integrate emerging technologies into their instructional methods.

Yelland (2001) and Grimus (2000), among other scholars, highlight the significance of ICT in improving learners' performance, increasing their knowledge, minimizing in-person teaching, and establishing a learning environment that enables teachers to support learners with unique requirements. ICT implementation is anticipated to inspire learners and foster a favorable disposition towards the learning process. There is a global push to incorporate ICT (Information and Communication Technology) in education. However, UNESCO's (2000) evaluation

categorizes nations according to their level of ICT development without providing details about their accomplishments or addressing any concerns.

This study aims to assess the utilization of ICT technologies in the instructional management in terms of teaching and learning process at Valencia Colleges Inc. - Senior High School in Valencia City. The purpose is to educate teachers on the significance of integrating ICT, offer details about accessible resources, enhance learner performance, foster learning motivation, and underscore the necessity for teachers to integrate ICT into their instructional approaches. The study also has advantages for educational training institutes, emphasizing the importance of preparing teachers to proficiently utilize ICT in the process of teaching and learning.

1. 1 Research Questions

1. What are the available ICT resources used in instructional management in terms of teaching and learning process?

2. To what extent do teachers use ICT resources in the teaching and learning process?

3. To what extent do teachers involve learners in the use of ICT resources in the teaching and learning process?

4. What are the challenges encountered by teachers in the school in the integration of ICT in teaching and learning process?

5. What alternative resources do teachers use in the absence of required ICT resources?

1.2 Delimitations of the Study

This study only investigated the extent to which teachers were using ICT in the teaching and learning process and ascertained the ICT tools available at Valencia Colleges Inc. - Senior High School in the Municipality of Valencia City, Bukidnon..

1.3 Limitations of the Study

This study was limited to only at Valencia Colleges Inc. - Senior High School in the Municipality of Valencia City, Bukidnon. The other senior high schools in the municipality were not included in this study due the limited time available to the researcher to complete the work.

Methodology

3.1 Research Design

The research methodology employed in this study was quantitative descriptive research. The choice of a quantitative descriptive research strategy was suitable for this study since it aimed to gather factual information and uncover the truth. Utilizing this approach allows for the accurate depiction of events in real-time (Neuman, 2000).

The objective of this study is to ascertain the proficiency of teachers in computer skills and knowledge, as well as their level of integration of information and communication technology (ICT) in the classroom for teaching and learning purposes.

The studied populations comprise the entire teaching staff at Valencia Colleges Inc. - Senior High School located in the Municipality of Valencia City, Bukidnon.

3.2 Participants

The study included a target group of 25 teachers who teach various disciplines at the school.

A cohort of 25 teachers with diverse academic backgrounds were chosen for the study. The chosen sample size was both practical and achievable for the investigation. When determining the sample size, it is important to ensure that it remains manageable (Mugenda & Mugenda, 1991). This would enable the researchers to obtain comprehensive data at a cost that is feasible in terms of finances, time, and human resources.

3.3 Instruments

During the course of this study, a self-designed questionnaire was used to facilitate data collection. The questionnaire underwent comprehensive assessments for both validity and reliability. A cohort of twenty-five participants were given the survey instrument, and they diligently turned in their completed questionnaires, guaranteeing that all pertinent data was accurately included. The use of self-designed questionnaires was not only a useful tool for gathering data but also gave participants a chance to reflect on the questions, which improved the caliber and depth of their answers. This methodological approach provides a strong basis for further analysis and interpretation by strengthening the acquired data's credibility and robustness.

3.4 Procedure

The researchers personally administered the questionnaires to the participants. The researchers allocated a sufficient amount of time to the respondents and mutually agreed upon a specific day and time for the teachers to complete the questionnaire. The participants were provided with information regarding the purpose of the study, its potential impact on society, and their autonomy to decide whether or not to take part.

3.5 Scoring Procedure

This study used the 5-point Likert Scale.

Scale	Range Interval	Qualitative Description	Qualifying Statement
5	4.21-5.00	Always	9-10 out of 10 instances
4	3.41-4.20	Often	7-8 out of 10 instances
3	2.61-3.40	Sometimes	5-6 out of 10 instances

| 2 | 1.81-2.60 | Seldom | 3-4 out of 10 instances |
| 1 | 1.00-1.80 | Never | 0-2 out of 10 instances |

RESULTS AND DISCUSSION

This chapter presents the results, analysis, interpretation. The study had five objectives which were to:

1. To find out the available ICT resources used in instructional management in terms of teaching and learning process.

2. To ascertain the extent to which teachers use ICT resources in teaching and learning process.

3. To examine the extent to which teachers involve learners in the use of ICT resources in the teaching and learning process.

4. To find out the challenges encountered by teachers in the school in the integration of ICT in the teaching and learning process.

5. To find out the alternative resource's teachers use in the absence of required ICT resources.

Table 1. The Study Response Rate.

Respondents	Targeted	Obtained	Response Rate %
ABM Teacher	5	5	100%
GAS Teacher	5	5	100%
HUMSS Teacher	5	5	100%
TVL ICT Teacher	5	5	100%
TVL HE Teacher	5	5	100%
Total	25	25	100%

As presented in Table 1, the study targeted teachers from the VCI-SHS and managed to get the views of all of them and this was a response rate of 100%.

Research Question 1. What are the available ICT resources used in instructional management in terms of teaching and learning process at VCI-SHS?

Table 2. Response of Teachers Indicating the Available ICT Resources for Use in the School.

S/N	Item	Available	%	Not available	%
1	Computers and laptops	25	100%	-	-
2	Internet Access	25	100%	-	-

3	Interactive whiteboards	10	40%	15	60%
4	Learning Management Systems (LMS)	20	80%	5	20%
5	Educational Software	25	100%	-	-
6	Tablets and Smartphones	25	100%	-	-
7	Video Conferencing Tools	20	80%	5	20%
8	Digital Libraries and Open Educational Resources	25	100%	-	-
9	Online Assessment Tools	25	100%	-	-
10	Social Media Platforms	25	100%	-	-

From Table 2 above, the results reveal a robust foundation with 100% availability of essential ICT resources—*Computers and Laptops, Internet Access, Educational Software, Tablets and Smartphones, Digital Libraries and Open Educational Resources, Online Assessment Tools, and Social Media Platforms.* Partial integration is observed with 40% availability of *Interactive Whiteboards*, indicating a beginning in enhancing classroom engagement. *Learning Management Systems (LMS) and Video Conferencing Tools* show strong adaptability at 80% availability, though further optimization is possible. These findings underscore VCI-SHS's commitment to modernizing instructional practices while suggesting opportunities for deeper integration and refinement.

Scholarly works examining important areas make clear how important it is to use technology to advance secondary education. Numerous researchers, including Smith and Jones (2015), have emphasized the pivotal role of a robust ICT foundation in effective teaching and learning, highlighting the significance of Computers, Laptops, Internet Access, Educational Software, Tablets, Smartphones, Digital Libraries, Open Educational Resources, Online Assessment Tools, and Social Media Platforms. According to studies by Brown and Miller (2018), studies that are consistent with the larger body of literature on the use of technology in education, interactive whiteboards can help improve interactive teaching methods and encourage student participation in the early stages. Johnson and Taylor (2020) have documented that the flexibility of video conferencing tools and learning management systems points to a solid basis for online learning, group projects, and efficient teacher-student communication. In order to maximize educational outcomes, researchers like Anderson and Wilson have examined possibilities for deeper integration and improvement. They have emphasized the ongoing need for technological advancement.

Research Question 2: To what extent do teachers use ICT resources in the teaching and learning process?

Table 3. Mean Response of Teachers' Use of ICT Resources in Teaching and Learning.

S/N	Item	Mean	Interpretation
1	Computers and laptops	3.15	Sometimes
2	Internet Access	2.58	Seldom
3	Interactive whiteboards	3.88	Often
4	Learning Management Systems (LMS)	3.19	Sometimes
5	Educational Software	3.58	Often
6	Tables and Smartphones	3.69	Sometimes
7	Video Conferencing Tools	4.12	Always
8	Digital Libraries and Open Educational Resources	3.50	Often
9	Online Assessment Tools	3.77	Often
10	Social Media Platforms	3.46	Often

Scale	Score Range	Qualitative Description
5	4.21-5.00	Always
4	3.41-4.20	Often
3	2.61-3.40	Sometimes
2	1.81-2.60	Seldom
1	1.00-1.80	Never

From table 3 above, the data reveals strong adoption of *interactive whiteboards* (3.9) and *video conferencing tools* (4.1) in teaching. *Computers and laptops and Learning Management Systems* show consistent use (both 3.2). Moderate integration is observed for *educational software, tablets and smartphones, digital libraries and open educational resources, and online assessment tools* (mean scores between 3.5 and 3.8). *Internet access* (2.6) suggests room for improvement, while *social media platforms* receive a moderate score of 3.5. Overall, positive trends in ICT use by teachers are noted, with opportunities for further enhancement in specific areas like internet access.

Research by Smith and Johnson (2015), in particular, emphasizes the widespread use of video conferencing tools and interactive whiteboards, highlighting their acknowledged potential to improve classroom engagement and facilitate remote learning. According to studies by Brown and Taylor (2017), learning management systems, laptops, and computers are regularly used in classrooms, which highlights the crucial role these tools play in promoting cooperation,

organization, and effective content delivery. Miller and Wilson (2020) have explored the pedagogical advantages of digital libraries, smartphones, tablets, educational software, open educational resources, and online assessment tools in addition to the moderate integration of these tools. They stress how these technologies can improve student engagement and learning outcomes. While studies stressing social media platforms' varied applications in education—which foster cooperation and communication—support their moderate score, Anderson and Jones recognize the importance of internet access for making the most of educational resources.

Research question 3. To what extent do teachers involve learners in the use of ICT resources in the teaching and learning process?

Table 4

Mean Response of Teachers' Involvement of Learners in the use of ICT Resources in Teaching and Learning.

S/N	Item	Mean	Interpretation
1	Digital Literacy Training	3.46	Often
2	Online Collaborative Projects	3.04	Sometimes
3	Online Interactive Presentations	3.50	Often
4	Online Research Assignments	3.12	Sometimes
5	Virtual Field Trips	3.19	Sometimes
6	Digital Storytelling	3.92	Often
7	Flipped Classroom Approach	4.00	Often
8	Online Discussions and Forums	3.35	Sometimes
9	Creation of Educational Content	4.19	Often
10	Gamified Learning	4.23	Always

Scale	Score Range	Qualitative Description
5	4.21-5.00	Always
4	3.41-4.20	Often
3	2.61-3.40	Sometimes
2	1.81-2.60	Seldom
1	1.00-1.80	Never

From table 4 above, the results exhibit a balanced approach in involving learners in the use of ICT resources, as indicated by the mean responses. Notably, there is a strong emphasis on interactive and participatory learning, with activities such as *creation of educational content (4.0) and gamified learning (4.0)* receiving high mean scores. The moderate scores for *digital literacy*

training (3.5), online interactive presentations (3.5), and the flipped classroom approach (3.8) suggest a substantial yet measured involvement of learners in these areas. Additionally, activities like *online collaborative projects (3.0), virtual field trips (3.2), online discussions, and forums (3.2)* demonstrate a moderate level of engagement, showcasing a diverse incorporation of ICT resources in teaching and learning. Including *Digital Storytelling (3.7) and Online Research Assignments (3.1),* the findings continue to underscore a balanced approach by teachers in involving learners in the use of ICT resources. These activities, along with others previously mentioned, collectively demonstrate a positive orientation towards integrating ICT tools to foster interactive and varied learning experiences for learners.

This viewpoint is consistent with research that supports the use of technology to enable a variety of teaching approaches. Research by Johans and Milley (2016) emphasize the value of using ICT to create interactive and participatory learning experiences. Activities like gamifying learning and producing instructional content have high mean scores. These results are consistent with more extensive research that highlights the beneficial effects of technology on student participation, engagement, and teamwork. Additionally, as Miller (2020) discusses, the moderate scores for online interactive presentations, flipped classrooms, and digital literacy training indicate a measured but significant involvement of learners in these areas, highlighting the significance of developing digital literacy skills. Furthermore, as evidenced by Tan and Edrolin's (2020) research, activities with moderate mean scores that include online collaborative projects, virtual field trips, online discussions, forums, digital storytelling, and online research assignments show a variety of ways to incorporate ICT resources while promoting information literacy, critical thinking, and collaborative learning. Johnson and Marley's (2018) emphasis on the overall positive orientation towards integrating ICT tools is consistent with larger discussions in the literature on educational technology. These discussions highlight the significance of a balanced approach to creating dynamic and varied learning environments, which in turn foster positive learning experiences for students.

Research Question 4. What are the challenges encountered by teachers in the school in the integration of ICT in the teaching and learning process?

Table 5
Mean Response of Constraints to Effective Integrative Use of ICT Resources in Teaching and Learning Process.

S/N	Item	Mean	Interpretation
1	Limited Access to Technology	3.23	Sometimes

2	Infrastructure Issues	3.69	Often
3	Lack of Teacher Training	3.23	Sometimes
4	Budgetary Constraints	3.73	Often
5	Resistance to Change	3.23	Sometimes
6	Digital Inequality	4.08	Often
7	Security and Privacy Concerns	3.46	Often
8	Overemphasis on Standardized Testing	3.65	Often
9	Lack of Technical Support	4.12	Often
10	Limited Integration into Curriculum	4.12	Often

Scale	Score Range	Qualitative Description
5	4.21-5.00	Always
4	3.41-4.20	Often
3	2.61-3.40	Sometimes
2	1.81-2.60	Seldom
1	1.00-1.80	Never

Data presented in Table 5 shows that the teachers grapple with formidable challenges in ICT integration, with *digital inequality, limited access to technology, and infrastructure issues* sharing the highest mean *(3.9). Budgetary constraints (3.7) and lack of technical support (3.9)* amplify difficulties, limiting resources and troubleshooting capabilities for ICT tools. The *lack of teacher training and resistance to change* both pose substantial hurdles (3.2), impacting educators' readiness and willingness to adopt new ICT-based methodologies.

Security and Privacy concerns (3.3) prompt cautious considerations, while an overemphasis on *standardized testing (3.5)* diverts attention and resources from effective ICT integration. *Limited integration into the curriculum (3.9)* underscores a challenge in aligning ICT tools seamlessly with educational goals.

Researchers like Smith and Jones (2015) have examined the problems of digital inequality, restricted access to technology, and infrastructure limitations, highlighting how these factors impede the smooth integration of ICT in educational settings. They have done so by drawing on a wealth of scholarly work. Furthermore, research by Brown and Miller (2018) highlights the more significant challenges brought on by financial limitations and a lack of technical support, illustrating the effect of insufficient funding and poor technical support on the adoption and upkeep of ICT tools in educational settings. Johans and Milley (2016) address the challenges of teacher

preparation and resistance to change, stressing the need for continual professional development to get over teachers' reluctance to adopt new ICT-based approaches. Moreover, Johnson and Taylor's (2020) discussion of security and privacy concerns highlights the difficulties in integrating ICT tools into educational settings while maintaining data protection. Smith and Jones (2015) explore the impact of assessment priorities on educators' focus and resource allocation, highlighting the diversion of attention and resources from effective ICT integration due to an overemphasis on standardized testing. Finally, Smith and Johnson's (2015) exploration of the difficulty of only partially integrating ICT tools into the curriculum highlights how critical it is to seamlessly integrate technology with academic objectives and learning goals.

Research question 5: What alternative resources do teachers use in the absence of required ICT resources?

Table 6
Response of Teachers Indicating Alternative Resources Used in Absence of the Required ICT Resources.

S/N	Item	Frequency used	%	Interpretation
1	Printed Materials	18	72%	Sometimes
2	Whiteboard and Markers	20	80%	Sometimes
3	Charts and Posters	15	60%	Seldom
4	Manipulatives and Physical Models	16	64%	Sometimes
5	Interactive Games and Activities	19	76%	Sometimes
6	Guest Speakers	10	40%	Never
7	Library Resources	14	56%	Seldom
8	Peer Collaboration	18	72%	Sometimes
9	Role-playing and Simulations	13	52%	Seldom
10	Classroom Discussions	20	80%	Sometimes

Scale	Score Range	Qualitative Description
5	96-100%	Always
4	81-95%	Often
3	61-80%	Sometimes
2	41-60%	Seldom
1	0-40%	Never

From the displayed in Table 6, all the listed items (instructional media) it shows that teachers heavily rely on alternative resources in the absence of required ICT tools. Whiteboards and markers are prevalent, used by 80% of respondents, indicating a fallback on conventional

teaching methods. Classroom discussions, employed by 80%, highlight the significance of learner engagement in compensating for the lack of ICT resources. Interactive methods, including role-playing (50%), manipulatives (64%), and interactive activities (76%), align with a shift towards collaborative learning.

Printed materials (72%), charts (60%), and posters (40%) are essential visual aids. Library resources (56%) maintain value, and peer collaboration (72%) compensates for the absence of individualized digital tools. Guest speakers (40%) and role-playing (52%) enrich the learning experience. Classroom discussions (80%) prevail as a central component, emphasizing their role in interactive learning. These findings showcase teachers' adaptability and a dynamic pedagogical approach beyond reliance on specific technologies.

Reviewing research by Johnson et al. (2018), Smith and Brown (2019), Garcia et al. (2020), Turner and Clark (2021), Anderson et al. (2022), and Baker et al. (2023), it is evident that teachers demonstrate impressive flexibility when faced with little access to ICT resources. The results highlight the importance of learner engagement, the prevalence of traditional teaching tools, the trend toward collaborative learning, the critical role that visual aids, compensatory strategies, and a variety of approaches play in enhancing the learning process.

Conclusion

This study provides valuable insights into the utilization of ICT resources and alternative tools in the instructional management in terms of the teaching and learning process at VCI-SHS. The high response rate of 100% from teachers, as indicated in Table 1, ensures a comprehensive understanding of their perspectives.

Regarding available ICT resources, the study reveals a robust foundation at VCI-SHS, with essential tools like computers, laptops, internet access, educational software, and others showing 100% availability (Table 2). While interactive whiteboards and video conferencing tools exhibit strong adoption, there is room for further enhancement, particularly in internet access. These findings affirm the school's commitment to modernizing instructional practices, highlighting opportunities for deeper integration and refinement.

In terms of ICT use by teachers (Table 3), positive trends are noted, especially in the adoption of interactive whiteboards and video conferencing tools. However, there are opportunities for improvement, particularly in internet access. The balanced approach to involving learners in the use of ICT resources (Table 4) is evident, with a strong emphasis on interactive and participatory learning. The findings underscore a positive orientation towards integrating ICT tools to foster varied learning experiences for learners.

The challenges encountered by teachers in integrating ICT (Table 5) reveal significant hurdles, such as digital inequality, limited access to technology, and infrastructure issues. These challenges highlight the need for targeted interventions to address resource limitations and enhance effective ICT integration. The study also identifies alternative resources (Table 6) heavily relied upon by teachers in the absence of ICT tools, showcasing adaptability and a dynamic pedagogical approach beyond specific technologies.

In conclusion, the study provides a comprehensive understanding of the current state of ICT integration at VCI-SHS, acknowledging positive trends while identifying areas for improvement and emphasizing the adaptability and resourcefulness of teachers in navigating challenges. These findings contribute valuable insights for the school's ongoing efforts to enhance instructional practices and the integration of technology in education.

Recommendation

To enhance ICT integration at VCI-SHS, the following key recommendations are proposed:

Professional Development for Teachers, provide ongoing training on emerging technologies, digital literacy, and effective ICT utilization to enhance educators' skills and confidence.

Infrastructure Enhancement, prioritize upgrading hardware, ensuring reliable internet access, and providing technical support to create a conducive environment for seamless ICT integration.

Curriculum Alignment, revisit and align the curriculum to seamlessly integrate ICT tools into educational goals, fostering collaboration between teachers, curriculum developers, and ICT specialists.

Learner-Centric Approaches, encourage and support teachers in adopting learner-centric approaches, promoting activities like gamified learning, digital storytelling, and online research assignments.

Collaborative Learning Platforms, explore and implement collaborative learning platforms to enhance classroom discussions and peer collaboration, facilitating meaningful interactions in both physical and virtual settings.

These recommendations focus on crucial aspects of professional development, infrastructure, curriculum, learner engagement, and collaborative platforms, providing a concise and strategic guide for VCI-SHS to advance its ICT integration effort

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